VR19 - Regulation COURSE OUTCOMES

(B.Tech, M. Tech, MBA & MCA)

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VIGNAN'S INSTITUE OF INFORMATION TECHNOLOGY (A) DEPARTMENT OF CIVIL ENGINEERING VR19 B.Tech - Civil Engineering Course Ourcomes

~	me Code	Programme	Course Code			CO Course Outcomes Course Outcome: After the completion of the course		
LIUII		Name	Course Code	Course Name	co	student will be able to		
	inc code	Name			COI	Executing mean value theorems and evaluate maxima and		
					COI	minima of functions of two variables without constraints		
		B Tech-Civil			CO2	Apply the analytical methods to solve higher order linear		
/R19	01		1000191100	Mathametics-1		differential equations.		
		Engineering			CO3	Evaluate of solution of Ordinary differential equations by		
				-		using Laplace Transform techniques		
-					CO4	Identify and solve partial differential equations.		
					COL	Apply the knowledge of crystal systems and X-ray diffraction techniques. to identify the crystal structure of		
					COT	materials.		
				-		Use the knowledge of acoustics and ultra-sonics for		
		R Tech-Civil			CO2	characterization of acoustics design and non-destructive		
/R19	01	The second secon	1000191120	Engineering Physics	CO2	testing.		
						Describe the wave phenomena and apply these concepts for		
					CO3	construction of Lasers and optical fibers.		
						Discussthe properties and synthesis techniques of		
		ii .			CO4	nanomaterials.		
						Read, understand and interpret material on Environment,		
					COI	Science and Technology, tourism, Energy Sources, Social		
				*		Awareness		
			- 1 1000191121 1		CO2	Analyze the functions of language and grammar in spoken		
		B Tech-Civil		Technical English		and written forms		
VR19	19 01	Engineering		Communication				
					CO3	Write effectively on various domains		
						Prepare and exhibit oral presentation skills by using		
					CO4	ICT(Individual/Team)		
						To remain tourny		
					COL	Analyze the force systems for equilibrium conditions and		
						able to draw free body diagram.		
					CO2	Evaluate the frictional forces between contact surfaces.		
VR19	01		1003191100			Differentiate between centroid and center of gravity and		
rosss/60.79	W E	Engineering	41.0000000 10000000000000000000000000000	Mechanics	CO3	determine Centroid, center of gravity and second moment of		
						area for composite sections.		
					CO4	Analyze the motion and calculate trajectory characteristics.		
						Interpret fundamentals of computers and convert		
					CO1	flowcharts/algorithms to C Programs		
			1			A shadeship and be seed as		
					CO2	Apply decision making and iterative		
. m		B.Tech-Civil		Problem solving and	CO2	feature of C programming language effectively		
VR19	01	Section of the Control of the Contro	1 1005191120	programming using C	CO3	Develop programs using modular techniques		
					- 503	Make use of user defined determine and implement them for		
						Make use of user defined datatypes and implement them for various		
					CO4	applications		
V!	R19	R19 01	R19 01 B.Tech-Civil Engineering R19 01 B.Tech-Civil Engineering	R19	R19 01 B.Tech-Civil Engineering 1000191120 Engineering Physics B.Tech-Civil Engineering 1000191121 Technical English Communication R19 01 B.Tech-Civil Engineering 1003191100 Engineering Mechanics	National Engineering 1000191100 Mathametics-1 CO3 CO4		

						COI	Have general knowledge and legal literacy and thereby to
							take up competitive examinations.
6	6 VR19 01	01	B.Tech-Civil Engineering	1000191130	Constitution of India	CO2	Distinguish the power of state and central government
			Linginicering			CO3	Summarize the election procedure in India before and after independence
						CO4	Association with the powers and functions of
						CO4	Municipalities, Panchayats and Cooperative Societies.
						COI	Solve approximate roots of an equation by using different numerical methods.
			1			CO2	Compute Interpolating polynomial for the given data.
7	VR19	01	B.Tech-Civil Engineering	1000191101	Mathematics-II	CO3	Compute Numerical Solution of ODE and Numerical Integration.
						CO4	Evaluate simultaneous linear equations numerically using rank of a matrix and also Eigen values and Eigen vectors of a square matrix.
						COI	Formulate any period function in terms of sine and cosine
						CO2	Simplify a non-periodic function as integral representation
8	VR19	01	01 B.Tech-Civil Engineering	1000191200	Transform and Vector Calculus	CO3	Apply multiple integration techniques in evaluating areas and volume bounded by region.
						CO4	Explain Gradient, divergence and curl operations in vector and scalar fields and apply Green's, Gauss and Stokes theorem as the generalisation of fundamental theorem of integral calculus.
			B.Tech-Civil	1 1000101220	Engineering Chemistry	COI	Measure water quality parameters, corrosive environment and protection of precious metal.
9	VR19	01	Engineering			CO2	Acquire the knowledge on advanced materials
						CO3	Analyze the different forms of energy sources
						CO4	Identify different polymers and their functionalities
						COI	Apply Ohms Law and Kirchhoff's Laws and solve electrical circuits
					Fundamentals of	CO2	Describe the constructional features of DC machines, select suitable starters for DC motors estimate losses and efficiency of DC motor.
10	VR19	01	B.Tech-Civil Engineering	1002191200	electrical and electronics engineering	CO3	Outline the constructional details and operating principles of AC machines and calculate the efficiency identify the characteristics, losses and efficiency of a three-phase induction motor.
						CO4	Identify the structure, operation and characteristics and applications of measuringinstruments and semi-conductor devices
	11 VR19 01					COI	Understand the use of drawing instruments to construct the polygons and curves
11		01	B.Tech-Civil Engineering	1003191101	Engineering Drawing	CO2	Learn the principle of orthographic projections. Draw Orthographic projections of points, lines.
			Engineering		500	CO3	Draw the various types of planes and solids its views in different Positions
						CO4	Draw isometric views of simple objects

						COL	[C-4-4-6] [H] [-1-4-6]
			10			COI	Set out of building in the field Construct a wall of thickness 1 ½ bricks using English bond
						CO2	Construct a wan of timekiess 172 bricks using English bolid
12	VR19	01	B.Tech-Civil Engineering	1001191210	Civil Engineering Workshop	CO3	Install plumbing the fixtures like Tap, T-Joint, Elbow, Bend, Threading.
						CO4	Apply wall putty, painting of wall base coat and laying of tile flooring
						COI	Realize the purpose/Role of Engineer for solving social problems
13	VR19	01	B.Tech-Civil	1000191110	Engineering	CO2	Learn to Design a component/system in an engineering way
		Engineering		Exploration	CO3	Learn to use mechanisms, Arduino, sensors, motors.	
						CO4	Integrating different systems (mechanical/Electrical/computer) to work as a unit
						COI	Learn new skills and boost academic performance
14	VR19	01	B.Tech-Civil Engineering	1000191131	Extra-Curricular Activities, Sports And Games (Audit	CO2	Broader social skills with improved time management
			Engineering		Course)	CO3	Explore Interest and Create Broader perspectives
						CO4	Participate in various co- curricular activities leading to their multifaceted personality development
						COI	Analyse the complex integration by using Cauchy's integral formula and find Taylor's, Maclaurin's series and Laurent series expansion of complex function.
15		9 01	B.Tech-Civil Engineering	1000192100	Complex Variables and Statistical Methods	CO2	Evaluate contour integrals by using Residue theorem and explain the notation of random variables and evaluate the expected value and probability of random variables
13	VR19	O1				CO3	Evaluate the confidence levels and maximum errors for large and small samplings and apply the concept of hypothesis testing for large and small samples in real life situations.
						CO4	Examine correlation for bi-variate data and predict the regression analysis.
						COI	Interpret various instruments to evaluate the required fields of surveying.
						CO2	Describe levelling survey to find elevations followed by contour mapping.
16	VR19	01	B.Tech-Civil Engineering	1001192120	Surveying	CO3	Estimate the distances, areas and volumes, elevations using various advanced methodologies solving most practical problems.
						CO4	Organize simple and compound curves along with examining the various measurements in accessing the aerial surveying with GPS devices.
						COI	Predict the properties of building stones, bricks, tiles and its classifications.
17	VR19	01	B.Tech-Civil	1001192100	Building Materials	CO2	Describe the types of masonry and the properties, types, defects and alternatives of wood
			Engineering		and Construction	CO3	Identify building components include lintels, staircases, floors, roofs and trusses
						CO4	Distinguish the finishings include proofing, plastering, pointing, washing, paints and describe formwork and scaffolding.

						COI	Understand the basics of material properties, stress and strain and evaluate the stress of thin cylinders.
			D. T. J. G			CO2	Compute the shear force bending moment of beams and
18	VR19	01	B.Tech-Civil Engineering	1001192121	Strength of Materials	CO3	Determine the flexural stresses, shear stresses and deflection in beams and springs
						CO4	Analyze columns and strutssubjected to axial loading under various end conditions anddetermine the deflections
							androtations produced by Torsionalloading of shafts
							Describe the physical properties of fluids & their influences
						COI	on fluid motion and Compute hydro static forces on various sub merged Surfaces.
19	VR19	01	B.Tech-Civil Engineering	1001192122	Fluid Mechanics	CO2	Compare the concepts of kinematics and dynamics of fluid flow.
			Engineering			CO3	Analyze the boundary layer of fluid in laminar and turbulent flows.
						CO4	Calibrate flow in pitot tube, venturi meter, orifice meter, orifices, notches and weirs
					×	COI	construction.
20	20 VR19 01	01	B.Tech-Civil	- 1 1001107101	Building Planning and Drawing	CO2	Describe the orientation, standards, requirements, types and planning of various residential and public buildings.
		-	Engineering			CO3	Draw the sign conventions of various types of building materials and bonds.
						CO4	Produce plans and sectional elevations of various residential and public buildings.
				1001192200		COI	Distinguish between stable and unstable and statically determinate and indeterminate structures.
						CO2	Analyze the S.F, B.M and deflection of propped, fixed and continuous beams.
21	VR19	01	B.Tech-Civil Engineering		Structural Analysis-I	CO3	Calculate the deflections of beams by using strain energy method and apply the moment distribution method and slope deflection method to analyze statically indeterminate structures
						CO4	Evaluate and draw the influence lines for reactions, shears, and bending moments in beams and girders due to moving loads.
						COI	Finalize suitable highway alignment and Design of geometric elements for different terrains.
22	VR19	01	B.Tech-Civil Engineering	1001192220	Transportation Engineering	CO2	Describe traffic engineering studies include traffic studies like volume parking, signaling, accident etc.
						CO3	Distinguish the highway materials and its suitability for different types pavement
						CO4	Assess the required Ideal Railway Alignment and suitable site for airport construction

						COI	Analyzing the behaviour of uniform and non- uniform flow
						COI	in a open channel.
					l	CO2	Creating a model for a prototype by using the concept of
			B.Tech-Civil		Hydraulic and	CO2	simulation techniques.
23	VR19	01	Engineering	1001192221	Hydraulic Machinery	CO3	Applying the concept of generating hydroelectricity using hydraulic turbines.
							Estimate the head and discharge through Centrifugal-Pumps
						CO4	and Reciprocating-Pumps in detail
						COI	Analyze problems associated with water supply engineering
							Design water conveyance, treatment, storage and
24	VR19	01	B.Tech-Civil	1001192222	Environmental	CO2	distribution systems.
	VICI	O1	Engineering	1001192222	Engineering	CO3	Solve societal water supply engineering problems through
						proper investigations and interpretation	
						CO4	Determine and maintain quality standards in water supply schemes.
						COI	Interpret and participate in writing skills that are needed in
			B.Tech-Civil Engineering	1020192100-	Employability Readiness Program-1 (Open Elective-1)		an organisation
		01				CO ₂	Recognize the need of core competencies to succeed in
25	VR19						professional and personal life.
25	VICIO					003	Solve various basic mathematics problems by following
						CO3	different methods and to perform in various competitive exams and placement drives.
			ł				
						CO4	Apply shortcut methods to solve problems and confidently.
						COI	Interpret and manage in public governance
26	VR19	01	B.Tech-Civil	1020192101	Public Administration	CO2	Participate in and contribute to the policy process.
			Engineering			CO3	Analyse, think critically, solve problems and make
							decisions.
_			-			CO4	Articulate and apply a public service perspective.
						COI	Construct simple sentences in French using Syntax and
						CO2	grammar. Pronounce and read French reasonably well.
27	27 VR19	01	B.Tech-Civil	1020192102	Foreign Linguistic -	CO2	
-	7107	VI.	Engineering	1020192102	French	CO3	Demonstrate an elementary knowledge of French sentence
							through speaking and writing
						CO4	Apply basic spoken French and demonstrate understanding
						by writing and/or responding properly	

28	VR19	01	B.Tech-Civil Engineering	1000192130	Environmental Science (Audit Course)	CO1 CO2	Gain a higher level of personal involvement and interest in understanding and solving environmental resource problems and its sustainable conservation practices. Overall understanding of the relationship between man and ecosystem & biodiversity. Demonstrate knowledge relating to the biological systems involved in the major global environmental problems of the 21st century. Recognize the interconnectedness of human dependence on
						CO4	the earth's ecosystems and influence their society in proper utilization of goods and services. Analyse the functions of language and grammar in spoken
						COI	and written forms with an emphasis on LSRW Skills.
29	VR19	01	B.Tech-Civil Engineering	1000192110	Communication Skills Lab	CO2	Disseminate the relevant skills while performing GDs, interviews, oral presentations with a focus on Non-verbal communication.
					5 min 240	CO3	Prepare and exhibit oral presentation skills by using ICT. (Individual/Team)
						CO4	Organize proper life skills for their employability.
		9 01	B.Tech-Civil Engineering	1 1001192170 1	Mini Project-I (EPICS/Societal Relevant Project)	COI	Understand the various social problems present in the world &problem to develop a technological project
30	VR19					CO2	Utilise the design thinking and project management with various technical software in addressing the project Apply the engineering knowledge,
						CO3	mathematics, design thinking and project management to develop a community project.
						CO4	Recogniseprofessional responsibilities and make informed judgements in civil practice.
					Managerial	CO1	Analyse the Demand, Price and Cost.
31	VR19	01	B.Tech-Civil	1099192100	Economics and	CO2	Identify the Nature of different markets
-		•	Engineering	1077172100	Financial Analysis	CO3	Understand Various Business Forms.
					anolar z marysts	CO4	Evaluate investment project proposals.
						COI	Identify the various types of materials and understand the quality control tests on construction materials
32	VR19	01	B.Tech-Civil	1001102120	Concerete	CO2	Assimilate the behaviour of fresh concrete and special concretes.
32	VKIS	υı	Engineering	1001193120	Technology	CO3	Determine the durability properties of hardened concrete.
						CO4	Design various grades of concrete mixes as per IS Code.

						CO1	
						CO1	Classify the different types of soil using Indian Standards
						CO2	Analyse the permeability of soils and solve seepage related problems.
33	VR19	01	B.Tech-Civil	1 1001102121	Geotechnical	CO3	Evaluate the stresses transformed through soils and compute geostatic and induced stresses
4.11.2.1			Engineering		Engineering		Evaluate the rate of consolidation, time rate of settlement
				}		CO4	and shear parameters of the effected by different drainage conditions.
						COI	Sketch the hydrologic cycle and discuss its impact on Environment.
34	VM10	0.1	B.Tech-Civil	1001103100	Hydrology and Water	CO2	Estimate various abstractions from Precipitation like Evaporation, Evapotranspiration and Infiltration.
34	VR19	01	Engineering	1001193100	Resources Engineering	CO3	Develop Hydrographs of a Catchment by evaluation the rainfall trends.
						CO4	Analyse frequency of Floods to estimate design flood, flood routing and groundwater movement.
							Interpret the concepts of working stress method and the
		7			CO1	limit state method and their relation to the design of structures.	
	100000000000000000000000000000000000000		B.Tech-Civil		Design of Reinfored	CO2	Outline the behaviour of RCC structural members for safe design.
35	35 VR19	01	Engineering	1001193101	Concrete Structures	CO3	Identify reinforced concrete beam failure modes under shear, torsion and design reinforcement details.
						CO4	Design basic structural elements (beams, slabs, columns, footings and staircase) according to the design code of IS 456: 2000.
			B.Tech-Civil Engineering	1020193160	Employability Readiness Program -2	COI	Have adequate writing skills that are in an organisation and perform well during campus drives and different interviews
						CO2	Understand the core competencies to succeed in professional and personal life and develop knowledge & experience with the use of standard programming language
36	VR19	01				CO3	Solve various Basic Mathematics problems byfollowing different methods and analysis, quantitative forms including table, graphs and formulas
						CO4	Follow strategies in minimizing time consumption in problem solving Apply shortcut methods to solve problems and confidently solve any mathematical problems and utilize these mathematical skills both intheir professional as well as personal life.
						COI	Explain the fundamentals of solar photovoltaic (PV) energy systems
37	VP10	0.1	B.Tech-Civil	1002102160	Solar Photovoltaic	CO2	Analyse the characteristics of solar radiation, PV cells, modules and arrays
ונ	VR19	01	Engineering	1002193160	Energy Systems	CO3	Design of Stand-Alone PV Schemes with battery energy storage and grid- connected PV schemes
						CO4	Analyse the system level issues related to PV energy systems
						COI	Understand the basic terminology used in object-oriented programming
38	VR19	01	B.Tech-Civil	1005193160	Programming in C++	CO2	Describe the object-oriented programming approach in connection with C++
			Engineering		S	CO3	Apply the concepts of object-oriented programming
						CO4	Apply virtual and pure virtual function and complex
							programming situations

						COI	Summarize robot components, configurations and different end effectors.
39	39 VR19 01	01	B.Tech-Civil Engineering	1003193160	Industrial Robotics	CO2	Select a robot for a given application and illustrate the working principles of various actuators and sensors that can be used in the manipulator, control system that can be used as well as the method of programming the robot.
						CO3	Analyse a given serial manipulator kinematically and dynamically.
						CO4	Derive as well as analyse the equation of trajectory that the end-effector should follow given the boundary conditions.
						COI	Analyse a complex engineering problem and to apply principles of civil engineering and relevant disciplines to identify solutions
40	40 VR19 01	01	B.Tech-Civil Engineering	1001193180	Technical Seminar	CO2	Design, implement, and evaluate a solution to meet the requirements in the context of the civil engineering program's discipline.
						CO3	Apply civil engineering fundamentals to produce proper solutions to real world problems.
						CO4	Recognize professional responsibilities and make informed judgments in civil practice based on legal and ethical principles.
						COI	Relate Ethical Human Values .
41	VR19	01	B.Tech-Civil Engineering	1099193130	Universal Human Values and	CO2	Apply Engineering knowledge for societal benefits.
			Engineering		Professional Ethics	CO3	Demonstrate responsibility for Safety, Risk & rights.
					,	CO4	Outline the various Current Global Issues
						CO1	Illustrate basic insights of management principles
				190		CO2	Summarize Production process, and Inventory techniques
42	VR19	19 01	B.Tech-Civil Engineering	1099192200	Management Science	CO3	Apply Strategies and policies to functional areas.
					CO4	Understand Contemporary management Practices.	

						COI	Identify the failure modes of bolted and welded different connections, and determine their Understanding design strengths.
43	VR19	01	B.Tech-Civil Engineering	1001193201	Design of Steel Structures	CO2	analyze and design tension members xompression members and beams
						CO3	create the solution for purlins to withstand the wind loads.
						CO4	design and complecated structurelike plategrider -1
						COI	Understand the failure of some civil engineering constructions due to geological drawbacks through some case histories.
44		01	B.Tech-Civil	1001193202	Engineering Coolean	CO2	Differentiate various rock forming minerals and economic minerals based on their physical properties and distinguish igneous, sedimentary and metamorphic rocks based on megascopic properties
44	VR19	υı	Engineering	1001193202	Engineering Geology	CO3	Describe the common geological structures associate within different rock strata and classify
						CO4	Investigate the project site or site selection for mega/mini civil engineering projects like Dams, Tunnels, disposal sites etc applying geological and geophysical methods such as Electrical resistivity method, seismic methods, gravity methods etc.
				1001193203	Estimation Specifications & Contracst	COI	Understand the preparation of an Abstract Estimate and detailed estimate of building
45	VR19	01	B.Tech-Civil			CO2	Calculate the quantity of materials required for civil works as per specifications
73	VICI	.17	Engineering			CO3	Determine earth work quantity for roads and canals
				/	Contract	CO4	Design bar bending schedule for reinforcement works, identify specifications and tendering process for contracts
						COI	and create various tender documents for bidding purpose Analyze the two hinged and three hinged arches for
			B.Tech-Civil		Advanced Structural	CO2	different support levels Analyze structures using portal and cantilever methods
46	VR19	01	Engineering	1001193250	Analysis	CO3	Analyze Cable structures and plastic behavior of structures
						CO4	Analyze structures using Kani's and Matrix methods.
						COI	Have knowledge on air pollutant control devices and the NAAQ standards.
			D Took Civil		Environmental	CO2	Differentiate the treatment techniques used for solid and industrial wastewater treatment methods.
47	VR19	01	B.Tech-Civil Engineering	1001193251	Pollution Control	CO3	Appreciate the methods of environmental sanitation and the management of community facilities without spread of epidemics.
						CO4	Appreciate the importance of sustainable development while planning a project or executing an activity.
						COI	Prepare the soil investigation report by using suitable field test
			P Tack Ciril		Gaotachuical	CO2	Analyze stability of slopes using suitable methods
48	VR19	01	B.Tech-Civil Engineering	1001193252	Geotechnical Engineering-II	CO3	Calculate the earth pressure values for design of retaining structures
						CO4	Determine the bearing capacity of the soil using different

						COI	Correlate Water requirement of different crops in each season.
49	VR19	01	B.Tech-Civil	1001193253	Hydraulic Structures	CO2	Design lined & unlined canalwithout impacting the
			Engineering			000	surroundings during floods.
						CO3	distinguish differentdrainage works and regulation works
\vdash			-			CO4	analyse the safety andstabilioty of gravity dams
						COI	Plan subsurface investigation based on the requirement of project and site condition
							Execute subsurface exploration tests, collect
			1		Subsurface	CO ₂	disturbed/undisturbed samples for laboratory tests and
50	VR19	01	B.Tech-Civil	1001193254	Investigation and		suggest design parameters
"	11017	0.	Engineering	1001175254	Instrumentation	CO3	Adopt suitable methods for estimation of soil properties
					mstrumentation	CO3	required for design
							Work with relevant instrumentation required for
						CO ₄	characterizing the soil and rock with interdisciplinary
							approach.
						COI	Analyse Traffic Problems And Plan For Traffic Systems
						COI	Various Uses Based on Traffic Surveys
						CO2	Design of intersection facilities including pedestrian
51	VR19	01	B.Tech-Civil	1001193255	Traffic Engineering	CO2	facilities and cycle tracks
"	JI VKI9 UI	Engineering	1001193255	and Management	CO3	Design of control devices for improving vehicular flows and	
					CO3	Develop efficient Traffic Management Systems.	
						CO4	Application of Traffic demand and management techniques
						CO4	for improving vehicular flows.
						COI	Explain the concepts and drive train configurations of
					Electric Vehicles	COI	electric drive vehicles.
			01 B.Tech-Civil Engineering			CO2	Describe different electric propulsion systems and energy
						CO2	storage devices
52	VR19	01				CO3	Discuss the technology, design methodologies and control
			Linginicering			COS	strategy of electric vehicles.
			1				Explain battery charger topologies for electric vehicles and
						CO4	discuss how the sizing of the drive system is done and
							energy management strategies used in electric.
-		-		-	-	COI	Understand the Architecture, protocols and applications of
						COI	IoT.
			B.Tech-Civil			CO2	Analyse the communication protocols and standards used in
53	VR19	01	Engineering	1019193260	Internet of Things		IoT
			Zinginicerining			CO3	Design the simple IoT applications to monitor or control
							IoT devices using simulation or hardware
\vdash						CO4	implement real time applications
						COI	Relate the procedural and object paradigm, with real world
							entities
54	54 VR19 0	01	B.Tech-Civil	1005193261	Oops through Java	CO2	Use Exception handling and multithreading mechanisms to
"		0.	Engineering	1005175201	Cops unough sava		create efficient software application
						CO3	Implement GUI Applications with modern tools
						CO4	Design various layouts along with applet usage
						CO1	Make use of the conventional signs and symbols
			B.Tech-Civil		Computer Aided	CO2	Draw the plan and sectional elevation of footing
55	55 VR19	19 01	B.Tech-Civil Engineering	1 1001103710 1	Civil Engineering	CO3	Design the plan, elevation and section of single storied and
			Linginicering		Drawing	CO3	multi storied building
						CO4	Develop the plan and cross section of doglegged staircase

						COI	Analyse a complex engineering problem and to apply principles of civil engineering and relevant disciplines to
		01	B.Tech-Civil			CO2	Design, implement, and evaluate a solution to meet the requirements in the context of the civil engineering
56	VR19		Engineering	1001193270	Mini Project-II	CO3	program's discipline Apply civil engineering fundamentals to produce proper solutions to real world problems.
						CO4	Recognize professional responsibilities and make informed judgments in civil practice based on legal and ethical
						COL	principles. Retrieve the information content of remotely sensed data.
						CO1	
57	VR19	01	B.Tech-Civil Engineering	1001194111	GIS and Remote Sensing Applications	CO2	Compute an image visually and digitally with digital image processing techniques.
			Digmeering		Sensing reprications	CO3	illustrate GIS applications in Civil Engineering domain
					CO4	Analyze spatial and attribute data for solving spatial problems	
						COI	Design of beams, columns and frames for RCC and steel by using Staad pro
58	VR19	01	B.Tech-Civil	1001104110	Computer Aided	CO2	Design of slabs, towers, buildings and water tank by using Staad pro
50	36 VK19 01	01	Engineering	1001194110	Design Lab	C03	At the end of the course the student acquires hands on experience in design
						CO4	Prepare structural drawings for concrete / steel structures normally encountered in Civil Engineering practice
			B.Tech-Civil Engineering	1 1001194150 1	Prestressed Concrete -	COI	Understand the concepts of pre-stressing in concrete structures and identify the materials for pre-stressing.
59	VM10	01				CO2	Calculate the stresses, losses and deflections of pre and post tensioned members.
39	VR19					CO3	Design flexure and shear reinforcement for prestressed concrete
						CO4	Interpet the torsional reinforcement and calculate the anchorage zone stresses in pre and post tension.
				-		COI	Design geometrics in a railway track
60	VR19	01	B.Tech-Civil		Railway, Airport and	CO2	Illustrate the master plan and site selection for Railway station and airport
			Engineering		Harbour Engineering	CO3	Design geometrics for airfield pavements
						CO4	Plan, construct and maintain docks and harbours
						COI	Distinguish between the quality of domestic and industrial
			B.Tech-Civil		Industrial Waste and	CO2	water requirements and wastewater quantity generation Distinguish between the quality of domestic and industrial
61	VR19	01	Engineering	1001194155	Waste Water Engineering	CO3	water requirements and wastewater quantity generation Describe the common methods of treatment in different
						CO4	industries Explain operational problems of common effluent treatment
						COI	plant Construct network diagrams and compute critical path,
					Construction	CO2	slack and floats for a given network diagram. Apply techniques to optimize time, cost and manpower
62	VR19	01	B.Tech-Civil Engineering	1001194152	Technology and		resources. Identify the suitable equipment for performing different
					Management	CO3	construction operations. Understand the fundamentals of quality management and
						CO4	safety management systems in construction industry

						COI	Understand The basic of components of pavement, stresses occurred in pavement and the basic elements in design of flexible pavement
63	VR19	01	B.Tech-Civil Engineering	1001194156	Payment Analysis and Design	CO2	Design of the flexible pavements along with various Standard methods
						CO3	Design of the Rigid pavements along with various standard methods
						CO4	Analysis of Temperature stresses, reinforced slabs
							Understand evaluate and create the basic concept of
						COI	environmental impact assessment, Flow of EIA, Types of
					Environmental		environmental Impacts
64	VR19	01	B.Tech-Civil	1001194153	Impact Assessment	CO2	Implement different methods in preparing an Environmental
"	11017		Engineering	1001174133	and Management	CO2	Impact Statement
					and management	CO3	Identify various mitigation measures that can be used.
1						CO4	Access environmental impacts and indicate their potential
							risks through environmental indices and indicators
						CO1	Analyse the vibration related problems in foundations
						CO2	Design the various machine foundations with respect to
65	VR19	01	B.Tech-Civil	1001194158	Soil Dynamics and	CO2	Indian standards.
03	VICIO	01	Engineering	1001194138	Foundations	CO3	Conduct the various types of tests to find the dynamic
						- 003	properties of the soil
						CO4	Calculate the dynamic bearing capacity of soil under
							shallow and pile foundations
ľ					Finite Element Method	COI	Understand the basic concepts in Finite element method
		01	B.Tech-Civil Engineering	1001194157		CO2	Analyse the one dimensional and two-dimensional
66	VR19					CO2	problems in finite element method.
	W-144000 V-					CO3	Solve one dimensional problem
						CO4	Apply the shape functions and Isoperimetric elements in
						CO4	finite element evaluation
						COI	Decide the suitable ground improvement method and
						COI	their suitability to different field situations.
						CO2	Design a reinforced earth embankment and check its
67			B.Tech-Civil		Ground Improvement		stability.
67	VR19	01	Engineering	1001194154	Techniques	CO3	Analyse the various functions of Geosynthetics and their
					A A S A S A S A S A S A S A S A S A S A		applications in Civil Engineering practice.
							Analyse the various functions of Geosynthetics and their
						CO4	applications in Civil Engineering practice.
-							Di
						CO1	Discuss the fundamental principles of nanotechnology and
							their application to biomedical engineering
						CO2	Apply engineering and physics concepts to the nano-scale
)			and non- continuum domain.
68	VR19	01	B.Tech-Civil	1003194160	Nani Technology	CO3	Choose appropriate synthesis technique to synthesize
"	68 VR19		Engineering	1003134100		CO3	quantum nanostructures of desired size, shape and surface properties
					}		Evaluate state-of-the-art, characterization methods for
							nanomaterials, and CO4 determine nanomaterial safety and
						CO4	handling methods required during characterization.
							monious required during characterization.

						COI	Understand the working principle of steam power plant and its circuits
69	VR19	01	B.Tech-Civil	1003194154	Power Plant	CO2	Illustrate the working of diesel and gas power plant and its components and compare it with steam power plant.
			Engineering		Engineering	CO3	Evaluate the performance of Hydro power plants and explain the components and working nuclear power plants.
						CO4	Analyze the economics involved in power plant
			0			COI	Recognise the characteristics of machine learning that make it useful to real- world problems
70	VR19	01	B.Tech-Civil	1005194160	Introduction to	CO2	Characterise the machine learning algorithms as supervised, semi-supervised and un-supervised
			Engineering		Machine Learning	CO3	Use support vector machine, regularized regression algorithms.
						CO4	Understand the concept behind neural networks for learning non-linear functions
			D.T. 1 6: 11			COI	Analyse the entrepreneurship design and the business environment.
71	VR19	01	B.Tech-Civil	1001194270	Main Project /	CO2	Define industrial policies.
			Engineering		Internship	CO3	Explain the business preparation.
						CO4	Integrate the knowledge of various courses and their applications in industry.

VIGNAN'S INSTITUE OF INFORMATION TECHNOLOGY (A) DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING VR19 B.Tech - Electrical and Electronics Engineering

	VR19 B.Tech - Electrical and Electronics Engineering								
S.No	Regula tion	Progra mme Code	Programme Name	Course Code	Course Name	со	Course Outcome: After the completion of the course student will be able to		
						CO1	Execute mean value theorems and evaluate maxima and minima of functions of two variables without constraints.		
1	VR19	02	B.Tech-Electrical and Electronics	1000191100	Mathematics-I	CO2	Apply the analytical methods to solve higher order linear differential equations.		
			Engineering			CO3	Evaluate and solve initial and boundary value problems arising in engineering stream.		
						CO4	Identify and solve ordinary differential equations using Laplace transforms		
						COI	Understand basic knowledge of crystal structures to characterize the materials using X-ray diffraction techniques.		
2	VR19	02	B.Tech-Electrical and Electronics	1000191122	Solid State	CO2	Interpret the magnetic and electrical properties of materials.		
	vici)	02	Engineering	1000171122	Physics	CO3	Analyzethe important properties of superconductors and their utilization in different engineering applications.		
-						CO4	Analyze energy bands in crystalline solids to understand semiconductor physics.		
			7			COI	Solve approximate roots of an equation by using different numerical methods.		
	1		B.Tech-Electrical		Mathematics –	CO2	Compute interpolating polynomial for a given data		
3	VR19	02	and Electronics	1000191101	II	CO3	To understand different numerical methods to solve integrations and ordinary differential equations.		
			Engineering			CO4	Solve the system of Linear equations using rank of a matrix and also Eigen values and Eigen vectors of a square matrix		
						COI	Analyze the force systems for equilibrium conditions and able to draw free body diagram.		
			B.Tech-Electrical			CO2	Evaluate the frictional forces between contact surfaces.		
4	VR19	02	and Electronics Engineering	1003191100	Engineering Mechanics	CO3	Able to differentiate between centroid and centre of gravity and determine Centroid, centre of gravity and second moment of area for composite sections.		
						CO4	Analyse the motion and calculate trajectory characteristics.		
					Problem Solving	COI	Interpret fundamentals of computers and convert flowcharts/algorithms to C Programs, compile and debug programs		
5	VR19	02	B.Tech-Electrical and Electronics	1005191120	and Programming	CO2	Apply decision making and Iterative feature of C Programming language effectively.		
			Engineering	1	using C	CO3	Design and implement programs to analyze the different pointer applications		
						CO4	Apply structures and unions and Implement file Operations in C programming for any given problem		
						CO1	Have general knowledge and legal literacy and thereby to take up competitive examinations		
6	VR19	02	B.Tech-Electrical and Electronics	1000191130	Constitution of	CO2	Understand state and central policies, fundamental duties.		
			Engineering		India	CO3	Understand Electoral Process, special provisions.		
						CO4	Assess the powers and functions of Municipalities, Panchayats and Cooperative		

			B.Tech-Electrical		Extra-Curricular		Learn new skills
7	VR19	02	and Electronics	1000191131	Activity (Audit	CO2	Boost academic performance
			Engineering		Course)	CO3	Broader social skills
					and the same of th	CO4	Improve time management
						COI	Formulate any period function in terms of sine and cosine
			B.Tech-Electrical			CO2	Simplify a non periodic function as integral representation
8	VR19	02	and Electronics	1000191200	Transforms and		Apply multiple integration techniques in evaluating
		-	Engineering	1000171200	Vector Calculus	CO3	areas and volume bounded by region.
							Apply Green's, Gauss and Stokes theorem as the
						CO4	generalisation of fundamental theorem of integral
							calculus.
						CO1	Identification of different polymers and their
						1-2-1-1-1-1	functionalities
9	VR19	02	B.Tech-Electrical and Electronics	1000191123	Applied Chemistry	CO2	Determination of structure to many compounds and apply the basic knowledge in construction of cell and its applications
			Engineering		Chemistry	CO3	Analysis of corrosive environments and protection of precious metal
							Adoption of different green methodologies and acquire
						CO4	knowledge on different advanced materials
						COI	Determine hardness and alkalinity of water.
10	VR19	02	B.Tech-Electrical and Electronics		Applied Chemistry -	CO2	Determine the concentration of acids.
			Engineering		Laboratory	CO3	Compute the iron (II) by using solutions
						CO4	Construct a galvanic cell
						COL	Solve various Electrical networks in the presence of
						COI	active and passive ELEMENTS
						CO2	Analyse Electrical networks with various Network
			B.Tech-Electrical			CO2	theorems for Dcexcitation
11	VR19	02	and Electronics	1002191221	Electrical		Illustrate R, L, C networks and solve various networks
1	VICIS	02	Engineering	1002171221	Circuit Analysis-	CO3	with ACCO3 excitation along with theorems and
			Engineering		I		Resonance concept
							Compare Electric and Magnetic Circuits and solve
						CO4	Magnetic circuits ALONG WITH DOT
							CONVENTION
						COI	Understand the use of drawing instruments to construct
							the polygons and curves
12	VR19	02	B.Tech-Electrical and Electronics	1003191101	Engineering	CO2	Learn the principle of orthographic projections. Draw Orthographic projections of points, lines.
			Engineering		Drawing	CO3	Draw the various types of planes and solids its views in different Positions
						CO4	Draw isometric views of simple objects

		e				COI	Read, understand and interpret material on Environment, Science and CO1 Technology, tourism,
			B. Tech-Electrical		Technical		Energy Sources, Social Awareness
13	VR19	02	and Electronics	1000191121	English	CO2	CO2 Analyze the functions of language and grammar in
1	5 SAMO	2344	Engineering		Communication		spoken and written forms.
					Communication	CO3	Write effectively on various domains
						CO4	Prepare and exhibit oral presentation skills by using
						CO4	ICT(Individual/Team)
							Understand different operations: Fitting, smithy,
						001	carpentry and Electrical
						COI	wiring.
			B.Tech-Electrical	·		CO2	Perform the fitting and carpentry operations.
14	VR19	02	and Electronics	1003191210	Engineering	00.	Develop simple objects like funnel, elbow etc. using
			Engineering	1000171210	Workshop	CO3	sheet metal.
							Apply basic electrical engineering knowledge for house
							wiring practice like stein sees wiring assistant and applied
						CO4	wiring practice like stair case wiring, series and parallel connections
						,	Connections
			D.Task Flant			COI	CO1 Realize the purpose/Role of Engineer for solving
15	VR19	02	B.Tech-Electrical	1000101110	Engineering	0.000 Bit 140	social problems.
15	VKI9	02	and Electronics	1000191110	Exploration	CO2	Design engineering way. a component/system in an
			Engineering			CO3	Implement mechanisms, Arduino, sensors, motors
\vdash						CO4	Design prototype machine using Arduino Uno board.
						COI	Distinguish between various types of signals and
			B.Tech-Electrical		Fundamentals of		systems.
16	VR19	02	and Electronics	1002192100	Signals and	CO2	Understand the conversion of continuous time signals to
			Engineering		Systems		discrete time signals and vice versa.
					Systems	CO3	Interpret continuous time LTI systems
\vdash						CO4	Analyze discrete time LTI systems
						COI	Understand the working principle and construction of
			_ 1				DC machine and Transformers
1 1							
			B.Tech-Electrical			CO2	Examine the characteristics and Testing methods of DC
17	VR19	02	and Electronics	1002192120	Electrical	002	Machines and Transformers
4800	97 300 EVENTS		Engineering		Machines-I		
						CO3	Illustrate speed control methods of DC Motors and
						003	study the losses in DC Machines and Transformers
						CO4	Develop Phasor diagrams for Transformer with
						004	different load conditions
							Calculate electric field from various charge distributions
						COI	and find magnetic field from various current
							distributions.
							Understand polarization in dielectrics, electric current
							density, and resistance of conductors and also Calculate
100			B.Tech-Electrical			CO ₂	force in electric and magnetic fields and torque in
18	VR19	02	and Electronics	1002192101	Electromagnetic		magnetic fields.
"	V IC1 7	UZ	Engineering	1002192101	Fields		- 1985 - 1985
			Linginicaling				Data di
8						COL	Determine inductance, capacitance of different physical
1 1						CO3	configurations.
1							
						CO4	Apply Faraday's Law to calculate induced Emf and
						CU4	understand the effect of Electromagnetic radiation.

		1				
					CO1	Distinguish the characteristics of different diodes and choose appropriate diode for an application based on the operation
19 VR19	02	B.Tech-Electrical	1004102122	Basic Electronic	CO2	Explain the operation and design aspects of rectifiers, and filter.
19 VR19	02	and Electronics Engineering	1004192122	and Circuits	CO3	Design different biasing and stabilization circuits and explain compensation techniques for a transistor.
					CO4	Analyze positive and negative feedback and the role of feedback in oscillators and amplifiers.
					COI	Analyze the functions of language and grammar in spoken and written forms with an emphasis on LSRW Skills.
20 VR19	02	B.Tech-Electrical and Electronics Engineering	1000192110	Communication Skills Lab	CO2	Disseminate the relevant skills while performing GDs, interviews, oral presentations with a focus on Non verbal communication.
					CO3	CO3 Prepare and exhibit oral presentation skills by using ICT.(Individual/Team)
					CO4	Organize proper life skills for their employability.
					COI	Understand the measurement of three-phase power under balanced and unbalanced load condition.
21 VR19	02	B.Tech-Electrical and Electronics	1002192102	Electrical Circuit Analysis-	CO2	Analyze transient response of the electrical networks with DC and AC excitation.
	02	Engineering	1002172102	II	CO3	Determine the two port network parameters for different types of electrical networks.
					CO4	Realize the electrical equivalent network for a given network transfer functions
					COI	Understand the construction and operation of induction motors and synchronous machines
22 VD10	02	B.Tech-Electrical	1002102220	Electrical	CO2	Interpret the torque producing mechanism and testing methods of induction motors and regulation of synchronous machines
22 VR19	02	and Electronics Engineering	1002192220	Machines-II	CO3	Analyze various starting methods, phasor diagrams and equivalent circuit of induction motors and synchronous machines
					CO4	Evaluate the performance of induction motors and synchronous machines in real time applications
					COI	Understand the concept of wave shaping circuits, switching characteristics of diode and transistor, PLL and Timer, the Logic gates and minimization of logic functions.
23 VR19	02	B.Tech-Electrical and Electronics	1004192203	Analog Electronics	CO2	Apply the knowledge of operational amplifiers with linear integrated circuits
		Engineering			CO3	Analyze the active filters using op-amp and Boolean Alzebra expression
					CO4	Design circuits using operational amplifiers for various applications.
		B.Tech-Electrical		Power	COI	Understand the layout of Thermal, Wind, Hydro, Nuclear, Solar, Gas, Geothermal and OTEC power stations.
24 VR19	02	and Electronics	1002192201	Generation	CO2	
27 VICIS	02	Engineering	1002172201	Engineering And Economics	CO3	Compare and contrast the energy scenario and tariffs in India and the World.
		1	l		CO4	

			-				
						COI	Derive the transfer function and state space models for electrical,mechanical and electro-mech systems
25	VR19	02	B.Tech-Electrical and Electronics	1002192221	Control Systems	CO2	Analyze the Transient & Steady State Performance of a different system.
			Engineering		,	CO3	Determine the stability of different Linear Time invariant systems.
						CO4	Design lag,lead and lag-lead compensators for different systems to improve system performance.
						COI	Illustrate basic insights of management principles
26	VR19	02	B.Tech-Electrical and Electronics	1099192200	Management Science	CO2	Summarize Production process, Quality control and Inventory techniques
			Engineering		Solelice	CO3	Apply Strategies and policies to functional areas
						CO4	AnalyzeContemporary management Practices
						COI	Gain a higher level of personal involvement and interest in understanding and solving environmental resource problems and its sustainable conservation practices.
27	VR19	02	B.Tech-Electrical and Electronics	1000192130	Environmental Science	CO2	Overall understanding of the relationship between man and ecosystem & biodiversity
21	VKI	02	Engineering	1000192130	(Audit Course)	CO3	Demonstrate knowledge relating to the biological systems involved in the major global environmental problems of the 21st century
						CO4	Recognize the interconnectedness of human dependence on the earth's ecosystems and Influence their society in proper utilization of goods and services.
						COI	Acquire adequate writing skills that are needed in an organization
					Employability	CO2	Understand the core competencies to succeed in professional and personal life
28	VR19	02	B.Tech-Electrical and Electronics	1020192100	Readiness Program-I (Open Elective-	CO3	Solve various Basic Mathematics problems by following different methods and to perform well in various competitive exams and placement drives.
			Engineering		1)	CO4	Implement strategies in minimizing time consumption in problem solving Apply shortcut methods to solve problems and confidently solve any mathematical problems and utilize these mathematical skills both in their professional as well as personal life.
						COI	Students will be able to understand definition, scope,
							approach and theories of public administration. Students will be able to identify the process and
						CO2	technique of decision making and also understand the concept of administrative behaviour and control.
						CO3	Students will be able tounderstand the process and technique of personnel and financial administration.
29	VR19	02	B.Tech-Electrical and Electronics Engineering	1020192101	Public Administration	CO4	Students will be able to understand and explain the major administrative techniques and values that public administration has and illustrate how those affect the work of government and also understand the process of administrative improvement.
						CO5	Students will be able to Discuss the tools that modern public administrators use to pursue public goals and public policy, along with the pros and cons of those tools.

						_	Students have the adequate reading and speaking skills
						COI	and will be able to express himself in French.
30	VR19	02	B.Tech-Electrical and Electronics	1020192102	Foreign Linguistic -	CO2	Understand the grammar and use them in their personal and professional life.
			Engineering		FRENCH	CO3	Students will be able to write proficiently in French.
,						CO4	Studentswill be able to compare and contrast world culture and it will expand his knowledge about various culture.
						COI	Create an Industrial environment and culture within the institution.
31	VR19	02	B.Tech-Electrical and Electronics	1002192170	Mini Project – 1 EPICS/Societal	CO2	Provide students hands on experience on, troubleshooting, maintenance, fabrication, innovation, record keeping, documentation etc thereby enhancing the skill and competency part of technical education.
			Engineering	1	relevant project	CO3	Inculcate innovative thinking and thereby preparing students for main project.
						CO4	Set up self-maintenance cell within departments to ensure optimal usage of infrastructure facilities.
						COI	Compute inductance/capacitance of transmission lines and to understand the concepts of GMD/GMR.
32	VR19	02	B.Tech-Electrical and Electronics	1002193100	Power Transmission	CO2	Analyze the performance of short, medium and long transmission lines.
			Engineering		Engineering	CO3	Summarize various factors related to charged transmission lines and underground cables.
						CO4	Estimate sag/tension of transmission lines, performance of line insulators.
33	VR19	02	B.Tech-Electrical and Electronics	1002102120	Electrical Measurements	COI	Describe the working principle and constructional features of different types of analog and digital measuring instrument for measurement of voltage, current, resistance, power, power factor, energy and magnetic measurements and various physical Quantities.
33	VKI9	02	Engineering	1002193120	and	CO2	Calibrate energy meter by suitable methods.
					Instrumentation	CO3	Select suitable bridge for measurement of electrical parameters.
	×					CO4	Measure voltage, current, resistance by using potentiometer and frequency and phase difference between signals using CRO.
						COI	Understand the static and dynamic characteristics of various power semiconductor devices
34	VR19	02	B.Tech-Electrical and Electronics	1002193121	Power	CO2	Interpret the operation of single phase and three phase rectifiers.
34	VIC17	02	Engineering	1002193121	Electronics	CO3	Analyzethe operation of different types of DC-DC converters.
						CO4	Evaluate the performace of different types of AC-AC converters

						COI	Understand the Number Systems and their conversions and Describe about Logic Gates and logic families.
35	VR19	02	B.Tech-Electrical and Electronics	1004193102	Digital Electronics	CO2	Apply minimization techniques (boolean algebra and K-maps) to minimize logic expressions.
	:*:		Engineering		Electronics	CO3	Analyze Combinational Logic Circuits and Sequential logic circuits .
						CO4	Design Combinational Logic Circuits and Sequential logic circuits .
						COI	Understand the modelling of digital control Systems in frequency domain and time domain.
36	VR19	02	B.Tech-Electrical and Electronics Engineering	1002193150	Digital Control Systems	CO2	Realize the z-transformations and their role in the mathematical analysis of different systems
					[CO3	Analyse stability of the Linear Discrete systems
						CO4	Design the state feedback controller for Linear Discrete systems
							Understand principles of energy auditing, Energy
						COI	management programme, purpose of energy conservation schemes and the operation of various energy instruments
37	VR19	02	B.Tech-Electrical and Electronics	1002193151	Energy Audit Conservation	CO2	Identify different space heating and ventilation methods
			Engineering		and Management	CO3	Solve and conclude the economic aspects of energy consumption
						CO4	Analyze power factor improvement methods and Distinguish the operating principle constructional features of energy efficient motors
						COI	Understand the performance and principle of operation of stepper motor ,Switch d reluctance motor,PMDC,PM Materials and BLDC motors
38	VR19	02	B.Tech-Electrical and Electronics	1002193152	Special Electrical	CO2	Implement different control and switching circuits for stepper motor, SRM, BLDC motors
50	VKI	ů.	Engineering	1002173132	Machines	CO3	Analyse the theory of travelling magnetic field and identify the applications of linear motors in electric traction
						CO4	Design the constructional features of Switched reluctance motor
	:					COI	Understand operators, conditionals, functions,data structures and OOPs concepts of python.
						CO2	Install Python IDE and run python scripts.
39	VR19	02	B.Tech-Electrical and Electronics Engineering	1012193161	Fundamentals of Python Programming	CO3	Import packages and handle Exceptions, files in Python.
						CO4	Develop programs using Numpy, Pandas,Matplotlib Libraries in Python.
						COI	Identification of different sensors, transducers, signal conditioning techniques
	an spens		B.Tech-Electrical		Mechatronics	CO2	Understanding and designing mechatronic motion logic control system and the key elements in its design
40	VR19	02	and Electronics Engineering	1003193162	ivicenduonies	CO3	Develop a PLC programming techniques with Microprocessor, ladder diagram for different logic Gates
						CO4	Design and Implementation of Micro Mechatronics System

VR19								12 .
VR19 O2 D2 D2 D2 D3 D3 D3 D3 D							COI	Design, simulate and realize different digital filters.
VR19	41	VR19	02	and Electronics	1004193160		CO2	by discrete time system and to verify the performance of
VR19							CO3	Design multi rate digital signal processing system
VR19								
VR19					_			
42 VR19 02 and Electronics Engineering B.Tech-Electrical Engineering B.Tec				B.Tech-Electrical	v			
Second Part Properties Properties Properties	42	VR19	02	and Electronics	1099193131	IPR & Patents	CO2	
VR19 UR19				Engineering			CO3	Obtain Patent Rights for New Innovations.
VR19								
VR19							COI	Relate literature to formulate problem statements of
VR19 O2 B.Tech-Electrical and Electronics Engineering D02193201 B.Tech-Electrical and Electronics Engineering D02193201 D02193201 B.Tech-Electrical and Electronics Engineering D02193201 D021				P Tech Floatrical				
Seminar Semi	13	1/P 10	02	5 -00	1002102100	Technical	CO2	
Lightering Lig	43	VKI9	02		1002193180	Seminar		
VR19				Engineering			CO3	
VR19							004	
WR19 August WR19 August B.Tech-Electrical and Electronics Engineering 1002193201 August Power Electronics Controllers and Electronics Engineering 1002193201 August Power Electronics Controllers and Electronics Controllers Controll							CO4	
VR19 O2 Analyze the stator side and rotor side control of three phase AC drives.							COI	Understand the principles of Power electronics control
Engineering Engineering Controllers and Drives CO3 Categorize the stator side and rotor side control of three phase AC drives. CO4 Describe VSI, PWM techniques to control the synchronous motor. CO4 Understand the per unit values of system and formulate Ybus&Zbus for a given power system network Analysis Analysis B. Tech-Electrical and Electronics Engineering B. Tech-Electrical and Electronics Engineering B. Tech-Electrical and Electronics Engineering Division Down's System And formulate Ybus&Zbus for a given power system network Analyze the steady state and transient stabilities of power system set seady state and transient stabilities of power system set of electrical and Electronics Engineering Energy Utilization of Electrical Energy Understand the per unit values of system and formulate Ybus&Zbus for a given power system network Analyze the steady state and transient stabilities of power system. CO3 Electrical Energy Analyze the speed –time characteristics of different services of traction and calculate tractive effort, power and specific energy. Understand the concepts of microcomputer system and formulate Ybus&Zbus for a given power system network CO4 Apply various numerical methods to power system for determining power flows CO5 CO6 Electrical Energy Analyze the steady state and transient stabilities of power system network CO6 Electrical Energy Analyze the speed –time characteristics of different services of traction and calculate tractive effort, power and specific energy. Understand the concepts of microcomputer system and formulate Ybus&Zbus for a given power system for determining power flows CO6 Explain the basic terminology in illumination and compare the type of lamps Analyze the speed –time characteristics of different services of traction and calculate tractive effort, power and specific energy. Understand the concepts of microcomputer system and formulate Ybus&Zbus for a given power system for determining power flows CO7 Explain the basic terminology in il	44	VP 10	02	NAME OF BOOKS OF STREET	1002102200		CO2	
Power System Analysis Drives Drives CO2 Describe VSI, PWM techniques to control the synchronous motor.	44	VKIS	02	10C2 10 N	1002193200	Controllers and	CO2	Categorize the stator side and rotor side control of three
VR19 UR19				Engineering		Drives	CO3	
VR19 UR19							CO4	
VR19							CO4	· · · · · · · · · · · · · · · · · · ·
VR19								
VR19							COI	
45 VR19 02 and Electronics Engineering B. Tech-Electrical and Electronics Engineering B. Tech-Electrical and Electronics Engineering B. Tech-Electrical and Electronics Engineering WR19 02 B. Tech-Electrical and Electronics Engineering WR19 03 B. Tech-Electrical and Electronics Engineering WR19 04 B. Tech-Electrical and Electronics Engineering WR19 05 B. Tech-Electrical and Electronics Engineering WR19 06 B. Tech-Electrical and Electronics Engineering WR19 07 B. Tech-Electrical and Electronics Engineering WR19 08 B. Tech-Electrical and Electronics Engineering WR19 09 B. Tech-Electrical and Electronics Engineering WR19 00 B. Tech-Electrical Energy Engineering WR19 00 B. T								Y bus&2bus for a given power system network
45 VR19 02 and Electronics Engineering B. Tech-Electrical Energy CO2 CO3 Electrical Energy CO4 Identify a suitable motor for electric drives and industrial applications CO5 Explain the basic terminology in illumination and compare the type of lamps CO6 CO7 Explain the basic terminology in illumination and compare the type of lamps CO8 Explain the basic terminology in illumination and compare the type of lamps CO9 CO9 Explain the basic terminology in illumination and compare the type of lamps CO1 Analyze the speed –time characteristics of different services of traction and calculate tractive effort, power and specific energy. Understand the concepts of microcomputer system andexplore the architecture of microprocessors and microcontroller. Explore hardware configuration of 8086 and able to applications. CO3 Apply the knowledge of Interfacing memory and I/O devices with 8086 Developinterfacing circuit of different sensors and actuators with 8051. And apply the knowledge or programming for industrial applications. CO1 Discuss about electrochemical batteries CO2 Analyze the steady state and transient stabilities of power system. CO2 Explain the basic terminology in illumination and compare the type of lamps Energy the speed –time characteristics of different sensors and actuators with 8086 and able to applications. CO2 Explore hardware configuration of 8086 and able to applications. CO3 Developmentaria periodical sensors and actuators with 8051. And apply the knowledge of programming for industrial applications. CO3 Developmentaria periodical sensors sensors and				B.Tech-Electrical		D C .	000	Apply various numerical methods to power system for
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46 VR19 02 B.Tech-Electrical and Electronics Engineering 1002193202 Engineering 1004193222 Engineering 1004193222 Engineering 1004193222 Engineering 1002193202 Engineering 1002193202 Engineering 1002193202 Engineering 1002193202 Engineering 1002193202 Energy Stem and Electronics Engineering 1002193202 Engineering 1002193202 Engineering 1002193202 Energy Stems 2003 calculations for a given power system network Analyze the steady state and transient stabilities of power system. Analyze the steady state and transient stabilities of power system and industrial applications. CO2 Describe various electrical heating, welding methods. Explain the basic terminology in illumination and compare the type of lamps Analyze the speed –time characteristics of different services of traction and calculate tractive effort, power and specific energy. Understand the concepts of microcomputer system andexplore the architecture of microprocessors and microcontroller. Explore hardware configuration of 8086 and able to write assembly language program for basic arithmetic applications. CO3 Apply the knowledge of Interfacing memory and I/O devices with 8086 Developinterfacing circuit of different sensors and actuators with 8051. And apply the knowledge of programming for industrial applications. Energy Storage Systems B.Tech-Electrical and Electronics and actuators with 8051. And apply the knowledge of programming for industrial applications. Energy Storage Systems Energy Storage Systems Energy Storage Systems				Engineering		Analysis	002	
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46 VR19 02 B.Tech-Electrical and Electronics Engineering B.Tech-Electrical and Electronics Engineering B.Tech-Electrical Energy B.Tech-Electrical Engineering B.Tech-Electrical Engineering B.Tech-Electrical Engineering B.Tech-Electrical Engineering B.Tech-Electrical Engineering B.Tech-Electrical Engineering B.Tech-Electrical and Electronics Engineering B.Tech-Electrical Engineering Microprocessors and microcontrollers CO2 Describe various electrical heating, welding methods. CO3 Explain the basic terminology in illumination and compare the type of lamps Analyze the speed –time characteristics of different services of traction and calculate tractive effort, power and specific energy. CO4 Understand the concepts of microcomputer system and explore the architecture of microprocessors and microcontrollers. Explore hardware configuration of 8086 and able to write assembly language program for basic arithmetic applications. CO3 Describe various electrical heating, welding methods. CO4 Explain the basic terminology in illumination and compare the type of lamps Analyze the speed –time characteristics of different services of traction and calculate tractive effort, power and specific energy. CO2 Explain the basic terminology in illumination and compare the type of lamps Analyze the speed –time characteristics of different services of traction and calculate tractive effort, power and specific energy. CO3 Discusses about electrical energy storage systems CO4 Examine about various electrochemical batteries CO3 Analyze the operation of Li-ion battery							COI	
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47 VR19 02 B.Tech-Electrical and Electronics Engineering 48 VR19 02 B.Tech-Electrical and Electronics Engineering Energy Storage Systems CO2 Examine about various electrochemical batteries CO3 Analyze the operation of Li-ion battery				Engineering		Energy		Analyze the speed -time characteristics of different
47 VR19 O2 B.Tech-Electrical and Electronics Engineering Energy Storage Systems CO1 Understand the concepts of microcomputer system and exchitecture of microprocessors and microcontroller. Explore hardware configuration of 8086 and able to write assembly language program for basic arithmetic applications. CO3 Apply the knowledge of Interfacing memory and I/O devices with 8086 Developinterfacing circuit of different sensors and actuators with 8051. And apply the knowledge of programming for industrial applications. CO1 Discuss about electrical energy storage systems CO2 Examine about various electrochemical batteries CO3 Analyze the operation of Li-ion battery							COA	services of traction and calculate tractive effort, power
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48 VR19 02 B.Tech-Electrical and Electronics Engineering Engineeri							CO4	
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48 VR19 02 and Electronics 1002193250 Systems CO3 Analyze the operation of Li-ion battery	40	1/D 10	02	DE CHINESE	1003103355	Energy Storage		
Engineering	48	VKI9	02	1	1002193250	· · ·		
				Engineering			CO4	Assess the Electric Vehicles Charging Station

						CO1	To analyze the characteristics of solar radiation, PV cells, modules and arrays
49	VR19	02	B.Tech-Electrical and Electronics	1002193251	Photovoltaic and Wind	CO2	Design of grid-connected PV schemes, Control of real and reactive power
			Engineering		Energy System	CO3	To analyze fixed speed and variable speed Wind Energy Conversion Systems.
						CO4	To analyze integration issues in PV-wind Systems.
						COI	Understand different architectures of ANN models of
			B.Tech-Electrical		Neural	COI	artificial neuron, learning strategies and algorithms
50	VR19	02	and Electronics	1002193252	Networks and	CO2	Classify between classical and fuzzy sets.
1001101011			Engineering	10021,0202	Fuzzy Logic	CO3	Use different modules of Fuzzy logic controller
			0 0		, , , , , , , , , , , , , , , , , , , ,	CO4	Apply Neural Networks and fuzzy logic for electrical engineering
						COI	Students have the adequate writing skills that are needed in an organization and To perform well during Campus Drives and different Interviews
				s.		CO2	Understand the core competencies to succeed in professional and personal life and Students will develop knowledge and experience with the use of the standard C programming language,
51	VR19	02	B.Tech-Electrical and Electronics Engineering	1020193100	Employability Readiness Program -II	CO3	Solve various Basic Mathematics problems by following different methods and analyses, summarize and present information in quantitative forms including table, graphs and formulas
						CO4	Follow strategies in minimizing time consumption in problem solving Apply shortcut methods to solve problems and confidently solve any mathematical problems and utilize these mathematical skills both in their professional as well as personal life.
		ę.				COI	Understand the basic concepts of an embedded system and able to know an embedded system design approach to perform a specific function
			B.Tech-Electrical		Introduction to	CO2	Design the Embedded hardware by considering the hardware components required for an embedded system.
52	VR19	02	and Electronics Engineering	1019193252	Embedded System	CO3	Analyze the various embedded firmware design approaches on embedded environment to suit for desired application.
		6:				CO4	integrate hardware and firmware of an embedded system and apply this knowledge to real time operating system.
						COI	Understand data pre-processing and data visualization techniques
53	VR19	02	B.Tech-Electrical and Electronics	1012193260	Data Mining	CO2	Study algorithms for finding hidden and interesting patterns in data
			Engineering			CO3	study and analyzevarious classification techniques.
						CO4	Apply various clustering techniques using tools in various algorithms
						COI	Understand ER model and Relational models
			B.Tech-Electrical		Introduction to	CO2	Execute SQL queries for various conditions
54	VR19	02	and Electronics	1005193260	Database		Analyze different indexing techniques, evaluate time
			Engineering		Management	CO3	complexity and its storage
					Systems	CO4	Create database and transactions
						CO1	Distinguish the IC, EV's
55	VR19	02	B.Tech-Electrical and Electronics	1002193260	Electric	CO2	Analyse the Storage systems and Energy management system for EV's
			Engineering		Vehicles	CO3	Design Electric Drive System
			~ ~				Assess the performance of HEV's

							T
						COI	Understand the construction of the both DC and AC machines
			B.Tech-Electrical		Fundamentals of	CO2	Distinguish the operation of DC and AC machines
56	VR19	02	and Electronics Engineering	1002193261	Electrical Machines	CO3	Calculate the performance parameters of DC motors, transformer
					Widenines		Calculate the performance parameters of induction
						CO4	motor, Synchronous generator
						tease et a	Evaluate the production theories and pricing policies of
						COI	various enterprises
							Design and implement different structures of market
							covering how price is determined under different market
			B.Tech-Electrical		Managerial	CO2	structures. Also can able to take decisions using
57	VR19	02	and Electronics	1099192100	Economics and		business cycles
			Engineering		Financial		Analyze different forms of business organizations
					Analysis	CO3	existing in the modern business and able to choose
							suitable form of business.
					l i		Prepare financial statements and understand and
						CO4	implement the capital budgeting tools and techniques.
							Understand the different types of Circuit Breakers and
			D.T. J. Fl			COI	Relay in Power system
58	VR19	02	B.Tech-Electrical	1002104100	Switchgear and	202	Design the rating of CB and Relay to protect the Power
38	VKI9	02	and Electronics	1002194100	Protection	CO2	System against the Faults
1			Engineering				Differentiate the grounded and ungrounded power
						CO3	system against over voltage Protection
						COI	Describe the PLC architecture and its I/O devices.
			B.Tech-Electrical		Progammable	CO2	Construct the Ladder diagram using contacts & coils.
59	VR19	02	and Electronics	1002104120	Logic	CO3	Apply various function blocks like timer, counter and
37	VICIO	02	Engineering	<u>1002194120</u>	Controllers &	CO3	program control & data handling instructions.
			Eligilicettiig		Applications	CO4	Develop ladder logic for various industrial automation.
						COI	Distingish the IC, EV's
			B.Tech-Electrical		Electric		Analize the Storage systems and Energy management
60	VR19	02	and Electronics	1002193260	Vehicles	CO2	system for EV's
			Engineering		venicles	CO3	Design Electric Drive System
						CO4	Design of HEV's
							Compare HVDC and AC transmission system w.r.t.
						COI	economical, technical and reliability aspects.
							Analyze the six pulse and twelve pulse converter
			B.Tech-Electrical			CO2	configurations and describe
61	VR19	02	and Electronics	1002194150	HVDC	CO2	converter control characteristics and MTDC systems.
"	, 1017	02	Engineering	1002174130	Transmission		
			Distincting		[Describe various converter faults and protection
						CO ₃	methods in HVDC transmission system.
						CO4	Explain generation of harmonics and design suitable
						204	filters to eliminate them.

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			B.Tech-Electrical			CO1	State and formulate the optimization problem, without and with constraints, by using design variables from an engineering design problem. Apply classical optimization techniques to minimize or maximize a multi- variable objective function, without
62	VR19	02	and Electronics Engineering	1002194151	Optimization Techniques		or with constraints, and arrive at an optimal solution. Formulate a mathematical model and apply linear programming technique by using Simplex method. Also
						CO3	extend the concept of dual Simplex method for optimal solutions.
						CO4	Apply gradient and non-gradient methods to nonlinear optimization
						COI	Understand different types of power quality problems with their source of generation and suggest preventive techniques.
63	VR19	02	B.Tech-Electrical and Electronics	1002194152	Power Quality	CO2	Evaluate the effects of harmonics on power system equipments and analyze the methods of controlling of harmonics.
	1117	02	Engineering	1002194152	1 ower Quarty	CO3	Analyze the sources, types and mitigation of over voltage issues and model of over voltage problem with computer software tools.
						CO4	Examine the power quality issues and operating conflicts when DG is interconnected to the grid.
			B.Tech-Electrical and Electronics Engineering	1002194153	Microgrid and - Smart Grid	COI	Explain topologies, interconnection issues of DGs and features of grid connected DG systems
		02				CO2	Design power converter topologies for DG applications and implement the control of Microgrid
64	VR19					CO3	Interpret the concept of Resilient and Self- Healing Grid.
						CO4	AnalyzeMicro Grids (MGs) and Distributed Energy Resources (DERs) and alsoPQ issues with RES and also ICT for Smart Grid.
				ı		COI	Model the different systems(electrical, mechanical and electro mechanical systems) in terms of various state models.
65	VR19	02	B.Tech-Electrical and Electronics	1002194154	Advanced Control Systems	CO2	Design the state feedback controller and observer for different systems.
			Engineering		Connor Systems	CO3	Interpret different nonlinearities and stability of the system
						CO4	Formulate and solve the different optimal control problems
						COI	To Understand the Architecture, protocols and applications of IoT.
66	VR19	02	B.Tech-Electrical and Electronics	1019193260	Internet of	CO2	To Analyse the communication protocols and standards used in IoT
	1117	U.	Engineering	1017173200	Things	CO3	To analyse and design the simple IoT applications to monitor or control IoT devices using simulation or hardware
						CO4	To implement the real time IoT applications.

						CO1	Recognize the characteristics of machine learning that make it useful to real-world Problems
			B.Tech-Electrical and Electronics Engineering		Introduction to Machine Learning	CO2	Characterize machine learning algorithms as supervised, semi-supervised, and Unsupervised
67	VR19	02		1005194160		CO3	Be able to use support vector machine, regularized regression algorithms.
						CO4	Analyze the concept behind neural networks for learning non-linear functions.
						COI	Identify various robot configuration and components .
68	VD 10	02	B.Tech-Electrical	1002102160	Industrial	CO2	Select appropriate actuators and sensors for a robot based on specific application
08	VR19	02	and Electronics Engineering	1003193160	Robotics	CO3	Carry out kinematic and dynamic analysis for simple serial kinematic chains
						CO4	Perform trajectory planning for manipulator by avoiding obstacles.
				1002194160	Programmable Logic Controllers	COI	Describe the PLC architecture and its I/O devices.
			B.Tech-Electrical			CO2	Construct the Ladder diagram using contacts & coils.
69	VR19	02	and Electronics			CO3	Apply various function blocks like timer, counter and program control & data handling instructions.
			Engineering			CO4	Develop ladder logic for various industrial automation.
		02	B.Tech-Electrical and Electronics Engineering	1002193151	Energy Audit Conservation and Management	COI	Understand principles of energy auditing, Energy management programme, purpose of energy conservation schemes and the operation of various energy instruments
70	VR19					CO2	Identify different space heating and ventilation methods
						CO3	Solve and conclude the economic aspects of energy consumption
						CO4	Analyze power factor improvement methods and Distinguish the operating principle constructional features of energy efficient motors
					,	CO1	Understand the Design of substations and distribution systems and Identifying the different factors of distribution systems CO2 Calculate voltage drops and power loss manually at each and every point in a line
71	VR19	02	B.Tech-Electrical and Electronics Engineering	1002194250	Electrical Distribution System	CO2	Calculate voltage drops and power loss manually at each and every point in a line
						CO3	Illustrate the distribution system protection and its coordination schemes.
			T .			CO4	Analyse the effect of compensation on power factor improvement and voltage control on distribution system.

						COI	Outline various components of power system control.
72	110.10	02	B.Tech-Electrical	1002104251	Power System	CO2	Apply algorithms to solve optimal scheduling of Hydrothermal Systems.
72	VR19	02	and Electronics Engineering	1002194251	Operation & Control	CO3	Analyse single area and two area load frequency control.
						CO4	Distinguish performance of reactive power compensation in transmission systems.
		02	B.Tech-Electrical and Electronics Engineering	1002194252	Flexible Alternating Current Transmission System	COI	Compare voltage sourced converter (VSC) and current sourced converter (CSC).
73	VR19					CO2	Apply the shunt and Series compensators for improving the transient stability, steady state stability and power oscillation damping's.
						CO3	Analyse control of SVC, STATCOM to compensate the transmission Parameters.
						CO4	Analyse the combined compensators used in enhancing the transmission line Performance.

VIGNAN'S INSTITUE OF INFORMATION TECHNOLOGY (A) DEPARTMENT OF MECHANICAL ENGINEERING

VR19 B. Tech. Mechanical Engineering Course Outcomes

S.No	Regula tion	Progra mme Code	Programme Name	Course Code	Course Name	co	Course Outcome: After the completion of the course student will be able to
	VR19			9		COI	Executing mean value theorems and evaluate maxima and minima of functions of two vari without constraints
1		03	B.Tech-Mechanical Engineering	1000191100	Mathematics-I	CO2	Apply the analytical methods to solve higher order linear differential equations.
			Engineering			CO3	Evaluate of solution of Ordinary differential equations by using Laplace Transform techni
						CO4	Identify and solve partial differential equations.
						COI	Apply the knowledge of crystal systems and X-ray diffraction techniques. to identify the crystal structure of materials.
2	VR19	03	B.Tech-Mechanical Engineering	1000191120	Engineering Physics	CO2	Use the knowledge of acoustics and ultra sonics for characterization of acoustics design and non-destructive testing.
			Engineering			CO3	Describe the wave phenomena and apply these concepts for construction of Lasers and optical fibers.
						CO4	Discuss the properties and synthesis techniques of nano materials.
		03	B.Tech-Mechanical Engineering	1000191121	Technical English Communication	COI	Read, understand and interpret material on Environment, Science and Technology, tourism, Energy Sources, Social Awareness
3	VR19					CO2	Read, understand and interpret material on Environment, Science and Technology, tourism, Energy Sources, Social Awareness
	1					CO3	Write effectively on various domains.
						CO4	Prepare and exhibit oral presentation skills by using ICT(Individual/Team)
				1003191100		COI	Analyze the force systems for equilibrium conditions and able to draw free body diagram.
			B.Tech-Mechanical		Engineering	CO2	Measure the frictional forces between contact surfaces.
4	VR19	03	Engineering		Mechanics	CO3	Determine Centroid, centre of gravity and second moment of area for composite sections.
		6				CO4	Analyse the motion and calculate trajectory characteristics.
					Problem	COI	Write compile and debug Programs in C language
5	VR19	03	B.Tech-Mechanical	1005191120	Solving and	CO2	Use operators, data types and write programs
-	0.0000		Engineering		Programming	CO3	Select the best loop construct for a given problem
					Using C	CO4	Design and implement C programs
						COI	Realize the purpose/Role of Engineer for solving social problems
6	VR19	03	B.Tech-Mechanical Engineering	1000191110	Engineering	CO2	Learn to Design a component/system in an engineering way
					Exploration	CO3	Learn to use mechanisms, Arduino, sensors, motors.
						CO4	Integrating different systems (mechanical/Electrical/computer) to work as a unit

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						COI	Solve approximate roots of an equation by using different numerical methods.
						CO2	
			B.Tech-Mechanical		Mathematics-	COZ	Compute Numerical Solution of ODE and Numerical
7	VR19	03	Engineering	1000191101	II	CO3	Compute Numerical Solution of ODE and Numerical
1				10	11		Integration.
						004	Evaluate simultaneous linear equations numerically using
						CO4	rank of a matrix and also Eigen values and Eigen vectors
							of a square matrix.
						COI	Formulate any period function in terms of sine and
							cosine
						CO2	Simplify a non periodic function as integral
					Transforms		representation
8	VR19	03	B.Tech-Mechanical	1000191200	and Vector	CO3	Apply multiple integration techniques in evaluating areas
_			Engineering	1000171200	Calculus		and volume bounded by region.
					Carounds		Explain Gradient, divergence and curl operations in
						CO4	vector and scalar fields and apply Green's, Gauss and
						004	Stokes theorem as the generalisation of fundamental
							theorem of integral calculus.
			A			COI	Measure water quality parameters, corrosive
			B.Tech-Mechanical Engineering	1000191220		COI	environment and protection of pre metal
					Engineering	CO2	Acquire the knowledge on advanced materials
9	VR19	03			Engineering	001	Inspect corrosive environments and protection of
			Engineering		Chemistry	CO3	precious metal.
						664	Identify different polymers and their functionalities,
						CO4	acquire knowledge on vari Engineering materials
						COI	Analyze& generate experimental skills.
		03	B.Tech-Mechanical Engineering	1000191220	Engineering Chemistry Lab	002	Enhance the thinking capabilities in the modern trends of
						CO2	engineering & technology.
10	VR19					001	Learn and apply basic techniques used in chemistry
1						CO3	laboratory for preparation of Organic compounds.
1						CO4	Learn safety rules in the practice of laboratory
						CO4	investigation.
						COI	Apply Ohms Law and Kirchhoff's Laws and solve
						COI	electrical circuits
							Describe the constructional features of DC machines,
						CO2	select suitable starters for DC motors estimate losses and
					Basic		efficiency of DC motor.
11	VR19	03	B.Tech-Mechanical	1002191220	Electrical and		Outline the constructional details and operating
11	VICIS	US	Engineering	1002191220	Electronics	CO2	principles of AC machines and calculate the efficiency
					Engineering	CO3	identify the characteristics, losses and efficiency of a
							three phase induction motor.
							Identify the structure, operation and characteristics and
						CO4	applications of measuring instruments and
							semiconductor devices.
						00:	Understand the use of drawing instruments to construct
						COI	the polygons and curves
						000	
,,	VD 10	03	B.Tech-Mechanical Engineering	1003191101	Engineering	CO2	Develop the orthographic projections of points and lines.
12	VR19				Drawing	00.	Apply the knowledge of orthographic projection to draw
					Diawing	CO3	the views of both planes and solids.
							Analyse orthographic projections to develop isometric
					1	CO ₄	views and vice-versa

							T
						COI	Understand different operations: Fitting, smithy,
						CO2	carpentry and Electrical wiring. Perform the fitting and carpentry operations.
		27.83	B.Tech-Mechanical	1003191210	Engineering	CO2	Develop simple objects like funnel, elbow etc. using
13	VR19	03	Engineering		Workshop	CO3	sheet metal.
					,		Apply basic electrical engineering knowledge for house
						CO4	wiring practice like stair case wiring, series and parallel
							connections
						COI	Have general knowledge and legal literacy and thereby to
						COI	take up competitive examinations.
						CO2	Distinguish the power of state and central
15	VR19	03	B.Tech-Mechanical	1000191130	Constitution of		centralgovernment.
			Engineering		India	CO3	Summarize theelection procedure in India before and
						-	after independence
						CO4	Association with the powers and functions of Municipalities, Panchayats and Cooperative Societies.
							Analyse the complex functions with reference to their
						CO1	analyticity.
							Analyse the complex integration by using Cauchy's
				}		CO2	integral formula and find Taylor's, Maclaurin's series
		03	B.Tech-Mechanical Engineering		Compley		and Laurent series expansion of complex function.
				1000192100	Complex Variables &		Evaluate contour integrals by using Residue theorem
16	VR19				Statistical Methods	CO3	andExplain the notation of random variables and
							Evaluate the expected value and probability of random
							variables
							Evaluate the confidence levels and maximum errors
						CO4	forlarge and small samplings and Apply the concept of hypothesis testing for large and small samples in real.
							Lifesituations
			B.Tech-Mechanical		Materials -		Categorize the properties of metals/alloys with respect to
						COI	crystal structure, grain size andunderstandthe necessity
						0.000.00	of alloying
						CO2	Explainthe concept of phase & phase diagram
							&understand the basic terminologies associated with
17	VR19	03		1003192120			metallurgy.
		03	Engineering		Engineering		Understand and suggest the heat treatment process &
						CO3	strengthening mechanisms. Significance of properties Vs
				-			microstructure.
						CO4	Identify the features and recommend appropriate materials viz. Ferrous alloys, non-ferrous alloys and
						C04	composite materials for suitable application.
							Identify the various stresses and strains that structural
						COI	members experience under varied loading circumstances.
						\$1 ER EV	1
1							Evaluate the shear force, bending moment, deflection of
						CO2	beams, and torsional stresses for different loading and
18	VR19	03	B.Tech-Mechanical Engineering	1003192121	Mechanics of		support conditions.
		55		.003172121	Solids		Assess societal issues by analysing the behaviour of
						CO3	various beams and columns under various loads and
							support conditions
						CO4	Analyze the stresses in thin and thick pressure vessels to
1						CO4	arrive an optimum section to withstand the internal
			I	l		1	pressure.

						COI	Acquire knowledge related to energy interactions in various fields of thermal engineering
						000	Importance of hidden governing laws behind various
19	VR19	03	B.Tech-Mechanical Engineering	1003192100	Thermodynami	CO2	engineering systems specially used in power generation
19	VICIO	03		1003192100	cs	CO3	Outline the degree of disorder and its associated changes
						CO3	in the system as well as surroundings
						CO4	Evaluate the properties of air, pure substances and
					1		perfect gases with respect to temperature change.
						COI	Understand the properties of fluids and the applications
					Fluid		of fluid mechanics
			B.Tech-Mechanical		Mechanics &	CO2	Analyse property measuring devices Relate the concept of the boundary layer in resolving
20	VR19	03	Engineering	1003192122	Fluid	CO3	continuity, momentum, and energy equations on an
			2.i.g.ii.eci.ii.g		Machines	CO3	activity basis
						Printer a	Apply the principles of hydraulic pumpsfor domestic,
						CO4	agricultural and industrial applications
							Examine introspect on individual strengths and
						COI	weaknesses, and emerge as a balanced personality with
							improved self-awareness and self-worth
		02	B.Tech-Mechanical Engineering	1000192110	Communication	CO2	Write a resume and gain the confidence to face an
21	VR19	03			Skills Laboratory	CO2	interview
						CO3	Develop the interpersonal skills to conduct
							himself/herself effectively in everyday professional and
						004	social contexts.
-						CO4	Communicate in a group with confidence.
			B.Tech-Mechanical Engineering	1005192170	Mini Project - 1 Epics / Societal Relevant Project		Understand the need of optimum design of a mechanical component or an assembly and Study the procedure to
		3				COI	bring cost effective manufacturing process with proper
						COI	material selection and technical procedure of planning
							the work.
22	VR19	02					Apply the engineering knowledge, mathematics, design
22	VKI9	03				CO2	thinking and project management to develop a
							community project.
			4		Troject	CO3	Realize the significance of real time applications, energy
							management and environmental affects.
						CO4	Obtain the skill of data collection and technical report
-		7					writing.
							Describe different kinematic inversions of four bar
						COI	mechanisms and process of finding and applying velocity and accelerations to Agriculture and mechanical
						COI	machine components.
							machine components.
-	1,000	00	B.Tech-Mechanical		Kinematics of		Produce different straight-line mechanisms and their
23	VR19	03	Engineering	1003192200	Machinery	CO2	applications in Automobile Engines and steering
							mechanism.
						003	Examine different cam and follower motions and their
						CO3	applications in IC engines.
						CO4	Solve different operating problems in transmission of
						CO4	power by belt, gear and gear trains.

						_	
			B.Tech-Mechanical			COI	Differentiate the basic combustion cycles and working of various IC engines along with engine systems and losses associated with engines.
24	VR19			1003192220	Applied	CO2	Learn the combustion physics involved in spark ignition and compression ignition engines and discuss the affects on environment
24		03	Engineering	1003192220	Thermodynami cs- I	CO3	Familiarize with the testing methods involved in determining and measurement of various performance parameters in SI and CI engines.
						CO4	Discuss the working principles of reciprocating air compressors and apply the principles in carrying out performance analysis.
						CO1	Understand the casting, welding, sheet metal and powder metallurgy processess.
25	25 VR19	03	B.Tech-Mechanical Engineering	1003192221	Manufacturing Process	CO2	Analyze the force requirements for various bulk and sheet metal forming operations,
						CO3	Importance of powder metallurgy process and processing of plastics
			B.Tech-Mechanical Engineering	1003192222	Machine Drawing	COI	Understand and apply the knowledge of machine drawing as a system of communication in which ideas are expressed clearly and all information fully conveyed
26	VR19	03				CO2	Identify and classify the functionalities of various machine elements such as vices, bearings, screw jacks, shafts, fasteners, keys, cotters, pins and their assembly with respect to design Standardization.
						CO3	Construct an assembly drawing from the given part drawings of machine components.
						CO4	Improve the 2D model components of various machine components using AUTOCAD software.
						COI	Elucidate the natural resource & their importance for the sustenance of life and recognises the need to conserve natural resource
27	VR19	03	B.Tech-Mechanical	1000192230	Environmental	CO2	Gives the broad view on the various attributes of pollution & and their impact & measure to reduce he pollution along with waste management
	VKI	03	Engineering	.000172230	Science	CO3	Debates on social issues both rural and urban environment possible means to combat the challenges and trace the legislation of India towards sustainability
						CO4	Educates about Environmental Impact Assessment, Environmental Impact Statement & Environmental Audit

						COI	Students have the adequate writing skills that are needed in an organization
						CO2	Understand the core competencies to succeed in professional and personal life
J			B.Tech-Mechanical		Employability		Solve various Basic Mathematics problems by following
		03				CO3	different methods and to perform well in various
28	VR19		Engineering	1020192100	Readiness	COS	
1			Lingineering		Program-1		competitive exams and placementdrives.
							Follow strategies in minimizing time consumption in
							problem solving Apply shortcut methods to solve
						CO4	problems and confidently solve any mathematical
1							problems and utilize these mathematical skills both in
-							their professional as well as personal life.
1						~~.	Apply the design procedure to engineering problems,
						COI	including the consideration of technical and
1							manufacturing constraints.
		03			Design of	CO2	Select suitable materials and significance of tolerances
29	VR19		B.Tech-Mechanical	1003193100	Machine		and fits in critical design applications.
			Engineering		Elements -I	CO3	Design various mechanical elements as per design
							procedure for strength, stiffness and fatigue
							Identify the loads, the machine members subjected and
						CO4	calculate static and dynamic stresses to ensure safe
							design
		03	B.Tech-Mechanical Engineering		Dynamics of Machinery	COI	Understand the Gyroscopic effect on sea, air and surface
							transport vehicles to establish safety.
				1003193120		CO2	Analyze the torque and effect of friction in mechanical
30	VR19					CO2	systems
						CO3	Examine the energy fluctuation in the flywheels and
						003	governors.
						CO4	Evaluate balancing of rotary and reciprocating masses to
							curb the failure
1				1003193101			Understand the working principle of all components and
1						COI	their types in a steam power plant such as boilers,
1							nozzles, turbines and condensers.
			B.Tech-Mechanical		Applied	CO2	Apply the conceptual theories in solving problems on all
31	VR19	03	Engineering		Thermodynami	002	components employed in the steam power plant.
1		- 10			cs-II	CO3	Evaluate the performance of impulse and reaction
							turbines by applying the theory of compounding.
1						CO4	Apply the principle of Newton's laws to Jet Propulsion
							systems such as gas turbines and rockets.
						COI	Understand the metal cutting mechanisms and different
							machining processes.
						CO2	Select the suitable cutting tool material for various
32	VR19	03	B.Tech-Mechanical	1003193121	Manufacturing		machining operations.
0.000			Engineering		Technology	CO3	Choose the type of machine based on the geometry of the
						503	final component.
						CO4	Importance of CNC machininigprocesses for inductrial
						004	needs.

						CO1	Relate data structure concepts with real time applications.
			D Took Machanical		Data	CO2	Apply linear and non-linear data structures by identifying
33	VR19	03	B.Tech-Mechanical Engineering	1005193161	Data Structures		the appropriate need. Analyze searching and sorting techniques for effective
						CO3	management of data
						CO4	Design and implement operations of linear and nonlinear
							data structures
			5			COI	Write the professional documents that are needed in an organization and To perform well during Campus Drives
						COI	and different Interviews
							Understand the core competencies to succeed in
						CO2	professional and personal life and Students will develop
						002	knowledge and experience with the use of the standard C
34	VR19	03	B.Tech-Mechanical	1020193160	Employability Readiness		programming language, Solve various Basic Mathematics problems by following
34	VICIS		Engineering	1020193100	Program-II	22 EE V	different methods and analyses, summarize and present
						CO3	information in quantitative forms including table, graphs
	1				-		and formulas
1					-		Apply shortcut methods to solve problems and
						CO4	confidently solve any mathematical problems and utilize
							these mathematical skills both in their professional as well as personal life.
							Distinguish between the quality of domestic and
					Industrial	CO1	industrial water requirements and wastewater quantity
			B.Tech-Mechanical Engineering				generation
35	VR19	03		1001193161	Waste and	CO2	Impart knowledge on selection of treatment methods for
33	VKI9				Waste Water - Engineering		industrial wastewater. Describe the common methods of treatment in different
						CO3	industries
						CO4	Explain operational problems of common effluent
						CO4	treatment plant
						COI	Explain the fundamentals of solar photovoltaic (PV)
					Solar		energy systems Analyze the characteristics of solar radiation, PV cells,
36	VR19	03	B.Tech-Mechanical	1002102160	Photovoltaic	CO2	modules and arrays
30	VKI9	03	Engineering	1002193160	Energy	CO3	Analyze the characteristics of solar radiation, PV cells,
					Systems		modules and arrays
						CO4	Analyze the system level issues related to PV energy systems
							Understood the core values that shape the ethical
						COL	behavior of an engineer
						COI	
					D. C		
37	VR19	03	B.Tech-Mechanical	1099193130	Professional Ethics and	CO2	Define importance of human values, harmony and ethical behavior in real life situations
"	VICIO	05	Engineering	1077173130	Human Values		Apply the professional ethics and human values in real
						CO3	life situations.
							Understand practically the importance of trust, mutually
						CO4	satisfying human behavior and enriching interaction with
							nature.

			B.Tech-Mechanical Engineering	1003193180		COI	Carryout literature survey, and choose a relevant topic reported in recent IEEE/CSI/ACM/ conference publications / transactions in the domain of computer science and engineering.
38	VR19	03			Technical Seminar	CO2	Simulate and analyze the results reported in the chosen paper for seminar topic.
						CO3	Communicate effectively before the expert panel and develop technical reports.
						CO4	Respond to the queries raised by the evaluation committee and audience
						CO1	Describe the economic activities performed by the businessmen in the business for profit earning. Understand the significance of demand, its analysis, measurement of demand and its Forecasting
					Managerial	CO2	Evaluate the production theories and pricing policies of various enterprises
39	VR19	03	B.Tech-Mechanical Engineering	1099192100	Economics & Financial Analysis	CO3	Design and implement different structures of market covering how price is determined under different market structures. Also can able to take decisions using business cycles
						CO4	Analyze different forms of business organizations existing in the modern business and able to choose suitable form of business.
		03	B.Tech-Mechanical Engineering	1003193200	Design of Machine Elements– II	COI	Understand the different types of machine elements behaviour under various working condition
						CO2	Design different types of machine elements like bearings, curved beams, power screws, differential and compounds screws.
40	VR19					CO3	Design various power transmission elements such as belts, ropes, chains, pulleys, gear and machine tool elements of levers.
	1					CO4	Design various I.C engine parts like piston, connecting rod, crank shaft and cylinder.
						COI	Understand basic concepts and governing equations of three modes of heat transfer
			D Took Markanian			CO2	Evaluate heat transfer coefficients for natural convection and forced convection.
41	VR19	03	B.Tech-Mechanical Engineering	1003193220	Heat Transfer	CO3	Design and develop a heat exchanger for the basic engineering applications by analyzing its performance
						CO4	Construct electrical analogy networks through basic principles of radiation to estimate the radiative heat exchange between the bodies.

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			8			CO1	Classify different instruments used for measurement of mechanical quantities
						CO2	Apply the various principles of working used in measurement systems
							Develop the measuring instruments for measurement of
	******************	-	B.Tech-Mechanical		Instrumentation		displacement, speed, temparature, pressure, strain, linear
42	VR19	03	Engineering	1003193221	& Metrology	CO3	and angular measurements
			Ziigiiiotiiig		a menology		and angular measurements
							Categorize the instruments for checking various elements
							of fits, surface roughness, screw thread and gear tooth
						CO4	parameters
							parameters
							Create the environment and run basic programs by make
						COI	use of fundamental concepts
					г		Define and demonstrate the use of built-in data
43	VD10	0.7	B.Tech-Mechanical	1010100161	Fundamentals	CO2	structures.
43	VR19	03	Engineering	1012193161	of Python	000	Import packages to the current working environment and
					Programming	CO3	create user defined modules.
						CO4	Implement object-oriented concepts and handle
						CO4	exceptions and files
						COI	Understand the basic terminology used in object-oriented
1						COI	programming
			B.Tech-Mechanical		Programming	CO2	Describe the object-oriented programming approach in
44	VR19	03	Engineering	1005193160	in C++		connection with C++
			5			CO3	Apply the concepts of object- oriented programming
						CO4	Apply virtual and pure virtual function & complex
-							programming situations
							Understand evaluate and create the basic concept of
					F	CO1	environmental impact assessment, environmental
				۰	Environmental		Impacts.Flow of EIA, types of
45	VR19	03	B.Tech-Mechanical	1001193260	Impact Assessment		In-law 4:00 to the law
13	VICI	05	Engineering	1001193200	and	CO2	Implement different methods in preparing an Environmental Impact Statement.
					Management	CO3	
							Identify various mitigation measures that can be used. Choose methodology for identification of environmental
						CO4	impacts, environmental indices and indicator.
							Understand the concepts and drive train configurations of
						COI	electric drive vehicles.
						205	Describe different electric propulsion systems and energy
			B.Tech-Mechanical		Floatric	CO2	storage devices
46	46 VR19	03	Engineering	1002193260	Electric Vehicles	CO2	Discuss the technology, design methodologies and
			Lingmeeting		venicies	CO3	control strategy of electric vehicles.
					-		Explain battery charger topologies for electric vehicles
						CO4	and discuss how the sizing of the drive system is done
							and energy management strategies used in electric.

47	VR19	03	B.Tech-Mechanical Engineering	1003193250	Condition Monitoring	CO1 CO2 CO3	Understand the basic vibration problems and develop mathematical models using Mass, spring and damper concepts Evaluate the vibrating system response and analyse the behavior of vibrating systems Apply the knowledge of vibration analysis, thermography techniques, oil and wear debris analysis for identifying faults in machine components Analyse the defects in components using the knowledge
						CO4	of ultrasonic monitoring methods.
48	VR19	03	B.Tech-Mechanical	1003193251	Gas Dynamics and Jet	CO1	Illustrate fluid flow systems. Analyze the isotropic flow of an ideal gas and its parameter.
"	1117	05	Engineering	1003173231	Propulsion	CO3	Explain frictional flow with heat transfer problems.
						CO4	Analyze the impact of heat transfer on flow parameters.
						COI	Understand the various robot configuration and components
					Industrial	CO2	Choose appropriate actuators and sensors for a robot based on specific application
49	VR19	03	B.Tech-Mechanical Engineering	1003193160	Robotics	CO3	Analyze the kinematic and dynamic analysis for simple serial kinematic chains
						CO4	Explain trajectory planning for a manipulator by avoiding obstacles.
						COI	Develop the different linear programming and assignment models for domain specific situations.
			B.Tech-Mechanical		Operations	CO2	Analyze the different transportation models.
50	VR19	03	Engineering	1003193252	Research	CO3	Design inventory and queueing theory models for optimal decisions.
						CO4	Apply optimal strategy to real time applications using dynamic programming and game theory.

						COI	Understand the concepts of potential energy, variational methods and weighted residual methods.
52	VR19	03	B.Tech-Mechanical Engineering	1003194100	Finite Element Methods	CO2	Identify the suitable FEA elements such as bars, truss, beams, constant strain triangle and isoparametric elements to create Finite Element Model with respect to the application
						CO3	Apply the suitable boundary conditions to the finite element model and solve the engineering problems
						CO4	Identify the finite element concept expands beyond the structural domain, for problems involving dynamics and heat transfer.
						COI	Describe basic structure of CAD workstation, Memory types, input/output devices and display devices and computer graphics
53	VR19	03	B.Tech-Mechanical Engineering	1003194101	CAD/CAM	CO2	Apply knowledge of mathematical concept for geometry manipulation and modelling of curves, surfaces and solids
						CO3	Develop a programming for NC operations using various methods available
						CO4	Define the use of GT and CAPP for the product development.
						COI	Illustrate the insights of management principles.
54	VR19	03	B.Tech-Mechanical Engineering	1099192200	Management Science	CO2	Summerize production process, quality control and inventory techniques.
1			Engineering			CO3	Identify strategies and policies to functional areas.
						CO4	Apply contemporary management polocies.
						COI	Identify Methods in AI that may be suited to solve a given problem and Game Playing
55	VR19	03	B.Tech-Mechanical Engineering	1005193261	Artificial Intelligence	CO2	Make use of AI search algorithms and formalizations on real world problems
			Zingineering		monigonee	CO3	Analyze the basic issues of different types of knowledge representation techniques to build intelligent system
						CO4	Apply probabilistic and fuzzy models to solve problems with uncertainty
						COI	Appraise the importance of data and choose an appropriate algorithm to create a models
56	VR19	03	B.Tech-Mechanical	1005194160	Introduction to Machine	CO2	Characterize machine learning algorithms as supervised, semi-supervised, and Unsupervised
		03	Engineering 10	1005194160	Learning	CO3	Relate various machine learning and deep learning algorithms with real world applications
						CO4	Analyze how to evaluate models build from the sample datasets on web

57	VR19	03	B.Tech-Mechanical Engineering	1001194160	Disaster Management	CO1 CO2 CO3	To know the basic concepts in Disasters and its triggering factures To understand stages of hydrological disaster To analysis the causes, effects, impacts and of hydrological, geological and coastal hazards. To understand the mitigation procedure of uncertain events
						COI	Describe the need and importance of non-traditional machining methods and Apply the basic principle, equipment, process variables and mechanics of metal removal rate
58	VR19	03	B.Tech-Mechanical Engineering	1003194150	Unconventional Machining	CO2	Design and analyze the surface finish and material removal in Chemical machining, electro chemical machining, electro chemical grinding,
			Engineering		Processes	C03	Estimate the material removal rate and effect of process parameters in EDM, Electric discharge grinding and wire cut EDM process.
						CO4	Analyze the material removal rate in Electron Beam Machining and Laser Beam Machining processes and identify the effect of process parameters.
						CO1	Understand the various mechatronics systems and their levels including the fundamental principles of different sensors and transducers
59	VR19	03	B.Tech-Mechanical	1003194151	Mechatronics	CO2	Develop the model containing solid state electronic devices and make use of signal processing and conditioning theories
			Engineering			CO3	Analyze various actuating systems to design mechatronic motion logic control system
						CO4	Assess PLC programming techniques and data acquisition systems for implementation of micro mechatronics systems

						CO1	Estimate the error for any two successive iterations for a simple laplacian equation using any numerical method
			D Took Machanical		Computational	CO2	Applying various numerical techniques to solve PDE's associated with governing equations applied in various engineering problems
60	VR19	03	B.Tech-Mechanical Engineering	1003194152	Fluid Dynamics	CO3	Determine momentum, energy, conservation laws and principles that are applied to conduction and convection problems using FDM approach
						CO4	Assess PLC programming techniques and data acquisition systems for implementation of micro mechatronics
						CO1	Recognize the development of Additive Manufacturing technology and opportunities for transforming a concept into product development.
61	VR19	03	B.Tech-Mechanical Engineering	1003194153	Additive Manufacturing	CO2	Apply the suitable rapid prototyping process for a given product
						CO3	Analyze STL file problems, find solution and repair
						CO4	Explore the applications of AM processes in various fields
						CO1	Understand the basic functional requirements of the elements of Steam power plant.
						CO2	Illustrate the working of various power plants viz Diesel,
62	VR19	03	B.Tech-Mechanical	1003194154	Power Plant	CO2	gas, hydro and nuclear.
02	11117	05	Engineering	1005174154	Engineering	CO3	Analyze economics of power plants and interpret the
							performance of power plants based on load variations
						CO4	Elucidate the impact of power plant emissions on global warming and their preventive measures.
						COI	Acquire knowledge of various air refrigeration cycles and their analysis.
					Refrigeration	CO2	Illustrate the performance improvement methods in VCR systems.
63	VR19	03	B.Tech-Mechanical Engineering	1003194155	and Air Conditioning	CO3	Outline the refrigerant characteristics & components of the VCR system.
						CO4	Apply the working principles of vapour absorption & Discuss the various non-conventional methods of refrigeration.
					Ovalitarand	COI	Understand the concepts of quality and the fundamentals of science of quality engineering
64	VR19	03	B.Tech-Mechanical	1003194156	Quality and Reliability	CO2	Draw and construct control charts
	,,,,,,	0.5	Engineering	1005174130	Engineering	CO3	Infer from sampling plans and determine the quality parameter levels
						CO4	Define a house of quality for a given scenario
				The state of the s		CO1	Understand the different parts of the automobile
65	VR19	03	B.Tech-Mechanical	1003194157	Automobile	CO2	Illustrate the working of various parts like engine, transmission, clutch, brakes, gearboxes, differential axle
05	YICLD	03	B.Tech-Mechanical Engineering	10031941571	Engineering	CO3	Describe the steering and the suspension system operation
						CO4	Identify the environmental implications of automobile emissions

						COI	Understand the basic knowledge of different NDE techniques which enables to carry out the various inspection.
66	VR19	03	B.Tech-Mechanical	100319418	Non- Destructive	CO2	Relate the ultrasonic testing method in various applications with other methods.
			Engineering		Evaluation	CO3	Aquire the knowledge of liquid penetrant, eddy current, magnetic particle testing methods and discuss the advantages and shortcomings
						CO4	differentiate various defect types and select appropriate testing method for better evaluation
						COI	Understand the properties of constituents, classification of composites and their suitability for the structural applications.
67	VR19	03	B.Tech-Mechanical Engineering	1003194159	Advanced Materials	CO2	Categorize and process of different PMC, MMC & CCC with their applications
						CO3	Compute micromechanical analysis of Lamina.
						CO4	Compare Nano materials with bulk materials.
					CAD/CAM	COI	Apply of CAD computational analysisi tools to engineering desing and create a compute CAD documenttation for an engineering design
68	VR19	03	B.Tech-Mechanical Engineering	1003194101	Lab	CO2	Model complex shapes including freeform curves and surfaces
						CO3	Explain basic concepts of NCN programming machining
						COI	Identify the basic concepts and various data model used in database design, design ER model for a given problem and formulate SQL queries.
69	VR19	03	B.Tech-Mechanical	1005193260	Introduction to Database	CO2	Apply relational database theory and be able to describe relational algebra expression, tuple and domain relation expression from queries.
		×	Engineering		Management Systems	CO3	Intrepret the use of normalization and functional dependency, indexing and hashing technique used in database design.
						CO4	Apply and relate the concept of transaction, concurrency control and recovery in database.
						COI	Categorize and assess various types of operating systems
7.0	70 1/010	02	B.Tech-Mechanical	1005103103	Operating	CO2	Analyze various process scheduling and memory management techniques to develop better solutions.
70	VR19	03	Engineering	1005193102	Systems	CO3	Formulation of dead lock management, resource management techniques and IPC abstraction.
						CO4	Ability to perform tasks in Windows/ UNIX / Linux /Android and other environments.

	i.					COI	Create visualizations in accordance with static UI using HTML tags
			B.Tech-Mechanical		Fundamentals	CO2	Apply intermediate and advanced web development practices
71	VR19	03	Engineering	1005193161	of Web Technology	CO3	Develop a fully functioning website using PHP and AJAX
						CO4	Analyze information from data and implement the same into web applications
						COI	CO1 Understand the current scenario of alternative fuels and reserve status of fossil fuels.
70		0.2	B.Tech-Mechanical		Alternative	CO2	CO2 Elucidate the important properties, production and storage of hydrogen and other gaseous fuels and address
72	VR19	03	Engineering	1003194250	Fuels	CO3	the implications during their use in IC engines. CO3 Evaluate the performance of clean propulsion technologies.
						CO4	Analyse the behavior of engines during the usage of alternative fuels
						CO1	Distinguish various types of solar thermal collectors
			D. Task Maskasiasi		Green	CO2	Describe the working of a photovoltaic system and wind energy conversion system.
73	VR19	03	B.Tech-Mechanical Engineering	1003194251	Engineering Systems	CO3	Analyze the operation of fuel cells and biomass conversion technologies.
						CO4	Elaborate on ocean, geothermal, electrical and Mechanical systems
						COI	Understanding basic design rules for manufacturing and material selection.
74	VR19	03	B.Tech-Mechanical	1003194252	Design for Manufacture	CO2	Applying the production process for ease of manufacturing.
			Engineering			CO3	Analyze factors for selection of metals and alloys and relationship to manufacturing processes.
						CO4	Apply the concepts of design for manufacturing for product development
						COI	Understand the basics of workflow and becomes well acquainted with line balancing and mixed model production theories
75	VR19	03	B.Tech-Mechanical Engineering	1003194253	Production Planning And Control	CO2	Comprehend the concepts of demand forecasting and the quantitative methods to meet the market demand.
					Control	CO3	Differentiate EOQ, ABC and VED models.
						CO4	Apply the concepts of demand, supply to the production planning across all industries.
						CO1	Analyze the entrepreneurship design and the business environment.
76	VR19	03	B.Tech-Mechanical	1003194270	Main Project		Difine industrial policies.
"		05	Engineering	1003177210	/Internship	CO3	Explain the business preparation.
						CO4	Integrate the knowledge of various courses and their applications in industry.

VIGNAN'S INSTITUE OF INFORMATION TECHNOLOGY (A) DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING VR19 B.Tech - Electronics and Communication Engineering Course Outcomes

			VR19 B.1e	ch - Electronic	s and Communi	cation I	Engineering Course Outcomes
S.No	Regula tion	Prog ram me	Programme Name	Course Code	Course Name	со	Course Outcome: After the completion of the course student will be able to
						COI	Executing mean value theorems and evaluate maxima and minima of functions of two variables without constraints
1	VR19	04	B.Tech-Electronics and communication	1000191100	Mathematics-I	CO2	Apply the analytical methods to solve higher order linear differential equations.
			Engineering			CO3	Evaluate of solution of Ordinary differential equations by using Laplace Transform technique.
						CO4	Identify and solve partial differential equations.
						COI	Identification of different polymers and their functionalities
2	VR19	04	B.Tech-Electronics and communication	1000191123	Applied	CO2	Determination of structure to many compounds and apply the basic knowledge in construction of cell and its applications
		•	Engineering	1000171120	Chemistry	CO3	Analysis of corrosive environments and protection of precious metal
						CO4	Adoption of different green methodologies and acquire
						COI	knowledge on different advanced materials Solve approximate roots of an equation by using
			NOT TOWNS THE INCOME			CO2	different numerical methods. Solve approximate roots of an equation by using
3	VR19	04	B.Tech-Electronics and communication	1000191101	Mathematics –	CO3	different numerical methods. Computer Numerical Solution of ODE and Numerical
			Engineering		11	CO3	Integration. Evaluate simultaneous linear equations numerically
						CO4	using rank of a matrix and also Eigen values and Eigen vectors of a square matrix.
						001	Understand the use of drawing instruments to construct
						COI	the polygons and curves
4	VR19	04	B.Tech-Electronics and communication	1003191101	Engineering	CO2	Learn the principle of orthographic projections. Draw Orthographic projections of points, lines.
		Op. Charl	Engineering	CA-0000 SETS TONO SESSIONS	Drawing	CO3	Draw the various types of planes and solids its views in different Positions
				1		CO4	Draw isometric views of simple objects
							Interpret fundamentals of computers and convert
				s.		COI	flowcharts/algorithms to C Programs. Apply decision making and Iterative features of C
			B.Tech-Electronics		Problem	CO2	Programming language effectively.
5	VR19	04	and communication	1005191120	Solving and	CO3	Develop programs using modular techniques.
			Engineering		Programming using C		Make use of user defined data types and implement
					using C	CO4	them for various applications.
						COI	Demonstrate the passive and active components
			B.Tech-Electronics		Davis Et	CO2	Analyze different Signal sources and measuring instruments
6	VR19	04	and communication Engineering	1004191110	Basic Electronic Workshop	соз	Apply different types of relays in communication systems
						CO4	Apply different types of relays in communication systems
						COI	Have general knowledge and legal literacy and thereby to take up competitive examinations.
	SENDER MAN	2004	B.Tech-Electronics		Constitution of	CO2	Distinguish the power of state and central central
7	VR19	04		1000191130	Constitution of India	CO3	Summarize theelection procedure in India before and after independence
			Engineering			CO4	Association with the powers and functions of

						COI	Evaluate the analyticity of a complex function using CR equations and also construct an analytic function using Millan Thomson method
						CO2	Compute Line integrals using complex integrations.
			B.Tech-Electronics		Complex	CO3	Expand the Taylor and Laurent series of simple functions and calculating residues by the nature of the singularities.
8	VR19	04	and communication Engineering	1000191201	Variables and Vector Calculus	CO4	Explain Gradient, divergence and curl operations in vector, scalar fields and apply Green's, Gauss and Stokes theorem as the generalisation of fundamental theorem of integral calculus.
						CO5	Evaluate the analyticity of a complex function using CR equations and also construct an analytic function using Millan Thomson method.
						COI	Apply the basic circuit analysis techniques, in DC circuits and To know the performance of the circuits
			D.T. 1.51			CO2	Analyze steady state analysis of AC circuits
9	VR19	04	B.Tech-Electronics and communication	1002191201	Network Analysis	CO3	Analyze steady state analysis of electrical circuits using theorems
			Engineering		,	CO4	Gain the knowledge in characteristics of two port networks using parameters (Z, Y, ABCD, h) and Analyze Transient state analysis of AC circuits
		-				COI	Discuss the wave phenomena of light and apply these principles to describe electromagnetic wave propagation.
			B.Tech-Electronics		Wave Optics and	CO2	Apply the knowledge of basic quantum mechanics, to set up one-dimensional Schrodinger's wave equation
10	VR19	04	and communication Engineering	1000191222	Semiconductor Physics	CO3	Identify the importance of classical and quantum mechanical treatment of materials.
						CO4	Make use of the basic concepts of energy bands in crystalline solids to understand semiconductor physics.
						COI	Relate data structure concepts with real time applications.
1,,	VD10	04	B.Tech-Electronics	1005101221	Data Structuras	CO2	Apply linear and non linear data structures by identifying the appropriate need.
11	VR19	04	and communication Engineering	1005191221	Data Structures	CO3	Analyze searching and sorting techniques for effective management of data
						CO4	Design and implement operations of linear and nonlinear data structures
						COI	Read, understand and interpret material on Environment, Science and Technology, tourism, Energy Sources, Social Awareness
12	VR19	04	B.Tech-Electronics and communication Engineering		Technical English Communication	CO2	Analyze the functions of language and grammar in spoken and written forms.
1					Communication	CO3	Write effectively on various domains.
						CO4	Prepare and exhibit oral presentation skills by using ICT(Individual/Team)

					I		D 11 1
						COI	Realize the purpose/Role of Engineer for solving social problems
			B.Tech-Electronics		Engineering	CO2	Learn to Design a component/system in an engineering way
13	VR19	04	and communication Engineering	1000191110	Exploration	CO3	Learn to Design a component/system in an engineering way
			-			CO4	Integrating different systems (mechanical/Electrical/computer) to work as a unit
					Extra Curricular	COI	Learn new skills and Boost academic performance
			B.Tech-Electronics		Activities,	·CO2	Broader social skills with improved time management
14	VR19	04	and communication	1000191131	Sports and	CO3	Explore Interests and Create Broader Perspectives
	, (()	٠.	Engineering	1000171151	Games (Audit		Participate in various co-curricular activities leading to
			Engineering		Course)	CO4	their multifaceted personality development
\vdash					Course)	COI	Analyze the Demand, Price and Cost.
					Managerial		Identify the Nature of different markets to determine
			B.Tech-Electronics		Economics &	CO2	Price Output for different Business Units
15	VR19	04	and communication	1099192100	Financial	CO3	Interpret various forms of businesses
			Engineering		Analysis		Evaluate and Prepare investment project proposals and
					Allalysis	CO4	Financial Statements
							Analyze PN junctions in semiconductor devices under
						COI	various conditions.
							Compare the construction, working principle of
						CO2	rectifiers with and without filters.
							Expalin the construction, principle of operation of
			B.Tech-Electronics		Electronic		transistors, BJT and FET with their V-I characteristics in
16	VR19	04	and communication	1004192120	Devices &	CO3	different configurations and understand the various
			Engineering		Circuits	CO3	biasing techniques for BJT and FET.
							biasing techniques for BJT and FET.
							Davidon the stabilization concents with avaraccions and
						CO4	Develop the stabilization concepts with expressions and
						CO4	perform the analysis of small signal low frequency
							transistor amplifier circuits using BJT.
						COI	Classify signals & systems for continues time, discrete
							time systems.
				ł		003	Analyze continuous-time signals and systems using
					1	CO2	Fourier series, Fourier transform and Laplace transform.
1			B.Tech-Electronics		Signals and		Contain and the same to account postion and time
17	VR19	04	and communication	1004192100	Systems	602	Explain sampling theorem to convert continuous-time
			Engineering			CO3	signals to discrete-time signal and also apply z-transform
							to analyze discrete-time signals and systems
			1	1	1		Evaluate the relationships among the various
			1			CO4	representations of LTI systems and apply the Concepts
							of convolution, correlation, Energy and Power density
-							spectrums to communication problems.
				1		00.	Illustrate the need for modulation and differentiate
						COI	various Analog modulation and demodulation
		1					techniques in terms of their spectral characteristics
			B.Tech-Electronics	1004:00:5	Analog	CO2	Interpret various functional blocks needed in the design
18	VR19	04	and communication	1004192121	Communications	400000000000000000000000000000000000000	of Radio Transmitters and Receivers
			Engineering	1004192121		CO3	Evaluate the performance characteristics of various
			Engineering				Analog modulation schemes in the presence of Noise
				1		CO4	Implement simple analog systems for various
						1	modulation techniques

						COI	Solve numeric information in different forms, e.g. different bases, signed integers, various codes such as ASCII, Gray, and BCD.
10	VIDIO	0.4	B.Tech-Electronics		Switching	CO2	Evaluate functions using various types of minimizing algorithms like Boolean expressions using the theorems and postulates, Karnaugh map or tabulation method
19	VR19	04	and communication Engineering	1004192101	Theory and Logic Design	CO3	Design Various logic gates starting from simple ordinary gates to complex programmable devices and arrays.
					,	CO4	Design and analyze small combinational and sequential circuits and to use standard combinational and sequential functions/building blocks to build larger more complex circuits.
						COI	Interpret and Participate in writing skills that are needed
						CO2	in an organization Recognize the need of core competencies to succeed in
20	VR19	04	B. Tech-Electronics and communication	1020192100	Employability Readiness	CO2	professional and personal life Solve various Basic Mathematics problems by following
20	VICI	01	Engineering	1020172100	Program-I	CO3	different methods and to perform well in various
							competitive exams and placementdrives. Apply shortcut methods to solve problems and
						CO4	confidently
						CO1	Interpret and manage in public governance.
21	VR19	04	B.Tech-Electronics and communication	1020192101	Public	CO2	Participate in and contribute to the policy process.
		•	Engineering	1020172101	Administration	CO3	Analyze, think critically, solve problems, and make decisions.
						CO4	Articulate and apply a public service perspective.
						COI	Construct simple sentences in French using syntax and grammar
			B.Tech-Electronics		Foreign	CO2	Pronounce and read French reasonably well.
22	VR19	04	and communication	1020192102	Linguistic -	CO3	Demonstrate an elementary knowledge of French
			Engineering		French		sentence structure through speaking and writing Apply basic spoken French and demonstrate
						CO4	understanding by writing and/or responding
							appropriately.
						COI	Gain a higher level of personal involvement and interest in understanding and solving environmental resource problems and its conservation practices.
						CO2	Overall understanding of different types of natural resources and its conservation.
							Demonstrate knowledge relating to the biological
23	VR19	04	B.Tech-Electronics and communication	1000192130	Environmental Science (Audit	CO3	systems involved in the major global environmental problems of the 21st century.
	***********************************	econdit!	Engineering	-	Course)		Recognize the interconnectedness of human dependence
							on the earth's ecosystems and Influence their society in proper utilization of goods and services. Learn the
						CO4	management of environmental hazards and to mitigate
							disasters and have a clear understanding of
							environmental concerns and follow sustainable development practices.
						COI	Analyze the small signal high frequency transistor amplifier using BJT and FET.
24	VR19	04	B.Tech-Electronics	1004192220	Analog Electronic	CO2	Design and analysis of multi stage amplifiers using BJT and analysis of different feedback amplifiers using BJT.
24	VICIT	04		1004192220	Circuits – I		Determine the expressions for frequency of oscillation
		Engineering		Circuits – I	CO3	and condition for oscillation of RC and LC oscillators	
						CO4	and their amplitude and frequency stability concept. Classify the wave shaping circuits with different inputs.
	L		L		L		1 me mane onapming officialis with different inputs.

VR19								1
VR19							COL	
VR19								
VR19							CO2	Learn the IEEE Standard 1076 Hardware Description
VR19				B Tech-Electronics			CO2	
Engineering Applications Coloral abstractions, behavioral, structural, simulation, synthesis and adesign basic digital circuits with Coloral and Analyse and design basic digital circuits with Coloral and Communication Engineering B. Tech-Electronics and communication Engineering Python Programming B. Tech-Electronics and communication Engineering Engineering B. Tech-Electronics and Engineering Engineering Engineering Engineering Electromagenetic Edexton Engineering Engineering Engineering Engineering E	25	VR 10	04	DESCRIPTION OF THE SECURITY OF THE PROPERTY OF	1004102221	Digital IC		Model complex digital systems at several levels of
and rapid system prototyping 24 VR19	23	VKIS	04	WILLIAM TO THE TOTAL THE TOTAL TO THE TOTAL THE TOTAL TO	1004192221	Applications	CO3	abstractions, behavioral, structural, simulation, synthesis
Number N				Engineering				
VR19								
26 VR19 04 B.Tech-Electronics and communication Engineering 100419220 Electromagnetic Marie							CO ₄	
VR19								
VR19							~~.	Enumerate different environments to install Python IDE
VR19							COI	
NR19								
Access Python libraries from various online resources and import packages to the current working environment. CO3 Access Python libraries from various online resources and import packages to the current working environment. CO4 Manipulate or Correlate the data through the accessing of files. CO5 Contrast the electric field and magnetic fields, analyze the Maxwell's Equations for static and time varying field	1			B. Tech-Electronics		Introduction to	CO2	
Programming CO3 and import packages to the current working CO3 and import packages to the current working CO3 Amalypuate or Correlate the data through the accessing of files. CO4 Contrast the electric field and magnetic fields, analyze the Maxwell's Equations for static and time varying field CO2 Electromagnetic CO3 Determine the EM wave equation and characterize the propagation of EM wave through conductor and dielectric medium. CO3 Determine the EM wave equation and characterize the propagation of EM wave through conductor and dielectric medium. CO3 Designing the transmission line using the basic circuit elements and analyzing the different transmission parameters. Justification of smith chart to find the impedance mismatching and measurement of VSVR using VNA CO4 CO5	26	VR19	04		1004192200			
VR19			20.0	SOURCE STORES SERVICE STORES			CO3	
VR19				gg		1108141111111	003	
VR19								
Variety Vari							CO4	
VR19	\vdash							
VR19							COL	
Propagation of EM wave through conductor and dielectric medium. Propagation of EM wave through conductor and dielectric medium.							COI	line waxwen's Equations for static and time varying field
Propagation of EM wave through conductor and dielectric medium. Propagation of EM wave through conductor and dielectric medium.								Determine the FM wave counting and absorbed in the
VR19				D Took Clostersian		Electromagnetic	003	
Engineering Engin	27	VDIO	0.4		1004102201	Waves and	CO2	
Lines CO3 elements and analyzing the different transmission parameters. CO4 Lines CO3 elements and analyzing the different transmission parameters. CO4 Listification of smith chart to find the impedance mismatching and measurement of VSWR using VNA Construct the Probability distribution and density functions for single and multiple random variables and communication Engineering Lines CO3 Random Variables & Stochastic Process CO4 Analyze the LTI systems with random inputs ANALYZE the functions of language and grammer in spoken and written forks with an emphasis on Isrw skills and communication Engineering CO3 Skills Lab CO4 Analyze the LTI systems with an emphasis on Isrw skills will performing gds interviewa, oral presentations with a focus on non verbal communication Prepare and exhibit oral presentation skills by using ict CO4 CO5 CO6 CO7 CO7 CO7 CO7 CO7 CO8 CO8 CO8	21	VKI9	04		1004192201	Transmission		
Parameters Par				Engineering		Lines	001	
VR 19							CO3	1
VR19								
VR19							CO4	
VR19								
VR19			i.	*			COI	
VR19 04 B.Tech-Electronics and communication Engineering 1004192202 Stochastic Process CO3 Characterize the random processes in the time and frequency domains.								
VR19 VR19 04 and communication Engineering 1004192202 Stochastic Process Stochastic Proce				D.T. J. El.		Random	CO2	
Engineering Engin	20	VDIO	0.4	Control of the Contro	1004102202	Variables &		their statistical averages
Process CO3 frequency domains. CO4 Analyze the LTI systems with random inputs ANALYZE the functiions of language and grammer in spoken and written forks with an emphasis on Isrw skills ANALYZE the functiions of language and grammer in spoken and written forks with an emphasis on Isrw skills CO2 disseminate the relevant skills while performing gds, interviewa, oral presentations with a focus on non verbal communation CO3 prepare and exhibit oral presentation skills by using ict CO4 Organize proper life skills for their employability Classify the various social problems present in the world & they will be able to identify and select a community problem to develop a technological project. B. Tech-Electronics and communication Engineering B. Tech-Electronics and communication Engineering Mini Project-I (Epics/Societal Relevant Project) CO2 Things, 3D Printing, Mobile App Creation, Thinker CAD, and Web page development. Apply the engineering knowledge, mathematics, design thinking and project management to develop a community project. Prepare professional work reports and develop	28	VKI9	04	2 6	1004192202	Stochastic		
VR19 04 B.Tech-Electronics and communication Engineering 1000192110 Communication Skills Lab CO2 disseminate the relevant skills while performing gds , interviewa , oral presentations with a focus on non verbal communication Organize proper life skills for their employability Co1 organize proper life skills for their employability CO2 organize proper life skills for their employability CO3 prepare and exhibit oral presentation skills by using ict CO4 organize proper life skills for their employability CO3 prepare and exhibit oral presentation skills by using ict CO4 organize proper life skills for their employability CO3 prepare and exhibit oral presentation skills by using ict CO4 organize proper life skills for their employability CO3 prepare and exhibit oral presentation skills by using ict CO4 organize proper life skills for their employability CO3 prepare and exhibit oral presentation skills by using ict CO4 organize proper life skills for their employability organize proper life skills for their employability organize proper life skills for their employability organize proper life skills on the world and community problem to develop a technological project. CO2 Things, 3D Printing, Mobile App Creation, Thinker CAD, and Web page development. Apply the engineering knowledge, mathematics, design thinking and project management to develop a community project.				Engineering		Process	CO3	
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VR19 VR19 04 B.Tech-Electronics and communication Engineering VR19 VR19 04 VR19 04 VR19 VR19 04 VR19 VR19 04							004	
VR19 VR19 04 B.Tech-Electronics and communication Engineering WR19 04 B.Tech-Electronics and communication Engineering Illustrate the concepts of Design Thinking and Project management. Learn the technologies like Internet of Things, 3D Printing, Mobile App Creation, Thinker CAD, and Web page development. Apply the engineering knowledge, mathematics, design thinking and project management to develop a community project. CO2 Prepare professional work reports and develop							CO4	
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CO3 prepare and exhibit oral presentation skills by using ict code organize proper life skills for their employability Classify the various social problems present in the world & they will be able to identify and select a community problem to develop a technological project. B.Tech-Electronics and communication Engineering 1004192270 Relevant Project) Figure 20 Apply the engineering knowledge, mathematics, design thinking and project management to develop a community project. CO3 Prepare and exhibit oral presentation skills by using ict organize proper life skills for their employability Classify the various social problems present in the world & they will be able to identify and select a community problem to develop a technological project. CO2 Apply the engineering knowledge, mathematics, design thinking and project management to develop a community project. CO3 Prepare professional work reports and develop				Engineering		SKIIIS Lab	CO2	
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Apply the engineering knowledge, mathematics, design thinking and project management to develop a community project. CO4 Prepare professional work reports and develop				and the second s				CAD, and Web page development.
CO3 thinking and project management to develop a community project. CO4 Prepare professional work reports and develop				- 8				
community project. CO4 Prepare professional work reports and develop								
Prepare professional work reports and develop							CO3	
presentation skills							CO4	
								presentation skills

							Design & Analyze different types of differential
						COI	amplifier circuits.
32	VR19	04	B.Tech-Electronics and communication	1004193120	Analog Electronic	CO2	Interpret the various linear and non-linear applications using operational amplifier.
			Engineering	1001170120	Circuits-2	CO3	Analyze the different types of active filters and their design with operational amplifier & examine the
							functionalities of IC 555, PLL, VCO.
-						CO4	Compare different types of ADC and DACs. Demonstrate the architecture of 8086 microprocessors.
			B.Tech-Electronics		NG		Make use of architecture and special functions of AVR
33	VR19	04	and communication	1004193121	Microprocessor and AVR	CO2	microcontrollers.
			Engineering	1001170121	Microcontroller	CO3	Develop programming for the AVR microcontrollers using C.
						CO4	Design and develop interface between I/O devices and AVR Microcontrollers.
						COI	Identify the basic concepts and various data model used
			D.T. 1 Cl		5		in database design and formulate SQL queries. Interpret use of normalization in designing the database.
34	VR19	04	B.Tech-Electronics and communication	1005192221	Database Management	CO2	
			Engineering	_	Systems	CO3	Evaluate indexing and hashing techniques used in database design.
						CO4	Apply and relate the concept of transaction, concurrency control and recovery in the database.
							Illustrate the basic antenna parameters and Providing
						COI	knowledge of different types of antenna.
			B.Tech-Electronics		Antennas and		or ancima.
35	VR19	04	and communication	1004193100	Wave	CO2	Design and Analyze antenna arrays.
			Engineering		Propagation	CO3	Analyze the importance of reasonent and non resonent antennas
						CO4	Compare different modes of wave propagation through
							ground wave, space wave and sky wave.
						COI	Categorize different types of system and identify a set of algebraic equations to represent and model a
						COI	complicated system into a more simplified form.
							Explain time domain analysis to predict and diagnose
			B.Tech-Electronics		Linear Control	CO2	transient performance parameters of the system for
36	VR19	04	and communication	1004193101	Systems		standard input functions. Evaluate different types of analysis in frequency domain
			Engineering			CO3	to explain the nature of stability of the system
							Determine the various kinds of compensator and also
						CO4	develop and analyze state space models for continuous time systems.
							space models for continuous tillie systems.
						CO1	Relate the procedural and object oriented paradigm with real world entities
			B.Tech-Electronics			CO2	Apply the concepts of function overloading, operator
37	VR19	04	and communication	1005193160	Programming in	CO2	overloading ,virtual functions and polymorphism
			Engineering		C++	CO3	classify inheritance with understanding of early and late binding.
						CO4	solve the critical order problems using STL and Generic Programming
						COI	Describe different types of computer applications
						CO2	Describe the basic concepts of client server application and WWW
38	38 VR19 04	04	B. Tech-Electronics and communication	1005193161	Fundamentals of Web	CO3	Describe the basic concepts of HTML and CSS to
			Technologies		design web pages and web site		
						CO4	Analyze a given problem and apply requisite appropriate tools for designing interactive web applications.
						waster of	

							Categorize and assess various types of operating systems
						CO1	and execution of system calls at each phase.
			B.Tech-Electronics				Analyze various process scheduling and memory
39	VR19	04	and communication	1005193102	Operating	CO2	management techniques to develop better solutions.
"	VICI	0.1	Engineering	1003173102	Systems		
			Lingineering			CO3	Formulation of dead lock management, resource
						CO3	management techniques and IPC abstraction.
						004	Ability to perform tasks in Windows/ UNIX / Linux
						CO4	/Android and other environments.
						COI	Identify various robot configuration and components
						000	Select appropriate actuators and sensors for a robot
			B.Tech-Electronics			CO2	based on specific application
40	VR19	04	and communication	1003193160	Industrial		Carry out kinematic and dynamic analysis for simple
			Engineering	(30,27012-45) (20,2712) (67,2000)	Robotics	CO3	serial kinematic chains
						SANSAN AND	Perform trajectory planning for a manipulator by
						CO4	avoiding obstacles.
							Discuss the importance of human values, harmony and
					Universal	COI	ethical behavior in real life situations
			B.Tech-Electronics		human values		Describe the core values that shape the ethical behaviour
41	VR19	04	and communication	1099193130	and	CO2	of an engineer
	1.5554		Engineering	10//1/5150	Professional	CO3	Recall basics of professional ethics and human values.
			25		ethics		Develop sustained happiness through identifying the
					Curios	CO4	essentials of human values and skills.
						COI	Illustrate basic insights of management principles
			B.Tech-Electronics			COI	Summarize Production process, Quality control and
42	VR19	04	and communication	1099192200	Management	CO2	
12	VICI	04	Engineering	1077172200	Science	CO3	Inventory techniques
l			Engineering			CO4	Identify Strategies and policies to functional areas
						CO4	Apply Contemporary management Practices Compare different digital carrier modulation and
						COI	demodulation schemes.
							Justify digital modulation techniques for optimal
050000		P07.000	B.Tech-Electronics		Digital	CO2	reception.
43	VR19	04	and communication	1004193220	Communications		Develop various errors correction and detection codes to
			Engineering		Communications	CO3	digital data.
							Assess the error probability calculations for digital
						CO4	modulation techniques
							Describe the fabrication process for MOS,CMOS and
						COI	BICMOS technologies along with their electrical
						COI	properties
			B.Tech-Electronics				Outline the concepts of design rules during the layout
44	VR19	04	and communication	1004193221	VLSI Design	CO2	design
	, ((1)	0.	Engineering	10041/3221	V LSI Design		Model various scaling Models and factors and their
			Liigincering			CO3	effects on MOSFET parameters.
							A CONTRACTOR OF THE CONTRACTOR
						CO4	Examine various design issues of VLSI Circuits and
							illustrate FPGA Design
						COI	Understand the Architecture, protocols and applications
			B.Tech-Electronics			-	of IoT.
45	VR19	04	and communication	1019193260	Internet of	CO2	Analyse the communication protocols and standards
43	VICIS	04	Company of the Compan	1019193200	Things		used in IoT
			Engineering			CO3	Design the simple IoT applications to monitor or control
						004	IoT devices using simulation or hardware
		-					Implementation of the real time IoT applications.
						COI	Describe Verilog HDL and Design Digital circuits.
						000	Construct behavior model of digital circuits and Write
			D Took Electricity		Digital Design	CO2	RTL models of digital circuits. Verify behavior and RTL
46	VR19	04	B.Tech-Electronics	1004103350	Through		models
46	VKI9	04	and communication	1004193250	Verilog	000	Contrast standard Cell Libraries and FPGAs Synthesize
			Engineering		Hdl	CO3	RTL models to standard cell libraries and FPGAs.
							L L DW
						CO4	Implement RTL models on FPGAs and testing and
							verification

47 VR19 VR19 VR19 VR19 VR19 VR19 VR19 VR19								Demonstrate the architecture of ARM processors & LPC
VR19							(()	A SECTION AND ADDRESS OF THE PROPERTY OF THE P
VR19				B.Tech-Electronics		ARM	CO2	Develop programming for the specific application using
CO4 Compare the specifications and suitability of IZC, SPI, RTC, WATCHDOG/TIMER, PWM generation blocks and communication Engineering B. Tech-Electronics and communication Engineering VR19 VR19 04 B. Tech-Electronics and communication Engineering VR19 VR19 04 B. Tech-Electronics and communication Engineering VR19 04 B. Tech-Electr	47	VR19	04	· · · · · · · · · · · · · · · · · · ·	1004193251		CO3	Make use of peripherals with microcontroller systems.
VR19		Engineering			CO4	RTC, WATCHDOG, TIMER, PWM generation blocks.		
VR19							COL	* 150 NO
VR19	1							
VR19				B Tech-Electronics		270.00 80 80.00	CO2	
Frocessing CO3 in terms of spatial filtering, frequency filtering, responsible and segmentation. CO4 Examine the different techniques of color and multi-resolution processing. Analyze the different microwave components and analyze different type of coupling mechanism of CO3 in terms of spatial filtering, frequency filtering, restoration and segmentation. CO4 Examine the different microwave components and multi-resolution processing. Analyze the different microwave components and analyze different type of coupling mechanism of CO3 in terms of spatial filtering, frequency filtering, restoration and segmentation. CO4 Examine the different microwave components and analyze different type of coupling mechanism of CO4 in terms of spatial filtering, frequency filtering, restoration to restoration to processing. CO5 in terms of spatial filtering, frequency filtering, restoration to prestoration and segmentation. CO6 Interms of spatial filtering, frequency filtering, restoration to prestoration to prestoration to prestoration of the different decrease and communication Engineering Microwave Engineering CO5 interms of spatial filtering, frequency filtering, frequency filtering, freatons for the different decrease and communication and communication and communication Engineering NRIP OF INTERPRETATION TO Analyze the components and different decrease of CO6 in terms of spatial filtering, frequency different decrease of CO6 in terms of spatial filtering, frequency different decrease of CO6 in terms of spatial filtering, frequency different decrease of CO7 in the different decrease of CO8 in terms of spatial filtering frequency different decrease of CO8 in terms of spatial filtering frequency different decrease of CO8 in terms of Spatial filtering frequency different decrease of CO8 in terms of Spatial filtering frequency different decrease of CO8 in terms of Spatial filtering frequency different decrease of CO8 in terms of Spatial filtering frequency different decrease of CO8 in terms of Spatial filtering frequenc	48	VR19	04	The last transfer towns to the control of the contr	1004193252	9		Solve the methods to extract information from the image
VR19				Engineering		Processing	CO ₃	
49 VR19 04 B.Tech-Electronics and communication Engineering 50 VR19 04 B.Tech-Electronics and communication Engineering 51 VR19 04 B.Tech-Electronics and communication Engineering 52 VR19 04 B.Tech-Electronics and communication Engineering 53 VR19 04 B.Tech-Electronics and communication Engineering 54 VR19 04 B.Tech-Electronics and communication Engineering 55 VR19 04 B.Tech-Electronics and communication Engineering 56 VR19 04 B.Tech-Electronics and communication Engineering 57 VR19 04 B.Tech-Electronics and communication Engineering 58 VR19 04 B.Tech-Electronics and communication Engineering 59 VR19 04 B.Tech-Electronics and communication Engineering 50 VR19 04 B.Tech-Electronics and communication Engineering 51 VR19 04 B.Tech-Electronics and communication Engineering 52 VR19 04 B.Tech-Electronics and communication Engineering 53 VR19 04 B.Tech-Electronics and communication Engineering 54 VR19 04 B.Tech-Electronics and communication Engineering 55 VR19 04 B.Tech-Electronics and communication Engineering 56 VR19 04 B.Tech-Electronics and communication Engineering 57 VR19 04 B.Tech-Electronics and communication Engineering 58 VR19 04 B.Tech-Electronics and communication Engineering 59 VR19 04 B.Tech-Electronics and communication Engineering 50 VR19 04 B.Tech-Electronics and								
VR19			3				CO4	
VR19					-			A palyze the different modes of rectangular and circular
VR19							COI	
VR19						Microwave	202	
VR19	49	VR19	04		1004193253	Engineering	CO2	
VR19				Engineering				
VR19							CO4	
VR19 VR19 O4 B.Tech-Electronics and communication Engineering Topic VR19 O4 B.Tech-Electronics and communication Engineering Topic VR19 O4 Selection Topic VR19 O4 VR19 O4 Selection Topic VR19 O4 VR19 VR19 O4							COI	
VR19								
Second Programming Engineering 1005193261 1005193261 1005193261 1005193261 1005193261 1005193261 1005193261 1005193261 1005193263 100519326				B.Tech-Electronics			CO2	to create exception free and parallel real world
Engineering Engineering Inrough Java Engineering Engineering Inrough Java Engineering Engineering Engineering Engineering CO3 Implement GUI for windows based applications with modern tools CO4 Design various layouts using swings and AWT Explain the concepts and drivetrain configurations of electric drive vehicles. CO5 Design various layouts using swings and AWT Explain the concepts and drivetrain configurations of electric drive vehicles. CO6 Design various layouts using swings and AWT Explain the concepts and drivetrain configurations of electric drive vehicles. CO7 Design various layouts using swings and AWT Explain the concepts and drivetrain configurations of electric drive vehicles. CO8 Design various layouts using swings and AWT Explain the concepts and drivetrain configurations of electric drive vehicles. CO8 Design various layouts using swings and AWT Explain the concepts and drivetrain configurations of electric drive vehicles. CO8 Design various layouts using swings and AWT Explain the concepts and drivetrain configurations of electric drive vehicles. CO8 Design various layouts using swings and AWT Explain the concepts and drivetrain configurations of electric drive vehicles. CO8 Design various layouts using swings and AWT Explain the concepts and drivetrain configurations of electric drive vehicles. CO8 Design various layouts using swings and AWT Explain the concepts and drivetrain configurations of electric drive vehicles. CO8 Design various layouts using swings and AWT Explain the concepts and drivetrain configurations of electric vehicles. CO9 Analyze the basic issues of different types of knowledge representation techniques to build intelligent system. CO9 Apply probabilistic and fuzzy models to solve problems with uncertainty. CO9 Analyze the strengths and weaknesses of various symmetric encryption algorithms. CO9 Analyze the strengths and weaknesses of various symmetric encryption algorithms. CO9 Apply the concepts of number theory and public key algorithms in crypt	50	VR19	04	Control of the contro	1005193261		002	
NR19			-	Engineering		through Java	CO1	Implement GUI for windows based applications with
VR19							CO3	
VR19							CO4	
VR19 VR19 04 B.Tech-Electronics and communication Engineering Describe different electric propulsion systems and energy storage devices Discuss the technology, design methodologies and control strategy of electric vehicles. Coot Explain battery charger topologies for electric vehicles and discuss how the sizing of the drive system is done and energy management strategies used in electric vehicles. Coot Choose appropriate methods in AI that may be suited to solve a given problem and Game Playing. Make use of AI search algorithms and formalizations on real world problems. Coot Analyze the basic issues of different types of knowledge representation techniques to build intelligent system. Coot Identify basic security attacks and services Analyze the strengths and weaknesses of various symmetric encryption algorithms. Coot Classify various cryptography protocols, hash function algorithms in cryptography protocols, hash function							COI	
Solution								Describe different electric propulsion systems and
VR19							CO2	
Explain battery charger topologies for electric vehicles and discuss how the sizing of the drive system is done and energy management strategies used in electric vehicles. CO1 Choose appropriate methods in AI that may be suited to solve a given problem and Game Playing. CO2 Make use of AI search algorithms and formalizations on real world problems. Analyze the basic issues of different types of knowledge representation techniques to build intelligent system. CO3 Apply probabilistic and fuzzy models to solve problems with uncertainty. CO4 Apply probabilistic and fuzzy models to solve problems with uncertainty. CO5 Identify basic security attacks and services Analyze the strengths and weaknesses of various symmetric encryption algorithms. Apply the concepts of number theory and public key algorithms in cryptography algorithms in cryptography protocols, hash function	51	VR19	04	and communication	1002193260	1000000-00000-0000	CO3	Discuss the technology, design methodologies and
52 VR19 04 B.Tech-Electronics and communication Engineering 1005193251 VR19 04 B.Tech-Electronics and communication Engineering 1005193251 VR19 04 B.Tech-Electronics and communication Engineering 1005193263 VR19 04 B.Tech-Electronics and communication Engineering 1005193263 VR19 04 Column 1005193263 Security 1005193263 VR19 04 Engineering 1005193263 Security				Engineering			CO4	and discuss how the sizing of the drive system is done and energy management strategies used in electric
VR19 04 B.Tech-Electronics and communication Engineering 1005193251 VR19 04 B.Tech-Electronics and communication Engineering 1005193263 VR19 04 B.Tech-Electronics and communication Engineering 1005193263 VR19 04 B.Tech-Electronics and communication Engineering 1005193263 VR19 04 Classify various cryptography CO2 Make use of AI search algorithms and formalizations on real world problems. CO3 Presentation techniques to build intelligent system. CO4 Apply probabilistic and fuzzy models to solve problems with uncertainty. CO5 Identify basic security attacks and services Analyze the strengths and weaknesses of various symmetric encryption algorithms. CO6 Classify various cryptography CO7 Classify various cryptography CO8 Classify various cryptographic protocols, hash function							COI	
VR19 04 B.Tech-Electronics and communication Engineering 1005193251 Artificial Intelligence CO3 Real world problems. CO2 real world problems. Analyze the basic issues of different types of knowledge representation techniques to build intelligent system. CO3 Preal world problems. Analyze the basic issues of different types of knowledge representation techniques to build intelligent system. CO4 Apply probabilistic and fuzzy models to solve problems with uncertainty. CO5 Identify basic security attacks and services Analyze the strengths and weaknesses of various symmetric encryption algorithms. CO6 Apply the concepts of number theory and public key algorithms in cryptography CO7 Classify various cryptographic protocols, hash function	1						-	
VR19 04 and communication Engineering 1005193251 Intelligence CO3 representation techniques to build intelligent system. CO4 Apply probabilistic and fuzzy models to solve problems with uncertainty. CO5 Identify basic security attacks and services Analyze the strengths and weaknesses of various symmetric encryption algorithms. CO6 CO6 CO6 CO6 CO7							CO2	
VR19 04 B.Tech-Electronics and communication Engineering 1005193263 Engineering Engineering CCV4 with uncertainty. CO1 Identify basic security attacks and services Analyze the strengths and weaknesses of various symmetric encryption algorithms. CO2 Apply the concepts of number theory and public key algorithms in cryptography CO3 Classify various cryptographic protocols, hash function	52	VR19	04	and communication	1005193251	A CONTRACTOR OF THE	CO3	Analyze the basic issues of different types of knowledge representation techniques to build intelligent system.
VR19 04 B.Tech-Electronics and communication Engineering							CO4	Apply probabilistic and fuzzy models to solve problems with uncertainty.
VR19 04 B.Tech-Electronics and communication Engineering	-	+	+				CO	Identify basic security attacks and services
VR19 04 B.Tech-Electronics and communication Engineering								Analyze the strengths and weaknesses of various
Engineering Security algorithms in cryptography COA Classify various cryptographic protocols, hash function							- 002	symmetric encryption algorithms.
Engineering Security algorithms in cryptography Coa Classify various cryptographic protocols, hash function	53	VR19	04		1005193263		CO:	Apply the concepts of number theory and public key
				Engineering		Security		algorithms in cryptography
				1			CO	digital signature schemes

						COI	Implement electronic hardware by learning PCB artwork design, soldering techniques, testing and troubleshooting etc
54	VR19	04	B.Tech-Electronics and communication	1005193270	Mini Project-II	CO2	Apply new technologies & design techniques (platform, database,etc.) concerned for devising a solution for a given problem statement
	ı		Engineering		J	CO3	Work as an individual or in a team in development of technical projects.
						CO4	Develop project management skills (scheduling work, procuring parts, and documenting Expenditures and working within the confines of adeadline).
						COI	Analyse the digital signals using various digital transforms DFT, FFT etc.
55	VR19	04	B.Tech-Electronics and communication	1004194120	Digital Signal	CO2	Design and realize various digital filters for digital signal processing
	VICI	04	Engineering	1004154120	Processing	CO3	Evaluate the different multi rate digital signal processing systems.
						CO4	Illustrate the architecture of DSP processor
						COI	Interpret the factors affecting the radar performance using Radar Range Equation.
			B.Tech-Electronics			CO2	Apply the principle of FMCW radar in the design of altimeter.
56	VR19	04	and communication Engineering	1004194150	Radar Systems	CO3	Analyze the principle of each and every block of MTI and Tracking Radar
		11				CO4	Demonstrate the basic principle of Receiver and also extraction of signal in Noise
			и			COI	Understand the characteristics of different biomedical signals
57	VD 10	0.1	B.Tech-Electronics	1004104151	Bio Medical	CO2	Analyse the nature of biomedical signals and related concepts.
37	VR19	04	and communication Engineering	1004194151	Signal Processing	CO3	Apply filters and averaging techniques to remove noise and extract features of biomedical signals,
						CO4	Analyse the biomedical signals using wavelet transform
						COI	Illustrate the concepi of MOS Design.
58	VR19	04	B.Tech-Electronics and communication	1004194152	Digital IC Design	CO2	Design and analysis of Combinational and Sequential MOS Circuits.
			Engineering		Design	CO3	Elaborate the Digital IC Design to Different Applications.
						COI	Interpret the role of miniaturization in microelectronic devices and scaling rules of MEMS.
50	VP10	0.4	B.Tech-Electronics	1004104153	Micro Electro Mechanical	CO2	Articulate the techniques for building the microelectronic devices on various types materials.
59	VR19	04	and communication Engineering	1004194153	Systems (Mems)	CO3	Deduce the Microsystems technology for technical feasibility.
						CO4	Design MEMS based micro systems and micro devices,
						CO1	Examine orbital mechanics and launch methodologies
(0)	VD 10		B.Tech-Electronics	100410415	Satellite		
60	VR19	04	and communication	1004194154	Communications	CO3	Design satellite access techniques
			Engineering			CO4	Analyze the earth station technology and constellation of NGSO
						COI	Explain fundamentals of pattern recognition.
	MB10		B.Tech-Electronics	1004104155	Pattern	CO2	Evaluate concepts various nonparametric techniques for pattern recognition.
61	61 VR19	04	4 and communication 1	1004194155	Recognition	CO3	Solve various discrete hidden markov models for pattern
	Engineering			CO4	recognition. Examine the concepts of continuous hidden markov models for pattern recognition		
			1	L	L		parent for pattern recognition

						COI	Examine the sources of power dissipation and learn
							methods to reduce power dissipation Analyze different low-Power Design Approaches and
			B.Tech-Electronics		Low Power	CO ₂	learn to estimate Power dissipation
62	VR19	04	and communication Engineering	1004194156	VLSI Design	CO3	Assess different Low-Voltage Low-Power Adders and Multipliers.
						CO4	Design Low-Voltage Low-Power Memories and compare the performance between different memories
							Illustrate the features and concepts of PLDs, CPLD,
						COI	FPGAs and its applications.
(2)		0.4	B.Tech-Electronics		CPLD & FPGA Architectures	CO2	Analyze different types of Complex Programmable Logic Devices (CPLDs)
63	VR19	04	and communication	1004194157	and	001	Understand different types of FPGAs and its
			Engineering		Applications	CO3	Architectures with Applications.
						CO4	FSM and different FSM techniques and different case studies.
						COI	Summarize the concepts, characteristics, principles and
						COI	operation of cellular systems.
			D.T. I. E.			96-	Apply Concepts, principles to Co-channel interference
64	VR19	04	B.Tech-Electronics and communication	1004194158	Cellular Mobile	CO2	Reduction factor, Desired C/I, directional Antenna
04	VKI9	04	Engineering	1004194138	Communications		system and Cell splitting. Analyse the concepts on cell coverage of signal and
			Lingineering			CO3	traffic, frequency and channel assignment strategies.
							Infer the concepts of handoff and discuss architecture of
						CO4	GSM
						COI	Summarize the evolution of 5G, system concepts and spectrum challenges
							Illustrate and explain the 5G functional and physical
						CO2	architecture and its requirements Explain the
			B.Tech-Electronics		Introduction to 5G Technology	002	architecture, Beamforming and hardware technologies
65	VR19	04	and communication	1004194159			for mm wave communications
			Engineering			CO3	Describe and explain the requirements and fundamental techniques for MTC and D2D Communication
		,		a		CO4	Categorize various radio access technologies for 5G
						CO4	networks
						COI	Summarize the basic faults that occur in digital systems
						002	outline procedures to generate test patterns for detecting
			B.Tech-Electronics		VLSI Testing &	CO2	single stuck faults in combinational and sequential circuits.
66	VR19	04	and communication	1004194190	Testability		Design for testability techniques with improved fault
			Engineering		restability	CO3	coverage
			9			001	Asses different approaches for introducing BIST into
						CO4	logic circuits, memories and embedded cores.
							Properties of optical fiber that affect the performance of
						COI	a communication link and types of fiber materials with
							their properties and the losses occur in fibers.
			B.Tech-Electronics			COS	Working of semiconductor lasers, and differentiate
67	7 VR19 0	04	THE RESERVE OF THE PROPERTY OF THE PARTY OF	1004194191	Optical	CO2	between direct modulation and external electro-optic modulation.
"	67 VR19 04 and communication 10 Engineering	"	A STANDARD OF THE STANDARD STANDARD CONTRACT CON	1004174171	Communications		Analyze the operation of LEDs, laser diodes, and PIN
			5			CO3	photo detectors (spectral properties, bandwidth, and
					circuits) and apply in optical systems		
				CO4	Analyze and design optical communication and fiber		
						004	optic sensor systems.

						COI	Appraise the importance of data and choose an appropriate algorithm to create a models
60		0.4	B.Tech-Electronics		Introduction to	CO2	Characterize machine learning algorithms as supervised, semi-supervised, and Unsupervised
68	VR19	04	and communication Engineering	1005194160	Machine Learning	CO3	Relate various machine learning and deep learning algorithms with real world applications
						CO4	Analyze how to evaluate models build from the sample datasets on web
						COI	choose appropriate techniques to Store data in the files
			B.Tech-Electronics			CO2	Apply and analyze various terms related to transaction management in centralized and distributed database
69	VR19	04	and communication Engineering	1005193254	Advanced Databases	CO3	Examine the issues related to multimedia and mobile database performance
						CO4	Analyze and Implement the concept of object- relational database in development of various real time software
					y .	COI	Choose functional/operational aspects of crypto currency echo system
			B.Tech-Electronics		Fundamentals	CO2	Make use of emerging abstract models for Block chain technology
70	VR19	04	and communication Engineering	1005193253	of Block Chain Technologies	CO3	Identify major research challenges and technical gaps existing in between theory and practice in
						CO4	cryptocurrency domain. Build fundamental characteristics of block chain using bit coin.
						COI	Examine how software development life cycle models can impact the software deliverables
71	VR19	04	B.Tech-Electronics	1005102252	Software	CO2	Conduct activities necessary to successfully complete and close the Software projects
'1	VKI9	04	and communication Engineering	1005193253	Project Management	CO3	Estimate the effort required for a software project development and identify software risks
						CO4	Develop the skills for tracking and controlling software deliverables
						COI	Relate literature to formulate problem statements of technology and innovations
72	VR19	04	B.Tech-Electronics and communication	1004194180	Technical Seminar	CO2	Develop documentation, presentation and communication skills for prefession and personal growth following ethical values
			Engineering			CO3	Identify new directions in Multidisciplinary area
						CO4	Assess engineering solution and its applications for Real time problem
						COI	Take Part openly on a global scale, with global learners and Instructor
73	VR19	04	B.Tech-Electronics and communication	1004194240	Professional Elective-5 /	CO2	Develop high quality learning using multimedia platform
1.5	·	"	Engineering	1001171210	Moocs*	CO3	Self assessment of their performance and learning process.
						CO4	Adapt a life long learning culture and updating the knowledge according with emerging trends
						COI	Apply knowledge of Electronics and communication engineering fundamentals to solve the complex Engineering problems
74	VR19	04	B.Tech-Electronics and communication	1004194270	Main Project	CO2	Design prototypes and solutions to solve the specific needs related with public health, safety, society and environment leading to sustainable development following ethical values
			Engineering	-	, mornamp	CO3	Adapt appropriate techniques, resources and modern engineering tools during the implementation of project
						CO4	Develop a multidisciplinary project leading to the ability of engagement in lifelong learning and self-development

	VIGNAN'S INSTITUE OF INFORMATION TECHNOLOGY (A) DEPARTMENT OF COMPUTER SCIENCE ENGINEERING										
	VR19 B.Tech. Computer Science and Engineering Course Outcomes										
S.No	Regula tion	Program me Code	Programme Name	Course Code	Course Name	CO	Course Outcome: After the completion of the course student will be able to				
						COI	Executing mean value theorems and evaluate maxima and minima of functions of two variables without constraints				
1	VR19	05	B.Tech-Computer Science and	1000191100	Mathematics-I	CO2	Apply the analytical methods to solve higher order linear differential equations.				
·	,,,,,	03	Engineering	1000171100	Wildliematics 1	CO3	Evaluate of solution of Ordinary differential equations by using Laplace Transform technique.				
						CO4	Identify and solve partial differential equations.				
						COI	Identification of different polymers and their functionalities				
2	VR19	05	B.Tech-Computer Science and	1000191123	Applied	CO2	Determination of structure to many compounds and apply the basic knowledge in construction of cell and its applications				
		9.2	Engineering		Chemistry	CO3	Analysis of corrosive environments and protection of precious metal				
						CO4	Adoption of different green methodologies and acquire knowledge on different advanced materials				
						COI	Understand the use of drawing instruments to construct the polygons and curves				
3	VR19	05	B.Tech-Computer Science and	1003191101	Engineering Drawing	CO2	Learn the principle of orthographic projections. Draw Orthographic projections of points, lines.				
			Engineering		Diawing	CO3	Draw the various types of planes and solids its views in different Positions				
						CO4	Draw isometric views of simple objects				
			P. Took Commuter		Taskaisal	COI	Read, understand and interpret material on Environment, Science and Technology, tourism, Energy Sources, Social Awareness				
4	VR19	05	B.Tech-Computer Science and Engineering	1000191121	Technical English Communication	CO2	Analyze the functions of language and grammar in spoken and written forms.				
			Lingineering		Communication	CO3	Write effectively on various domains.				
			*			CO4	Prepare and exhibit oral presentation skills by using ICT(Individual/Team)				
						COI	Interpret fundamentals of computers and convert flowcharts/algorithms to C Programs, compile and debug programs				
5	VR19	05	B.Tech-Computer Science and	1005191120	Problem Solving & Programming	CO2	Apply decision making and Iterative feature of C Programming language effectively.				
			Engineering		using C	CO3	Design and implement programs to analyze the different pointer applications				
						CO4	Apply structures and unions and Implement file Operations in C programming for any given problem				
			B.Tech-Computer		Engineering	COI	Realize the purpose/Role of Engineer for solving social problems				
6	6 VR19	05	Science and Engineering	1000191110	Explo ration	CO2	Learn to Design a component/system in an engineering way				
					i i i i i i i i i i i i i i i i i i i	CO3	Learn to use mechanisms, Arduino, sensors, motors.				
						CO4	To develop prototype machine using Arduino Uno board.				
			D Took C		Extra Curricular	COI	Learn new skills and Boost academic performance				
7	7 VR19	05	B.Tech-Computer Science and	1000191131	Activities,	CO2 CO3	Broader social skills with improved time management				
'	VICIO	05	50.00 1001 10	1000191131	Sports and		Explore Interests and Create Broader Perspectives Participate in various co-curricular activities leading to their				
			Engineering		Games	CO4	multifaceted personality development				

-							T
						COI	Elucidate the notion of random variable and evaluate the expected value and probability of random variables.
						CO2	Apply Binomial, Poisson, Normal, gamma and weibull
			B.Tech-Computer		Probability and	CO2	distributions for real data to compute probabilities, theoretical frequencies.
8	VR19	05	Science and Engineering	1000191202	Statistics	CO3	Evaluate the confidence levels and maximum error for large and small samples.
							Analyze the concept of hypothesis testing for large and small
						CO4	samples in real life situations to draw the inferences and
							estimate the goodness of fit.
						COI	Describe the wave phenomena and apply these concepts for construction of Lasers and optical fibers.
						CO2	Apply the knowledge of basic quantum mechanics, to set up
			B.Tech-Computer			CO2	one-dimensional Schrodinger's wave equation
9	VR19	05	Science and Engineering	1000191221	Applied Physics	CO3	Identify the importance of classical and quantum mechanical treatment of materials
			Engineering				
						CO4	Make use of the basic concepts of energy bands in crystalline solids to understand semiconductor physics.
							solids to dideistand senticonductor physics.
							Hadaratand the book terminals
						COI	Understand the basic terminology used in object-oriented programming
							programming.
							Describe the object-oriented programming approach in
			B.Tech-Computer		OOPS through	CO2	connection with C++
10	VR19	05	Science and	1005191222	C++		and designation of the state of
			Engineering				
						CO3	Apply the concepts of object- oriented programming
		2				CO4	Apply virtual and pure virtual function & complex
		-					programming situations
						COI	Explain the basic concepts of Circuit theory, semiconductor
			B.Tech-Computer			COI	physics and analyze the PN junction diode and special purpose diode.
11	VR19	05	Science and	1004191200	Basic Electronics		Explain the BJT and FET and analyze various biasing
			Engineering		Licettonies	CO2	techniques for BJT.
						CO3	Design electronic circuit using logic gates
						CO4	Analyze basics working and principle of sensors
						COI	Solve approximate roots of an equation by using different numerical methods.
							numerical methods.
						602	
			B.Tech-Computer			CO2	Compute Interpolating polynomial for the given data.
12	VR19	05	Science and	1000191101	Mathematics-II		
			Engineering			CO3	Constitute Numerical Solution of ODE and Numerical Integration.
			3				Evaluate simultaneous linear equations numerically using
						CO4	rank of a matrix and also Eigen values and Eigen vectors of a
							square matrix.
			B.Tech-Computer			CO1	Assemble and disassemble components of a PC
13	VR19	05	Science and	1005191210	IT Workshop	CO2	utilize MS-office package
			Engineering		,	CO3	make use of linux operating system commands
						CO4	intrepret cyber threats. Have general knowledge and legal literacy and thereby to
						COI	take up competitive examinations.
			D.Task Co.			CO2	Distinguish the power of state and central government.
14	VR19	05	B.Tech-Computer Science and	1000191130	Constitution of	CO3	Summarize the election procedure in India before and after independence
* *			Engineering		India		macponaciite
						CO4	Association with the powers and functions of Municipalities,
						231	Panchayats and Cooperative Societies.

	Т					COI	Demonstrate skills in solving counting problem
						CO2	Develop reasoning skills using Mathematical Logic concepts.
15	VR19	05	B.Tech-Computer Science and Engineering	1005192100	Discrete Mathematical Structures	CO3	Identify the solutions for various problems using recurrence relations
						CO4	Apply concepts of graph theory for a given problem.
						COI	Apply the principles of number system, binary codes and Boolean algebra to minimize logic expression
			B.Tech-Computer		Digital Logic	CO2	Analyze functionality of digital circuits
16	VR19	05	Science and Engineering	1005192101	Design	CO3	Design efficient combinational logic circuit implementations from functional description of digital systems
						CO4	Demonstrate the use of sequential circuits and storage elements in real-time applications.
						COI	Apply the concept of linear and non-linear data structures to various applications
17	VR19	05	B.Tech-Computer Science and	1005192120	Data Structures	CO2	Analyze and implement operations on linked lists and demonstrate their applications.
1000	aand.5		Engineering		through C	CO3	implement stacks and queues using arrays and linked lists
						CO4	develop programs by nonlinear data structures such as tree and graphs
			D.T. J. C.			COI	Relate the procedural and object paradigm, with real world entities
18	VR19	05	B.Tech-Computer Science and	1005192121	Java Programming	CO2	Use Exception handling and multithreading mechanisms to create efficient software application
			Engineering			CO3	Implement GUI Applications with modern tools
						CO4	Design various layouts along with applet usage
					Managerial	COI	Analyze the Demand, Price and Cost.
19	VR19	05	B.Tech-Computer Science and	1099192100	Economics and Financial	CO2	Identify the Nature of different markets to determine Price Output for different Business Units
			Engineering		Analysis	CO3	Understand Various Business Forms
					0,1000,000	CO4	Evaluate investment project proposals
						COI	Students have the adequate writing skills that are needed in an organization
			. S.			CO2	Understand the core competencies to succeed in professional and personal life
20	VR19	05	B.Tech-Computer Science and Engineering	1020192100	Employability Readiness Program	CO3	Solve various Basic Mathematics problems by following different methods and to perform well in various competitive exams and placementdrives.
			2.ig.iicci iii.g		riogian.	CO4	Follow strategies in minimizing time consumption in problem solving Apply shortcut methods to solve problems and confidently solve any mathematical problems and utilize these mathematical skills both in their professional as well as personal life.
						COI	Understand definition, scope, approach and theories of public administration.
21	VD10	0.5	B.Tech-Computer	1020102101	Public	CO2	Identify the process and technique of decision making and also understand the concept of administrative behaviour and control.
21	VR19	05	Science and Engineering	1020192101	Administration	CO3	Understand the process and technique of personnel and financial administration.
						CO4	Discuss the tools that modern public administrators use to pursue public goals and public policy, along with the pros and cons of those tools.
						COI	Students have the adequate reading and speaking skills and will be able to express himself in French.
22	VR19	05	B.Tech-Computer Science and	1020192102	Foreign Linguistic -	CO2	Understand the grammar and use them in their personal and professional life.
			Engineering		French	CO3	Students will be able to write proficiently in French.
						CO4	Studentswill be able to compare and contrast world culture and it will expand his knowledge about various culture.

							Irratora de la companya della companya della companya de la companya de la companya della compan
						COI	Understand the various social problems present in the world & they will be able to identify and select a community problem to develop a technological project.
			B.Tech-Computer		Mini Project – 1	CO2	Learn the concepts of Design Thinking and Project management.
23	VR19	05	Science and Engineering	1005192170	EPICS/Societal relevant project	CO3	Learn the technologies like Internet of Things, 3D Printing, Mobile App Creation, Thinker CAD, and Web page development.
						CO4	Apply the engineering knowledge, mathematics, design thinking and project management to develop a community project.
		X				COI	Gain a higher level of personal involvement and interest in understanding and solving environmental resource problems and its sustainable conservation practices.
					Environmental	CO2	Overall understanding of the relationship between man and ecosystem & biodiversity
24	VR19	05	B.Tech-Computer Science and Engineering	1000192130	Science (Audit Course)	CO3	Demonstrate knowledge relating to the biological systems involved in the major global environmental problems of the 21st century
						CO4	Recognize the interconnectedness of human dependence on the earth's ecosystems and Influence their society in proper utilization of goods and services.
						COI	To understand graph representations, Minimum Spanning Trees and traversals
			B.Tech-Computer		Advance Data	CO2	Understand dictionaries, hashing mechanism which supports faster retrieval.
25	VR19	05	Science and Engineering	1005192220	Structures	CO3	Implement heaps, queues and their operations, B Trees and B+ Trees
						CO4	Illustration of tries which share some properties of table look up, various issues related to the design of file structures
						COI	To conceptualize the basics of organizational and architectural issues of a digital computer and to perform computer arithmetic operations.
26			B.Tech-Computer		Computer	CO2	To analyze performance issues in processor and can calculate the effective address of an operand by addressing modes.
26	VR19	05	Science and Engineering	1005192200	Organization and Architecture	CO3	Ability to design memory organization that uses banks for different word size operations to understand the concept of cache memory techniques
						CO4	Understand the concept of Input / Output organization.
						COI	Describe ER model and normalization f or database design.
27	VR19	05	B.Tech-Computer Science and	1005192221	Database Management	CO2	Create, maintain and manipulate a relational database using SQL
21	VICIT		Engineering	1003172221	Systems	CO3	Design and build database system for a given real world problem
	"					CO4	Examine issues in data storage and query processing and can formulate appropriate solutions.
			B.Tech-Computer		Formal	COI	Employ finite state machines to solve problems in computing
28	VR19 05 Science and 1005192202 Languages Engineering Automa	Languages and Automata Theory	CO2 CO3	Classify machines by their power to recognize languages To Design PDA for solving computational Problems			
						CO4	To design Turing Machine for arithmetic Operations

						COI	Apply the appropriate process models for the application development of SDLC
						CO2	Understand the phases of SDLC from requirement gathering phase to design phase via Analysis Phase
29	VR19	05	B.Tech-Computer Science and	1005192201	Software Engineering	CO3	Analyzing the strategies for coding and testing phase in Software product development
			Engineering			CO4	Apply the knowledge about estimation and maintenance of software systems and modeling the software project by using CASE tools
						CO1	Analyze the functions of language and grammar in spoken and written forms with an emphasis on LSRW Skills.
30	VR19	05	B.Tech-Computer Science and Engineering	1000192110	Communication Skills Lab	CO2	Disseminate the relevant skills while performing GDs, interviews, oral presentations with a focus on Non verbal communication.
						CO3	Prepare and exhibit oral presentation skills by using ICT.(Individual/Team)
						CO4	Organize proper life skills for their employability.
						CO1	Understand HTML tags to design static web pages
			B.Tech-Computer			CO2	Describe the basic concepts of Java Scripts to design dynamic web pages
31	VR19	05	Science and	1005193120	Web	CO3	Familiarize the concepts of PHP and AJAX
31	VKI	03	Engineering	1005193120	Technologies	CO4	Analyze a given problem and apply requisite appropriate tools for designing dynamic and interactive web applications
						COI	Able to analyze the performance of an algorithm in terms of time and space.
			B.Tech-Computer		Design and	CO2	Give an intuition on how to find a solution to large problems
32	VR19	05	Science and Engineering	1005193100	Analysis of Algorithms	CO3	by dividing them into smaller sub problems. Identifying which designing technique can be used to solve a particular problem.
						CO4	Able to analyse the complexities between naïve and parallel algorithms
		-				COI	Understand the concepts of data warehouse and data mining
			B.Tech-Computer		Data	CO2	Use data pre processing techniques to build data warehouse.
33	VR19	05	Science and	1005193101	Warehousing	CO3	Analyze transaction databases for association rules.
	N		Engineering		and Data Mining	CO4	Understand the details of different algorithms made available by popular commercial data mining software and Solve real data mining problems by using the right tools to find interesting patterns.
						CO1	Summarize various concepts of Operating Systems
			B.Tech-Computer		Operating	CO2	Implement and Apply Process Scheduling Algorithms
34	VR19	05	Science and Engineering	1005193102	Operating Systems	CO3	Illustrate concepts of Paging, Segmentation and Apply Concurrency, Deadlock Mechanisms in real world.
						CO4	Analyze the concepts of file systems in operating systems
						COI	Develop essential programming skills in computer programming concepts like data types, containers
	100.00		B.Tech-Computer	100510515	Programming	CO2	Apply the basics of programming in the Python language
35	VR19	05	Science and Engineering	1005193150	Essentials in Python	CO3	Solve coding tasks related to the fundamental notions and
					-	CO4	techniques used in object-oriented programming. Solve coding tasks related OOPS, and Multithreading
						COI	Develop essential programming skills in computer
			B.Tech-Computer		Industrial	CO2	programming concepts like data types, containers Apply the basics of programming in the Python language
36	36 VR19	05	Science and 10	1005193151	Oriented Python		Solve coding tasks related to the fundamental notions and
			Engineering		Programming	CO3	techniques used in object-oriented programming.
						CO4	Solve coding tasks related OOPS, and Multithreading

VR19								
VR19							COL	Explain the architecture and features of UNIX Operating
VR19 05 B.Tech-Computer Science and Engineering 1005193152 Unix and Shall Programming COL CO3 Build Regular expressions for pattern matching and apply tempts of them to various filters for a specific task Analyze gave problem and apply requisite facets of SHELL, programming in order to devise a SHELL script to solve the problem CO3 Build Regular expressions for pattern matching and apply them to various filters for a specific task Analyze gave problem and apply requisite facets of SHELL, programming in order to devise a SHELL script to solve the problem CO4 To understand the various computer graphics hardware and display technologies CO4 To understand the various computer gaphics hardware and display technologies CO4 To understand the basic concepts of gaming theory CO4 To understand Schalbé Architectures CO5								
VR19				DT 10			CO2	
Programming Programming Programming Programming CO3 Section 2 agestific task CO4 SHELL or a government and apply requisite facets of your pollution to surrous filters for a government and apply requisite facets of your pollution of surrous filters for a government and apply requisite facets of your pollution of the programming in order to devise a SHELL sirght to solve the programming in order to devise a SHELL sirght to solve the programming in order to devise a SHELL sirght to solve the programming in order to devise a SHELL sirght to solve the programming in order to devise a SHELL sirght to solve the programming in order to devise a SHELL sirght to solve the programming in order to devise a SHELL sirght to solve the programming and propose original sport thms. In additional displayment of the programming in order and single thread or solve the programming and propose original sport thms. In additional displayment or solve the programming and propose original sport thms. In additional displayment or solve the sport or solve the sport or solve the sport original spor	37	VP10	I I I I I I I I I I I I I I I I I I I		9 8800			
Name	31	VKI9	03		1005193132	Programming	CO3	
VR19				Engineering				
solve the problem 18. Tech-Computer Science and Engineering 19. VR19							COA	
VR19							CO4	
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Part							COI	
VR19 OS Science and Engineering 1005193153 Computer Graphics Computer Grap				B Tech-Computer		l		
Engineering Engin	38	VR19	05	D. CONCLASSIVE AND SERVICE CONTRACTOR	1005193153		CO ₂	
VR19 UR19				TOTAL ACT DISTON DESCRIPTION	1000170100	Graphics		
VR19							CO3	
VR19							CO4	
Advanced Science and Engineering								
VR19 05 Science and Engineering 1005193154 Computer Architecture CO2 Costign and Analyze pacallel computer models.				B.Tech-Computer		Advanced	CO1	
Architecture CO3 Understand Scalable Architectures, Pipelinines	39	VR19	05		1005193154	1000	CO2	
VR19				Engineering	0.784,5-9,3-200,9-0,007,007,00			
VR19						27 V-ABSON - OCCUPANT -		
VR19								
VR19							COI	
VR19 OS Science and Engineering IO01193161 Energy Audit Conservation and Management IO01193161 IO03193161 IO				D.T. 1.0		Industrial Waste		
VR19 OS Science and Engineering Energy Audit Conservation Energy Engineering Energy Audit Conservation and Engineering Energy Audit Conservation Energy Energy Engineering Energy Audit Conservation Energy Engineering Energy	10	,,,,,,	0.5				CO2	
Engineering CO3 industries CO4 plant CO5 plant CO6 plant CO7 plant CO7 plant CO8 plant CO8 plant CO9 p	40	VR19	05		1001193161	Water		
CO4 Explain operational problems of common effluent treatment plant				Engineering		Engineering	CO3	The second control of
VR19 UR19							~~.	
VR19							CO4	
conservation schemes. B.Tech-Computer Science and Engineering Data Communications CO1 Understand the network layer architecture CO2 Learn about various digital modulation techniques. CO3 Apply various errors correction and detection codes to digital data. CO4 Learn about electromagnetic properties. CO5 Apply the basics of programming skills in computer programming concepts like data types, containers CO2 Apply the basics of programming in the Python language Solve coding tasks related to the fundamental notions and techniques used in object-oriented programming.							201	
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VR19							CO2	
VR19						i i		
VR19						F	CO3	
41 VR19 05 Science and Engineering 1002193151 and Management CO4 To Analyze about space heating and ventilation methods and demonstrate the operation of various energy instruments. CO4 To Analyze about space heating and ventilation methods and demonstrate the operation of various energy instruments. CO5 Analyze and compute the economic aspects of energy consumption communications and demonstrate the operation of various energy instruments. CO6 Analyze and compute the economic aspects of energy consumption communications and demonstrate the operation of various energy instruments. CO7 Analyze and compute the economic aspects of energy consumption communications and demonstrate the operation of various energy instruments. CO8 Select appropriate actuators and sensors for a robot based on specific application and dynamic analysis for simple serial kinematic chains Perform trajectory planning for a manipulator by avoiding obstacles. CO1 Understand the network layer architecture CO2 Learn about various digital modulation techniques. CO3 Apply various errors correction and detection codes to digital data. CO4 Learn about electromagnetic properties., CO6 Develop essential programming skills in computer programming concepts like data types, containers CO2 Apply the basics of programming in the Python language CO3 Solve coding tasks related to the fundamental notions and techniques used in object-oriented programming.				B.Tech-Computer			003	
VR19	41	VR19	05	Science and	1002193151	PROPERTY PROPERTY SAME PROPERTY OF		motors.
VR19				Engineering				
demonstrate the operation of various energy instruments. Costantly and compute the economic aspects of energy consumption Engineering B.Tech-Computer Science and Engineering B.Tech-Computer Science and Engineering B.Tech-Computer Science and Engineering B.Tech-Computer Science and Engineering Data Communications Costant Science and Engineering Data Communications Costant Science and Engineering Data Communications Costant Science and Engineering Data Costant Science and Engineering B.Tech-Computer Science and Engineering Data Costant Science and Engineering Data Costant Science and Engineering Data Costant Science and Engineering Engineering Data Costant Science Science Adata. Costant Science Science Adata. Costant Science Science Science Science Adata. Costant Science Science Science Science Adata. Costant Science Science Science Science Science Science Adata. Costant Science Scie						ivianagement		To Analyze about space heating and ventilation methods and
42 VR19 05 B.Tech-Computer Science and Engineering 1003193161 B.Tech-Computer Science and Engineering 2004 Professional Engineering 2015 B.Tech-Computer Science and Engineering 2016 Professional Engineering 2017 Professional Engineering 2018 Prof							CO4	
42 VR19 05 B.Tech-Computer Science and Engineering Data Communications CO2 Learn about various digital modulation techniques. CO3 Apply various errors correction and detection codes to digital data. CO4 Learn about electromagnetic properties., Develop essential programming skills in computer programming concepts like data types, containers CO2 Apply the basics of programming in the Python language CO3 Solve coding tasks related to the fundamental notions and techniques used in object-oriented programming.								demonstrate the operation of various energy institutions.
42 VR19 05 B.Tech-Computer Science and Engineering Data Communications CO2 Learn about various digital modulation techniques. CO3 Apply various errors correction and detection codes to digital data. CO4 Learn about electromagnetic properties., Develop essential programming skills in computer programming concepts like data types, containers CO2 Apply the basics of programming in the Python language CO3 Solve coding tasks related to the fundamental notions and techniques used in object-oriented programming.								
42 VR19 05 B.Tech-Computer Science and Engineering B.Tech-Computer Science an							COF	Analyze and compute the economic aspects of energy
VR19 05 B.Tech-Computer Science and Engineering 1003193161 Potential Robotics 1003193161 Potential Robotics 2003 Select appropriate actuators and sensors for a robot based on specific application 2003 Carry out kinematic and dynamic analysis for simple serial kinematic chains 2004 Perform trajectory planning for a manipulator by avoiding obstacles. VR19 05 B.Tech-Computer Science and Engineering 1004193161 Potential Robotics 2004 Communications 2005 Code Carry out kinematic and dynamic analysis for simple serial kinematic chains 2004 Carry out kinematic and dynamic analysis for simple serial kinematic chains 2004 Code Carry out kinematic and dynamic analysis for simple serial kinematic chains 2004 Code Carry out kinematic and dynamic analysis for simple serial kinematic chains 2004 Code Carry out kinematic and dynamic analysis for simple serial kinematic and dynamic analysis for simple serial kinematic chains 2004 Code Carry out kinematic and dynamic analysis for simple serial kinematic analysis for								
42 VR19 05 B.Tech-Computer Science and Engineering 1003193161 Industrial Robotics						ε.	COI	Identify various robot configuration and components
VR19 05 Science and Engineering 1003193161 Industrial Robotics CO3 Carry out kinematic and dynamic analysis for simple serial kinematic chains CO4 Perform trajectory planning for a manipulator by avoiding obstacles. CO3 Carry out kinematic and dynamic analysis for simple serial kinematic chains CO4 Perform trajectory planning for a manipulator by avoiding obstacles. CO2 Learn about various digital modulation techniques. CO3 Apply various errors correction and detection codes to digital data. CO4 Learn about electromagnetic properties., CO5 Develop essential programming skills in computer programming concepts like data types, containers CO6 Apply the basics of programming in the Python language CO7 Solve coding tasks related to the fundamental notions and techniques used in object-oriented programming.							CO2	Select appropriate actuators and sensors for a robot based on
42 VR19 05 Science and Engineering 1003193161 Robotics CO3 Carry out kinematic and dynamic analysis for simple serial kinematic chains CO4 Perform trajectory planning for a manipulator by avoiding obstacles. CO3 Carry out kinematic and dynamic analysis for simple serial kinematic chains CO4 Perform trajectory planning for a manipulator by avoiding obstacles. CO2 Learn about various digital modulation techniques. CO3 Apply various errors correction and detection codes to digital data. CO4 Learn about electromagnetic properties., CO5 Develop essential programming skills in computer programming concepts like data types, containers CO6 Apply the basics of programming in the Python language CO7 CO7 Carry out kinematic and dynamic analysis for simple serial kinematic chains CO8 Perform trajectory planning for a manipulator by avoiding obstacles. COC Learn about various digital modulation techniques. CO3 Apply various errors correction and detection codes to digital data. CO4 Learn about electromagnetic properties., CO6 Develop essential programming skills in computer programming concepts like data types, containers CO7 Apply the basics of programming in the Python language CO8 Solve coding tasks related to the fundamental notions and techniques used in object-oriented programming.						Industrial	CO2	
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VR19 05 B.Tech-Computer Science and Engineering 1004193161 Potata Communications CO2 Learn about various digital modulation techniques. CO3 Apply various errors correction and detection codes to digital data. CO4 Learn about electromagnetic properties., CO5 Develop essential programming skills in computer programming concepts like data types, containers CO6 Apply the basics of programming in the Python language CO7 Solve coding tasks related to the fundamental notions and techniques used in object-oriented programming.				Engineering		Robbites	003	kinematic chains
VR19 05 B.Tech-Computer Science and Engineering 1004193161 Potata Communications CO2 Learn about various digital modulation techniques. CO3 Apply various errors correction and detection codes to digital data. CO4 Learn about electromagnetic properties., CO5 Develop essential programming skills in computer programming concepts like data types, containers CO6 Apply the basics of programming in the Python language CO7 Solve coding tasks related to the fundamental notions and techniques used in object-oriented programming.							CO4	Perform trajectory planning for a manipulator by avoiding
43 VR19 05 B.Tech-Computer Science and Engineering 1004193161 Apply various errors correction and detection codes to digital data. CO4 Learn about various digital modulation techniques. Apply various errors correction and detection codes to digital data. CO4 Learn about electromagnetic properties., CO5 Develop essential programming skills in computer programming concepts like data types, containers CO6 Apply the basics of programming in the Python language CO7 CO8 CO9 CO9 CO9 CO9 CO9 CO9 CO9							004	
43 VR19 05 B.Tech-Computer Science and Engineering 1004193161 Apply various errors correction and detection codes to digital data. CO4 Learn about various digital modulation techniques. Apply various errors correction and detection codes to digital data. CO4 Learn about electromagnetic properties., CO5 Develop essential programming skills in computer programming concepts like data types, containers CO6 Apply the basics of programming in the Python language CO7 CO8 CO9 CO9 CO9 CO9 CO9 CO9 CO9							COL	Understand the network layer architecture
VR19 05 Science and Engineering 1004193161 Communications CO3 Apply various errors correction and detection codes to digital data. CO4 Learn about electromagnetic properties., Develop essential programming skills in computer programming concepts like data types, containers CO2 Apply the basics of programming in the Python language CO3 Solve coding tasks related to the fundamental notions and techniques used in object-oriented programming.								onderstand the network layer architecture
44 VR19 05 Science and Engineering 1004193161 Communications CO3 Apply various errors correction and detection codes to digital data. CO4 Learn about electromagnetic properties., Develop essential programming skills in computer programming concepts like data types, containers CO2 Apply the basics of programming in the Python language CO3 CO3 Apply the basics of programming in the Python language CO3						Data	CO2	Learn about various digital modulation techniques.
data. CO4 Learn about electromagnetic properties., Develop essential programming skills in computer programming concepts like data types, containers Python Programming Lab CO2 Apply the basics of programming in the Python language CO3 Solve coding tasks related to the fundamental notions and techniques used in object-oriented programming.	43	VR19	05		1004193161	. 35.000		Apply various errors correction and detection codes to digital
CO4 Learn about electromagnetic properties., EVENTY OF THE PROPERTY OF THE PR				Engineering		Communications	CO3	
44 VR19 05 B.Tech-Computer Science and Engineering 1005193110 Python Programming Lab CO2 Apply the basics of programming in the Python language CO3 Solve coding tasks related to the fundamental notions and techniques used in object-oriented programming.								
44 VR19 05 B.Tech-Computer Science and Engineering Lab Python Programming Lab CO2 Apply the basics of programming in the Python language CO3 Solve coding tasks related to the fundamental notions and techniques used in object-oriented programming.							CO4	Learn about electromagnetic properties.,
44 VR19 05 B.Tech-Computer Science and Engineering Lab Python Programming Lab CO2 Apply the basics of programming in the Python language CO3 Solve coding tasks related to the fundamental notions and techniques used in object-oriented programming.								Develop essential programming drills in computer
VR19 05 B.Tech-Computer Science and Engineering 1005193110 Python Programming Lab CO2 Apply the basics of programming in the Python language CO3 Solve coding tasks related to the fundamental notions and techniques used in object-oriented programming.							CO1	
44 VR19 05 Science and Engineering Engineering Lab CO2 Apply the basics of programming in the Python language CO3 Solve coding tasks related to the fundamental notions and techniques used in object-oriented programming.			B.Tech-Computer Python	Puthon		programming concepts tike data types, containers		
Engineering Lab CO3 Solve coding tasks related to the fundamental notions and techniques used in object-oriented programming.	44	VRIO			CO2	Apply the basics of programming in the Python language		
CO3 Solve couling tasks related to the turndamental notions and techniques used in object-oriented programming.	77	1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	-	a (E)				
techniques used in object-oriented programming.				Lingmeeting		Lau	CO3	
CO4 Solve coding tasks related OOPS, and Multithreading							A4	
							CO4	Solve coding tasks related OOPS, and Multithreading

						001	
			B.Tech-Computer		Professional	CO1	Relate ethical human values
45	VR19	05	Science and	1099193130		CO2	Apply engineering knowledge for society
			Engineering		Values	CO3	Elaborate responsibility for safety & risk
						CO4	Outline the various current global issues
						CO1	Define Network and its components and Illustrate the functionality of OSI and TCP/IP reference models.
46	VR19	05	B.Tech-Computer Science and	1012193120	Computer Networks	CO2	Compare different network layer protocols and Demonstrate various types of routing technique
			Engineering		rictworks	CO3	Evaluate Architecture for Application layer protocols.
						CO4	Choose appropriate protocol for desired communication service.
						COI	Acquire knowledge in different phases and passes of Compiler
47	VR19	05	B.Tech-Computer Science and	1005193200	Compiler	CO2	Understand Parser and its types i.e. Top-down and Bottom- up parsers.
			Engineering		Design	CO3	Construct LL, SLR, CLR and LALR parse table.
				9		CO4	Syntax directed translation, synthesized and inherited attributes and analyze techniques for code optimization
						COI	Illustrate basic insights of management principles
48	VR19	05	B.Tech-Computer Science and	1099192200	Management	CO2	Summarize Production process, Quality control and Inventory techniques
			Engineering		Science	CO3	Indentify Strategies and policies to functional areas
						CO4	Apply Contemporary management Practices
						CO1	Understand the concepts and formula of number theory
						CO2	Understand the basic concepts of various algebraic structures and theorems like Euler's theorem for designing security algorithm.
49	VR19	05	B.Tech-Computer Science and Engineering	1005193250	Basics of Mathematics for Security	CO3	Describe the basic concepts of coding theory which will be useful for data compression, information hiding
						CO4	Illustrate various pseudorandom number generation used for designing security protocols and for its analysis.
			B.Tech-Computer			COI	The student should be able to identify problems that are amenable to solution by AI methods.
50	VR19	05	Science and Engineering	1005193251	Artificial Intelligence	CO2	The student should be able to identify appropriate AI methods to solve a given problem.
						CO3	Implement basic AI algorithms (e.g., standard search algorithms or dynamic programming).
						CO4	The student should have knowledge in expert system
			D Took Commit		Come	CO1	Compare parallel programs and sequential programs
51	VR19	05	B.Tech-Computer Science and	1005193252	Concurrent and Parallel	CO2	Classify parallel computing platforms.
			Engineering		Programming	CO3	List the parallel algorithm models.
						CO4	Write shared memory parallel programs with openMP
						COI	To understand the basic concepts and issues of software project management
52	VR19	05	B.Tech-Computer Science and	1005193253	Software Project	CO2	To conduct activities necessary to successfully complete and close the Software projects
	Engineering Ma		Management	CO3	To implement the project plans through managing people, communications and change		
						CO4	To develop the skills for tracking and controlling software deliverables

						COI	Store data in the files and to implement indexing schemes for the fast retrieval of data
53	VR19	05	B.Tech-Computer Science and	1005193254	Advanced	CO2	Implement query complier, planner and executor
			Engineering	1003175237	Databases	CO3	Implement concurrency control protocols for transaction processing system
						CO4	Recovery techniques for recovering from transaction.
		×				COI	Understand evaluate and create the basic concept of environmental impact assessment, Flow of EIA, Types of environmental Impacts
54	VR19	05	B.Tech-Computer Science and	1001193260	Environmental Impact	CO2	Implement different methods in preparing an Environmental Impact Statement.
			Engineering		Assessment and Management	CO3	Identify various mitigation measures that can be used.
					3	CO4	Select methodology for identification of environmental impacts, environmental indices and indicators
						COI	Design, simulate and realize different digital filters.
55	VR19	05	B.Tech-Computer Science and Engineering	1004193161	Signal Processing	CO2	Estimate the spectra of signals that are to be processed by discrete time system and to verify the performance of various spectrum estimation techniques
						CO3	Design multi rate digital signal processing system.
						CO4	Understand the architecture of DSP processor
						COI	Understand the basic concepts of an embedded system and able to know an embedded system design approach to perform a specific function
			B.Tech-Computer		Embedded	CO2	Design the Embedded hardware by considering the hardware components required for an embedded system
56	VR19	05	Science and Engineering	1019193261	System Design	CO3	Analyze the various embedded firmware design approaches on embedded environment to suit for desired application
						CO4	Understand how to integrate hardware and firmware of an embedded system and apply this knowledge to real time operating system.
						COI	Students have the adequate writing skills that are needed in an organization and To perform well during Campus Drives and different Interviews
			B.Tech-Computer		Employability	CO2	Understand the core competencies to succeed in professional and personal life and Students will develop knowledge and experience with the use of the standard C programming language,
57	VR19	05	Science and Engineering	1020193200	Readiness Program-III	CO3	Solve various Basic Mathematics problems by following different methods and analyses, summarize and present information in quantitative forms including table, graphs and formulas
	ē ³					CO4	Follow strategies in minimizing time consumption in problem solving Apply shortcut methods to solve problems and confidently solve any mathematical problems and utilize these mathematical skills both in their professional as well as personal life.
						COI	The ability to understand, analyze and develop computer programs in the areas related to algorithms.
58	VR19	05	B.Tech-Computer Science and Engineering	1005193210	Algorithms Lab	CO2	To find an algorithm to solve the problem and prove that the algorithm solves the problem correctly.
			Engineering			CO3	To understand the mathematical criterion for deciding whether an algorithm is efficient.

			,				
							apply the software engineering principles in planning,
						CO1	formulating an innovative design/ approach and computing
							the requirements appropriate to chosen topic within the context of legal, societal and environment constraint.
							Ability to perform individually as well as in a team, accepting
			B.Tech-Computer			CO2	responsibility, taking initiative, and providing leadership,
59	VR19	05	Science and	1005193270	Mini Project-II		necessary to ensure project success
			Engineering				Ability to use formal and informal communications with
						CO3	team members and guide, make presentations and prepare
							technical document.
						004	Develop/implement the solutions with appropriate
						CO4	techniques, resources and contemporary tools for social relavent issues/problems
							Carryout literature survey, and choose a relevant topic
						201	reported in recent IEEE/CSI/ACM/ conference publications /
						COI	transactions in the domain of computer science and
			B.Tech-Computer				engineering.
60	VR19	05	Science and	1005193280	Technical	CO2	Simulate and analyze the results reported in the chosen paper
			Engineering	ALL DECEMBER 1500M PROPERTY.	Seminar		for seminar topic.
						CO3	Communicate effectively before the expert panel and develop
							technical reports. Respond to the queries raised by the evaluation committee
						CO4	and audience
						201	Appraise the importance of data and choose an appropriate
						COI	algorithm to create a models
			_			CO2	Characterize machine learning algorithms as supervised,
			D				semi-supervised, and Unsupervised
61	VR19	05	B.Tech-Computer Science and	1005193280	Machine		Relate various machine learning and deep learning
01	VKI9	03	Engineering	1003193280	Learning	CO3	algorithms with real world applications
			Lingineering				agoritans with real world applications
							Analysis have to evaluate and the build formation of
						CO4	Analyze how to evaluate models build from the sample datasets on web
							databets on web
						COI	Relate different aspects of BigData in accordance with
							various big data applications
			B.Tech-Computer			CO2	Catergorize various dimensions of BigData (5V's) and its
62	VR19	05	Science and	1005194100	Big Data	CO2	sources in real time
			Engineering		Analytics		Note that the second se
						CO3	Make use of recent tools related to Hadoop, Spark and MapReduce etc
					a ·		Mapreduce etc
						604	Analyze the different aspects of cluster computing with real
						CO4	world applications
							D. T. L.
					Object Ocionta	CO1	Build solutions to the complex problems using object
			B.Tech-Computer	1,4000000000000000000000000000000000000	Object Oriented Analysis and	CO2	oriented approach Identify classes and responsibilities of the problem domain
63	VR19	05	Science and	1005194121	Design using	CO2	Apply UML tools for various case studies
			Engineering		UML		Represent classes, objects, responsibilities and states using
						CO4	UML notations.
						CO1	Identify basic security attacks and services
						CO2	Analyze the strengths and weaknesses of various symmetric
٠.	100.0		B.Tech-Computer		Cryptography	502	encryption algorithms.
64	VR19	05	Science and Engineering	1005193263	and Network	CO3	Apply the concepts of number theory and public key
			Engineering		Security (PE-III)		algorithms in cryptography
						CO4	Classify various cryptographic protocols, hash functions, digital signature schemes
						COI	Demonstrate ANN structure and activation Functions.
							and don't directly.
			B.Tech-Computer		Artificial Neural	CO2	Define foundations and learning mechanisms and state-space
65	VR19	05	Science and	1005194150	Networks (PE-	202	concepts.
	0.00000	. «3	Engineering		III)		Evaluis multi lavas for I formad and I I I I
						CO3	Explain multi-layer feed forward networks and Back propagation algorithms.
						CO4	Analyze Radial Basis Function Networks and SVMs
			<u> </u>				1 July Could be a second to the second to the second

						CO1	Enumerate the layers of the OSI model and TCP/IP model. Explain the function(s) of each layer. Ability to understand about different architectures network.
66	VR19	05	B.Tech-Computer Science and	1005194151	Advanced Computer	CO2	Identify the different types of network devices and their functions within a network.
			Engineering		Networks (PE- III)	CO3	build the skills to inter work with sub netting, routing mechanisms and transport layer protocols.
						CO4	Select appropriate quality of service mechanism for a given computer network
						COI	Create, classify and build the software architecture
	i 1		B.Tech-Computer		Software	CO2	Illustrate and evaluate the architecture structures
67	VR19	05	Science and	1005194152	Architecture and Design Patterns	CO3	Design creational and structural patterns
			Engineering		(PE-III)	CO4	Outline behavioural pattern and case study in uitlizing the software architectural structures
						COI	Illustrate the basic elements and concepts related to distributed system technologies
			B.Tech-Computer		Distributed	CO2	List the characteristics of distributed systems for designing architectural models
68	VR19	05	Science and Engineering	1005194153	Systems (PE- III)	CO3	Enumerate the features and applications of important standard protocols which are used in the distributed system
						CO4	Interpret inter-process communication in a distributed system
						COI	apply the knowledge of cloud technology to infer the working principles of cloud computing
		0.5	B.Tech-Computer		Cloud	CO2	analyse cloud services extended by various cloud providers to build a cloud
69	VR19	05	Science and Engineering	1005194154	Computing (PE-IV)	CO3	Identify emerging cloud programming paradigms and its software environments
						CO4	Design and develop the backup strategies for cloud data by pridcting the future risks
						COI	elucidate the parametric and linear models of classification in domain specific applications
70	VR19	05	B.Tech-Computer Science and	1005104155	Pattern	CO2	Compare and parameterize different learning algorithms in NLP applications
/0	VKIS	03	Engineering	1003194133	Recognition (PE- IV)	CO3	Develop machine independent and unsupervised learning techniques.
						CO4	Apply pattern recognition techniques to real world problems such as documentation analysis and recognition
						COI	develop new applications in Manets and WSN.
71	VR19	05	B.Tech-Computer Science and	1005194156	Mobile Adhoc	CO2	enable the student to understand the need for security and the challenges and also the role of cross layer design in enhancing the network performance
71	VKI	03	Engineering	1003194130	Networks (PE- IV)	CO3	develop algorithms/protocols for Manets and WSN.
						CO4	examine new technical issue related to these new thrust areas and come up with a solution(s).
						COI	Figure out practical solutions to the problems for various applications
72	VD10	0=	B.Tech-Computer	1005104157	Software	CO2	formulate and analyze test cases for given problem domain
72	VR19	05	Science and Engineering	1005194157	Testing Methodologies	CO3	manage test plans and test models for projects from inception to transition
						CO4	find out the implementation of different strategies to replace errors
						COI	make use of HTML5, CSS, JavaScript and Bootstrap.
			B.Tech-Computer		Mern Stack	CO2	Implement a Fast, unopinionated, minimalist web framework for Node is using Express
73	VR19	05	Science and Engineering	1005194158			Develop MongoDB-a schema-less (document-oriented) NoSQL database
						CO4	Build and deploy a social network with Node.js

						CO1	know the basic concepts in Disasters and its triggering factures
74	VR19	05	B.Tech-Computer Science and	1001194160	Disaster Management	CO2	understand stages of hydrological disaster
			Engineering		(OE-IV)	CO3	analysis the causes, effects, impacts and of hydrological, geological and coastal hazards.
						CO4	understand the mitigation procedure of uncertain events
						COI	formulate and solve various practical problems in manufacturing and service organizations.
			B.Tech-Computer		Operations	CO2	solve the allocation models
75	VR19	05	Science and Engineering	1003193252	Research (OE- IV)	CO3	perform iterations in the Transportation, assignment, game, inventory problems
						CO4	perform iterations in the replacement, sequencing, queuing problems
						COI	Explain the fundamentals of gray scale and color image processing.
			B.Tech-Computer		Digital Image	CO2	Apply different compression methods on image for image processing applications.
76	VR19	05	Science and Engineering	1004193252	Processing (OE-IV)	CO3	Solve the methods to extract information from the image in terms of spatial filtering, frequency filtering, restoration and segmentation.
						CO4	Examine the different techniques of color and multi resolution processing.
						COI	Understand the Architecture, protocols and applications of IoT.
77	VR19	05	B.Tech-Computer Science and	1019103260	Internet of Things (OE-IV)	CO2	Analyse the communication protocols and standards used in IoT
			Engineering		Tinings (OE-IV)	CO3	design the simple IoT applications to monitor or control IoT devices using simulation or hardware
						CO4	implement the real time IoT applications.

VIGNAN'S INSTITUE OF INFORMATION TECHNOLOGY (A) DEPARTMENT OF INFORMATION TECHNOLOGY VR19 B. Tech - Information Technology Course Outcomes

		D		VK	19 B. Lech - Intorn	nation	Technology Course Outcomes
S. No	Regula tion	Progr amme Code	Programm e Name	Course Code	Course Name	СО	Course Outcome: After the completion of the course student will be able to
						COI	Executing mean value theorems and evaluate maxima and minima of functions of two variables without constraints
1	VR19	12	B.Tech- Information	1000191100	Mathematics-I	CO2	Apply the analytical methods to solve higher order linear differential equations.
			Technology			CO3	Evaluate of solution of Ordinary differential equations by using Laplace Transform technique.
						CO4	Identify and solve partial differential equations.
						CO1	Identification of different polymers and their functionalities
2	VR19	12	B.Tech- Information	1000191123	Applied Chemistry	CO2	Determination of structure to many compounds and apply the basic knowledge in construction of cell and its applications
=	,,,,,		Technology	1000171123	rippiica Chemistry	CO3	Analysis of corrosive environments and protection of precious metal
						CO4	Adoption of different green methodologies and acquire knowledge on different advanced materials
						COI	Understand the use of drawing instruments to construct the polygons and curves
3	VR19	12	B.Tech- Information	1003191101	Engineering Drawing	CO2	Learn the principle of orthographic projections. Draw Orthographic projections of points, lines.
			Technology		Diaming	CO3	Draw the various types of planes and solids its views in different Positions
						CO4	Draw isometric views of simple objects
			3			COI	Interpret fundamentals of computers and convert flowcharts/algorithms to C Programs, compile and debug programs
4	VR19	12	B.Tech- Information	1005191120	Problem Solving & Programming	CO2	Apply decision making and Iterative feature of C Programming language effectively.
			Technology		using C	CO3	Design and implement programs to analyze the different pointer applications
						CO4	Apply structures and unions and Implement file Operations in C programming for any given problem
			2007			COI	Read, understand and interpret material on Environment, Science and Technology, tourism, Energy Sources, Social Awareness
5	VR19	12	B.Tech- Information	1000191121	Technical English Communication	CO2	Analyze the functions of language and grammar in spoken and written forms.
			Technology			CO3	Write effectively on various domains.
						CO4	Prepare and exhibit oral presentation skills by using ICT(Individual/Team)
						COI	Realize the purpose/Role of Engineer for solving social problems
,	11010	10	B.Tech-		Engineering	CO2	Learn to Design a component/system in an engineering way
6	VR19	12	Information	1000191110	Exploration	CO3	Learn to use mechanisms, Arduino, sensors, motors.
			Technology			CO4	Integrating different systems (mechanical/Electrical/computer) to work as a unit
			B.Tech-			COI	Solve approximate roots of an equation by using different numerical methods.
8	VR19	12	Information	1000191101	Mathematics-II	CO2	Compute Interpolating polynomial for the given data.
		H-152	Technology			CO3	Constitute Numerical Solution of ODE and Numerical Integration.
			3)		,	CO4	Evaluate simultaneous linear equations numerically using rank of a matrix and also Eigen values and Eigen vectors of a square matrix.
						COI	describe the wave phenomen and applu thesse concepts for construction of lasers and optical fibers.
9	VR19	12	B.Tech- Information	1000191221	Applied Physics	CO2	apply the knowledge of basic quantum mechanics, to set up one deimesional schrodingers wave equation.
			Technology	1000191221 A		CO3	identify the importance if classical and quantum.
						CO4	male use od the basic comcepts of energy bands in ctystalline solids to
	L						undestsnd semiconductor physics .

VR19 12								
VR19							COI	Relate the procedural and object paradigm, streams, classes, functions, data and objects with real world entities
Internation Internation Internation Internation Internation India	10	VR19	12	Information	1005191222		CO2	Apply the concepts of function overloading, operator overloading
VR19				Technology		C	CO3	classify inheritance with understanding of early and late binding.
1								
1								Explain the basic concepts of Circuit theory, semiconductor physics
12 VR19				D Took			COI	and analyze the PN junction diode and special purpose diode.
VR19 12 B. Tech- Information Technology 12 Information Technology 12 Information Technology 13 VR19 14 VR19 15 Information Technology 15 Information Technology 16 Information Technology 17 Information Technology 17 Information Technology 18 Information 1005192101 Information Technology 18 Information 1005192101 Information Technology 18 Information 1005192101 Inf	11	VR19	12	Information	1004191200	Basic Electronics	CO2	
12 VR19 12 Information Technology 12 Information Technology 13 VR19 14 VR19 15 Information Technology 15 Information Technology 15 Information Technology 16 Information Technology 17 Information Technology 17 Information Technology 18 Information Technology 18 Information Technology 18 Information Technology 18 Information							CO3	
VR19 12 B.Tech- Information Technology 100191202 Probability and Statistics CO2 Core real, data to compute probabilities, theoretical frequencies. Apply Binomial, Poisson, Normal, agamba and Weibull distributions for real, data to compute probabilities, theoretical frequencies. Apply Binomial, Poisson, Normal, agamba and Weibull distributions for real, data to compute probabilities, theoretical frequencies. Apply Binomial, Poisson, Normal, agamba and Weibull distributions for real, data to compute probabilities, theoretical frequencies. Apply Binomial, Poisson, Normal, gamma and Weibull distributions for real, data to compute probabilities, theoretical frequencies. Apply Binomial, Poisson, Normal, gamma and Weibull distributions for real, data to compute probabilities, theoretical frequencies. Apply Binomial, Poisson, Normal, gamma and Weibull distributions for real, data to compute probabilities, theoretical frequencies. Apply Binomial, Poisson, Normal, gamma and Weibull distributions for real, data to compute probabilities, theoretical frequencies. Apply Binomial, Poisson, Normal, gamma and Weibull distributions for real, data to compute probabilities, theoretical frequencies. Apply Binomial, Poisson, Normal, gamma and Weibull distributions for real, data to compute probabilities, theoretical frequencies. CO4 Assemble and disassemble components of a PC CO2 Construct a fully functional virtual machine (CO2 C							CO4	
VR19							COI	value and probability of random variables.
Technology Statistics Statistics Co3 Samples Co4 Samples Co4 Samples Co5 Samples Co5 Samples Co6 Information Technology Co5 IT Workshop Co5 IT Workshop Co6 IT Workshop Co6 IT Workshop Co7				B.Tech-		Pool of Silver and	CO2	
13 VR19 12 B. Tech- Information 1005191210 IT Workshop 12 Information 1005191210 IT Workshop 12 Information 1005191210 IT Workshop 13 VR19 14 VR19 15 Information 12 Information 1005191210 IT Workshop 14 VR19 IT Workshop It W	12	VR19	12	10 W 0 0	1000191202		CO3	
13 VR19 12 Information Technology IT Workshop Technology It							CO4	in real life situations to draw the inferences and estimate the goodness
13 VR19 12 Information Technology				B Tech-				
Technology Techno	13	VR19	12		1005191210	IT Workshop		
VR19 12 B. Tech-Information Technology 100191130 100191130 Constitution of India Constit				Technology				
VR19 12								
VR19 12							COI	competitive examinations.
Technology Techno	1.4	VD 10	12	n-1 201	1000101130	Constitution of	CO2	
The content of the	14	VK19	12	50000 St 30	1000191130	India	CO3	
Panchayats and Cooperative Societies. CO1 Demonstrate skills in solving counting problem CO2 Develop reasoning skills using Mathematical Logic concepts. CO3 Identify the solutions for various problems using recurrence relations CO4 Apply concepts of graph theory for a given problem. CO5 Identify the solutions for various problems using recurrence relations CO6 Apply concepts of graph theory for a given problem. CO7 Identify the solutions for various problems using recurrence relations CO8 Identify the solutions for various problems using recurrence relations CO9 Identify the solutions for various problems using recurrence relations CO9 Identify the solutions for various problems using recurrence relations CO9 Identify the solutions for various problems using recurrence relations CO9 Identify the solutions for various problems using recurrence relations CO9 Identify the solutions for various problems using recurrence relations CO9 Identify the solutions for various problems using recurrence relations CO9 Identify the solutions for various problems using recurrence relations CO9 Identify the solutions for various problems using recurrence relations CO9 Identify the solutions for various problems using recurrence relations CO9 Identify the solutions for various problems using recurrence relations CO9 Identify the solutions for various problems using recurrence relations CO9 Identify the solutions for various problems using recurrence relations CO9 Identify the solutions for various problems CO9 Identify the solu				recimology				
VR19							CO4	
15 VR19 12 Information Technology 1005192100 Mathematical Structures 1005192100 Purple Passoning skills using Mathematical Logic concepts. CO2 Develop reasoning skills using Mathematical Logic concepts. CO3 Identify the solutions for various problems using recurrence relations 2004 Apply concepts of graph theory for a given problem. CO4 Apply concepts of graph theory for a given problem. CO5 Co3 Identify the solutions for various problems using recurrence relations 2004. Simplify the Boolean functions into minimum number of literals using k-maps, boolean laws and tabular methods. CO3 Design different combinational logic circuits. CO4 Apply knowledge of flip flops in designing registers and counters. Relate data structure concepts with real time applications. Apply linear and non linear data structures by identifying the appropriate need. CO3 Apply linear and implement operations of linear and nonlinear data structures. CO4 Develop reasoning skills using Mathematical Logic concepts. CO4 Apply concepts of graph theory for a given problem. CO5 Classify different number systems and generate various codes. Simplify the Boolean functions into minimum number of literals using k-maps, boolean laws and tabular methods. CO6 Design different combinational logic circuits. CO7 Poly Information applications. CO8 Apply knowledge of flip flops in designing registers and counters. CO8 CO9 Apply linear and non linear data structures by identifying the appropriate need. CO9 Design and implement operations of linear and nonlinear data structures CO9 Relate the procedural programming languages with object oriented paradigm CO9 Design and implement operations of linear and nonlinear data structures CO9 Implement GUI for windows based applications with modern tools.							COI	Demonstrate skills in solving counting problem
Technology Techno	15	VR19	12		1005192100		CO2	Develop reasoning skills using Mathematical Logic concepts.
VR19 12 B. Tech- Information Technology Digital Logic Design CO2 Simplify the Boolean functions into minimum number of literals using k-maps, boolean laws and tabular methods. CO3 Design different combinational logic circuits. CO4 Apply knowledge of flip flops in designing registers and counters. CO1 Relate data structure concepts with real time applications. CO2 Apply linear and non linear data structures by identifying the appropriate need. CO3 Analyze searching and sorting techniques for effective management of data CO4 Design and implement operations of linear and nonlinear data structures CO1 Relate the procedural programming languages with object oriented paradigm CO2 CO3 Implement GUI for windows based applications with modern tools. CO3 Implement GUI for windows based applications with modern tools. CO3		VICIO	12		1003172100		CO3	Identify the solutions for various problems using recurrence relations
12 B.Tech-Information Technology 12 B.Tech-Information Technology 14 B.Tech-Information Technology 15 B.Tech-Information Technology 16 Digital Logic Design 16 Digital Logic D							CO4	Apply concepts of graph theory for a given problem.
16 VR19 12 Information Technology 1005192101 1005192101 1005192101 1005192101 1005192101 1005192101 1005192101 1005192101 1005192120 1005192120 1005192120 1005192120 1005192120 1005192120 1005192120 1005192120 1005192120 1005192120 1005192120 1005192120 1005192120 1005192121							COl	
Technology CO3 Design different combinational logic circuits. CO4 Apply knowledge of flip flops in designing registers and counters.	16	VR19	12	THE RESERVE OF THE PARTY OF THE	1005192101		CO2	
Part of the properties of the properties of the part o				Technology		Design		
VR19 12 B.Tech-Information Technology Data Structures through C Data Structures through C Data Structures through C CO2 Apply linear and non linear data structures by identifying the appropriate need. CO3 Analyze searching and sorting techniques for effective management of data								
B.Tech-Information Technology 12 B.Tech-Information Technology 13 VR19 14 VR19 15 B.Tech-Information Technology 16 Data Structures through C 17 VR19 18 VR19 18 VR19 18 VR19 19 Data Structures through C CO3 Analyze searching and sorting techniques for effective management of data CO4 Design and implement operations of linear and nonlinear data structures CO5 Relate the procedural programming languages with object oriented paradigm CO6 Use Exception handling and multithreading mechanisms to create exception free and parallel real world applications CO7 Implement GUI for windows based applications with modern tools.							CO1	
17 VR19 12 Information Technology 1005192120 Data Structures through C CO3 Analyze searching and sorting techniques for effective management of data CO4 Design and implement operations of linear and nonlinear data structures Relate the procedural programming languages with object oriented paradigm CO2 Use Exception handling and multithreading mechanisms to create exception free and parallel real world applications Implement GUI for windows based applications with modern tools.				B.Tech-		D. a. Ca	CO2	
CO4 Design and implement operations of linear and nonlinear data structures Relate the procedural programming languages with object oriented paradigm CO2 Use Exception handling and multithreading mechanisms to create exception free and parallel real world applications CO3 Implement GUI for windows based applications with modern tools.	17	VR19	12		1005192120		CO3	Analyze searching and sorting techniques for effective management of
Relate the procedural programming languages with object oriented paradigm CO1 Relate the procedural programming languages with object oriented paradigm CO2 Use Exception handling and multithreading mechanisms to create exception free and parallel real world applications Implement GUI for windows based applications with modern tools.				recomology			CO4	Design and implement operations of linear and nonlinear data
18 VR19 12 B.Tech-Information Technology 1005192121 Java Programming CO2 Use Exception handling and multithreading mechanisms to create exception free and parallel real world applications Use Exception free and parallel real world applications with modern tools.							COI	Relate the procedural programming languages with object oriented
Technology CO3 Implement GUI for windows based applications with modern tools.	18	VR19	12		1005192121	Java Programmino	CO2	Use Exception handling and multithreading mechanisms to create
CO4 Design various layouts along with applet usage					1005192121		CO3	
							CO4	Design various layouts along with applet usage

					[COI	Analyze the Demand, Price and Cost.
			B.Tech-		Managerial		Identify the Nature of different markets to determine Price Output for
19	VR19	12	Information	1099192100	Managerial Economics and	CO2	different Business Units
			Technology		Financial Analysis	CO3	Understand Various Business Forms
						CO4	Evaluate investment project proposals
						CO1	Produce adequate writing skills that are needed in an organization
						CO2	Evaluate the core competencies to succeed in professional and personal life
			p.m. i				Solve various mathematics problems by following different methods
20	VR19	12	B.Tech- Information	1020192100	Employability Readiness	CO3	and to perform well in various competitive exams and placement drives.
			Technology		Program		Developing new strategies in minimizing time consumption in problem
						COA	solving Apply shortcut methods to solve problems and confidently
						CO4	solve any mathematical problems and utilize these mathematical skills both in their professional as well as personal life.
						COI	Understand definition, scope, approach and theories of public
				,			administration. Identify the process and technique of decision making and also
						CO2	understand the concept of administrative behaviour and control.
21	VR19	12	B.Tech- Information	1020192101	Public	CO3	Understand the process and technique of personnel and financial administration.
			Technology	1020172101	Administration	CO4	Understand definition, scope, approach and theories of public
							administration. Discuss the tools that modern public administrators use to pursue
						CO5	public goals and public policy, along with the pros and cons of those
							tools.
						COI	Students have the adequate reading and speaking skills and will be able
			B.Tech-				to express himself in French. Understand the grammar and use them in their personal and
22	VR19	12	Information	1020192102	Foreign Linguistic	CO2	professional life.
			Technology		- French	CO3	Students will be able to write proficiently in French.
						CO4	Students will be able to compare and contrast world culture and it will
							expand his knowledge about various culture. Survey various social problems present in the viscinity & develop
						COI	solution in technical aspects.
							Compare and contrast various latest technologies like Internet of
					100 Mari	CO2	Things, 3D Printing, Mobile App Creation, Thinker CAD, and Web page
23	V/D 10	12	B.Tech-	1012102170	Mini Project – I	CO2	development suitable for the chosen project.
23	VR19	12	Information Technology	1012192170	EPICS/Societal relevant project		• •
			l		isis and project	CO3	Apply the engineering knowledge, mathematics, design thinking and project management to develop a community project.
							Document project to the intended community and analyze the feedback
						CO4	collected from community and extend any kind of support in future by
							the students. Gain a higher level of personal involvement and interest in
						COI	understanding and solving environmental resource problems and its
							sustainable conservation practices.
24	VR19	12	B.Tech- Information	1000192130	Environmental Science	CO2	Sustaining the relationship between man and ecosystem & biodiversity.
-	11(1)	12	Technology	1000172130	(Audit Course)	CO3	Enhance knowledge relating to the biological systems involved in the
							major global environmental problems of the 21st century
						CO4	Recognize the interconnectedness of human dependence on the earth's ecosystems and Influence their society in proper utilization of goods
							and services.
						COI	Apply the concepts of basic functional units to demonstrate the
	1 m / -		B.Tech-	100	Computer		working of computational system. analyze the design issues in the development of processor and other
25	VR19	12	Information	1005192200	Organization & Architecture	CO2	components to articulate improvement in computer design.
			Technology		Architecture	CO3	Design Arithmetic Logic unit by analyzing performance issues
			L	L		CO4	Compare various Memory organizations.

				ſ		COI	compare and contrast various software models applied to different real world applications.
						CO2	evaluate the process models for the development of SDLC
26	VR19	12	B.Tech- Information Technology	1005192201	Software Engineering	CO3	Design a prototype for a software design and user interface & apply strategies of coding & testing for the development of software product
						CO4	Apply the knowledge about cost effect estimation and maintenance of software system and modeling the software project by using CASE tools
					*	COI	Apply the basic concepts of Languages, operations of Languages, NFA, DFA and its conversions.
27	17010		B.Tech-	101210220	Automata Theory	CO2	Identify the similarities and differences among various parsing techniques and will be able to solve problems related to Shift reduce parsing, compute FIRST and FOLLOW sets, LR(0), LR(1) and LALR sets of items and parse table for a given grammar
27	VR19	12	Information Technology	1012192200	and Complier Design	CO3	Construct syntax directed translations of simple statements and understand the working of procedure calls and use various storage allocation schemes for the better utilization of run time memory.
					14	CO4	Construct syntax directed translations of simple statements and understand the working of procedure calls and use various storage allocation schemes for the better utilization of run time memory.
			B.Tech-		Database	COI	identify the basic concepts and various data model used in database design and formulate SQL queries.
28	VR19	12	Information	1005192221	Management Management	CO2	interpret use of normalization in designing the database.
-	,,,,,		Technology	1003172221	Systems	CO3	evaluate indexing and hashing technique used in database design.
					-	CO4	apply and relate the concept of transaction, concurrency control and recovery in database.
						COI	Enumerate different environments to install Python IDE and run basic Python scripts.
			B.Tech-			CO2	Ascertain use the operators, functions, key Concepts of Object Oriented Programming in python.
29	VR19	12	Information Technology	1012192120	Python Programming	CO3	Access Python from various online resources and import packages to the current working environment.
						CO4	Develop front end GUI using Visualization Libraries and Multithreading techniques.
						COI	: Analyze the functions of language and grammar in spoken and written forms with an emphasis on LSRW Skills.
30	VR19	12	B.Tech- Information	1000192110	Communication Skills Lab	CO2	Disseminate the relevant skills while performing GDs, interviews, oral presentations with a focus on Non verbal communication.
			Technology			CO3	Prepare and exhibit oral presentation skills by using ICT.(Individual/Team)
						CO4	Organize proper life skills for their employability.
			B.Tech-			COI	Analyze dictionary ADT along with hashing mechanisms.
31	VR19	12	Information	1005192220	Advanced Data	CO2	implement priority queues and their operations. Build efficient Binary Search Trees and Multiway search trees.
100.0	a man.f.		Technology		Structures		Illustrate tries and various issues related to the design of file structures.

						CO1	Identify stages in building a Data Warehouse and challenges in Data
32	VR19	12	B.Tech- Information	1005193101	Data Warehousing	CO2	mining Access raw input data and apply data pre-processing techniques, generalization techniques and data characterization techniques to provide suitable input for a range of data mining algorithms
			Technology		and Data Mining	CO3	Analyze data mining techniques like classification and Association rules that can be applied to data objects and to find the interesting patterns.
						CO4	Solve real world problems by using the various Clustering methods
					Computer	COI	compare and illustrate functionality of OSI and TCP/IP reference models.
33	VR19	12	B.Tech- Information	1012193120	Networks (Integrated	CO2	select and evaluate appropriate routing techniques among network protocols.
			Technology		Course)	CO3	Evaluate and analyze various application layer protocols.
					,	CO4	Choose and design appropriate protocol for desired communication service.
						COI	Categorize and assess various types of operating systems and execution of system calls at each phase.
34	VR19	12	B.Tech- Information	1005193102	Operating Systems	CO2	Analyze various process scheduling and memory management techniques to develop better solutions.
54	VICIO	12	Technology	1003193102	Operating Systems	CO3	Formulate dead lock management, resource management techniques and IPC abstraction.
						CO4	perform tasks in Windows/ UNIX / Linux / Android and other environments.
					Principles of	CO1	Recognize syntax and semantics of programming languages.
35	VR19	12	B.Tech-	1012102150	Programming	CO2	Comprehend the list of variables, data types, and basic statements in programming languages.
33	VKI9	12	Information Technology	1012193150	Languages (Professional	CO3	Analyze to understand the sub programs and implementation of Object oriented concepts.
					Elective-I)	CO4	Identify the ways of adapt new programming languages.
						COI	Classify NoSQL, its characteristics and history, and the primary benefits for using NoSQL databases
26	10010		B.Tech-		NoSQL Databases	CO2	Characterize the major types of NoSQL databases including a primary use case and advantages/disadvantages of each type
36	VR19	12	Information Technology	1012193151	(Professional Elective-I)	CO3	Create wide-column, document, key-value, graph and object-oriented databases, add content, and run queries
						CO4	Outline and develop basic storage architecture and distributed file systems
						COI	Familiarize with R workspace and Programming with R
37	VR19	12	B.Tech- Information	1012193152	R- Programming (Professional	CO2	Access online resources for R and import new function packages into the R workspace
			Technology		Elective-I)	CO3	Apply math functions to calculate probability and statistical distributions and knowledge on Graphics in data visualization.
						CO4	Analyze the datasets using various models like linear, non-linear regression models, and classification techniques for data analysis
					Advanced	COI	analyze concepts of parallelism in hardware/software.
			B.Tech-		Computer	CO2	Implement the Hardware for Arithmetic Operation
38	VR19	12	Information Technology	1005193154	Architecture (Professional	CO3	Distinguish the performance of pipelining and non pipelining environment in a processor
				,	Elective-I)	CO4	Analyze the performance of different scalar Computers
					Industrial Waste	COI	Distinguish between the quality of domestic and industrial water requirements and wastewater quantity generation
39	VR19	12	B.Tech- Information	1001193161	and Waste Water Engineering	CO2	Impart knowledge on selection of treatment methods for industrial wastewater.
			Technology		(Open Elective)	CO3	Describe the common methods of treatment in different industries
							Explain operational problems of common effluent treatment plant

						COI	Summarize robot components, configurations and different end effectors
40	VR19	12	B.Tech- Information Technology	1003193161	Industrial Robotics	CO2	Select a robot for a given application and illustrate the working principles of various actuators and sensors that can be used in the manipulator, control system that can be used as well as the method of programming the robot
				1		CO3	Analyze a given serial manipulator kinematically and dynamically
							Derive as well as analyze the equation of trajectory that the end- effector should follow given the boundary conditions.
			B.Tech-		Data Communications	CO1	Interpret ISO-OSI and TCP/IP models and various Network topology models
41	VR19	12	Information	1004193161	(Open Elective)		Illustrate the concept of data framing and error control mechanisms
			Technology		(Open Licetive)	CO3	Compare different types routing protocols
						CO4	Familiar with the World Wide Web concept
					Energy Audit	COI	Analyze power factor improvement methods, and Demonstrate the operating principle of energy efficient motors
			B. Tech-		Conservation and	CO2	Demonstrate principle and organizing energy management program
42	VR19	12	Information Technology	1002193151	Management (Open Elective)	CO3	Apply principles of energy auditing and propose energy conservation schemes
						CO4	analyse about space heating and ventilation methods and demonstrate the operation of various energy instruments
			D.TI		Professional	COI	Relate ethical human values
43	VR19	12	B.Tech- Information	1099193130	Ethics & Human	CO2	Apply engineering knowledge for society
43	VKI9	12		1099193130	Values	CO3	Elaborate responsibility for safety & risk
			Technology		(Audit Course)	CO4	Outline the various current global issues
						CO1	Create web-based applications using features of HTML and CSS.
			B.Tech-		Advanced Java Web Technologies	CO2	Develop reusable component for Graphical User Interface applications
44	VR19	12	Information Technology	1012193220	(Integrated Course)	CO3	Apply the concepts of server side technologies for dynamic web applications.
						CO4	Implement the web based applications using effective data base access with rich client interaction.
			13		Unified Modeling	COI	Illustrate software design with UML diagrams
			B.Tech-		Language &	CO2	Design software applications using OO concepts
45	VR19	12	Information	1012193221	Design Patterns	CO3	Identify various scenarios based on software requirements
			Technology		(Integrated Course)	CO4	Apply UML based software design into pattern based design using design patterns
						COI	Illustrate basic insights of management principles
46	VR19	12	B.Tech- Information	Course Code :	Management	CO2	Summarize Production process, Quality control and Inventory techniques
	,,,,,		Technology	1099192200	Science	CO3	Indentify Strategies and policies to functional areas
						CO4	Apply Contemporary management Practices
			 			COI	Understand and assess the environmental impact
			B.Tech-		Environmental Impact	CO2	Implement different methods in preparing Environmental Impact Statement
47	VR19	12	Information	1001193251	Assessment and	CO3	Identify various mitigation measures that can be used
			Technology		Management	CO4	Identify the methodology for controlling of environmental impacts,
-						COI	environmental indices and indicators Apply the principles and practices of cryptography and network
						CO2	security Analyze the concepts of symmetric block cipher or conventional key
				1	1		encryption or private key encryption or one key encryption.
48	VR19	12	B.Tech- Information	1012194100	Applied Cryptography	CO3	Execute basic knowledge of public key cryptography or asymmetric key cryptography or two key cryptography.
			Technology	AND THE PERSON NAMED OF TH		CO4	Implement cryptographic protocols, hash functions, authentication, key management, key exchange, signature, schemes Email and web security, viruses, firewalls.
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						COI	Appraise the importance of data and choose an appropriate algorithm to create a models
49	VD10	12	B.Tech-	1005104120	Machine Learning	CO2	Characterize machine learning algorithms as supervised, semi- supervised, and Unsupervi
49	VR19	12	Information Technology	1005194120	(Integrated Course)	CO3	Relate various machine learning and deep learning algorithms with real world application
					7,	CO4	Analyze how to evaluate models build from the sample datasets on web
						COI	Relate different aspects of BigData in accordance with various big data applications
50	VR19	12	B.Tech- Information	1005194100	Big Data Analytics	CO2	Catergorize various dimensions of BigData (5V's) and its sources in real time.
			Technology		Analytics	CO3	Make use of recent tools related to Hadoop, Spark and MapReduce etc
						CO4	Analyze the different aspects of cluster computing with real world applications
						COI	Reproduce models to effectively test the applications.
51	VR19	12	B.Tech- Information	1012194150	Software Testing (Professional	CO2	Apply techniques of transaction flow testing and dataflow testing in various programs
		W-22	Technology		Elective-III)	CO3	Test the software using domain testing and Logic Based Testing
			0.5		,	CO4	Apply various software testing tools for real world applications
						COI	choose appropriate techniques to Store data in the files
					Advanced	CO2	Apply and analyze various terms related to transaction management in centralized and distributed database
52	VR19	12	B.Tech- Information	1005193254	Databases (Professional	CO3	Examine the issues related to multimedia and mobile database performance
			Technology		Elective-III)		Analyze and Implement the concept of object- relational database in
					Elective in)	CO4	development of various real time software.
						COI	Choose appropriate methods in AI that may be suited to solve a given problem and Game Playing
53	10010	12	B.Tech-	1005103251	Artificial Intelligence	CO2	Make use of AI search algorithms and formalizations on real world problems
53	VR19	12	Information Technology	1005193251	(Professional Elective-III)	CO3	Analyze the basic issues of different types of knowledge representation techniques to build intelligent system
						CO4	Apply probabilistic and fuzzy models to solve problems with uncertainty.
						COI	Analyze, design and develop new mobile application.
			B.Tech-		Mobile	CO2	Apply various techniques that take new technical issue related to a new paradigm and come up with a solution(s).
54	VR19	12	Information Technology	1012194151	Computing (Professional	CO3	Create a new ad hoc network applications and/or algorithms/protocols.
			3,		Elective-III)	CO4	Design and develop any existing or new protocol related to mobile environment
						COI	Extract architecture and features of UNIX Operating System and differentiate it from other Operating Systems.
			B.Tech-		UNIX	CO2	Use of UNIX commands for various file handling and process control strategies.
55	VR19	12	Information Technology	1012194152	Programming (Professional Elective-IV)	CO3	Build Regular expressions for pattern matching and apply them to various filters for a specific task
						CO4	Analyze a given problem and apply requisite facets of SHELL programming in order to devise a SHELL script to solve the problem

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					- was no	COI	Execute basic concepts of react, node, express and mongodb technologies
					Full Stack	CO2	Design front end application using React and Redux libraries
56	VR19	12	B.Tech- Information	1012194153	Development (MERN)	CO3	Develop interactive web applications on server side with NOSQL databases.
			Technology		(Professional Elective-IV)	CO4	Build responsive web application communicating with RES API and managing data with NOSQL databases
						COI	Enumerate the computer forensics fundamentals
			B.Tech-		Cyber Security &	CO2	compare and contrast the types of computer forensics technology
57	VR19	12	Information	1012194154	Forensics (Professional	CO3	CO3 Analyze various computer forensics systems used at various levels
			Technology		Elective-IV)	CO4	Illustrate the methods for data recovery, evidence collection and data seizure
						CO1	Examine how software devlopment life cycle models can impact the
			B.Tech-		Software Project	CO2	software deliverables conduct activities necessary to successfully complete and close the
58	VR19	12	Information	1005193253	Management		Software projects
			Technology	11. M. Gard 11 Commission (Co.)	(Professional Elective-IV)	c04	develop the skills for tracking and controlling software deliverables
					Elective-IV)	CO3	Estimate the effort required for a software project development and identify software risks
			B.Tech-		Cryptography &	COI	Evaluate different encryption algorithms on number theory
59	VR19	12	Information	1012194110	Network Security	CO2	Implement Symmetric cryptographic algorithms
37	VICI	12	Technology	1012194110	Lab	CO3	Implement Asymmetric cryptographic algorithms
			recimiology		Lao	CO4	Execute Various Cryptographic Hash algorithms
					5.	COI	Know the basic concepts in Disasters and its triggering factures
			B.Tech-		Disaster Management	CO2	Understand stages of hydrological disaster
60	VR19	12	Information	1001194160	(Open Elective-	CO3	Analyse the causes, effects, impacts and of hydrological, geological
			Technology		IV)		and coastal hazards.
					8888-20	CO4	Understand the mitigation procedure of uncertain events
						COI	apply the knowledge of cloud technology to infer the working principles of cloud computing
61	VR19	12	B.Tech- Information		Cloud Computing (Professional	CO2	analyse cloud services extended by various cloud providers to build a cloud
01	VKI9	12	Technology		Elective-V)	CO3	Identify emerging cloud programming paradigms and its software environments
						CO4	Design and develop the backup strategies for cloud data by pridcting the future risks
						COI	elucidate the parametric and linear models of classification in domain specific applications
			B.Tech-		Natural Language	CO2	Compare and parameterize different learning algorithms in NLP
62	VR19	12	Information		Processing (Professional		applications
			Technology		Elective-V)	CO3	Develop machine independent and unsupervised learning techniques.
					•	CO4	Apply pattern recognition techniques to real world problems such as documentation analysis and recognition
					Ad has Comme	COI	minimise and deploy the challenges in designing MAC, routing and transport protocols for wireless ad-hoc/sensor networks
63	VR19	12	B.Tech- Information	1012194250	Ad-hoc Sensor Networks	CO2	Comprehend the various sensor network Platforms, tools and
			Technology		(Professional Elective-V)		applications.
					Elective-v)	CO3	resolve the unique issues in ad-hoc/sensor networks Implement designing routing and transport protocols for wireless Ad-
							hoc/sensor networks. Illustrate the basic elements and concepts related to distributed system
					Diotributed	CO1	technologies
64	VR19	12	B. Tech- Information		Distributed Systems	CO2	List the characteristics of distributed systems for designing architectural models
"	VICIT	12	Technology		(Professional Elective-V)	CO3	Enumerate the features and applications of important standard protocols which are used in the distributed system
					2000 MARIE (2004) 18 W	CO4	Interpret inter-process communication in a distributed system.
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VIGNAN'S INSTITUE OF INFORMATION TECHNOLOGY (A) DEPARTMENT OF ELECTRONICS AND COMPUTER ENGINEERING VR19 B.TECH. ECM COURSE OUTCOMES

C N	Regula	Progr	D		ECH. ECM COU		Course Outcome: After the completion of the
S.No	tion	amme Code	Programme Name	Course Code	Course Name	со	course student will be able to
						COI	Executing mean value theorems and evaluate maxima and minima of functions of two variables without constraints
1	VR19	19	B.Tech-Electronics	1000191100	Mathematics-I	CO2	Apply the analytical methods to solve higher order linear differential equations.
	VKI	19	and Computer Engineering	1000191100	Mathematics-1	CO3	Evaluate of solution of Ordinary differential equations by using Laplace Transform technique.
						CO4	Identify and solve partial differential equations
						COI	Identification of different polymers and their functionalities
2	VR19	19	B.Tech-Electronics and Computer	1000191123	Applied Chemistry	CO2	Determination of structure to many compounds and apply the basic knowledge in construction of cell and its applications
			Engineering		Chemistry	CO3	Analysis of corrosive environments and protection of precious metal
						CO4	Adoption of different green methodologies and acquire knowledge on different advanced materials
			B.Tech-Electronics and Computer Engineering	1000191101	Mathematics – II	CO1	Solve approximate roots of an equation by using different numerical methods.
3	VR19	19				CO2	Compute Interpolating polynomial for the given data Compute Numerical Solution of ODE and Numerical Integration.
						CO4	Evaluate simultaneous linear equations numerically using rank of a matrix and also Eigen values and Eigen vectors of a square matrix.
						COI	Understand the use of drawing instruments to construct the polygons and curves
4	VR19	19	B.Tech-Electronics and Computer	1003191101	Engineering	CO2	Learn the principle of orthographic projections. Draw Orthographic projections of points, lines.
			Engineering	1003171101	Drawing	CO3	Draw the various types of planes and solids its views in different Positions
						CO4	Draw isometric views of simple objects
			B.Tech-Electronics		Problem Solving And	CO2	Write compile and debug Programs in C language Use operators, data types and write programs
5	VR19	19	and Computer Engineering	1005191120	Programming	CO3	Select the best loop construct for a given problem
					using C	CO4	Design and implement C programs
						COI	Realize the purpose/Role of Engineer for solving social problems
6	VR19	19	B.Tech-Electronics and Computer Engineering	1000191110	Engineering Exploration	CO2	Learn to Design a component/system in an engineering way
						CO3	Learn to use mechanisms, Arduino, sensors, motors.
						CO4	Integrating different systems (mechanical/Electrical/computer) to work as a unit

						COI	Formulate any period function in terms of sine and cosine
						CO2	Simplify a non periodic function as integral representation
7	VR19	19	B.Tech-Electronics and Computer Engineering	1000191200	Transforms and Vector Calculus	CO3	Apply multiple integration techniques in evaluating areas and volume bounded by region.
			Engineering			CO4	Explain Gradient, divergence and curl operations in vector and scalar fields and apply Green's, Gauss and
							Stokes theorem as the generalisation of fundamental
\vdash							theorem of integral calculus. Discuss the wave phenomena of light and apply these
						COI	principles to describe electromagnetic wave
							propagation.
					Wave Optics		
8	VR19	19	B.Tech-Electronics and Computer	1000191222	and Semiconductor	CO2	Apply the knowledge of basic quantum mechanics, to set up one-dimensional Schrodinger's wave equation.
			Engineering		Physics		Identify the importance of classical and quantum
						CO ₃	mechanical treatment of materials.
							mechanical treatment of materials.
			a			CO4	crystalline solids to understand semiconductor
-							physics.
						COI	Outline the need for data structure techniques.
9	VR19	10	B.Tech-Electronics	1005101221	D . G.	CO2	Implement standard data.
9	VKI9	19	and Computer Engineering	1005191221	Data Structures	CO3	structures like stack, queue, list, tree and graph.
						CO4	structures like stack, queue, list, tree and graph.
						COI	Apply the basic circuit analysis techniques, in DC
							circuits and To know the performance of the circuits
			B.Tech-Electronics		N I	CO2	Analyze steady state analysis of AC circuits
10	VR19	19	and Computer	1002191201	Network Analysis	CO3	Analyze steady state analysis of electrical circuits using theorems
			Engineering		Allarysis		Gain the knowledge in characteristics of two port
						CO4	networks using parameters (Z, Y, ABCD, h) and
							Analyze Transient state analysis of Accircuits
							Read, understand and interpret material on
						CO1	Environment, Science and Technology, tourism,
			B.Tech-Electronics		Technical		Energy Sources, Social Awareness
11	VR19	19	and Computer	1000191121	English	CO2	Analyze the functions of language and grammar in
		1000	Engineering	was and with a set of	Communication		spoken and written forms.
						CO3	Write effectively on various domains.
						CO4	Prepare and exhibit oral presentation skills by using ICT(Individual/Team)
						00:	Understand the basic components and peripherals of a
			B.Tech-Electronics			COI	computer.
12	VR19	19	and Computer	1005191210	IT Workshop	CO2	To become familiar in configuring a system.
1.2	, 1017		Engineering	1003171210	11 HORKSHOP	CO3	Learn the usage of productivity tools.
						CO4	Acquire knowledge about the netiquette and cyber
							hygiene. Have general knowledge and legal literacy and
				_		CO1	thereby to take up competitive examinations.
						CO2	Distinguish the power of state and central central
			B.Tech-Electronics		Constitution of	CO2	government
13	VR19	19	and Computer	1000191130	India	CO3	Summarize the election procedure in India before and
			Engineering				after independence
						CO4	Association with the powers and functions of
						CU4	Municipalities, Panchayats and Cooperative Societies.
	L		L	1			

						CO1	Analyze the Demand, Price and Cost.
			B.Tech-Electronics		Managerial	CO2	Identify the Nature of different markets to determine
15	VR19	19	and Computer	1099192100	Economics and		Price Output for different Business Units
	, ,,,,,	.,	Engineering	10//1/2100	Financial	CO3	Interpret various forms of businesses
			Engineering		Analysis	CO4	Evaluate and Prepare investment project proposals
						CO4	and Financial Statements
							Explain the notion of random variable and evaluate
						COI	the expected value and probability of random
						COI	variables.
							Apply Binomial, Poisson, Normal, gamma and
						000	weibull distributions for real data to compute
			D.T. 1 El			CO2	probabilities, theoretical frequencies.
10	1/0.10	10	B.Tech-Electronics		Probability and		,
16	VR19	19	and Computer	1000191202	Statistics		Evaluate the confidence levels and maximum error for
			Engineering			CO3	large and small samples
							Apply the concept of hypothesis testing for large and
						CO4	small samples in real life situations to draw the
							inferences and estimate the goodness of fit.
							Examine correlation for the bi-variate data and fit the
						C05	different curves using principle of least squares and to
							predict the regression analysis
							Summarize the characteristics of PN junction diode in
						CO1	different modes of operation.
							Compare the construction, working principle of
			*			CO2	rectifiers with and without filters with relevant
						002	expressions and necessary comparisons.
			B.Tech-Electronics		Electronics		Summarize the construction, principle of operation of
17	VR19	19	and Computer	1004192120	Devices &		transistors, BJT and FET with their V-I characteristics
		.,	Engineering	1001172120	Circuits	CO3	in different configurations and understand the various
			Sugmeeting .		Circuits	003	biasing techniques for BJT and FET.
							blasting techniques for B31 and FB1.
							Explain the stabilization concepts with expressions
						CO4	and perform the analysis of small signal low frequency
							transistor amplifier circuits using BJT
						COI	Install Python IDE and run basic Python scripts.
							Understand the operators, functions, key Concepts of
						CO2	Object Oriented Programming in python.
			B.Tech-Electronics		Python		Access Python from various online resources and
18	VR19	19	and Computer	1012192120	Programming	CO3	import packages to the current working environment.
			Engineering		ogramming	003	import packages to the current working environment.
							Understand file handling operations and implement
						CO4	ML/DS Libraries using in Python.
							Describe various number systems, error detecting and
						CO1	correcting binary codes.
							Apply boolean laws, k-map & Q-M methods to
			B.Tech-Electronics		Digital Logic	CO2	minimize switching functions.
19	VR19	19	and Computer	1019192100	Design	1 002	minimize switching functions.
			Engineering		Design		Design combinational and sequential logic circuits
				Ì		CO3	Design combinational and sequential logic circuits
						COA	Design simple digital quaternative DLD-
						CO4	Design simple digital systems using PLDs.

						CO1	Characterize the signals and systems and principles of vector spaces, Concept of orthogonality
				d.		CO2	Analyze the continuous-time signals and continuous- time systems using Fourier series, Fourier transform and Laplace transform.
20	VR19	19	B.Tech-Electronics and Computer Engineering	1004192100	Signals and Systems	CO3	Apply sampling theorem to convert continuous- time signals to discrete-time signal and also apply z-transform to analyze discrete-time signals and systems
						CO4	Illustrate the relationships among the various representations of LTI systems and apply the Concepts of convolution, correlation, Energy and Power density spectrums to communication problems.
				·		CO1	Understand the various social problems present in the world & they will be able to identify and select a community problem to develop a technological project.
21	21 VR19	19	B.Tech-Electronics and Computer	1019192170	Mini Project-I (EPICS/Societal Relevant	CO2	Understand the various social problems present in the world & they will be able to identify and select a community problem to develop a technological project.
			Engineering		Project)	CO3	Learn the technologies like Internet of Things, 3D Printing, Mobile App Creation, Thinker CAD, and Web page development.
						CO4	Apply the engineering knowledge, mathematics, design thinking and project management to develop a community project.
						COI	Compare and contrast various software models applied to different real world applications.
			B.Tech-Electronics and Computer Engineering	1005192201	Software Engineering	CO2	Evaluate the process models for the development of SDLC
22	VR19	19				CO3	Design a prototype for a software design and user interface & apply strategies of coding & testing for the development of software product
						CO4	Design a prototype for a software design and user interface & apply strategies of coding & testing for the development of software product
						COI	Understand DC machines operation, testing and calculate the efficiency of DC machines.
			B.Tech-Electronics		Electrical	CO2	Analyze the performance of transformer 3-phase alternator and 3- phase induction motors.
23	VR19	19	and Computer Engineering	1019192200	Technology and Instrumentation	CO3	Explain and analyze the operation of Electrical and
						CO4	Electronic Measuring instruments Describe the working principle of various sensors and actuators.
			φ.			CO1	Understand the basic principle of communication system
24	VR19	10	B.Tech-Electronics	1019192201	Principles of	CO2	Describe the principles of Analog and Digital modulation techniques and be able to analyze their performance
24	VKIY	13	19 and Computer Engineering	1013137701	Communications	CO3	Explain the various communication system parameters for different types of modulation and demodulation techniques.
						CO4	Distinguish various Analog and Digital modulation techniques.

25	VR19	19	B.Tech-Electronics and Computer Engineering	1019192220	Computer Operating Systems	CO1 CO2 CO3	Apply the appropriate process models for the application development of SDLC. Understand the phases of SDLC from requirement gathering phase to design phase via Analysis Phase. Analyzing the strategies for coding and testing phase in Software product development. Apply the knowledge about estimation and maintenance of software systems and modeling the software project by using CASE tools.
26	VR19	19	B.Tech-Electronics and Computer Engineering	1019192221	Pulse and Digital Circuits	CO1 CO2 CO3 CO4	Understand and Apply the fundamental concepts of wave shaping for various switching and signal generating circuits. Understand and Apply the fundamental concepts of wave shaping for various switching and signal generating circuits. Analyze the different multivibrators and time base generators Analyze the different multivibrators and time base generators
27	VR19	19	B.Tech-Electronics and Computer Engineering	1000192130	Environmental Science (Audit Course)	CO1 CO2 CO3	Gain a higher level of personal involvement and interest in understanding and solving environmental resource problems and its conservation practices. Overall understanding of different types of natural resources and its conservation Demonstrate knowledge relating to the biological systems involved in the major global environmental problems of the 21st century. Recognize the interconnectedness of human dependence on the earth's ecosystems and Influence their society in proper utilization of goods and services. Learn the management of environmental hazards and to mitigate disasters and have a clear understanding of environmental concerns and follow sustainable development practices.
28	VR19	19	B.Tech-Electronics and Computer Engineering	1000192110	Communication Skills Lab	CO2	Analyze the functions of language and grammar in spoken and written forms with an emphasis on LSRW Skills Disseminate the relevant skills while performing GDs, interviews, oral presentations with a focus on Non verbal communication Prepare and exhibit oral presentation skills by using ICT.(Individual/Team)

						CO1	Understand basic operation and characteristics of opamp.
29	VR19	19	B.Tech-Electronics and Computer	1019193120	Linear & Digital	CO2	Understand basic operation and characteristics of op-
2,	VICI	.,	Engineering	1017173120	IC Applications	CO3	Explain the basic operation and characteristics of different Logic Families
						CO4	Design of digital logic Circuits using IC's
			11 - 12 8 P - 1			CO+	Conceptualize the basics of organizational and
						COL	
						COI	architectural issues of a digital computer and to
							perform computer arithmetic operations.
							Analyze performance issues in processor and can
	1		100 ACC 40 MARI		200	CO2	calculate the effective address of an operand by
			B.Tech-Electronics		Computer	002	addressing modes.
30	VR19	19	and Computer	1005192200	Organization &		
			Engineering		Architecture		Ability to design memory organization that uses banks
							for different word size operations to understand the
						CO3	concept of cache memory techniques.
						CO4	Describe the concept of Input / Output organization.
						COI	Identify the basic concepts and various data model
						001	used in database design and formulate SQL queries.
			B. Tech-Electronics		Database	CO2	Intrepret use of normalization in designing the
31	VR19	19	and Computer	1005192221	Management	CO2	database.
٥.	11017	.,	Engineering	1003172221	Systems	CO3	Evaluate indexing and hashing technique used in
			Bugmeering	~-			database design.
						CO4	Apply and relate the concept of transaction,
						C04	concurrency control and recovery in database.
						COI	Able to analyze the performance of an algorithm in
						COI	terms of time and space.
					Fundamentals of		Give an intuition on how to find a solution to large
			B.Tech-Electronics		Algorithm	CO2	problems by dividing them into smaller sub problems.
32	VR19	19	and Computer	1019193100	Design and		
			Engineering		Analysis	CO3	Identifying which designing technique can be used to
					7 mary sis	003	solve a particular problem.
						CO4	Knowing how to explore the solution space by using
						004	Branch and Bound technique.
						CO1	Understand the basis of Sensors with its applications
			- W				Conceptualize the networking technologies
					Wireless Sensor	CO2	
			B.Tech-Electronics		Networks		
33	VR19	19	and Computer	1019193150	(Professional		Explain the protocols for wireless sensor networks
			Engineering		Elective-I)	CO3	
						001	
						CO4	Analyze routing and congestion algorithms
						C05	Understand the basis of Sensors with its applications
					1	COI	Understand graph representations Minimum
					Advanged Date	COI	Understand graph representations, Minimum
					Advanced Data Structures and		Spanning Trees and traversals
			B.Tech-Electronics			CO2	Understand graph representations, Minimum
34	VR19	19	and Computer	1019193151	Algorithms		Spanning Trees and traversals
			Engineering		(Professional	CO3	Implement heaps, queues and their operations, B
					Elective-I)		Trees and B+ Trees
						CO4	Illustration of tries which share some properties of
				1		CO4	1,
		L				L	file structures

					Digital Signal	CO1	Design, simulate and realize different digital filters.
			20 424 W P P		Processing and		Estimate the spectra of signals that are to be processed
			B.Tech-Electronics		Architecture	CO2	by discrete time system and to verify the performance
35	VR19	19	and Computer	1019193152	(Professional	CO2	of various spectrum estimation techniques
			Engineering		Elective-I)		
						CO3	Design multi rate digital signal processing system.
						CO4	Understand the architecture of DSP processor
							Define Network and its components and Illustrate the
					Introudction to	COI	functionality of OSI and TCP/IP reference models.
			D.T. 1. 171		Computer		
36	VD 10	10	B.Tech-Electronics	1010102152	Networks	CO2	Compare different network layer protocols and
36	VR19	19	and Computer	1019193153	(Professional		Demonstrate various types of routing technique
			Engineering		Elective-I)	CO3	Evaluate Architecture for Application layer protocols.
						CO4	Choose appropriate protocol for desired
-							communication service.
	-					COL	Students have the adequate writing skills that are
						COI	needed in an organization
							I I adamstand the arms assessed to the second to
						CO2	Understand the core competencies to succeed in professional and personal life
					Employability		Solve various Basic Mathematics problems by
			B.Tech-Electronics		Readiness		following different methods and to perform well in
37	VR19	19	and Computer	1020192100	Program-I	CO3	various competitive exams and placement drives.
"	11017	• •	Engineering	1020172100	(Open Elective-		various competitive exams and placement drives.
					I)		Follow strategies in minimizing time consumption in
							problem solving Apply shortcut methods to solve
				ę		004	problems and confidently solve any mathematical
						CO4	problems and utilize these mathematical skills both in
							their professional as well as personal life.
							Students will be able to understand definition, scope,
						COI	approach and theories of public administration.
							Students will be able to identify the process and
						CO2	technique of decision making and also understand the
							concept of administrative behaviour and control.
					Public		
					Administration	CO3	Students will be able to understand the process and
			D.T. J. Pl.				technique of personnel and financial administration.
20	VD10	10	B.Tech-Electronics	102010216			Students will be able to Discuss the tools that modern
38	VR19	19	and Computer	1020192101			public administrators use to pursue public goals and
			Engineering			CO4	public policy, along with the pros and cons of those
							tools.
							Charles will be able to a large to the large
							Students will be able to understand and explain the
							major administrative techniques and values that public
						C05	administration has and illustrate how those affect the work of government and also understand the process
						(03	of administrative improvement.
							or administrative improvement.
	L	L					

						CO1	Students have the adequate reading and speaking
							skills and will be able to express himself in French.
			B.Tech-Electronics		Foreign	CO2	Understand the grammar and use them in their
39	VR19	19	and Computer	1020192102	Linguistic -	50 88 100	personal and professional life.
65333			Engineering	1020172102	French	CO3	Students will be able to write proficiently in French.
			2		77011011		Students will be able to compare and contrast world
						CO4	culture and it will expand his knowledge about
							various culture.
			lon emp 2 mm			COI	Relate ethical human values
			B.Tech-Electronics		Professional	CO2	Apply engineering knowledge for society.
40	VR19	19	and Computer	1099193130	Ethics & Human		3
			Engineering		Values	CO3	Elaborate responsibility for safety & risk
						CO4	Outline the various current global issues
							Carryout literature survey, and choose a relevant topic
						COI	reported in recent IEEE/CSI/ACM/ conference
						COI	publications / transactions in the domain of computer
			B.Tech-Electronics				science and engineering.
41	VR19	19	and Computer	1019193180	Technical	CO2	Simulate and analyze the results reported in the
71	VICI	1,7	Engineering	1017175160	Seminar	COZ	chosen paper for seminar topic.
			Lingineering			CO3	Communicate effectively before the expert panel and
						COS	develop technical reports.
			,			CO4	Respond to the queries raised by the evaluation
						CO4	committee and audience
							Understand the concepts of architecture, memory
						001	organization of Intel 8086 microprocessor and
						COI	Intel 8051 and PIC 16C6X/7X microcontrollers.
							Summarize the concepts of addressing modes,
) / C	000	instruction set of Intel 8086 microprocessor and
			B.Tech-Electronics		Micro	CO2	Intel 8051 and PIC microcontroller.
42	VR19	19	and Computer	1019193220	Processors and		
			Engineering		Micro		Develop an assembly language programs for
			2000		Controllers	COL	simple problem statements of 8086, 8051 and PIC
į .						CO3	microcontroller.
1							Design an interface between peripheral chips &
1						CO4	processors using assembly language programs.
						COL	Understand the basic concepts of client server
						COI	application and WWW
						002	Describe the basic concepts of HTML & CSS to
			D Took Di			CO2	design web pages and web site
43	VR19	19	B.Tech-Electronics	1010102221	W-L D		Analyze a given problem and apply requisite
43	VKIY	19	and Computer	1019193221	Web Design	CO3	appropriate tools for designing interactive web
			Engineering		1		applications.
							Develop reusable component for Graphical User
						CO4	Interface applications
						Control of the	
							Describe the fabrication process for MOS,CMOS and
				1		COI	BICMOS technologies along with their electrical
							properties
			B.Tech-Electronics		VLSI		Outline the concepts of design rules during the layout
44	VR19	19	and Computer	1019193250	Technology	CO2	design
		0.00000	Engineering		(Professional		Model various scaling Models and factors and their
					Elective-II)	CO3	effects on MOSFET parameters.
							Examine various design issues of VLSI Circuits and
				1		CO4	illustrate FPGA Design
			L				I

						e service in	Understand the concepts, characteristics, principles
						COI	and operation of cellular systems.
45	VD 10	19	B.Tech-Electronics and Computer Engineering		Cellular and Mobile Communications	CO2	Apply Concepts, principles to Co- channel interference Reduction factor, Desired C/I, directional Antenna system and Cell splitting.
45	VR19			1019193251	(Professional Elective-II)	CO3	Analyse Point to point model, other cell coverage of signal and traffic, frequency and channel assignment strategies.
						CO4	Compare concepts of handoff and architectures of GSM, Technology comparison of 3G, 4G and 5G cellular systems.
						COI	Identify stages in building a Data Warehouse and challenges in Data mining
	46 11710		B.Tech-Electronics		Data Warehousing	CO2	Access raw input data and apply data pre- processing techniques, generalization techniques and data characterization techniques to provide suitable input for a range of data mining algorithms
46	VR19	19	and Computer Engineering	1005193101	and Data Mining (Professional Elective-II)	CO3	Analyze data mining techniques like classification and Association rules that can be applied to data objects and to find the interesting patterns.
						CO4	Solve real world problems by using the various Clustering methods
						COI	Apply the basic concepts of Languages, operations of Languages, NFA, DFA and its conversions.
			,	1012192200	Automata	CO2	Identify the similarities and differences among various parsing techniques and will be able to solve problems related to Shift reduce parsing, compute FIRST and FOLLOW sets, LR(0), LR(1) and LALR sets of items and parse table for a given grammar
47	VR19	19	B.Tech-Electronics and Computer Engineering		Theory and Complier Design (Professional Elective-II)	CO3	Demonstrate the ability to write syntax directed translations of simple statements and understand the working of procedure calls and use various storage allocation schemes for the better utilization of run time memory.
						CO4	Apply various schemes for optimized code and will be able to write 3 addresses code and identify the basic blocks, draw flow graphs and represent directed Acyclic graphs for the identified basic blocks and also be able to write the target optimized code (assembly code) for the given three address code.

						CO1	Students have the adequate writing skills that are needed in an organization and To perform well during Campus Drives and different Interviews
			D.T. J. El.		Employability Readiness	CO2	Understand the core competencies to succeed in professional and personal life and Students will develop knowledge and experience with the use of the standard C programming language,
48	VR19	19	B.Tech-Electronics and Computer Engineering	1020193100	Program-II (Open Elective- II)	CO3	Solve various Basic Mathematics problems by following different methods and analyses, summarize and present information in quantitative forms including table, graphs and formulas.
						CO4	Follow strategies in minimizing time consumption in problem solving Apply shortcut methods to solve problems and confidently solve any mathematical problems and utilize these mathematical skills both in their professional as well as personal life.
						COI	Describe Verilog HDL and Design Digital circuits.
		~ 8	B.Tech-Electronics and Computer Engineering	1004193250	Digital Design System through Verilog HDL (Open Elective- II)	CO2	Write behavior model of digital circuits and Write RTL models of digital circuits. Verify behavior and RTL models
49	VR19	19				CO3	Describe standard Cell Libraries and FPGAs Synthesize RTL models to standard cell libraries and FPGAs.
						CO4	Implement RTL models on FPGAs and testing and verification
						COI	Able to explain Implementation of RISC design and ARM design in ARM processors.
			B.Tech-Electronics		ARM Processes	CO2	Program on LPC 2148 for the specific application.
50	VR19	19	and Computer Engineering	1004193251	(Open Elective- II)	CO3	Understand the peripherals microcontroller systems.
			, `			CO4	Compare the specifications and suitability of I2C, SPI, RTC, WATCHDOG, TIMER, PWM generation blocks.
					Environmental	COI	Understand evaluate and create the basic concept of environmental impact assessment, Flow of EIA, Types of environmental Impacts.
51	VR19	19	B.Tech-Electronics and Computer Engineering	1001193260	Impact Assessment and Management (Open Elective –	CO2	Implement different methods in preparing an Environmental Impact Statement.
			Dugmeeting		II)	CO3	Identify various mitigation measures that can be used.
					,	CO4	Select methodology for identification of environmental impacts, environmental indices and indicators

						CO1	Identify the principles of object oriented programming through Java features.
			B.Tech-Electronics		Object Oriented Programming	CO2	Designing the programs to read the input dynamically
52	VR19	19	and Computer	1005193261	thorugh Java		Analyze the programs to implement the predefined
32	VKI9	19	Engineering	1003193261	(Open Elective- III)	CO3	and user defined exceptions with real world scenario.
			9		111)		Implement and analyze the programs to provide the
						CO4	same services to multiple clients at the same time
						001	using synchronization concepts.
					Object Oriented	COI	BUIld solutions to the complex problems using object
			THE REAL PROPERTY.		Analysis and	COI	oriented approach
		**	B.Tech-Electronics		Design	CO2	identify classes and responsibilities of the problem
53	VR19	19	and Computer	1005193262	(Open Elective-		domain
			Engineering		III)	CO3	apply uml tools for various case studies
						CO4	represent classes objects responsibilities and states
							using uml notations Understand the principles and practices involved in
						COI	cryptography and network security
					Cryptography	000	Describe the various symmetric and Asymmetric
			B.Tech-Electronics		and Network	CO2	encryption algorithms.
54	VR19	19	and Computer	1005193263	Security		Identifying cryptographic protocols, hash functions,
	,,,,,	• •	Engineering	1003173203	(Open Elective-	CO3	authentication, key management, key exchange,
					III)		signature schemes
						COA	Design of network security solutions for E- mail
						CO4	Security like PGP, S/MIME and web security like SSL, TLS.
							55B, 1E5.
						COI	Understand the R workspace and Programming with R
						CO2	Access online resources for R and import new
1			B.Tech-Electronics		R Programming		function packages into the R workspace
55	VR19	19	and Computer	1012193100	(Open Elective-	003	Apply math functions to calculate probability and
1			Engineering		III)	CO3	statistical distributions and knowledge on Graphics in data visualization.
							data visualization.
						CO4	Understand and use linear, non-linear regression
							models, and classification techniques for data analysis
				_			Interpret the factors affecting the radar performance
						COI	using Radar Range Equation.
					Dodon C		A Laboratory
			B.Tech-Electronics		Radar Systems (Open Elective	CO2	Apply the principle of FMCW radar in the design of
56	VR19	19	and Computer	1019193262	–III)		altimeter. Analyze the principle of each and every block of MTI
			Engineering			CO3	and Tracking Radar.
						- 00	
						CO4	Demonstrate the basic principle of Receiver and also
							extraction of signal in Noise.
			D			CO1	Illustrate basic insights of management principles
57	VD10	10	B.Tech-Electronics	1000102202	Management	CO2	Summarize Production process, Quality control and
57	VR19	19	and Computer Engineering	1099192200	Science	CO2	Inventory techniques
			Lugmeeting			CO3	Indentify Strategies and policies to functional areas Apply Contemporary management Practices
					L	004	Trippiy Contemporary management Fractices

						CO1	Understand the Architectural view, protocols and applications of IoT.
	i i		-		Internet of	COL	Analyse the communication protocols and standards
59	VR19	19	B.Tech-Electronics	1019193260	Internet of Things	CO2	used in IoT.
39	VK19	19	and Computer Engineering	1019193260	(Open Elective)		Design the simple IoT applications to monitor or
						CO3	control IoT devices using simulation or hardware.
						CO4	Implementation of the real time IoT applications.
							Understand the basic concepts of an embedded system
						COI	and able to know an embedded system design
							approach to perform a specific function Design the Embedded hardware by considering the
					Street as Street to St	CO2	hardware components required for an embedded
			B.Tech-Electronics		Embedded System Design	002	system.
60	VR19	19	and Computer Engineering	1019193261	(Open Elective)		Analyse the various embedded firmware design
			Bilgineering			CO3	approaches on embedded environment to suit for
							desired application.
							Interprete how to integrate hardware and firmware of
						CO4	an embedded system and apply this knowledge to real time operating system
						601	Recognize the characteristics of machine learning that
						CO1	make it useful to real-world Problems
1			B.Tech-Electronics		Machine Learning	CO2	Characterize machine learning algorithms as supervised, semi-supervised, and Unsupervised
61	VR19	19	and Computer Engineering	1005194120	(Integrated	CO3	Be able to use support vector machine, regularized
			Engineering		Course)	CO3	regression algorithms
				-		CO4	Understand the concept behind neural networks for learning non-linear functions
						CO1	Understand the implementation procedures for the
						COI	machine learning algorithms
(2)	1,1010	10	B.Tech-Electronics		Machine	CO2	Design Java/Python programs for various Learning algorithms.
62	VR19	19	and Computer Engineering		Learning Lab	CO3	Apply appropriate data sets to the Machine Learning
			Diigiticering				algorithms
			-			CO4	Identify and apply Machine Learning algorithms to solve real world problems
						COI	Understand the Architectural view, protocols and
							applications of IoT.
63	VD10	10	B.Tech-Electronics	1010104120	IOT and its	CO2	Analyse the communication protocols and standards used in IoT
03	VR19	19	and Computer Engineering	1019194120	Applications		Design the simple IoT applications to monitor or
			3 3 3 3 3 3 3			CO3	control IoT devices using simulation or hardware.
						CO4	Implementation of the real time IoT applications.
						COI	Relate different aspects of BigData in accordance with
					Big Data		various big data applications Catergorize various dimensions of BigData (5V's) and
64	VR19	19	B.Tech-Electronics and Computer	1005194100	Analytics (Professional	CO2	its sources in real time
04	VICIO	19	Engineering	1003134100	Elective-III)	CO3	Make use of recent tools related to Hadoop, Spark and MapReduce etc
						CO4	Analyze the different aspects of cluster computing
						CO4	with real world applications

						CO1	Choose appropriate methods in AI that may be suited
							to solve a given problem and Game Playing
			D.Tl. Electronico		Artificial	CO2	Make use of AI search algorithms and formalizations
65	VR19	19	B.Tech-Electronics	1005102251	Intelligence		on real world problems
63	VKI9	19	and Computer	1005193251	(Professional		Analyze the basic issues of different types of
			Engineering		Elective – III)	CO3	knowledge representation techniques to build
							intelligent system.
						CO4	Apply probabilistic and fuzzy models to solve
-							problems with uncertainty.
							Apply communication concepts to solve wireless
						CO1	communications problems. Submit Review report
						CO1	from Research journals with professional ethics, team
							work and self-learning.
					Wireless		The Control of the American III
							Identify existing model's, Apply cellular system
			B.Tech-Electronics		Communication	CO2	design concepts, wireless wide area networks for their
66	VR19	19	and Computer	1019194150	Systems	CO2	performance analysis. Submit Review report from
			Engineering		(Professional		Research journals with professional ethics, team work
					Elective-III)		and self-learning.
							Analyse various multiple access schemes used in
							wireless communications and existing and emerging
					e	CO3	wireless standards. Submit Review report from
							Research journals with rofessional ethics, team work
			2				and self-learning.
-							
							Understand the basic concepts and hardware
						COI	components of an embedded system and able to know
						COI	the design approach to perform a specific function.
			and the second s		Embedded		·
			B.Tech-Electronics		System Design		Identify hardware components required for an
67	VR19	19	and Computer	1019193261	(Professional	CO2	embedded system design.
			Engineering		Elective-III)		Apply various embedded firmware design approaches
						CO3	on embedded environment.
							Understand how to integrate hardware and firmware
						CO4	of an embedded system using real time operating
							system.
							Examine the fundamentals of gray scale and color
						CO1	image processing.
					Fundamentals of		Apply different transforms and compression methods
1					Digital Image	CO2	on image for image processing applications.
1		52000	B.Tech-Electronics	Vanuar N. 2001	Processing		
68	VR19	19	and Computer	1019194151	(Professional		Analyze the methods to extract information from the
1			Engineering		Elective-IV)	CO3	image in terms of spatial filtering, frequency filtering,
					2.00	203	restoration and segmentation.
						104000-0-1	Validate the different techniques of color and multi
						CO4	resolution processing.
						001	
					Data	CO1	Understanding of basic digital switching techniques.
			B.Tech-Electronics		Communications	CO2	Analyze the OSI model, TCP/IP model, MAC layer
69	VR19	19	and Computer	1004193160	(Professional	CO2	protocols and LAN technologies
			Engineering		Elective-IV)	CO3	Design of different Elementary Data Link Protocols.
1						CO4	Minimize the error by using different control methods.
			l				*

VR19				,			CO1	Apply the knowledge of cloud technology to infer the working principles of cloud computing
Part	70	VR 10	10		1005104154	Computing	CO2	Analyse cloud services extended by various cloud
VR19	/0	VKI	19		1003194134	1.50	CO3	its software environments
VR19						1	CO4	data by pridcting the future risks
No.							COI	and limitations
VR19			B.Tech-Electronics			CO2	meet desired needs.	
72 VR19 19 B. Tech-Electronics and Computer Engineering 1019194161 73 VR19 19 B. Tech-Electronics and Computer Engineering 1019194161 74 VR19 19 B. Tech-Electronics and Computer Engineering 1019194161 75 VR19 19 B. Tech-Electronics and Computer Engineering 1019194162 76 VR19 19 B. Tech-Electronics and Computer Engineering 1019194162 77 VR19 19 B. Tech-Electronics and Computer Engineering 1019194162 78 VR19 19 B. Tech-Electronics and Computer Engineering 1019194162 79 VR19 19 B. Tech-Electronics and Computer Engineering 1019194161 70 VR19 19 B. Tech-Electronics and Computer Engineering 1005194161 70 VR19 19 B. Tech-Electronics and Computer Engineering 1005194161 70 VR19 19 Engineering 1005194161 71 VR19 19 Engineering 1005194161 72 VR19 19 Engineering 1005194161 73 VR19 19 Engineering 1005194161 74 VR19 19 Engineering 1005194161 75 VR19 19 Engineering 1005194161 76 VR19 19 Engineering 1005194161 77 VR19 19 Engineering 1005194161 8 Engineering 100519	71	VR19	19		1019194160	Interaction (Professional	CO3	quality of a user interface, new theories, tools and
VR19						Elective-IV)	CO4	Apply appropriate HCI techniques to design systems that are usable by people, fundamental aspects of
VR19	-						COL	
VR19						Satalliata	COI	
VR19				B.Tech-Electronics		(8) 333 (3) (3) (3) (3) (3) (3)	CO2	
Total Part Project Engineering Total Part Project Management (Open Elective- Engineering Total Part Project Project Part Part Part Part Part Part Part Par	72	VR19	19	and Computer	1019194161		CO2	
VR19				Engineering		, ,	CO3	
VR19						'''		
VR19 19 B.Tech-Electronics and Computer Engineering 1019194162 Robotics CO3 Select Appropriate actutators and senors for a robot based on specific applications CO3 Carry out kinematic and dynamic analysis for simple serial kinematic chains CO4 Perform trajectory planning for a manipulator by avoiding obstacles Explain the functional/operational aspects of crypto currency ecosystem. CO2 Describe emerging abstract models for Blockchain Technology Identify major research challenges and technical gaps existing in between theory and practice in cryptocurrency domain. CO4 Explain fundamental characteristics of block chain using bit coin. CO5 Explain the basic concepts and issues of software project management CO6 CO7								· · · · · · · · · · · · · · · · · · ·
VR19								
73 VR19 19 and Computer Engineering 1019194162 Robotics CO3 Carry out kinematic and dynamic analysis for simple serial kinematic chains CO4 perform trajectory planning for a manipulator by avoiding obstacles Explain the functional/operational aspects of crypto currency ecosystem. CO2 Describe emerging abstract models for Blockchain Technology CO3 Carry out kinematic and dynamic analysis for simple serial kinematic chains CO4 Describe emerging abstract models for Blockchain Technology CO5 Describe emerging abstract models for Blockchain Technology CO6 Describe emerging abstract models for Blockchain Technology CO7 Describe emerging abstract models for Blockchain Technology CO8 Describe emerging abstract models for Blockchain Technology CO9 Describe emerging abstract models for Blockchain Tec				R Tech-Flectronics			CO ₂	
Engineering Engin	73	VR19	19	THE DESCRIPTION DESCRIPTION OF STREET	1019194162	Robotics		
The second secon		11(1)	.,		1017171102	Robotics	CO3	
avoiding obstacles CO1 Explain the functional/operational aspects of crypto currency ecosystem. CO2 Describe emerging abstract models for Blockchain Technology Identify major research challenges and technical gaps existing in between theory and practice in cryptocurrency domain. CO3 Explain fundamental characteristics of block chain using bit coin. CO4 Explain fundamental characteristics of block chain using bit coin. CO5 Explain the functional/operational aspects of crypto currency ecosystem. CO2 Describe emerging abstract models for Blockchain Technology Identify major research challenges and technical gaps existing in between theory and practice in cryptocurrency domain. CO4 Explain fundamental characteristics of block chain using bit coin. CO5 CO6 CO7 CO7 CO7 Explain the basic concepts and issues of software project management (Open Elective IV) CO8 Find out and schedule the required resources for the project execution. CO9 Estimate the effort required for a software project CO9 CO9 CO9 CO1 Explain the functional/operational aspects of crypto currency ecosystem. CO2 C04 CO9 CO3 CO9 CO9 CO9 CO3 CO9 CO9 CO9 CO9 CO9				Diigincoring		180		
THE PROPERTY OF THE PROPERTY O							CO4	
74 VR19 19 B.Tech-Electronics and Computer Engineering B.Tech-Electronics Explain the basic concepts and issues of software project Compare the iterative and incremental lifecycle models. CO2 Estimate the effort required for a software project								
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74 VR19 19 B.Tech-Electronics and Computer Engineering 1005194161 Fundamentals of Block Chain Technology CO3 Identify major research challenges and technical gaps existing in between theory and practice in cryptocurrency domain. CO4 Explain fundamental characteristics of block chain using bit coin. CO5 Explain the basic concepts and issues of software project management (Open Elective-Engineering IV) Fundamentals of Block Chain Technology CO3 Explain fundamental characteristics of block chain using bit coin. CO6 Explain the basic concepts and issues of software project management (Open Elective-IV) CO7 Find out and schedule the required resources for the project execution. CO8 Estimate the effort required for a software project								
74 VR19 19 and Computer Engineering 1005194161 Block Chain Technology CO3 Identify major research challenges and technical gaps existing in between theory and practice in cryptocurrency domain. CO4 Explain fundamental characteristics of block chain using bit coin. CO5 Explain the basic concepts and issues of software project management (Open Elective-Engineering IV) To VR19 19 B. Tech-Electronics and Computer Engineering IV) Software Project Management (Open Elective-IV) CO2 CO3 Find out and schedule the required resources for the project execution. CO3 Estimate the effort required for a software project				B.Tech-Electronics		Fundamentals of	CO2	
Engineering Technology CO3 existing in between theory and practice in cryptocurrency domain. CO4 Explain fundamental characteristics of block chain using bit coin. CO1 Explain the basic concepts and issues of software project management CO2 Management (Open Elective-Engineering Technology CO3 Explain fundamental characteristics of block chain using bit coin. CO2 CO3 Explain the basic concepts and issues of software project models. CO3 Find out and schedule the required resources for the project execution. CO3 Estimate the effort required for a software project	74	VR19	19		1005194161			
cryptocurrency domain. CO4 Explain fundamental characteristics of block chain using bit coin. CO1 Explain fundamental characteristics of block chain using bit coin. CO2 Explain the basic concepts and issues of software project management (Open Elective-Engineering IV) CO3 Find out and schedule the required resources for the project execution. CO4 Explain fundamental characteristics of block chain using bit coin. CO3 Explain the basic concepts and issues of software project management (CO2 CO3 Find out and schedule the required resources for the project execution. CO3 Estimate the effort required for a software project					1005171101		CO3	
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VR19 19 B.Tech-Electronics and Computer Engineering 1005193253 Engineering 1005193253 Software Project Management (Open Elective-IV) Software Project Management (Open Elective-IV) CO2 Compare the iterative and incremental lifecycle models. CO3 Find out and schedule the required resources for the project execution. Estimate the effort required for a software project								
VR19 19 B.Tech-Electronics and Computer Engineering 1005193253 Software Project Management (Open Elective-IV) Software Project Management (Open Elective-IV) CO1 Explain the basic concepts and issues of software project management Compare the iterative and incremental lifecycle models. CO3 Find out and schedule the required resources for the project execution. Estimate the effort required for a software project							CO4	
VR19 19 B.Tech-Electronics and Computer Engineering 1005193253 Software Project Management (Open Elective-IV) Software Project Management (Open Elective-IV) CO2 Compare the iterative and incremental lifecycle models. CO3 Find out and schedule the required resources for the project execution.								
VR19 19 B.Tech-Electronics and Computer Engineering 1005193253 Software Project Management (Open Elective-IV) CO2 Compare the iterative and incremental lifecycle models. CO3 Find out and schedule the required resources for the project execution. CO4 Estimate the effort required for a software project							CO1	
75 VR19 19 and Computer Engineering 1005193253 (Open Elective-IV) Find out and schedule the required resources for the project execution. CO2 models. CO3 Find out and schedule the required resources for the project execution.							and the state of	
Total and Computer Engineering 1005193253 Open Elective IV CO3 Find out and schedule the required resources for the project execution. CO4 Estimate the effort required for a software project		V 10 10		ACTION OF THE PERSON OF THE PE			CO2	- Committee of the Comm
project execution. CO4 Estimate the effort required for a software project	15	VK19	19		1005193253			
CO4 Estimate the effort required for a software project				Engineering		IV)	CO3	
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1							00:	
							CO4	development and identify software risks.

VIGNAN'S INSTITUTE OF INFORMATION TECHNOLOGY (A) DEPARTMENT OF MECHANICAL ENGINEERING

VR19 - M.Tech- Machine Design Course Outcomes

S No	Regulat ion	Progr amme Code	Programme Name	Course Code	Course Name	СО	Course Outcomes Course Outcome: After the completion of the course student will be able to
	150		M.Tech -		Research	COI	Discuss the process used for research Problem selection and Research Paper Writing
l	VR19	15	Machine Design	2000191100	Methodology	CO2	Interpret the Patent writing and Development
					and IPR	CO3	Describe the Procedure for Grant of Patents Illustrate new Developments in IPR
						COI	Solve stress, strain calculatins
,	VD 10	15	M.Tech -	2015101100	Advanced	CO2	Examine different failure criteria for different members
2	VR19	15	Machine Design	2015191100	Mechanics of Solids	CO3	Evaluate the various parameters to stop unsymmetrical bending
					Solids	CO4	Compile the torsion coming on to the machine components
							Understand the basic concepts of Acoustics and Noise, noise
						COI	measuring instruments and control the noise using diffrent noise
							control techniques
3	VR19	15	M.Tech -	2015101101	Mechanical Vibrations and	CO2	Determine vibratory responses of SDOF systems to different
)	VKI9	13	Machine Design	2015191101	Acoustics		excitations like harmonic, periodic and non-periodic excitation
					Acoustics	CO3	Obtain eigen values and eigen vectors of MDOF systems using theoretical and numerical methods
							Analyze for frequency and amplitudes of continuous systems like
						CO4	Bars, Beams and Shafts
							Calculate the damped and undamped natural frequency and
						COI	amplitude of the vibrating system from experiment
4	VR19	15	M.Tech -	2015101110	Machine	CO2	Test for the balancing of masses in static and dynamic cases
4	VKI9	13	Machine Design	2015191110	Dynamics Lab	CO3	Evaluate the magnitude of gyroscopic couple, angular velocity of
						COS	precession
						CO4	Explain the Direct and Inverse kinematic of a robot
						COI	Classify the various types of load applications
5	VR19	15	M.Tech -	2015191111	Design Practice	CO2	Decide the correct profile of the components
			Machine Design		Lab-I	CO3	Create the final dimensions of the components
						CO4	Construct the final component in all the parameters
						COI	Understand the safety and conseptual design of Automobiles. design of structural elements and load analysis for different
					,		vehicles based on cornering loads
					D : 6		Identify the Basic design, performance of Electric vehicles (EV),
6	VR19	15	M.Tech -	2015191150	Design of Modern Vehicle	CO2	and Hybridness of vehicles and their performance.
"	VICIO	13	Machine Design	2013191130	Systems		Understand Working Principle and Design of UAVs/Drones and
					Systems	CO3	their Applications, Flight controller, Remote Controller and
	Ì						Quadcopter dynamics.
						CO4	Analyze Safety aspects of automobiles and energy absorbing
							systems through testing(lab, field testing.
						COI	To understand the basic concept a product design based on the requirement.
			500 34402000 100			CO2	process.
7	VR19	15	M.Tech -	2015191151	Product Design		Make the solid model in virtual platform and evaluate the product
	IA DEMARAGES	1000	Machine Design			CO3	using computer software.
						001	Selecting the correct process of fabrication to optimze the cost
						CO4	and quality.
						COI	Understand to relate design rules for manufacturability.
			M.Tech -	Section at the Auto-Contract	Design for	CO2	Apply design rules for ease of machining.
8	VR19	15	Machine Design	2015191152	Manufacturing	CO3	Enumerate the general design considerations for casting, casting
	1				& Assembly		tolerances.
\vdash						CO4	Apply design guidelines to assembly.
						COI	Identify the prediction of mechanical failure and discuss various failure modes
	1					-	Employ the concept of griffith's analysis for energy release rate
			2.00000			CO2	and describe the concept of stress intensity factor in linear elastic
9	VR19	15	M.Tech -	2015191153	Fracture		fracture mechanics.
			Machine Design		Mechanics	000	Analyze failure prediction parameters and crack tip opening
						CO3	displacement in Elastic-Plastic fracture mechanics.
				1		CO4	Assess the fatigue damage and creep damage and illustrate the
							creep-fatigue interactions.

S No	Regulat ion	Progr amme Code	Programme Name	Course Code	Course Name	со	Course Outcome: After the completion of the course student will be able to
			M.Tech -		Advanced	COI	Understand the various degreesof freedom in various linkages of mechanism
10	VR19	15	Machine Design	2015191154	Mechanisms	CO2	Analyze the synthesis of mechanism using analytical methods
						CO3	Analyze the plane motion in mechanism graphically
						CO4	Evaluate the maipulator kinematics with D-H notation Identify various surface flaws by using Liquid penetrant
						COI	inspection and Magnetic particle inspection.
			M.Tech -		Non-Destructive	CO2	Apply the systematic understanding of knowledge on
11	VR19	15	Machine Design	2015191155	Evaluation		radiography techniques.
			macinia Design		Braidation	CO3	techniques.
						CO4	Summarize the various techniques of optical holography and electron beam holography.
						COI	Summarize robot components, configurations and different end effectors
							Select a robot for a given application and illustrate the working
			M.Tech -			CO2	principles of various actuators and sensors that can be used in the
12	VR19	15	Machine Design	2015191156	Robotics	002	manipulator, control system that can be used as well as the
						CO3	method of programming the robot Analyze a given manipulator kinematically and dynamically
							Derive as well as analyze the equation of trajectory that the end-
						CO4	effector should follow given the boundary conditions
						COI	Use various mathematical equation to represent curves.
13	VR19	15	M.Tech -	2015191157	Geometric	CO2	Apply the cubic splines in modeling of a product.
			Machine Design		Modeling	CO3	Select appropriate synthetic curves in modeling process. products.
						CO1	To meet desired needs and solve engineering problems
						CO2	Understand and implement the dynamics of the planar and spatial
14	VR19	15	M.Tech -	2015191158	Multi Body	CO2	systems.
			Machine Design		Dynamics	CO3	Inverse dynamic analysis and forward dynamic analysis of the planar systems.
						CO4	Analyse the formulations of spatial multi body systems.
						COI	Suggest and explain the physical requriements for developing a
			MT		Vision Systems		vision system
15	VR19	15	M.Tech - Machine Design	2015191159	and Image	CO2	transformations Select and Explain a suitable image enhancement technique for a
			ividentine Besign		Processing	CO3	given image
						CO4	Summarize various image compression techniques
						COI	Understand the concepts of potential energy, Raleigh Ritz
							method and weighted residual methods. Identify the suitable FEA elements such as bars, truss, beams,
	1 m 10		M.Tech -	2015101000	Advanced Finite	CO2	constant strain triangle and isoparametric elements to create
16	VR19	15	Machine Design	2015191200	Element Methods		Finite Element Model with respect to the application
					Michious	CO3	Apply suitable boundary conditions to the finite element model
						CO4	and solve the engineering problems Solve problems involving dynamics and heat transfer.
							Design mechanical components by selecting a suitable material
						COI	and failure criteria.
						CO2	Evaluate fatigue life of mechanical components for ductile and
17	VR19	15	M.Tech - Machine Design	2015191201	Advanced Machine Design		brittle materials
			Wacillie Design	ļ	Wacillie Design	CO3	Analyze and predict the fracture strength of mechanical components under different fracture modes
						604	Design mechanical components involving contacts avoiding the
						CO4	surface failures.
						COI	Apply MATLAB and Python code for solving a system of linear
			M.Tech -		Computational		equationusing using Gauss Elimination Method. Apply MATLAB and Python code for Iterative methods to solve
18	VR19	15	Machine Design	2015191210	Mathematics	CO2	equations using Jacobil teration.
					Lab	CO3	Apply MATLAB and Python code for Matrices and Eigenvalues
							Differential equations
			M.Tech -		Design Practice	CO1	Classify the various types of load applications Decide the correct profile of the components
19	VR19	15	Machine Design	2015191211	Lab-II	CO3	Create the final dimensions of the components
						CO4	Constuct the final component in all the parameters

S No	Regulat ion	Progr amme Code	Programme Name	Course Code	Course Name	со	Course Outcome: After the completion of the course student will be able to
						CO1	Understand the importance of yield point in the stress analysis.
			M.Tech -		Therese	CO2	Analyze the governing equations of plasticity
20	VR19	15	Machine Design	2015191250	Theory of	CO3	Apply principles of plasticity in the design analysis
1			Machine Design		Plasticity	004	Develop constitutive models based on experimental results on
						CO4	material behavior.
					Signal Analysis	COI	Understand basic concepts of Fourier analysis, Bandwidth. Signal, and Convolution.
21	VR19	15	M.Tech -	2015191251	and Condition	CO2	Analysis of stationary signals.
21	VICI	13	Machine Design	2013171231	Monitoring	CO ₂	Analysis of stationary signals. Analysis of continuous non-stationary signals.
					Widilitoring	CO4	Apply condition monitoring in real systems.
—						COI	Understand the fundamental of finite element method.
1			M.Tech -		Computational	CO2	Use the finite element method to solve fluid dynamics problems.
22	VR19	15	Machine Design	2015191252	Fluid Dynamics	CO3	Formulation the equations for incompressible and compressible
1			Machine Design		Fluid Dyllalliles		flows using various avaible metyhod
						CO4	Implement finite volume method and Standard variational
-				-		COL	methods for real-life problems.
ł						COI	Understand the importance of composite materials
23	VR19	15	M.Tech -	2015191253	Composite	CO2	Distinguish various materials used for matrix and reinforcement
23	VICIO	13	Machine Design	2013191233	Materials	CO3	Recommend the composite material according to the application
					y .	CO4	Modify the material according to the types of loads coming on to specimen
						CO1	Learn about soft computing techniques and their applications
24	VR19	15	M.Tech -	2015191254	Soft Computing	CO2	Define the fuzzy systems
24	VICI	13	Machine Design	2015191254	Soft Computing	CO3	Analyze the genetic algorithms and their applications.
						CO4	Analyze various neural network architectures
						COI	Clean and manipulate raw data sets so they are ready for analysis
					Experimental	CO2	Determine and carry out the appropriate statistical test for a
25	VR19	15	M.Tech -	2015191255	Techniques and	COZ	variety of experimental questions about different data sets
23	VICI >	1.5	Machine Design	2013171233	data Analysis	CO3	Draw conclusions about whether research hypotheses have been
					data Atlatysis	CO3	supported by empirical data.
						CO4	Plan the statistical analysis of an independent research project
							Understand the concepts such as elasticity in materials, plastic
				2		CO1	deformation, and advanced concepts like solid solution and
				9			dispersion strengthening.
			M.Tech -		Design with	CO2	Select the material based on cost, service, and mechanical
26	VR19	15	Machine Design	2015191256	advanced	CO2	properties using material property charts
			Machine Design	2013191236	Materials	CO3	Analyze material characteristics of various modern metallic
					iviaterials C	COS	materials such as sual phase steels, intermetallics, and alloys.
						CO4	Evaluate the porcessing and properties of polymer based
				9		CO4	compsoite materials, smart materials, shape memory alloys.

S No	Regulat ion	Progr amme Code	Programme Name	Course Code	Course Name	со	Course Outcome: After the completion of the course student will be able to
	*					CO1	Understand the basic concepts behind design considerations of mechatronics systems, various actuators, and drive systems.
27	VR19	15	M.Tech -	2015191257	Mechatronics	CO2	Develop motion control algorithms using fuzzy logic
	,,,,,	15	Machine Design	2013171237	Wicellationics	CO3	machines.
						CO4	Assess the machine vision concept and various micro mechatronics systems
			MTl			COI	Illustrate the fundamentals of tribology and the tribological parameters of all classes of materials.
28	VR19	15	M.Tech - Machine Design	2015191258	Tribology	CO2	Explain about various Lubrication Technquies
			Machine Design			CO3	failure
						CO4	Classify different types of seals and its uses
						CO1	Understand different modal analysis: Vibrations of single and multiple degree of freedom.
29	VR19	15	M.Tech -	2015191259	Experimental	CO2	Analyse Frequency response functions measurement.
27	VICIO	13	Machine Design	2013191239	Modal Analysis	CO3	Understand Inverse Method, Residuals MDOF, curve-fitting
					_		procedures.
						CO4	varients.
						001	Carryout literature survey, and choose a relevant topic reported in
				J)		COI	recent SCI / IEEE/ Scopus / conference publications /
			M.Tech -		Mini Project		transactions in the domain of mechanical engineering.
30	VR19	15	Machine Design	2015191270	with Seminar	CO2	Simulate and analyze the results reported in the chosen paper for seminar topic.
			Machine Besign		with Seminar	CO3	Communicate effectively before the expert panel and develop
					,	CO4	technical reports.
						C04	Summarize robot components, configurations and different end
			;			COI	effectors
	,,,,,,		M.Tech -		Industrial	CO2	Fourmulate the kinematics and dynamics of a mainpulator
31	VR19	15	Machine Design	2015192150	Robotics		Write a program to manipluate the end effector of a robot to
						CO3	move along a specified path
						CO4	cell layout
						COI	Explain the fundamental knowledge of Linear Programming and
							Dynamic Programming problems
			Maria		Advanced	CO2	Use classical optimization techniques and numerical methods of
32	VR19	15	M.Tech - Machine Design	2015192151	Optimization	CO2	optimization
			Machine Design		Techniques	CO3	Describe the basics of different evolutionary algorithms Enumerate fundamentals of Integer programming technique and
						CO4	apply different techniques to solve various optimization problems
						001	arising from engineering areas
							Recognize the development of Additive Manufacturing
			195			COI	technology and opportunities for transforming a concept into
33	VR19	15	M.Tech -	2015192152	Additive		product development.
33	VICIO	13	Machine Design	2013192132	Manufacturing	CO2	Apply the suitable rapid prototyping process for a given product.
							Apply the suitable rapid tooling process for a given product.
							Explore the applications of AM processes.
						CO1	Understand the importance of composite materials
2.4	VP10	15	M.Tech -	2015102152	Mechanics of		Distinguish various materials used for matrix and reinforcement
34	VR19	15	Machine Design	2015192153	Composite	CO3	Recommend the composite material according to the application
					Materials	CO4	Modify the material according to the types of loads coming on to specimen
						COI	vehicle
	200 00		M.Tech -		Vehicle	CO2	vehicles
35	VR19	15	Machine Design	2015192154	Dynamics	CO3	vehicle.
			3			CO4	Apply the mechanical theories on the vehicle dynamics design.
							Develop the different linear programming and assignment models
						COI	for domain specific situations.
36	VR19	15	M.Tech -	2015192160	Operations	CO2	Analyze the different transportation models.
50	1 117	'3	Machine Design	2013192100	Research	CO3	decisions.
				1		CO4	Apply optimal strategy to real time applications using dynamic
		L					programming and game theory.

S No	Regulat ion	Progr amme Code	Programme Name	Course Code	Course Name	со	Course Outcome: After the completion of the course student will be able to
						COI	of mechanical engineering and relevant disciplines to idenitfy solutions
37	VR19	15	M.Tech -	2015192170	Project Phase -I/ Industrial Project	CO2	Determine suitable methodology to attain at a sustainable solutions for the identified problems.
	VICIO	13	Machine Design	2013192170	#	CO3	Design, implement, and optimize the solution to meet all the feasible requirements.
	-					CO4	judgments in mechanical domain based on legal and ethical principles.
						COI	apply the mechanical engineering principles in planning, formulating an innovative design/approach to chosen topic within the context of legal, societal and environment constraint.
38	VR19	15	M.Tech -	2015107270	D : A DI - W	CO2	initiative, and providing leadership, necessary to ensure project success
38	VKI9	15	Machine Design	2015192270	Project Phase -II	CO3	Ability to use formal and informal communications with guide, make presentations and prepare technical document.
						CO4	Develop/implement the solutions with appropriate techniques, resources and contemporary tools for social relavent issues/problems.

VIGNAN'S INSTITUTE OF INFORMATION TECHNOLOGY (A) DEPARTMENT OF CIVIL ENGINEERING VR19 -M.Tech. Transport Engineering Course Outcomes

			· · · · · · · · ·	ICI > -IVI. I CCII.	Transport Engl	neer mg	g Course Outcomes
S.No	Regul ation	Program me Code	Programme Name	Course Code	Course Name	со	Course Outcome: After the completion of the course student will be able to
						COI	Understand the sequential stages involved in the construction of flexible and bituminous pavements
1	VR19	22	M.Tech- Transportation	2022191100	Pavement Materials and	CO2	Determine the optimum bitumen content by applying the bitumen mix design methods
			Engineering	2022171100	Construction	CO3	Assess the suitability of aggregates used in various layers of pavement.
						CO4	Identify the suitable equipment for construction of different pavements.
	ж		MTack		Highway Tag 65 a	COI	Develop a basic Knowledge of the fundamental issues in traffic engineering and understanding of the factors influencing road vehicle performance
_	10010		M.Tech-		Highway Traffic	CO2	Understand Headways and Gap acceptance behavior
2	VR19	22	Transportation Engineering	2022191101	Analysis and Design	CO3	Define the critical procedures for highway capacity and level of service analysis
			2		9	CO4	Build knowledge on traffic signal theory and elements of traffic signal Operations and design the links and intersections
						COI	Decide the suiatable ground improvement method and their suitability to different field situations
3	VR19	22	M.Tech- Transportation	2022191150	Ground Improvement	CO2	Design a reinforced earth embankment and check its stability.
	VICI		Engineering	2022171130	Techniques	CO3	Analyze the various functions of Geosynthetics and their applications in Civil Engineering practice
						CO4	Adapt the suiatable grouting techniques for various applications
						COI	Interpret various remotely sensed images with the help of acquired knowledge in remote sensing technology.
			M.Tech-		RS & GIS for	CO2	Apply the GPS instrument in field for various applications
4	VR19	22	Transportation Engineering	2022191151	Transportation Engineering	CO3	Make use of the techniques of RS, GIS and GPS techniques in different transportation engineering applications.
						CO4	Extend knowledge on Intelligent Transportation systems
			14 T 1		Numerical	COI	Apply the different numerical techniques to transportation problems.
5	VR19	22	M.Tech-	2022101122	Methods and	CO2	Understand applications of probability theory
	VKI9	22	Transportation Engineering	2022191152	Applied Statistics	CO3	Use regression and correlation analysis to process transportation data.
						CO4	Understand the concpets of sampling
						COI	Understand the sensor and communication technologies
6	VR19	22	M.Tech- Transportation	2022191153	Intelligent	CO2	Apply the various ITS methodologies for Indian Traffic Conditions.
	VKIY	44	Engineering	2022191133	Transportation Systems	CO3	Evaluate the ITS User Needs and functional areas for Indian Conditions.
						CO4	Overview of ITS implementations in devloped countries
					Trongaration	COI	Develop an understanding of the fundamentals of pavement modelling processes
7	VR19	22	M.Tech- Transportation	2022191154	Transportation System	CO2	Extend knowledge on the Key Relationships and physical laws of models
			Engineering		Modeling and	CO3	Build knowledge on growth and decay processes
					Simulation		Distinguish between virtual and real problems related to
						CO4	various simulation processes

			MTork			COI	Prepare a detailed project report for the construction of bridge giving hydraulic particulars ofthe river and soil details and be able to select the suitable site and type of the bridge
8	VR19	22	M.Tech- Transportation Engineering	2022191155	Bridge Engineering	CO2	Design various types of bridges like Culvert, Slab Bridge and T-beam Bridge using provisions of IRC
			Engineering			CO3	Design pier, abutment, foundations, bearing and detailing of joints
						CO4	Prioritize the best type of maintenance to be applied to different defects in bridges
			M.Tech-		Highway	COI	Develop knowledge of regarding the quality behavior of sub- grade soils
9	VR19	22	Transportation	2022191110	Aggregates and	CO2	Analyze the quality behavior of road aggregates
,	VKI	22	Engineering	2022191110	Soil Testing Lab	CO3	Utilize aggregate and bitumen properties in pavement design
						CO4	Determine the strength characterictes of subgrade soils.
			MTb		Bituminous	COI	Develop Knowledge on types of bitumen and their quality behavior
10	VR19	22	M.Tech- Transportation	2022191111	Testing and Pavement	CO2	Utilize aggregate and bitumen properties in pavement design
	- 1		Engineering		Evaluation Lab	CO3	Examine the unevenness of existing pavements
						CO4	Develop Knowledge on mix design of Flexible pavements
			M.Tech-		Research	CO1	Identify research problem.
11	VR19	22	Transportation	2000191130	Methodology	CO2	Find solutions for research problem
11	VKI9	22	Engineering	2000191130	and IPR	CO3	Explore on various IPR components and process of filing.
			Eligilicering		and IF K	CO4	Understand the adequate knowledge on patent and rights
			M.Tech-			COI	learn to connect and work with others to achieve a set task
12	VR19	22	Transportation	2000191131	Soft Skills	CO2	Assess the requirements of a task
12	VICIS	22	Engineering	2000191131	JULI JAILIS	CO3	Identify the strengths within the team
			Engineering			CO4	utilize the diverse skills of the group to achieve the set objective, awareness of risk/safety
						COI	Understand the components of rigid and flexible pavements
13	VR19	22	M.Tech- Transportation	2022191200	Pavement Analysis and	CO2	Know the stresses, strains and deflections in rigid and flexible pavements
			Engineering		Design	CO3	Know the traffic loading; and material characterization.
					*	CO4	Design methodologies for both rigid and flexible pavements
				i.		COI	Build knowledge on traveler choices on mode of travel and route choice
			M.Tech-		Т	CO2	Understand urban activity system and travel patterns
14	VR19	22	Transportation	2022191201	Transportation	CO3	Evaluate four stage travel demand modelling in transportation
			Engineering		Planning	COS	network planning
						CO4	Clasify the study zones and varioues methods of data
						CO4	collection subjected to urban transportation planning
			M.Tech-			CO1	Analyze the traffic stream parameters
15	VR19	22	Transportation	2022191250	Traffic Flow	CO2	Apply the queuing theory to find the cogestion problem.
	,,,,,		Engineering	2022171230	Theory	CO3	Define the significance of ITS under Indian conditionS
			2. g			CO4	study macroscopic and microscopic modelling.
			M.Tech-			COI	Understand the construction of interlocking block pavements, quality control test, and construction of various types of joints
16	VR19	22	Transportation	2022191251	Pavement	CO2	Understand mix design, construction control and quality
		22	22 Transportation 20 Engineering	2022191251	Construction	CO3	control checks of stabilised pavement layers. Understand the structural and function failures and evaluation
						CO4	of pavements
			1	L	1	1 004	Develop pavement management systems.

						COI	Demonstrate the clear understanding of the airport components
17	VR19	22	M.Tech- Transportation	2022191252	Aviation Infrastructure	CO2	Build knowledge on basic principles in airport components, geometric design and delays
			Engineering		and Planning	CO3	Build knowledge on critical factors consideration in airport grading and design.
			1			CO4	Develop Knowledge on air traffic control aids.
							Develop an understanding of overall Port and Harbour
						COI	Engineering and its impact.
						ricerius rise	Build knowledge on the Key design Characteristics for design
			M.Tech-		Port and	CO2	of Elements like Groins, Breakwaters
18	VR19	22	Transportation	2022191253	Harbour		Extend knowledge on flow regime, lift force mechanism, bed
			Engineering		Engineering	CO3	load and suspended load and other advanced topics
							Assess the design principles and construction of jetties along
						CO4	
			-				with desing of off shore structures
						COI	Understand the importance of sustainable urban and transport
)		Sustainable		planning
		22	M.Tech-		Urban and	CO2	Understand the sustainable urban and transport planning
19	VR19	22	Transportation	2022191254	Transport		techniques
	- 1		Engineering		Development	CO3	Understand the benefits of human community
				3	Bevelopment	CO4	Evaluate the economic, financial and pricing of sustainiable
						CO4	transport
			M.Tech-		C	COI	Able to prepare and evaluate EIA reports
20	11010	22		2022101255	Environmental	CO2	Identify risks and impacts of the projects
20	VR19	22	Transportation	2022191255	Impact	CO3	Selection of an appropriate EIA methodology
			Engineering		Assessment	CO4	Estimate the cost benefit ratio of the project.
						COI	Analyze the traffic flow and parking characteristics
				1			Determine the capacity and saturation flow of the road
			M.Tech-		Traffic	CO2	network.
21	VR19	22	Transportation	2022191210	Engineering	CO3	
			Engineering		Laboratory	CO3	Design traffic signal contral system for given intersection.
						CO4	Develop Knowledge on to solve complex traffic problems
							with definite solutions.
						COI	Build knowledge on quality behavior of hetrogenous traffic
			MEL				flow.
22	1/0.10	22	M.Tech-		Transportation	CO2	Develop simulation models for various traffic and geometric
22	VR19	22	Transportation	2022191211	Simulation Lab		conditions in Indian conditions.
			Engineering		0 855	CO3	Interprit the simulation to find suitable solutions.
						CO4	Apply similulation results to plan and design complex
							transportation network.
						COI	Understand historical background of the constitution making
						- 001	and its importance for building a democratic India.
			M.Tech-	1		CO2	Understand the functioning of three wings of the government
23	VR19	22	Transportation	2000191230	Constitution of	CO2	ie., executive, legislative and judiciary.
دے	VICIO	22	Engineering	2000191230	India	CO2	Familiarise the value of the fundamental rights and duties for
			Engineering			CO3	becoming good citizen of India.
						00.	Analyze the decentralization of power between central, state
						CO4	and local self-government.
							Analyze a complex engineering problem and to apply
				1	-	coı	principles of civil engineering and relevant disciplines to
				1			idenitfy solutions
				1			Determine suitable methodology to attain at a sustainable
			M.Tech-		Mini Project	CO2	
24	VR19	22	Transportation	2022191270			solutions for the identified problems.
			Engineering	l .	with Seminar	CO3	Design, implement, and optimize the solution to meet all the
	-			1			feasible requirements.
				1			Recognize professional responsibilities and make informed
			1	1		CO4	judgments in civil practice based on legal and ethical
							principles.
					Finacial and	CO1	Understand the concepts of decision making
		-	M.Tech-	I	Ecoomic	CO2	Calculate transportation demand and supply with estimation
25	VR19	22	Transportation	2022192150	Analysis of		of vehicle operating cost and accident cost
			Engineering		trnasportation	CO3	Perform economic analysis of transportation project
					Porjects	CO4	
		•				040015-01-01	1 11 2 0

						COI	Understand causes of accidents and carryout statistical analysis of accident data.
			M.Tech-			CO2	Apply road safety technique in the construction of new roads.
26	VR19	22	Transportation Engineering	2022192151	Highway Safety Engineering	CO3	Explain road reconstruction principle and improvement of road considering the different
			Engineering				components of road and intersections.
							Emphasize on road safety auditing principle and procedures;
					,	CO4	analyse the effectiveness of various traffic management techniques.
					Computational	COI	Understand the introdcution to systems approach
27	VR19	22	M.Tech- Transportation	2022192152	Techniques in Transportation		A working knowledge of simulation and GPSS programming
			Engineering		Engineering	CO3	A good understanding of GA applications
					Signitering	CO4	The ability to apply ANN
						COI	Distinguish between the quality of domestic and industrial
							water requirements and wastewater quantity generation
28	VR19	22	M.Tech- Transportation	2022192160-	Waste water	CO2	Impart knowledge on selection of treatment methods for industrial wastewater.
	1100000		Engineering	Α	Management	CO3	Describe the common methods of treatment in different industries
						CO4	Design of wastewater treatment plant for the given sewage characteristics
							Understand evaluate and create the basic concept of
						COI	environmental impact assessment, Flow of EIA, Types of
			M.Tech-		Environmental		environmental Impacts
29	VR19	22	Transportation	2022192160-	Impact	CO2	Implement different methods in preparing an Environmental
	W140961861		Engineering	В	Assessment		Impact Statement
						CO3	Identify various mitigation measures that can be used.
						CO4	Access environmental impacts and indicate their potential
							risks through environmental indices and indicators
						COI	Analyze a complex engineering problem and to apply
						COI	principles of civil engineering and relevant disciplines to idenitfy solutions
							Determine suitable methodology to attain at a sustainable
			M.Tech-		Dissertation	CO2	solutions for the identified problems.
30	VR19	22	Transportation	2022192170	-I/Industrial		Design, implement, and optimize the solution to meet all the
			Engineering		Project	CO3	feasible requirements.
							Recognize professional responsibilities and make informed
						CO4	judgments in civil practice based on legal and ethical
							principles.
							Analyze a complex engineering problem and to apply
						CO1	principles of civil engineering and relevant disciplines to
							idenitfy solutions
			M.Tech-		D:	CO2	Determine suitable methodology to attain at a sustainable
31	VR19	22	Transportation	2022192270	Dissertation	an 5 mi	solutions for the identified problems.
			Engineering		Phase -II	CO3	Design, implement, and optimize the solution to meet all the
							feasible requirements.
						CO4	Recognize professional responsibilities and make informed judgments in civil practice based on legal and ethical
			1			004	principles.
						21000	principles.

VIGNAN'S INSTITUTE OF INFORMATION TECHNOLOGY (A) DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

VR19 - M.Tech - Software Engineering Course Ourcomes

	VR19 - M.Tech - Software Engineering Course Ourcomes										
S NO	Progr amme Code	Programme Name	Course Code	Course Name	СО	Course Outcome: After the completion of the course student will be able to					
		M.Tech-			COI	Analyze software development process models and their suitability to industrial applications.					
1	25	Software	2025191100	Software	CO2	Develop SRS document for software design.					
		Engineering		Engineering	CO3	Employ software architectural styles to design user interface.					
					CO4	Compare software testing approaches and aspects.					
					COI	Compare linear and non linear data structures					
		M.Tech-			CO2	Implement searching, sorting and traversing methods					
2	25	Software	2025191101	Advanced Data	CO3	Implement priority queues using Binary heap					
		Engineering		Structures	CO4	Analyze algorithms for Height balanced trees like AVL trees, red-black trees, B-trees and Splay trees.					
					COI	To understand the basic concepts and issues of software project management					
		M.Tech-		Software Project		To conduct activities necessary to successfully complete and close the					
3	25	Software	2025191150	and Process	CO2	Software projects					
	23	Engineering	2023171130	Management		To implement the project plans through managing people,					
		Lugineering		ivianagement	CO3	communications and change					
					CO4	To develop the skills for tracking and controlling software deliverables					
					COI	Demonstrate on Supervised and Computational Learning					
		M.Tech-			CO2	Analyze on Statistics in learning techniques and Logistic Regression					
4	25	Software	2025191151	Machine	CO3	Illustrate on Support Vector Machines and Perceptron Algorithm					
		Engineering		Learning		Design a Multilayer Perceptron Networks and classification of decision					
				CO4	tree						
					COI	Understand the basic concepts of E-commerce					
5	25	M.Tech- Software	2025191152	E-Commerce	CO2	Demonstrate an retailing in E-commerce by using the effectiveness of market research					
	23	Engineering	2023191132	L-Commerce	CO3	Describe Internet trading relationships including Business to Consumer, Business-to-Business, Intra organizational					
					CO4	Describe about Consumer Search and Resource Discovery					
					COI	Describe various standards used for Software Quality Assurance					
6	25	M.Tech- Software	2025191153	Software Quality Assurance and	CO2	Explain fundamental concepts in software quality (e.g., internal / external quality, as well as quality in use) and quality assurance models.					
		Engineering		Testing	CO3	Name and describe different testing techniques and approaches					
					CO4	Compare various Automation tools used for Software Testing					
					COI	Differentiate among various cloud offerings, cloud environments, distributed technologies					
		M.Tech-		Cloud	CO2	Analyze various cloud platforms and cloud applications.					
7	25	Software Engineering	2025191154	Computing	CO3	Survey the policies and mechanisms for resource management, performance, scheduling					
					CO4	Choose among different storage technologies for cloud like DFS, GFS, HDFS, S#, Big Table.					
					CO1	Enumerate the list of IoT Applications					
		M.Tech-		Internet of	CO2	Evaluate different IoT application architectures					
8	25	Software	2025191155	Things	CO3	Construct IoT applications with Cloud for data analytics					
		Engineering 2023191133 Things		CO4	Chose a real world commercial platform for deploying IoT Applications						
		M.Tech-	2000101102	Research	COI	Discuss the process used for research Problem selection and Research Paper Writing					
9	25	Software	2000191100	Methodology and	CO2	Interpret the Patent writing and Development					
		Engineering		IPR	CO3	Describe the Procedure for Grant of Patents					
					CO4	Illustrate new Developments in IPR					

S NO	Progr amme Code	Programme Name	Course Code	Course Name	СО	Course Outcome: After the completion of the course student will be able to
					COI	Identify classes, objects, members of a class and relationships among them needed for a specific problem.
10	25	M.Tech- Software Engineering	2025191110	Advanced Data Structures Lab	CO2	Organize and apply to solve the complex problems using advanced data structures (like arrays, stacks, queues, linked lists, graphs and trees.)
				·	CO3	Apply and analyze functions of Dictionary
					CO4	Implement Programs on Hashing
	1044 (1920)	M.Tech-	2025191111	40-704 - 104 - 104 - 104 - 104 - 104 - 104 - 104 - 104 - 104 - 104 - 104 - 104 - 104 - 104 - 104 - 104 - 104 -	COI	Demonstrate the constructs of Ruby scripting Language, use of Perl language elements
11	25	Software		SE LAB-I	CO2	Implement PERL program to connect to MySQL database
		Engineering			CO3	Implement Map Reduce Program for weather data
					CO4	Implement PHP program for cotactuspage.
	25	M.Tech-	2000191130	Soft skills (Audit	COI	Teamwork – learning to connect and work with others to achieve a set task.
12	25	Software Engineering	N 1 40 10 10 10 10 10 10 10 10 10 10 10 10 10	course)	CO2	Leadership – assessing the requirements of a task, identifying the strengths within the team, utilizing the diverse skills of the group to
						achieve the set objective, awareness of risk/safety.
					COI	learn to demonstrate a critical understanding of key concepts in disaster risk reduction and humanitarian response.
13	25	M.Tech- Software	2000191130	Disaster Management	CO2	critically evaluate disaster risk reduction and humanitarian response policy and practice from multiple perspectives.
		Engineering		(Audit course)	CO3	develop an understanding of standards of humanitarian response and practical relevance in specific types of disasters and conflict situations.
					CO4	critically understand the strengths and weaknesses of disaster management approaches, planning and programming in different countries
		M.Tech-		Pedagogy	COI	What pedagogical practices are being used by teachers in formal and informal classrooms in developing countries?
14	25	Software Engineering	2000191130	Studies (Audit course)	CO2	What is the evidence on the effectiveness of these pedagogical practices, in what conditions, and with what population of learners?
					CO3	How can teacher education (curriculum and practicum) and the school curriculum and guidance materials best support effective pedagogy?
15	25	M.Tech- Software	2000191130	Stress Management By	COI	Develop healthy mind in a healthy body thus improving social health also
		Engineering		Yoga (Audit course)	CO2	Improve efficiency
					CO1	Creation of SOA compliant web service using various technologies.
16	25	M.Tech-	2025101200	Service Oriented	CO2	Make use of variousservice oriented analysis techniques also understand the technology underlying the service design.
16	25	Software Engineering	2025191200	Architecture	CO3	Demonstrate on basic concepts of SOA and it differs with other architectures
					CO4	Organize advanced concepts of service composition, Orchestration and Choreography. Understanding of web service framework with respect to SOA.
					COI	Design mathematical logic with Propositional Calculus and Predicate Calculus.
Species-	140000	M.Tech-		Mathematical Foundations of	CO2	Assume mathematical principles and logics to solve real time problems.
17	25	Software Engineering	2025191201	Computer Science	CO3	Apply graph theory for real time problems like network routing problem.
			e:		CO4	Examine Principles of Inclusion–Exclusion, Pigeonhole Principle and its Application and Apply Recurrence Relations by Substitution and Generating Functions.

S NO	Progr amme Code	Programme Name	Course Code	Course Name	со	Course Outcome: After the completion of the course student will be able to
		M.Tech-	2025191250	Software Testing Methodologies	COI	Examine Taxonomy of Bugs, Basics Concepts of Path Testing and theme of testing.
					CO2	Illustrate Domain testing and Interface Testing.
18	25	Software			CO3	Organize Logic Based Testing, Graph Matrices and apply node reduction
		Engineering			CO3	algorithm
					CO4	Identify the needs of software test automation and develop a test tool to
					CO4	support test automation.

S NO	Progr amme Code	Programme Name	Course Code	Course Name	СО	Course Outcome: After the completion of the course student will be able to
		M.Tech-			COI	Summarize the agile methodologies: extreme programming, scrum, and feature driven programming.
19	25	Software	2025191251	Agile Software Development	CO2	Apply The Twelve XP Practices and Illustrate pair programming and its characteristics
		Engineering			CO3	Apply XP to a small project.
					CO4	Examine Feature-Driven Development and Regaining Control
					COI	Construct a model to generate forecasts for a company's products.
20	25	M.Tech-	2025101252	ERP & Supply	CO2	Develop a Business Modules by using fundamentals Supply chain Management.
20	23	Software Engineering	2025191252	Chain	CO3	Apply Supply chain strategies and list the performance Metrics.
		Engineering		Management	CO4	Develop an aggregate production plan with relevant deterministic and stochastic inventory models.
		M.Tech-			COI	Explain the Properties of Secure Software and Specify Desired Security Properties.
21	25	Software	2025191253	Secure Software	CO2	Incorporate requirements into secured software development process
		Engineering		Engineering	CO3	Apply secure design principles for developing attack resistant software
					CO4	Analyze the Security and complexity of system drivers.
					CO1	Illustrate on big data and its use cases from selected business domains.
		M.Tech-		Big Data	CO2	Interpret and summarize on No SQL, Cassandra
22	25	Software Engineering	2025191254	Analytics	CO3	Analyze the HADOOP and Map Reduce technologies associated with big data analytics and explore on Big Data applications Using Hive.
		Engineering			CO4	Make use of Apache Spark, RDDs etc. to work with datasets.
						Identify the appropriate design patterns to solve object oriented design
		M.Tech-			COI	problems.
23	25	Software		Design patterns	CO2	Develop design solutions using creational patterns.
		Engineering			CO3	Apply structural patterns to solve design problems.
			2025191255	500	CO4	Construct design solutions by using behavioural patterns.
					COI	Demonstrate a wide range of techniques including testing, test case
		M.Tech-				coverage determination and Software quality factor.
24	25	Software Engineering	2025191210	Software Testing Lab	CO2	Choose the existing testing techniques are most effective for vulnerability detection.
		Engineering			CO3	Design test planning and Examine the test process
				· ·	CO4	Prepare test plan and develop test case hierarchy
					COI	Creating applications for Big Data analytics
25	2.5	M.Tech-		00111	CO2	Building a complete business data analytic solution
25	25	Software Engineering	2025191211	SE Lab-II	CO3	Understand how design patterns solve design problems
		Engineering			CO4	Develop design solutions using creational patterns, structural and behavioural patterns
		M.Tech-		Constitution of	COI	Have general knowledge and legal literacy and thereby to take up competitive examinations.
26	25	Software	2025191270	India (Audit	CO2	Understand state and central policies, fundamental uties.
		Engineering		Course)	CO3	Understand Electoral Process, special provisions.
				ŕ	CO4	Understand powers and functions of Municipalities, Panchayats and Cooperative Societies
		M.Tech-		Sanskrit For	CO1	Understanding basic Sanskrit language
27	25	Software	2025191270	Technical	CO2	Ancient Sanskrit literature about science & technology can be understood
		Engineering		Knowledge		Being a logical language will help to develop logic in
20	25	M.Tech-	202510:255	Value Education	CO1	Knowledge of self-development
28	25	Software Engineering	2025191270	(Audit Course)	CO2	Learn the importance of Human values 3.Developing the overall personality
		M.Tech-		Personality Development	COI	Study of Shrimad-Bhagwad-Geeta will help the student in developing his personality and achieve the highest goal in life
29	25	Software	2025191270	Through Life		The person who has studied Geeta will lead the nation and mankind to
		Engineering		Enlightenment	CO2	peace and prosperity Study of Neetishatakam will help in developing
29	25	Software	2025191270	Development Through Life		personality and achieve the highest goal in life The person who has studied Geeta will lead the nation and man

S NO	Progr amme Code	Programme Name	Course Code	Course Name	со	Course Outcome: After the completion of the course student will be able to
		4.0			COI	Carryout literature survey, and choose a relevant topic reported in recent IEEE/CSI/ACM/ conference publications / transactions in the domain of computer science and engineering.
30	25	M.Tech- Software	2000191230	Mini Project with Seminar	CO2	Simulate and analyze the results reported in the chosen paper for seminar topic.
		Engineering		with Schillar	CO3	Communicate effectively before the expert panel and develop technical reports.
					CO4	Respond to the queries raised by the evaluation committee and audience
					COI	Analyze of a formally specified problem statement with Modeling Concepts.
		M.Tech-		Object Oriented	CO2	Examine Project Organization, Communication and analysis Concepts.
31	25	Software Engineering	2025192150	Software Engineering	CO3	Produce appropriate System Design, object design of reusable Activities
			*		CO4	Apply skills relevant for Mapping Models to Code, Configuration and project Management
					COI	Select a search algorithm for a problem and characterize its time and space complexities.
32	25	M.Tech- Software		Artificial	CO2	Experiment with knowledge using the appropriate techniques for Logic concepts
		Engineering	2025192151	Intelligence	CO3	Develop knowledge representation using semantic network, semantic web and List advanced techniques of knowledge representation.
					CO4	Apply AI techniques to solve problems of Expert Systems
					COI	Connect openly on a global scale, with global learners and instructors.
		M.Tech-			CO2	Develop high quality learning using multimedia platform.
33	25	Software	2025192160	MOOCS	CO3	Self assessment of their performance and learning process.
		Engineering	2023192100		CO4	Develop a lifelong learning culture and updating the knowledge
					CO4	according with emerging trends.
					COI	Analyze a user interface from a communication perspective with graphical user interface.
34	25		2025102152	User Interface	CO2	Discuss the nature of the design process.
			2025192152	Design	CO3	Select an appropriate interaction design pattern for Screen Designing.
					CO4	Demonstrate on selection of window and Components.
		M.Tech-			COI	apply the software engineering principles in planning, formulating an innovative design/ approach and computing the requirements appropriate to chosen topic within the context of legal, societal and environment constraint.
35	25	Software	2025192170	Dissertation-I	CO2	Ability to perform individually accepting responsibility, taking
		Engineering			CO3	Ability to use formal and informal communications with guide, make
						presentations and prepare technical document.
					CO4	Develop/implement the solutions with appropriate techniques, resources and contemporary tools for social relavent issues/problems
		M.Tech-			COI	apply the software engineering principles in planning, formulating an innovative design/ approach and computing the requirements appropriate to chosen topic within the context of legal, societal and environment constraint.
36	25	Software	2025192270	Dissertation-II	CO2	Ability to perform individually accepting responsibility, taking initiative, and providing leadership, necessary to ensure project success
		Engineering			CO3	Ability to use formal and informal communications with guide, make presentations and prepare technical document.
					CO4	Develop/implement the solutions with appropriate techniques, resources and contemporary tools for social relavent issues/problems

VIGNAN'S INSTITUTE OF INFORMATION TECHNOLOGY (A) DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING VR19 - M.Tech. DECS Course Outcomes

ALC: N				V F	119 - IVI. I ECII	. DEC	S Course Outcomes
S.N O	Regula tion	Progra mme Code	Progra mmme Name	Course Code	Course Name	COs	Course Outcomes (COs):Upon completion of the course student will be able to
			MT		Divide to	COI	Understand the basic concepts of a Karnaugh Map ("K-map") for a 2-, 3-, 4-, or 5-variable logic function and to identify the prime implicates, essential prime implicates, and nonessential prime implicates of a function depicted on a K-map.Perform the minimization of a Boolean function using tabular method, QM algorithm and CAMP algorithm and determine the Adjacencies, DA, CSC, SSMs, EPCs and SPCs.
1	VR19	38	M.Tech - DECS	2038191100	Digital System Design	CO2	Perform the minimization of PLA using IISc algorithm and folding using COMPACT algorithm.
						CO3	Design a digital circuit by steps involving ASM chart and understand the digital system design approaches using CPLDs, FPGAs and ASICs.
						CO4	Rectify a single fault and multiple faults in combinational circuits using Path sensitization method, Boolean difference method and Kohavi algorithm and also perform fault diagnosis in sequential
				=		COI	Model digital communication system using appropriate mathematical techniques (error probability, constellation diagrams, pharos diagrams).
			M.Tech -		Digital Data	CO2	Understanding the basic concepts of how digital data is transferred across computer networks. Independently understand basic computer network technology.
2	VR19	38	DECS	2038191101	Communication	CO3	Understand and explain Data Communications System and its components and identification of the different types of network topologies and protocols.
						CO4	Enumerate the layers of the OSI model and TCP/IP. Explain the function(s) of each layer. Identify the different types of network devices and their functions within a network and finally network design and implementation.
						COI	learn basics of two-dimensional transforms.
3	VR19	38	M.Tech -	2038191150	Transform	CO2	Understand the definition, properties and applications of various two- dimensional transform.
	, KIZ	30	DECS	2030171130	Techniques	CO3	Understand the basic concepts of wavelet transform.
						CO4	Understand the special topics suchas wavelet packets,Bi-orthogonal wavelets e.t.c.
			NOTE 1		VLSI	COI	Review of FET fundamentals for VLSI design.
4	VR19	38	M.Tech - DECS	2038191151	Technology and	CO2 CO3	To acquires knowledge about stick diagrams and layouts.
			DECS		Design	CO4	EnabletodesignthesubsystemsbasedonVLSIconcepts Analyse the floor planning methods
						CO1	UnderstandtheoperationofRadarandcharacteristicsofMatchedfilter fornon-whitenoise.
5	VR19	38	M.Tech - DECS	2038191152	Radar Signal Processing	CO2	Know the significance and types of pulse compression techniques for analog and digital signals and phase coding in Radar and various
						COI	polyphase codes used for phase coding. Generalize the properties of statistical models in the analysis of signals using Stochastic processes.
6	VR19	38	M.Tech -	2038191153	Statistical Signal	CO2	Differentiate the prominence of various spectral estimation techniques for Achieving higher resolution in the estimation of power spectral density.
			DECS		Processing	CO3	Outline various parametric estimation methods to accomplish the signal modeling even at higher order statistics.
						CO4	Design and development of optimum filters using classical and adaptive algorithms.

						COI	Able to analyze characteristics of optical fiber and signal propagation through optical fibers
					Optical		Know the commonly used components and subsystems in optical
7	VR19	38	M.Tech -	2038191154	Communication	CO2	communication and network systems ,Working principle of optical
			DECS		Technology		communication components ,amplifiers, filters
						CO3	Analyze Transmission system model
						CO4	Understand the importance of wavelength division multiplexing
\vdash						COI	(WDM) and de-multiplexing, Identify and utilize different forms of cryptography techniques.
					-	CO2	Incorporate authentication and security in the network applications.
		• •	M.Tech -		Network		Distinguish among different types of threats to the system and handle
8	VR19	38	DECS	2038191155	Security &	CO3	the same.
					Cryptography	CO4	Analyze and design hash and MAC algorithms, and digital signatures.
							Identify, formulate, solve and implement problems in signal
			M.Tech -		System Design	COI	processing, communication systemsetc using RTL design tools.
9	VR19	38	DECS	2038191110	Using VHDL	CO2	Use EDA tools like Cadence, Mentor Graphics and Xilinx.
			DLCS		Lab	CO3	Design different digital circuits and simulate using Xilinx
						CO4	Apply verilog programming tools to implement different applications.
						COI	Understand the basics of data communication, networking, internet
			MT		Data		and their importance.
10	VR19	38	M.Tech - DECS	2038191111	Communication	CO2	Analyze the services and features of various protocol layers in data
			DECS		s Lab	CO3	networks. Differentiate wired and wireless computer networks
						CO4	Analyse TCP/IP and their protocols.
							Understandresearchproblemformulation and analyzeresearch
						COI	related information Followresearchethics
							Understand that today's world is controlled by Computer, Information
						CO2	Technology, buttomorrowworldwill beruled byideas, concept,
							andcreativity.
			M.Tech -		Research		Understanding that when IPR would take such important place in
11	VR19	9 38	DECS	2000191100	Methodology and IPR	CO3	growth of individuals & nation, it is needless to emphasis the need of
					and IPK		information about Intellectual Property Right to be promoted among
							students in general & engineering in particular. Understand that IPR protection provides an incentive to inventors for
							further research work and investment in R&D, which leads to creation
						CO4	of new and better products, and inturn brings about, economic growth
							and social benefits.
						COI	prepare project title.
12	VR19	38	M.Tech -	2000191130	Soft Skills	CO2	prepare a project report.
			DECS		(Audit course 1)	CO3	Identify gaps in literature.
						CO4	Improve writing and presentation skills of the project
							Know digital image, representation of digital image, importance of
						COI	image resolution, applications in image processing, the advantages of representation of digital images in transform domain, application of
							various image transforms.
							Understand and analyze the image enhancement and image
	*					CO2	degradation, image restoration techniques using spatial filters and
			M Task		Image and side	000000000000000000000000000000000000000	frequency domain.
13	VR19	38	M.Tech - DECS	2038191200	Image and video processing		Understand and analyze the detection of point, line and edges in
			DECS		processing	CO3	images, edge linking and various segmentation techniques and the
				redundancy in images, various image compression techniques.			
							Describe the video technology from analog color TV systems to digital
						CO4	video systems, how video signal is sampled and filtering operations in
						CO4	video processing as well as describing the general methodologies for
							2D motion estimation, various coding used in video processing.
				 		CO1	UnderstandCellularcommunicationconcepts
					777	CO2	Studythemobileradiopropagation
14	VR19	38	M.Tech -	2020101201	Wireless	CO3	Studythewireless networkdifferent typeof MAC protocols
14	VKIY	36	DECS	2038191201	Communication s and Networks		Determine the type and appropriate model of wireless fading channel
					3 and Networks	CO4	based on the system parameters and the property of the wireless
							medium.

					CMOS 4 1	COI	Analyze, design, optimize and simulate analog and digital circuits using CMOS constrained by the design metrics.
15	VR19	38	M.Tech -	2038191250	CMOS Analog	CO2	Connect the individual gates to form the building blocks of asystem.
13	VKI	50	DECS	2038191230	& Digital IC Design	CO3	Use EDA tools like Cadence, Mentor Graphics and other open source software tools like Ngspice.
						CO4	Design Analog and digital circuits using CMOS
							Understand parallelism and pipelining concepts, the design aspects and
						COI	challenges.
16	VR19	38	M.Tech -	2020101251	Advanced	CO2	Evaluate the issues in vector and array processors.
10	VICIO	30	DECS	2038191251	Computer Architecture	CO3	Study and analyze the high performance scalable multithreaded and
					Architecture		multiprocessor systems
						CO4	Interpret the different architecture models
							Understand the basic concepts of Artificial neural network systems as
						COI	well as understand the McCulloch-Pitts neuron model, simple and
							multilayer Perception, Adeline and Madeline concepts.
							Data processing, Hopfield and self-organizing network and difference
						CO2	between crisp sets to fuzzy sets, fuzzy models, fuzzification, inference,
			M.Tech -		Soft Computing	COZ	membership functions, rule based approaches and defuzzification and
17	VR19	38	DECS	2038191252	Techniques		Self - organizing fuzzy logic control, non linear time delay systems.
			DECS		reciniques		Understand the concept of Genetic Algorithm steps. Tabu, anD-colony
						CO3	search techniques for solving optimization problems.
							GA applications to power system optimization problems, identification
						004	and control of linear and nonlinear dynamic systems using MATLAB-
						CO4	Neural network toolbox and also know the application and importance
							stability analysis
						CO1	Analyze and evaluate the cyber security needs of an organization.
18	VR19	38	M.Tech -	2038191253	Cyber Security	CO2	Conduct a cyber security risk assessment.
			DECS		, ,	CO3	Measure the performance and troubleshoot cyber security systems.
_			-			CO4	Implement cyber security solutions.
			1			COI	Understand the basics concepts of Digital Signal Processing (DSP) and transforms.
						-100-00-00-00	Distinguish between the architectural features of General purpose
			N.T.		DSP Processors	CO2	processors and Programmable DSP processors
19	VR19	38	M.Tech - DECS	2038191254	and	CO3	Understand the architectures of TMS320C54xx devices.
			DECS		Architectures		Understand the architectures of ADSP 2100 DSP devices and Black fin
						CO4	Processor and interfacing various devices to DSP Processors as well as
						204	able to write simple assembly language programs using instruction set
							of TMS320C54xx.
							Understand the electromagnetic environment the definitions of
						COI	EMI and EMC, history of EMI some examples of practical experiences due to EMI such as mains power supply, switches
							and relays etc.
							Understand the celestial electromagnetic noise the
							occurrence of lightning discharge and their effects, the
20	VR19	38	M.Tech -	2038191255	EMI/EMC	CO2	charge accumulation and discharge in an electrostatic
			DECS	2030171233	Distribute		discharge, model ESD wave form, the various cases of
							nuclear explosion and the transients.
						CO3	Understand the methods to measure RE and RS in the open are test sites
						CO4	Understand the measurement facilities and procedures using
							anechoic chamber, TEM cell, reverberating chamber GTEM cell.
						COI	The model of object oriented programming: abstract data types,
							encapsulation, inheritance and polymorphism
						CO2	Fundamental features of an object oriented language like Java: object
21	VR19	38	M.Tech -	2038191256	Object Oriented	202	classes and interfaces, exceptions and libraries of object collections
21	VKIY	30	DECS	2030191236	Programming		How to take the statement of a business problem and from this
						CO3	determine suitable logic for solving the problem; then be able to
							proceed to code that logic as a program written in Java.
						CO4	How to test, document and prepare a professional looking package for
				<u> </u>		L	each business project using java doc.

VR19 38								1
VR19 38							COI	Identify the different types of network devices and their functions within anetwork.
VR19 38 M.T.ech DECS VR19 VR	22	VR19	38		2038191210	0.0000000000000000000000000000000000000	CO2	Understand and build the skills of sub-netting and routingmechanisms.
VR19				DLCS		s Lab	CO3	
VR19 38 M.Tech DECS 2038191211 Advanced Image COL Perform and analyze image and video enhancement and restoration COL Perform and analyze image and video enhancement and restoration COL Perform and analyze image and video enhancement and restoration COL Perform and analyze image and video enhancement and restoration COL COL Perform and analyze image and video enhancement and restoration COL COL Perform and analyze image and video enhancement and restoration COL COL Perform and analyze image and video enhancement and restoration COL COL Perform and analyze image and video enhancement and restoration COL COL Perform and analyze image and video enhancement and restoration COL COL Perform and analyze image and video enhancement and restoration COL COL COL Perform and analyze image and video enhancement and restoration COL COL Perform and analyze image and video enhancement and restoration and pressure COL COL Perform and analyze image and video enhancement and restoration in the present COL COL Perform and analyze image and video enhancement and restoration in the present COL COL Perform and analyze image and video enhancement and response and the present Performance COL COL Perform and analyze image and video enhancement and response and the present Performance COL Perform and analyze image and video enhancement and enhanced in the present COL Perform and analyze image and video enhancement and enhanced COL COL Perform and analyze image and video enhancement and enhanced COL COL Perform and analyze image and video enhancement and enhanced COL COL Perform and analyze image and video enhancement and enhanced COL COL Perform and analyze image and video enhanced COL Per							CO4	
VR19 38 M.Tech DECS Decision (Lab Decision (Lab DECS Decision (Lab Decision (L								
VR19 38 DECS DECS DECS Processing Lab DECS				N. T			2400.0000000	Perform and analyze image and video segmentation and compression
Part	23	VR19	38	10.000000000000000000000000000000000000	2038191211			
VR19 38 M.Tech DECS VR19 VR19 38 M.Tech DECS VR19 VR19 38 M.Tech DECS VR19				DECS	Anna Anna Anna anna an	Processing Lab		Extract the information from the image using boundary and regional
VR19 38 M.Tech DECS VR19 VR19 38 M.Tech DECS VR19 38 M.Tech DECS VR19 VR19 38 M.Tech DECS VR19 VR							COI	Identify, discuss and justify the technical aspects of the chosen project
VR19				M Tach		Mini	CO2	Reproduce, improve and refine technical aspects for engineering
Communicate and report effectively project related activities and findings	24	VR19	38		2038191238	Project(Seminar)	CO3	Work as an individual or in a team in development of technical
VR19 38 M. Tech DECS VR19 VR19 38 M. Tech DECS VR19							CO4	Communicate and report effectively project related activities and
Constitution of DECS NR19 38								
Marcel DECS VR19 38 M.Tech DECS VR19 VR19 38 M.Tech DECS VR19 VR				MT	Tach	Constitution of	100 07/002	competitive examinations.
Course C	25	VR19	38		2000191230	India (Audit		
VR19 38 M.Tech DECS 2038192150 Detection & Estimation Theory 2038192150 Detection & Estimation Theory 2038192151 December of signal detection and parameter estimation. CO4 Estimate the Parameters of Random Processes from Data CO1 Understand theory of different filters and apply filtering methods for parameter estimation. CO4 Estimate the Parameters of Random Processes from Data CO1 Understand theory of different filters and apply filtering methods for parameter estimation. CO4 Estimate the Parameters of Random Processes from Data CO1 Understand theory of different filters and apply filtering methods for parameter estimation. CO2 CO2 CO2 CO3 C				DECS		course)	CO3	
Magnetic							CO4	Understand powers and functions of Municipalities, Panchayats and Cooperative Societies
Detection & Estimation Develop and planeter estimation Detection & Estimate the Parameters of Random Processes from Data							COL	
Main								and the state of t
Theory Signals. CO3 Derive and apply filtering methods for parameter estimation. CO4 Estimate the Parameters of Random Processes from Data Understand theory of different filters and algorithms CO3 Understand theory of multirate DSP, solve numerical problems and writeal gorithms CO3 Understand theory of multirate DSP, solve numerical problems and writeal gorithms CO3 Understand theory of prediction and solution of normalequations CO4 Estimate the Parameter Methods of Power Spectrum CO5 Understand theory of prediction and solution of normalequations CO6 Understand theory of prediction and solution of normalequations CO7 Understand theory of prediction and solution of normalequations CO8 Estimate the Parameter Methods of Power Spectrum CO9 Understand theory of prediction and solution of normalequations CO9 Understand theory of prediction and solution of normalequations CO9 Understand theory of prediction and solution of normalequations CO9 Understand theory of prediction and solution of normalequations CO9 Understand theory of prediction and solution of normalequations CO9 Understand theory of prediction and solution of normalequations CO9 Understand theory of prediction and solution of normalequations CO9 Understand theory of prediction and solution of normalequations CO9 Understand theory of prediction and solution of normalequations CO9 Understand theory of prediction and solution of normalequations CO9 Understand theory of prediction and solution of normalequations CO9 Understand theory of prediction and solutions of normalequations CO9 Understand theory of prediction and solutions of normalequations CO9 Understand theory of prediction and solutions of normalequations CO9 Understand theory of prediction and solutions of normalequations CO9 Understand theory of prediction and solutions and consumerical problems CO9 Understand theory of prediction and solutions of solve the specific needs related with public health, safety, society and environment leading to the ability of engagement	26	VD10	20	M.Tech -				
CO3 Derive and apply filtering methods for parameter estimation.	26	VRI9	38	DECS	2038192150		CO2	
CO4 Estimate the Parameters of Random Processes from Data CO1 Understand theory of different filters and algorithms						Theory		
VR19 38 M.Tech DECS 2038192151 Advanced Digital Signal Processing CO1 Understand theory of different filters and algorithms Understand theory of multirate DSP, solve numerical problems and writeal gorithms CO3 Understand theory of prediction and solution of normal equations CO4 Estimate the Parametric Methods of Power Spectrum CO1 Learning the measurement of information and errors. CO2 Obtain knowledge in designing Linear Block Codes and Cyclic codes. CO3 Construct tree and trellies diagrams for convolution codes CO3 Construct tree and trellies diagrams for convolution codes CO4 Design the Turbo codes and Space time codes and also their applications CO4 Consect openly on a global scale, with global learners and Instructors CO4 CO5								
VR19 38 M.Tech DECS 2038192151 DECS D	-							
VR19 38						Advanced	COI	
Processing CO3 Understand theory of prediction and solution of normalequations CO4 Estimate the Parametric Methods of Power Spectrum CO5 Learning the measurement of information and errors. CO6 Learning the measurement of information and errors. CO7 Obtain knowledge in designing Linear Block Codes and Cyclic codes. CO8 Construct tree and trellies diagrams for convolution codes Design the Turbo codes and Space time codes and also their applications CO8 Design the Turbo codes and Space time codes and also their applications CO9 Connect openly on a global scale, with global learners and Instructors CO9 Self assessment of their performance and learning process. Adapt a life long learning culture and updating the knowledge according with emerging trends CO9 Self assessment of their performance and learning process. Adapt a life long learning culture and updating the knowledge according with emerging trends CO9 Self assessment of their performance and learning process. Adapt a life long learning culture and updating the knowledge according with emerging trends CO9 Self assessment of their performance and learning process. Adapt a proprotypes and solutions to solve the specific needs related with public health, safety, society and environment leading to sustainable development following ethical values CO9 Self assessment of their performance and learning process. Adapt appropriate techniques, resources and modern engineering fundamentals to solve the complex Engineering problems Design prototypes and solutions to solve the specific needs related with public health, safety, society and environment leading to sustainable development following ethical values CO9 Self assessment of their performance and learning problems Design prototypes and solutions to solve the specific needs related with public health, safety, society and environment leading to sustainable development following ethical values CO9 Self assessment of their performance and learning problems Design prototypes and solutions on the specific needs related w	27	VR19	38		2038192151		CO ₂	
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VR19 38 M.Tech DECS 2038192152 Coding Theory and Applications CO2 Obtain knowledge in designing Linear Block Codes and Cyclic codes.						l recomme		
VR19 38 M.Tech DECS								
DECS 2038192152 and Applications WR19 38 DECS 2038192152 and Applications WR19 38 M. Tech DECS 2038192160 DECS 2038192160 WR19 38 M. Tech DECS 2038192180 DECS 2038192180 WR19 38 M. Tech DECS 2038192180 DECS 2038192180 DESCS DESCRIPTION APPLICATION APPLIC				M.Tech -				
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29 VR19 38 M.Tech DECS VR19 38 M.Tech DECS 2038192160 MOOCs-2 MOOCs-2 Develop high quality learning using multimedia platform CO2 Develop high quality learning using multimedia platform CO3 Self assessment of their performance and learning process. Adapt a life long learning culture and updating the knowledge according with emerging trends Apply knowledge of Electronics and communication engineering fundamentals to solve the specific needs related with public health, safety, society and environment leading to sustainable development following ethical values Adapt a prototypes and solutions to solve the specific needs related with public health, safety, society and environment leading to sustainable development following ethical values Adapt appropriate techniques, resources and modern engineering tools during the implementation of project CO4 Develop a multidisciplinary project leading to the ability of engagement in lifelong learning and self-development Apply knowledge of Electronics and communication engineering fundamentals to solve the specific needs related with public health, safety, society and environment leading to sustainable development following ethical values CO3 Develop a multidisciplinary project leading to sustainable development following ethical values Adapt appropriate techniques, resources and modern engineering fundamentals to solve the complex Engineering problems Design prototypes and solutions to solve the specific needs related with public health, safety, society and environment leading to sustainable development following ethical values Adapt appropriate techniques, resources and modern engineering following ethical values Adapt appropriate techniques, resources and modern engineering following ethical values Design prototypes and solutions to solve the specific needs related with public health, safety, society and environment leading to sustainable development following ethical values Design prototypes and solutions to solve the specific needs related with public h						Applications		
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VR19 38 M.Tech DECS Dissertation Phase -I							COI	
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WR19 38 M.Tech-DECS Dissertation Phase -I VR19 38 M.Tech-DECS Dissertation Phase -I Dissertation Phase -I VR19 38 M.Tech-DECS Dissertation Phase -I Dissertation Phase -I CO1 Apply knowledge of Electronics and communication engineering fundamentals to solve the complex Engineering problems Design prototypes and solutions to solve the specific needs related with public health, safety, society and environment leading to sustainable development following ethical values CO3 Adapt appropriate techniques, resources and modern engineering tools during the implementation of project Develop a multidisciplinary project leading to the ability of engagement in lifelong learning and self-development CO1 Apply knowledge of Electronics and communication engineering fundamentals to solve the complex Engineering problems Design prototypes and solutions to solve the specific needs related with public health, safety, society and environment leading to sustainable development following ethical values CO2 Adapt appropriate techniques, resources and modern engineering tools during the implementation of project CO3 Develop a multidisciplinary project leading to the ability of engagement in Develop a multidisciplinary project leading to the ability of engagement in							CO4	
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34 VR19 38 DECS 2038192238 DISSERTATION Phase -II Following ethical values CO3 Adapt appropriate techniques, resources and modern engineering tools during the implementation of project CO4 Develop a multidisciplinary project leading to the ability of engagement in				MTI	1	Dissert	CO2	그 그들은 그 그는 그 그는
CO3 Adapt appropriate techniques, resources and modern engineering tools during the implementation of project CO4 Develop a multidisciplinary project leading to the ability of engagement in	34	VR19	38		2038192238	CONTRACTOR		
CO4 Develop a multidisciplinary project leading to the ability of engagement in				DECS		rnase -II	CO3	Adapt appropriate techniques, resources and modern engineering tools during
						1	CO4	

VIGNAN'S INSTITUE OF INFORMATION TECHNOLOGY DEPARTMENT OF INFORMATION TECHNOLOGY VR - 19 B.TECH. IT COURSE OUTCOMES

					VR - 19 B.TECH. I	T CO	URSE OUTCOMES
S. No.	Regul ation	Progr amme Code	Programme Name	Course Code	Course Name	со	Course Outcome: After the completion of the course student will be able to
						COI	To understand the basic notions of discrete and continuous probability.
			M.Tech-			CO2	To understand the methods of statistical inference, and the role that sampling
1	VR19	40	Information	2040191100	Discrete Mathematical	STATE OF THE PARTY	distributions play in those methods. To be able to perform correct and meaningful statistical analyses of simple to
			Technology		Structures	CO ₃	moderate complexity.
						CO4	Illustrate properties and characteristics of various graphs and optimization
							techniques
			M.Tech-			CO1	Understand the implementation of symbol table using hashing techniques. Develop and analyze algorithms for red-black trees, B-trees and Splay trees.
2	VR19	40	Information	2040191101	Advanced Data Structures	CO3	Develop algorithms for text processing applications.
			Technology		Structures	CO4	Identify suitable data structures and develop algorithms for computational
							geometry problems.
						COI	Demonstrate knowledge of the building blocks of AI as presented in terms of intelligent agents.
			M.Tech-			CO2	Analyze and formalize the problem as a state space, graph, design heuristics and
3	VR19	40	Information	2040191150	Artificial Intelligence	COZ	select amongst different search or game based techniques to solve them.
			Technology			CO3	Develop intelligent algorithms for constraint satisfaction problems and also
						CO4	design intelligent systems for Game Playing. Solve problems with uncertain information using Bayesian approaches.
						COI	Understand the basics of XML.
			M.Tech-		Service Oriented	CO2	Learn the concepts of SOA and Web services.
4	VR19	40	Information	2040191151	Architectures and Web	CO3	find different approaches for providing security for XML documents as well as
			Technology		Security		messages exchanged among Web Services.
	-					CO4	determine some of the prevailing standards and technologies of Web Services. Summarize on the term 'internet of things' in different contexts.
_	VD 10	40	M.Tech-	2040101152		CO2	Design a PoC of an IoT system using Rasperry Pi/Arduino.
5	VR19	40	Information Technology	2040191152	Internet of Things	CO3	Apply data analytics and use cloud offerings related to IoT.
			reciniology			CO4	Analyze applications of IoT in real time scenario.
			M.Tech-			COI	Students should able to apply the dynamic programming to solve problems of
6	VR19	40	Information	2040191153	Optimization Techniques	CO2	discreet and continuous variables. Students should able to apply the concept of non-linear programming.
5		19.77	Technology	20.0171100		CO3	Students should able to carry out sensitivity analysis.
						CO4	Student should able to model the real world problem and simulate it.
					1	COI	Students accustomed with the representation of data, addressing modes, and instructions sets.
7	VR19	40	M.Tech- Information	2040191154	Parallel Computer Architecture	CO2	Students able to understand parallelism both in terms of a single processor and multiple processors.
			Technology			CO3	Technical knowhow of parallel hardware constructs to include instruction-level parallelism for multi core processor design.
						CO4	Use different performance metrics for analysis of parallel algorithms.
						COI	Understand the programming requirements viz., generic types and methods to
			N/T 1			COI	perform data analysis.
8	VR19	40	M.Tech- Information	2040191155	Big Data Analytics	CO2	Formulate an effective strategy to implement a successful Data analytics project.
			Technology			CO3	To understand and analyze Map-Reduce programming model for better
						CO4	optimization. Identify the need based tools, viz., Pig and Hive and to handle.
						COI	Building a new unbreakable cryptosystem.
						CO2	Blending the existing cryptographic algorithms with the existing communication
•	1,0010	40	M.Tech-		Principles of		protocols.
9	VR19	40	Information Technology	2040191156	Cryptography	CO3	Analyzing and application of cryptography for secure eCommerce and other secret transactions.
			Leciniology				clasify various cryptographic protocols, hash functions, digital signature
						CO4	schemes.
						CO1	student will have knowledge of Grid Computing.
10	VR19	40	M.Tech-	2040101157	Cluster and Grid	CO2	student will have knowledge in web services and service-oriented architecture.
10	VKIS	40	Information Technology	2040191157	Computing	CO3	student will have knowledge of Architecture for grid computing and Cluster Computing.
			- comiology			CO4	student will have knowledge of process scheduling and load balancing.
						10000000	

			M.Tech-			COI	Technical know to develop new compression standards.
11	VR19	40	Information	2040191158	Imaging and Multimedia	CO2	Acquire skill set to handle all multimedia components efficiently.
• •	, 1017	10	Technology	2040171138	Systems	CO3	Develop Integrated and Collaborative multimedia systems.
			reciniology			CO4	Execute various algorithms require for image and multimedia systems.
						COI	Demonstrate basic concepts in graph theory: coloring, planar graphs.
			M.Tech-			CO2	Evaluate precise and accurate mathematical definitions of objects in graph theory
12	VR19	40	Information	2040191159	Advanced Graph Theory	CO3	Build some classical graph algorithms in order to find sub graphs with desirable
			Technology				properties. Compile and deduce properties of chromatic numbers and polynomials and
						CO4	identify certain problems as graph colouring problems
			M.Tech-			COI	Understand the research problem, process and ethics.
13	VR19	40	Information	2000191100	Research Methodology	CO2	Prepare a well-structured research paper and scientific presentations
	, , , ,	"	Technology	2000171100	and IPR	CO3	Explore on various IPR components and process of filing.
			recimology			CO4	Understand the adequate knowledge on patent and rights
			M.Tech-			CO1	Implement List ADTs and their operations.
14	VR19	40	Information	2040191110	Advanced Data	CO2	Develop programs for implementing trees algorithms.
14	VICE	40	Appear to the second se	2040191110	Structures Lab	CO3	Implement graph algorithms.
			Technology			CO4	Apply algorithm design techniques.
			M.Tech-			COI	Implement real time problems using python.
15	VR19	40	1 April 1979	2040101111	0	CO2	Develop programs for AI Techniques using Python.
13	VKI9	40	Information	2040191111	Computing Lab	CO3	Implement big data problems using Hadoop.
			Technology			CO4	Apply algorithm design techniques on cryptography.
						COI	Understand that how to improve your writing skills .
	i					CO2	readability Learn about what to write in each section.
	, m		M.Tech-		English for Research		Understand the skills needed when writing a Title Ensure the good quality of
16	VR19	40	Information	2000191130	Paper Writing	CO3	Paper at year first, time submission
			Technology		r aper writing		paper at very first- time submission.
						CO4	applying the knowledge in writing a technical paper and process of submission in qualititative journals.
						COI	Understanding foundations of hazards, disasters and associated natural/social
							phenomena.
17	VD 10	40	M.Tech-			CO2	Familiarity with disaster management theory (cycle, phases).
17	VR19	40	Information	2000191131	Disaster Management	CO3	Methods of community involvement as an essential part of successful DRR and
	1 1		Technology				Analyze Risk Assessment and Strategies for Survival.
						CO4	Technological innovations in Disaster Risk Reduction: Advantages and
						199101-02	problems.
	1 1		M.Tech-	l		CO1	Understanding basic Sanskrit language.
18	VR19	40	Information	2000191132	Sanskrit for Technical		Ancient Sanskrit literature about science & technology can be understood.
	1		Technology		Knowledge	CO3	Being a logical language will help to develop logic in students.
						CO4	Learning Sanskrit Grammar, History of Sanskrit Literature, Drama.
			MTb			COI	Knowledge of self-development.
19	VR19	40	M.Tech-	2000101122		CO2	Learn the importance of Human values.
19	VKI9	40	Information	2000191133	Value Education	CO3	Developing the overall personality.
			Technology		,	CO4	Learn the importance of value education towards personal, national and global
		-					development.
						COI	Introduce students to the advanced methods of designing and analyzing
							algorithms.
			M.Tech-			CO2	The student should be able to choose appropriate algorithms and use it for a
20	VR19	40	Information	2040191200	Advanced Algorithms		specific problem.
			Technology		J	CO3	To familiarize students with basic paradigms and data structures used to solve
						000	advanced algorithmic problems.
						CO4	To introduce the students to recent developments in the area of algorithmic
	\vdash						design.
							Identify the Basic Concepts of Web & Markup Languages.
	,,,,,	40	M.Tech-	201012		CO2	Creating & Running Applications using JSP libraries.
21	VR19	40	Information	2040191201	Full Stack Technologies	CO3	Creating Our First Controller Working with and Displaying in Angular Js and
			Technology			VI. 100-100	Nested Forms with ng-form.
						CO4	Working with the Files in React JS and Constructing Elements with Data.
						COI	Domain Knowledge for Productive use of Machine Learning and Diversity of
						COL	Data.
			M.Tech-		1		
22	VR19	40	M.Tech- Information	According to the control of the cont	Machine Learning	CO2	Demonstrate on Supervised and Computational Learning.
22	VR19	40	Information	2040191250	Machine Learning	CO2 CO3	Demonstrate on Supervised and Computational Learning. Analyze on Statistics in learning techniques and Logistic Regression.
22	VR19	40		According to the control of the cont	Machine Learning		Demonstrate on Supervised and Computational Learning.

							Understand the principles of continuous development and deployment,
						COI	automation of configuration management, inter-team collaboration, and IT
			M.Tech-				service agility
23	VR19	40	Information	2040191251	DevOps	CO2	Describe DevOps & DevSecOps methodologies and their key concepts.
			Technology			CO3	Explain the types of version control systems, continuous integration tools,
							continuous monitoring tools, and cloud models.
						CO4	Set up complete private infrastructure using version control systems and CI/CD
_	_						tools.
						COI	Familiarization of the different layers of TCP/IP protocol stack.
			MTh			CO2	Analyze the Concepts of Network media and topologies, Network security
24	VR19	40	M.Tech- Information	2040191252	Advanced Network		concepts and Network management.
24	VKIS	40	Technology	2040191232	Principles and Protocols	CO3	
			reciniology				Understanding of the working principle of different protocols at different layers.
						CO4	Plan the interworking of distributed application basing on Semantic Web
						COI	technology. Elucidate the foundations and issues of distributed systems.
						COI	Describe the features of peer-to-peer and distributed shared memory systems and
						CO2	Understand the various synchronization issues and global state for distributed
2.2			M.Tech-			CO2	systems.
25	VR19	40	Information	2040191253	Distributed Computing	1219 0	Understand the Mutual Exclusion and Deadlock detection algorithms in
			Technology			CO3	distributed systems.
							Describe the agreement protocols and fault tolerance mechanisms in distributed
						CO4	systems.
							Demonstrate social network analysis and measures and components of virtual
			M.Tech-			COI	communities.
26	VR19	40	Information	2040191254	Social Network Analytics	CO2	Analyze random graph models and navigate social networks data.
			Technology			CO3	Apply the network topology and Visualization tools.
						CO4	Analyze the experiment with small world models and clustering models.
						COI	Demonstrate the components of image processing and usage of various filteration
			M.Tech-			COI	techniques.
27	VR19	40	Information	2040191255	Digital Image Processing	CO2	Apply image compression techniques.
			Technology			CO3	Discuss the concepts of wavelet transforms.
						CO4	Analyze the concept of morphological image processing.
						COI	Demonstrate the foundation of the Block chain technology and understand the
							processes in payment and funding.
20	10010	40	M.Tech-	2040101256	DI 1 OI : 77 I I I	CO2	Identify the risks involved in building Block chain applications and how to earn
28	VR19	40	Information	2040191256	Block Chain Technologies		profit from trading cryptocurrencies.
			Technology			CO3	Review of legal implications using smart contracts.
						CO4	Choose the present landscape of Blockchain implementations and Understand
						COI	Crypto currency markets. Explain how data is collected, managed and stored for data science.
			M.Tech-			COI	Understand the key concepts in data science, including their real-world
29	VR19	40	Information	2040191257	Data Science	CO2	applications.
			Technology			CO3	Implement data collection and management scripts using MongoDB.
			,			CO4	Evaluate toolkits used by various data scientist on real world applications
			***				Comprehend the fuzzy logic and the concept of fuzziness involved in various
						CO1	systems and fuzzy set theory.
			1	1		000	Understand the concepts of fuzzy sets, knowledge representation using fuzzy
			M.Tech-			CO2	rules, approximate reasoning, fuzzy inference systems, and fuzzy logic.
30	VR19	40	Information	2040191258	Soft Computing		To understand the fundamental theory and concepts of neural networks, Identify
			Technology			CO3	different neural network architectures, algorithms, applications and their
							limitations.
				1		CO4	Understand appropriate learning rules for each of the architectures and learn
						CU4	several neural network paradigms and its applications.
						CO1	Explain approaches to syntax and semantics in NLP.
				1		CO2	Demonstrate approaches to discourse, generation, dialogue and summarization
	M.Tech-	Natural Language	CO2	within NLP.			
31	VR19	VK19 40 Information 2040191259 Processing	CO3	Identify machine learning techniques used in NLP, including hidden Markov			
			Technology	233	models and probabilistic.		
			1	1		CO4	Explain context-free grammars, clustering and unsupervised methods, log-linear
							and discriminative models, and the EM algorithm as applied within NLP.
			1	1		COI	Identify classes, objects, members of a class and relationships among them
			M.Tech-	1			needed for a specific problem.
32	VR19	40	Information	2040191210	Advance Algorithms Lab	CO2	Examine algorithms performance using Prior analysis and asymptotic notations.
			Technology			CO3	Organize and apply to solve the complex problems using advanced data
				1		004	structures (like arrays, stacks, queues, linked lists, graphs and trees.
	1					CO4	Apply and analyze functions of Dictionary.

						COI	Develop web Applications using Scripting Languages & Frameworks.
			M.Tech-			CO2	Creating & Running Applications using JSP libraries.
33	VR19	40	Information	2040191211	ull Stack Technologies La		Creating Our First Controller Working with and Displaying in Angular Js and
			Technology			CO3	Nested Forms with ng- form.
			0-0.00			CO4	Working with the Files in React JS and Constructing Elements with Data.
							Carryout literature survey, and choose a relevant topic reported in recent
				COI	IEEE/CSI/ACM/ conference publications / transactions in the domain of		
			M.Tech-				computer science and engineering.
34	VR19	40	Information Technology	2040191270	Mini Project with Seminar	CO2	Simulate and analyze the results reported in the chosen paper for seminar topic.
						CO3	Communicate effectively before the expert panel and develop technical reports.
						CO4	Respond to the queries raised by the evaluation committee and audience.
						COI	Discuss the growth of the demand for civil rights in India for the bulk of Indians
			M.Tech-			CO2	Discuss the intellectual origins of the framework of argument that informed the
35	VR19	40	Information Technology	2000191230	Constitution of India	CO3	Discuss the circumstances surrounding the foundation of the Congress Socialist Party [CSP] under the leadership of Jawaharlal Nehru and the eventual failure of the proposal of direct elections through adult suffrage in the Indian Constitution.
						CO4	Discuss the passage of the Hindu Code Bill of 1956.
						CO1	What pedagogical practices are being used by teachers in formal and informal
			M.Tech-			CO2	What is the evidence on the effectiveness of these pedagogical practices, in what
36	VR19	40	Information	2000191231	Pedagogy Studies	CO2	conditions, and with what population of learners?
-			Technology	2000171231	r caagogy stadies	CO3	How can teacher education (curriculum and practicum) and the school
			l same ag				curriculum and guidance materials best support effective pedagogy?
						CO4	Encourage Cooperative Learning Environment.
			M.Tech-			CO1	Develop healthy mind in a healthy body thus improving social health.
37	VR19	40	Information	2000191232	tress Management by Yog	CO2	Improve efficiency.
			Technology			CO3	Reduces Stress and Anxiety. Identify and apply injury prevention principles related to yoga activities.
							Study of Shrimad-Bhagwad-Geeta will help the student in developing his
						COI	personality and achieve the highest goal in life.
			M.Tech-	2000191233	Personality Development through Life Enlightenemnt Skills	000	The person who has studied Geeta will lead the nation and mankind to peace and
38	VR19	40	Information			CO2	prosperity.
			Technology			CO3	
						1000000	Study of Neetishatakam will help in developing versatile personality of students
						CO4	To re-engineer attitude and understand its influence on behavior.
			M.Tech-			CO1	Demonstrate the basic concepts fundamental learning techniques and layers.
39	VR19	40	Information	2040192150	Deep Learning	CO2	Discuss the Neural Network training, various random models.
			Technology			CO3	Explain different types of deep learning network models.
						CO4	Classify the Probabilistic Neural Networks and deep learning techniques.
						CO1	Knowledge and understanding of Embedded Linux OS Architecture, Linux Kernel Modules.
40		40	M.Tech-		l		Describes the differences between the general computing system and the
40	VR19	40	Information	2040192151	Embedded Computing	CO2	embedded computing system.
			Technology			CO3	Write client server program using TCP sockets.
						CO4	Knowledge on IPv4 and IPV6 addresses.
			M.Tech-			CO1	Learn various hacking methods.
41	VR19	40	Information	2040192152	Ethical Hacking	CO2	Perform system security vulnerability testing.
			Technology		Sunour ruoming		Perform system vulnerability exploit attacks.
							Produce a security assessment report and issues related to hacking.
						CO1	Explain about web pages with basic HTML5, DHTML tags using CSS and XMI the overview of W3C DOM.
			M.Tech-			10 <u>00</u> 000000	Demonstrate advanced practical skills in common digital marketing tools such a
42	VR19	40	Information	2040192153	Digital Marketing	CO2	SEO, SEM, Social media and Blogs and discuss the key elements of a digital Jav
			Technology		5	000	Scripts.
						CO3	Apply search engine optimization techniques to a website.
			,			CO4	Illustrate how the effectiveness of a digital marketing campaign can be measured

						CO1	Understand and comprehend the basics of python programming.
						COL	Demonstrate the principles of structured programming and be able to describe,
	1		M.Tech-			CO2	
43	VR19	40	Information	2040192160	Python Programming	CO2	design, implement, and test structured programs using currently accepted methodology.
43	VICIO	40	Technology	2040192100	Fython Frogramming	CO2	89
	1		reciniology			CO3	Explain the use of the built-in data structures list, sets, tuples and dictionary an
						CO4	Identify real-world applications using oops, files and exception handling
							provided by python.
						COI	Understand the concepts of Java Script and develop a dynamic webpage by the
							use of Java Script.
			M.Tech-			CO2	100° N N N N N N N N N N N N N N N N N N
44	VR19	40	Information	2040192161	Web Technologies		Write a well formed / valid XML document and describe the concepts of Ajax.
	1		Technology	F-00-1-00 B10-1-00000		CO3	Creating & Running PHP script and also to connect & working with DBMS su
			3,				as MySql.
						CO4	Understand the concepts PERL & RUBY and develop the web applications by
							using PERL & RUBY.
						COI	Demonstrate knowledge of the building blocks of AI as presented in terms of
	1						intelligent agents.
			M.Tech-			CO2	Analyze and formalize the problem as a state space, graph, design heuristics an
45	VR19	40	Information	2040192162	Artificial Intelligence	CO2	select amongst different search or game based techniques to solve them.
	1		Technology	2010172102	7 attricial interrigence	CO3	Develop intelligent algorithms for constraint satisfaction problems and also
			recimorogy			C03	design intelligent systems for Game Playing.
	1					CO4	Attain the capability to represent various real life problem domains using logic
						C04	based techniques and use this to perform inference or planning.
						COI	Summarize on the term 'internet of things' in different contexts.
			M.Tech-			CO2	Analyze various protocols for IoT.
46	VR19	40	Information	2040192163	Internet of Things	001	Design a PoC of an IoT system using Rasperry Pi/Arduino and Apply data
			Technology		1291	CO3	analytics and use cloud offerings related to IoT.
						CO4	Analyze applications of IoT in real time scenario.
				L		601	Domain Knowledge for Productive use of Machine Learning and Diversity of
			M.Tech-			CO1	Data.
47	VR19	40	Information	2040192164	Mashina I assiss	000	Demonstrate on Supervised and Computational Learning and Analyze on
47	VICIO	40	Total Vision Control of	2040192104	Machine Learning	CO2	Statistics in learning techniques and Logistic Regression .
			Technology	-		CO3	Illustrate on Support Vector Machines and Perceptron Algorithm.
						CO4	Design a Multilayer Perceptron Networks and classification of decision tree.
						CO1	Understand the implementation of symbol table using hashing techniques.
	1		M.Tech-		Advanced Data	CO2	Develop and analyze algorithms for red-black trees, B-trees and Splay trees.
48	VR19	40	Information	2040192165	The Property Control of the Control	CO3	Develop algorithms for text processing applications.
			Technology		Structures	604	Identify suitable data structures and develop algorithms for computational
						CO4	geometry problems.
							Apply the software engineering principles in planning, formulating an innovati
						COI	design/ approach and computing the requirements appropriate to chosen topic
							within the context of legal, societal and environment constraint.
			M.Tech-		Dissertation-I/Industrial	CO2	Perform individually as well as in a team, accepting responsibility, taking
49	VR19	40	Information	2040192170	Project	CO2	initiative, and providing leadership, necessary to ensure project success.
			Technology		rioject	002	Use formal and informal communications with team members and guide, make
						CO3	presentations and prepare technical document.
	1					001	Develop/implement the solutions with appropriate techniques, resources and
						CO4	contemporary tools for social relavent issues/problems.
							Apply the software engineering principles in planning, formulating an innovati
		M.Tech-	COI	design/ approach and computing the requirements appropriate to chosen topic			
				within the context of legal, societal and environment constraint.			
			0.000	Perform individually as well as in a team, accepting responsibility, taking			
50	VR19 40 Information 2040192270 Dissertation-II	CO2	initiative, and providing leadership, necessary to ensure project success.				
	H. 605455	Technology		Use formal and informal communications with team members and guide, make			
		Technology CO		CO3	presentations and prepare technical document.		
							Develop/implement the solutions with appropriate techniques, resources and
						CO4	contemporary tools for social relayent issues/problems
	1						TRAINCHIDOLALY ROOTS TOL SOCIAL ICIAVEIL ISSUES/IHOHERIS

VIGNAN'S INSTITUTE OF INFORMATION TECHNOLOGY (A) DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

VR19 M. Tech. Power and Industrial Drives Course Outcomes

			VR	19 M. Tech. Pow	er and	Industrial Drives Course Outcomes
S. No.	Progra mme Code	Programme Name	Course Code	Course Name	со	Course Outcome: After the completion of the course student will be able to
					CO1	Understand the behavior of DC motors and also model the different Dc motors.
		M.Tech-Power		Electrical Machine	CO2	Apply the knowledge of reference frame theory for AC machines to model the induction and Synchronous machine
1	42	and Industrial Drives	2042191100	Modeling and Analysis	CO3	Evaluate the steady state and transient behaviour of induction and synchronous machines to Propose the suitability of drives for different industrial application
				-	CO4	Analyze the characteristics of different types of DC motors and 2-Phase induction machines using voltage and torque equations to differentiate the behaviour and to propose their applications in real world
		M.Tech-Power		Analysis of Power	COI	Examine the operation of phase controlled converters and AC voltage converters
2	42	and Industrial Drives	2042191101	Electronic Converters	CO2 CO3	Determine the requirements of power factor correction in converter circuits Analyze the operation of 3-phase inverters with and without PWM techniques
				Conventors	CO4	Describe principles of operation and features of multilevel inverters.
3	42	M.Tech-Power and Industrial	2042101110	Power Electronics	CO1	Examine power semiconductor device properties via simulation Analyze and implementing the speed controlling techniques for AC machines in
ر	42	Drives	2042191110	Simulation Laboratory	CO3	simulation Explain the operation of various power electronic converters in simulation.
		M.Tech-Power			CO4 CO1	Implement the PWM techniques in simulation Experimentally understand the different converters
4	42	and Industrial	2042191111	Power Converters Laboratory	CO2	Experimentally understand the dual converter application experimentally understand inverters for single and three phase loads
		Drives			CO4	Design of gate drive circuits for IGBT & MOSFET"s. Understand the state variable approach's which are suitable for higher order
		M.Tech-Power	2042191150	Modern Control Theory	CO1	systems
5	42	and Industrial Drives				Analyze the concepts of controllability and observability. Examine the stability and instability problems in continuous time invariant
		Dilves			CO3	systems, various non-linearities using phase plane analysis and descriptive functions an
					CO4	Solve the optimal control problems for any continuous time invariant system
		M.Tech-Power and Industrial	2042191151	Power Quality and Custom Power Devices	COI	Identify the issues related to power quality in power systems and also address the problems of transient and long duration voltage variations in power systems.
6	42				CO2	Analyze the effects of harmonics and study of different mitigation techniques.
		Drives			CO3	Understand the importance of custom power devices and their applications. Acquire knowledge on different compensation techniques to minimize power
					CO4	quality disturbances
		M.Tech-Power		Programmable	COI	Understand the PLCs and their I/O modules.
7	42	and Industrial	2042191152	Logic Controllers	CO2	Develop control algorithms to PLC using ladder logic etc. Manage PLC registers for effective utilization in different applications and
		Drives		& Applications	CO3	also andle data functions & control of two axis, their axis robots with PLC. Design PID controller with PLC
						Understand the concept of genetic algorithm and its application in optimization.
۰	42	M.Tech-Power	2042101153	Artificial		Differentiate between Algorithmic based methods and knowledge based methods
8	42	and Industrial Drives	2042191153	Intelligence Techniques	CO3	Use appropriate AI framework for solving of power system problems.
					CO4	Design the fuzzy logic controllers for power engineering applications.
		M.Tech-Power		Renewable Esser	CO1	Understand various general aspects of renewable energy systems
9	42	and Industrial	2042191154	Renewable Energy Technologies	CO2	Analyze and design induction generator for power generation from wind Design MPPT controller for solar power utilization
		Drives			CO4	Utilize fuel cell systems for power generation.
	l s	_ 5	_	HVDC	COI	Evaluate the HVDC converter configurations and assess the performance metrics.
10	42	M.Tech-Power	2042101155	Transmission and	CO2	Understand controllers for controlling the power flow through a dc link and compute filter Parameters
10	42	and Industrial Drives	2042191155	Flexible AC Transmission	CO3	Apply impedance, phase angle and voltage control for real and reactive power flow in ac transmission systems with FACTS controller.
				Systems	CO4	Analyze and select a suitable FACTS controller for a given power flow condition.
			L	L		

S. No.	Progra mme Code	Programme Name	Course Code	Course Name	со	Course Outcome: After the completion of the course student will be able to
		M.Tech-Power	2018	Switched Mode	CO1	Analyze operation and control of non-isolated and isolated switch mode converters.
11	42	and Industrial	2042191200	Power Conversion	CO2	Design of non-isolated and isolated switch mode converters
		Drives		Tower Conversion	CO3	Understand the operation and control of resonant converters
					CO4	Create the switch mode converters based on linearized models
					COI	Understand the concepts of scalar and vector control methods for drive systems.
12	42	M.Tech-Power and Industrial	2042191201	Power Electronic Control of Electrical Drives	CO2	Design controllers and converters for induction motor, PMSM and BLDC drives.
		Drives			CO3	Select and implement proper control techniques for induction motor and PMSM for specific applications
					CO4	Analyze the control techniques and converters for SRM drives.
					COI	Simulation of Buck converter, Boost converter, single-phase square wave inverter and PWM inverter.
13	42	M.Tech-Power and Industrial	2042191210	Electric Drives Simulation	CO2	Design controllers and converters for induction motor, PMSM and BLDC drives
		Drives		Laboratory	CO3	Simulate D.C separately excited motor and transmission line by incorporating line, load and transformer models.
					CO4	Simulation of single phase AC voltage regulator with different loads.
					001	Explain about characteristics of various power semiconductor devices and firing
		MTID			COI	circuits. Analyze the performance of single-phase and three-phase full-wave bridge
14	42	M.Tech-Power and Industrial	2042191211	Electric Drives Laboratory	CO2	converters with both resistive, inductive and motor loads.
		Drives		Laboratory	CO3	Illustrate the working of Buck converter, Boost converter, single-phase square wave inverter and PWM inverter.
					CO4	Describe the operation of single phase AC voltage regulator with different loads.
				Control &	COI	Gain knowledge on different renewable energy sources and storage devices
		M.Tech-Power		Integration of	CO2	Recognize, model and simulate different renewable energy sources
15	42	and Industrial Drives	2042191250	Renewable Energy Systems	CO3	Analyze, model and simulate basic control strategies required for grid connection
				Systems	CO4	Implement a complete system for standalone/grid connected system
		M.Tech-Power			COI	Analyze the concept of electric vehicles and hybrid electric vehicles
16	42	and Industrial	2042191251	Hybrid Electric Vehicles	CO2	Discover the different motors used for hybrid electric vehicles
		Drives			CO3	Understand the power converters used in hybrid electric vehicles
					CO4	Know the different batteries and other energy storage systems.
		MT I D			COI	Analyze digital control systems using Z-transforms and Inverse Z-Transforms
	12	M.Tech-Power	201212122	Digital	CO2	Evaluate the state transition matrix and solve state equation for discrete model for
17	42	and Industrial	2042191252	ControlSystems	04 M/05	continuous time systems, investigate the controllability and observability.
		Drives		,	CO3	Determine the stability; design state feedback controller.
					CO4	Solve a given optimal control problem
10		M.Tech-Power		Advanced Digital	COI	Design digital filters with different techniques and also describe structure of digital filter
18	42	and Industrial	2042191253	Signal Processing		provide the provid
		Drives				Know the effect of finite word length in signal processing.
_					CO4	Analyze different power spectrum estimation techniques
					COI	Analyze power electronic application requirements
		M.Tech-Power			CO2	Identify suitable power converter from the available configurations
19	42	and Industrial Drives	2042191254	Applications of PowerConverters	CO3	Develop improved power converters for any stringent application requirements.
					CO4	Improvise the existing control techniques to suit the application. Design of Bi- directional converters for charge/discharge applications
) (T.) -			CO1	Understand about DSP architecture and assembly programming for DSP processors.
20	42	M.Tech-Power and Industrial	2042191255	Microcontrollers	CO2	Design the interfacing circuits for input and output to PIC micro controllers and
		Drives			CO3	DSP processors Create ALP for DSP processing devices
					CO4	Design PWM controller for power electronic circuits using FPGA
					004	
		M. T. T.			COI	Carryout literature survey, and choose a relevant topic reported in recent IEEE/IET/Elsevier/ Springer/Taylor and Francis/conference publications / transactions in the domain of Electrical and Electronics Engineering.
21	42	M.Tech-Power and Industrial Drives	2042191270	Mini Project with Seminar	CO2	Simulate and analyze the results reported in the chosen paper for seminar topic.
		Dires		- Commun	CO3	Communicate effectively before the expert panel and develop technical reports.
	1 1					

S. No.	Progra mme Code	Programme Name	Course Code	Course Name	со	Course Outcome: After the completion of the course student will be able to
22	42	M.Tech-Power and Industrial	2042192150	Digital Signal Processing	CO1	Interface the DSP platform with sensors such as hall-effect voltage sensors, Understand the hall-effect current sensors, shaft encoder for data acquisition for motor drive applications and also use algorithms for the realization of controllers, Pulse Width Modulators and observers.
		Drives		Controlled Drives	CO3	Scale and normalize the data to suit the requirements of the drive system Exploit the architectural features of the DSP platform to design and implement
		M.Tech-Power		Smart Grid	CO1	Explain about the micro grids and distributed generation systems. Develop concepts of smart grid technologies in hybrid electrical vehicles etc. Understand smart substations, feeder automation, GIS, smart grids, smart grid
23	23 42	and Industrial Drives	2042192151	Technologies	CO3	policies and developments in smart grids Analyze the effect of power quality in smart grid and to understand latest
				Modeling &	COI	developments in ICT for smart grid. Understand the back ground activities i.e. numerical solution used in the simulation software
24	42	M.Tech-Power and Industrial Drives	2042192152	Simulation of PowerElectronic	CO2 CO3	Choose the required numerical solver to be used for analysis Debug the convergence problems occurring during simulation
		1		Systems	CO4	Investigate different switching function technique and their properties of the switching function Analyze operation and control of different switch mode converters.
25	42	M.Tech-Power and Industrial Drives	2042192160	MOOCs	CO2 CO3	Design of switch mode converters Understand the operation and control of resonant converters
		M.Tech-Power			CO4 CO1	Create the switch mode converters based on linearized models Gain knowledge on different renewable energy sources and storage devices Recognize, model and simulate different renewable energy sources
26	42	and Industrial Drives	2042192161	Renewable Energy Systems	CO3	Analyze, model and simulate basic control strategies required for grid connection
					CO4	Implement a complete system for standalone/grid connected system Define an objective function and constraint functions in terms of design variables, and then state the optimization problem
27	42	M.Tech-Power and Industrial	2042192162	Optimization Techniques	CO2	Solve single variable and multi variable optimization problems, without and with constraints.
		Drives			CO3	Apply linear and non-linear programming technique to an optimization problem. Explain basic principles of Genetic Algorithms and Particle Swarm Optimization
					CO4	methods Understand the PLCs and their I/Omodules.
28	42	M.Tech-Power and Industrial	2042192163	Programmable	CO2	Develop control algorithms to PLC using ladderlogic. Manage PLC registers for effective utilization in different applications.
		Drives	2,000	Logic Controller	CO4	Design Hardware configuration and develop logic for different Industrial Applications.
					COI	Apply knowledge of Electrical and Electronics engineering fundamentals to solve the complex Engineering problems Design prototypes and solutions to solve the specific needs related with public
29	42	M.Tech-Power and Industrial	2042192170	Dissertation-I/ Industrial Project #	CO2	health, safety, society and environment leading to sustainable development following ethical values
		Drives		maastrar rojeet #	CO3	Adapt appropriate techniques, resources and modern engineering tools during the implementation of project
					CO4	Develop a multidisciplinary project leading to the ability of engagement in lifelong learning and self-development Apply knowledge of Electrical and Electronics engineering fundamentals to solve
		M.Tech-Power				the complex Engineering problems Design prototypes and solutions to solve the specific needs related with public health, safety, society and environment leading to sustainable development
30	42	and Industrial Drives	2042192270	Dissertation-II	CO3	following ethical values Adapt appropriate techniques, resources and modern engineering tools during the implementation of project
					CO4	Develop a multidisciplinary project leading to the ability of engagement in lifelong learning and self-development

VIGNAN'S INSTITUTE OF INFORMATION TECHNOLOGY (A) DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

VR19 - M.Tech - Computer Science and Engineering Course Outcomes

S. No.	Regul ation	Progra mme Code	Programme Name	Course Code	Course Name	со	Course Outcome: After the completion of the course student will be able to
			M.Tech-		Mathematical	COI	To apply the basic rules and theorems of probability theory such as Baye's Theorem, to determine probabilities that help to solve engineering problems and to determine the expectation and variance of a random variable from its distribution.
1	VR19	58	Computer Science and	2058191100	Foundations of	CO2	Able to perform and analyze of sampling, means, proportions, variances and estimates the maximum likelihood based on population parameters.
			Engineering		Computer Science	CO3	To learn how to formulate and test hypotheses about sample means, variances and proportions and to draw conclusions based on the results of statistical tests.
						CO4	Apply graph theory for real time problems like network routing problem.
					COI	Ability to write and analyze algorithms for algorithm correctness and efficiency.	
2	VR19	58	M.Tech- Computer	2058191101	Advanced Data Structures &	CO2	Master a variety of advanced abstract data type (ADT) and data structures and their Implementation.
2	VKIS	96	Science and Engineering	2038191101	Algorithms	CO3	Demonstrate various searching, sorting and hash techniques and be able to apply and solve problems of real life.
						CO4	Design and implement variety of data structures including linked lists, binary trees, heaps, graphs and search trees.
			M.Tech-			COI	Identify classes, objects, members of a class and relationships among them needed for a specific problem.
3	VR19	58	Computer Science and	2058191110	Advanced Data Structures &	CO2	Organize and apply to solve the complex problems using advanced data structures (like arrays, stacks, queues, linked lists, graphs and trees.).
			Engineering		Algorithms Lab	CO3	Apply and analyze functions of Dictionary.
			0 0			CO4	Implement Programs on Hashing.
					Advanced	COI	The student should have hands on experience in using various sensors like temperature, humidity, smoke, light, etc. and should be able to use control web camera, network, and relays connected to the Pi.
4	VR19	58	M.Tech- Computer	2058191111		CO2	Development and use of s IoT technology in Societal and Industrial Applications.
			Science and Engineering		Computing Lab	CO3	Skills to undertake high quality academic and industrial research in Sensors and IoT.
						CO4	To classify Real World IoT Design Constraints, Industrial Automation in IoT.
			M.Tech-			COI	Identify Methods in AI that may be suited to solving a given problem and Game Playing.
5	VR19	58	Computer Science and	2058191150	Artificial Intelligence	CO2	Analyze the basic issues of different types of knowledge representation techniques to build intelligent system.
		9	Engineering		mienigence	CO3	Build Expert systems for real time applications.
		2				CO4	Determination of uncertainty of data using different probability approaches for real time applications.
			M.Tech-			CO1	Demonstrate the components of image processing.
6	VR19	58	Computer	2058191151	Digital ImageProcessing	CO2	Explain various filtration techniques.
			Science and Engineering		imageriocessing	CO3	Apply image compression techniques. Discuss the concepts of wavelet transforms.
			2115111ccring				Illustrate on the fundamental concepts of distributed operating systems, its
			M.Tech-			CO1	architecture and distributed mutual exclusion. Analyze on deadlock detection algorithms and agreement protocols.
7	VR19	58	Computer	2058191152	Advanced		Make use of algorithms for implementing DSM and its scheduling for
		wv(C)	Science and		OperatingSystems	CO3	protection and security in distributed operating systems.
			Engineering			CO4	Elaborate on concurrency control mechanisms in distributed database systems.

S. No.	Regul ation	Progra mme Code	Programme Name	Course Code	Course Name	со	Course Outcome: After the completion of the course student will be able to
						COI	Illustrate reference models with layers, protocols and interfaces.
			M.Tech-		a. 1 1	CO2	Describe the routing algorithms, Sub netting and Addressing of IP V4and IPV6.
8	VR19	58	Computer Science and Engineering	2058191153	Advanced ComputerNetworks	CO3	Describe and Analysis of basic protocols of computer networks, and how they can be used to assist in network design and implementation.
			z.ig.i.iee.i.i.g			CO4	Describe the concepts Wireless LANS, WIMAX, IEEE 802.11, Cellular
			M.Tech-			CO1	telephony and Satellite networks. Summarize on the term 'internet of things' in different contexts.
9	VR19	58	Computer	2058191154	Internet of Things	CO2	Design a PoC of an IoT system using Rasperry Pi/Arduino.
	,,,,,	30	Science and	2030171131	memer or rinings	CO3	Apply data analytics and use cloud offerings related to IoT.
			Engineering			CO4	Analyze applications of IoT in real time scenario.
			M.Tech-		Object Original	COI	Apply the Object Oriented Software-Development Process to design software.
10	VR19	58	Computer	2058191155	Object Oriented SoftwareEngineerin	CO2	Analyze and Specify software requirements through a SRS documents. Design and Plan software solutions to problems using an object-oriented
			Science and Engineering	2030171133	g	CO3	strategy.
			Sugmeeting			CO4	Model the object oriented software systems using Unified Modeling Language (UML).
			M.Tech-		Research	COI	Discuss the process used for research Problem selection and Research Paper Writing.
11	VR19	58	Computer Science and	2000191100	Methodology and	CO2	Interpret the Patent writing and Development.
			Engineering		IPR	CO3	Describe the Procedure for Grant of Patents.
						CO4	Illustrate new Developments in IPR.
			M.Tech- Computer	2000191130	Soft skills (Audit	COI	Teamwork - learning to connect and work with others to achieve a set task.
12	VR19	58	Science and Engineering	2000171130	course)	CO2	Leadership – assessing the requirements of a task, identifying the strengths within the team, utilizing the diverse skills of the group to achieve the set
						COI	objective, awareness of risk/safety. learn to demonstrate a critical understanding of key concepts in disaster risk reduction and humanitarian response.
13	VR19	58	M.Tech- Computer	2000191130	Disaster	CO2	critically evaluate disaster risk reduction and humanitarian response policy and
15	VKI	96	Science and Engineering		Management (Audit course)	CO3	practice from multiple perspectives. develop an understanding of standards of humanitarian response and practical relevance in specific types of disasters and conflict situations.
						CO4	critically understand the strengths and weaknesses of disaster management
						CO4	approaches, planning and programming in different countries.
			M.Tech-			COI	What pedagogical practices are being used by teachers in formal and informal classrooms in developing countries?
14	VR19	58	Computer Science and	2000191130	Pedagogy Studies (Audit course)	CO2	What is the evidence on the effectiveness of these pedagogical practices, in what conditions, and with what population of learners?
			Engineering		(rtuan course)		How can teacher education (curriculum and practicum) and the school
						CO3	curriculum and guidance materials best support effective pedagogy?
15	VR19	58	M.Tech- Computer Science and	2000191130	Stress Management By Yoga (Audit	COI	Develop healthy mind in a healthy body thus improving social health also.
			Engineering		course)	CO2	Improve efficiency.
			M Tack			COI	Domain Knowledge for Productive use of Machine Learning and Diversity of Data. Demonstrate on Supervised and Computational Learning.
16	VR19	58	M.Tech- Computer Science and	2058191200	Machine learning	CO2	Analyze on Statistics in learning techniques and Logistic Regression Illustrate on Support Vector Machines and Perceptron Algorithm.
			Engineering			CO3	Design a Multilayer Perceptron Networks and classification of decision tree.
						CO4	Demonstrate how to apply a variety of learning algorithms to data.
			M.Tech-				Illustrate on big data and its use cases from selected businessdomains.
17	VR19	58	Computer	2058191201	Big DataAnalytics	CO2	Interpret and summarize on No SQL,Cassandra. Analyze the HADOOP and Map Reduce technologies associated with big data
			Science and Engineering			CO3	analytics and explore on Big Data applications UsingHive.
						CO4	Make use of Apache Spark, RDDs etc. to work withdatasets.

S. No.	Regul ation	Progra mme Code	Programme Name	Course Code	Course Name	со	Course Outcome: After the completion of the course student will be able to
			M.Tech-			COI	Implement procedures for the machine learning algorithms.
18	VR19	58	Computer	2050101210	Machine Learning	CO2	Design Python programs for various Learning algorithms.
10	VKIS	36	Science and	2058191210	with python lab	CO3	Apply appropriate data sets to the Machine Learning algorithms.
_			Engineering			CO4	Identify and apply Machine Learning algorithms to solve real world problems.
			M.Tech-			COI	Illustrate on Bigdata and its usecases from selected business domains. Analyse the Hadoop with Java and Map reduce techniques associated with big
19	VR19	58	Computer	2058191211	Big Data Lab	CO2	data.
			Science and Engineering			CO3	analyze and explore on big data applications using HIVE.
_						CO4	Access real time processing with Hadoop.
			M.Tech-		Advanced	CO1	Analyze on normalization techniques. Elaborate on concurrency control techniques and query optimization.
20	VR19	58	Computer Science and	2058191250	Databases and	CO3	Summarize the concepts of data mining, data warehousing and data
			Engineering		Mining	300000000000000000000000000000000000000	preprocessing strategies.
						CO4	Apply data mining algorithms.
						COI	Explain the Fundamental Concepts and applications of ad hoc and wireless sensor networks.
			M.Tech- Computer		Ad Hoc & Sensor	CO2	Discuss the MAC protocol issues of ad hocnetworks.
21	VR19	58	Science and	2058191251	Networks	CO3	Enumerate the concept of routing protocols for ad hoc wireless networks with
			Engineering		er valentalisten ontrekatastatta		respect to TCP design issues.
						CO4	Analyze & Specify the concepts of network architecture and MAC layer protocol for WSN.
					10824	COI	Elaborate fuzzy logic and reasoning to handle uncertainty in
			M.Tech-			110-230 A	engineeringproblems.
22	VR19	58	Computer	2058191252	SoftComputing	CO2	Make use of genetic algorithms to combinatorial optimizationproblems. Distinguish artificial intelligence techniques, including search heuristics,
22	VICIS	50	Science and	2030191232	SoftComputing	CO3	knowledge representation, planning andreasoning.
			Engineering		*	CO4	Formulate and apply the principles of self-adopting and self organizing neuro fuzzy inference systems.
						COI	Interpret the key dimensions of the challenge of CloudComputing.
			M.Tech-			CO2	Examine the economics, financial, and technological implications for selecting
23	VR19	58	Computer	2058101252	CIIC		cloud computing for ownorganization.
23	VKI9	36	Science and	2058191253	CloudComputing	CO3	Assessing the financial, technological, and organizational capacity of employer's for actively initiating and installing cloud-basedapplications.
			Engineering			CO4	Evaluate own organizations' needs for capacity building and training in cloud
						CO4	computing-related IT areas.
						COI	Describe the key security requirements of confidentiality, integrity, and availability, types of security threats and attacks and summarize the functional
						COI	requirements for computersecurity.
			M.Tech- Computer		Principles of	CO2	Explain the basic operation of symmetric block encryption algorithms, use of secure hash functions for message authentication, digital signaturemechanism.
24	VR19	58	Science and	2058191254	Computer Security		Discuss the issues involved and the approaches for user authentication and
			Engineering			CO3	explain how access control fits into the broader context that includes
							authentication, authorization, andaudit. Explain the basic concept of a denial-of-service attack, nature of flooding
						CO4	attacks, distributed denial- of-service attacks and describe how computer
							security vulnerabilities are a result of poor programming practices.
						COI	Design, formulate, solve and implement high performance versions of standard
	- 1		M.Tech-				single threaded algorithms. Demonstrate the architectural features in the GPU and MIC hardware
25	VR19	58	Computer	2058191255	High Performance	CO2	accelerators.
23	VICIO	36	Science and	2038191233	Computing	CO3	Design programs to extract maximum performance in a multicore, shared
			Engineering			212.5	memory execution environment processor.
						CO4	Develop and deploy large scale parallel programs on tightly coupled parallel systems using the message passing paradigm.
							Carryout literature survey, and choose a relevant topic reported in recent
			MT			COI	IEEE/CSI/ACM/ conference publications / transactions in the domain of
			M.Tech- Computer		Mini Project with		computer science and engineering. Simulate and analyze the results reported in the chosen paper for seminar
26	VR19	58	Science and	2058191270	Seminar	CO2	topic.
			Engineering			CO3	Communicate effectively before the expert panel and develop technical reports.
l	1	1				CO4	Respond to the queries raised by the evaluation committee and audience.

S. No.	Regul ation	Progra mme Code	Programme Name	Course Code	Course Name	со	Course Outcome: After the completion of the course student will be able to
			M.Tech-		Constitution of	COI	Have general knowledge and legal literacy and thereby to take up competitive examinations.
27	VR19 58 Computer 20	2025191270	India (Audit	CO2	Understand state and central policies, fundamental uties.		
			Science and	2020171270	Course)	CO3	Understand Electoral Process, special provisions.
			Engineering		Section of the sectio	CO4	Understand powers and functions of Municipalities, Panchayats and Cooperative Societies.
20	VD10	50	M.Tech- Computer	2025101270	Sanskrit For Technical	COI	Understanding basic Sanskrit language.
28	VR19	58	Science and Engineering	2025191270	Knowledge (Audit Course)	CO2	Ancient Sanskrit literature about science & technology can be understood Being a logical language will help to develop logic in.
			M.Tech-		Value Education	COI	Knowledge of self-development.
29	VR19	58	Computer Science and Engineering	2025191270	Value Education (Audit Course)	CO2	Learn the importance of Human values 3.Developing the overall personality.
			M.Tech-		Personality Development	COI	Study of Shrimad-Bhagwad-Geeta will help the student in developing his personality and achieve the highest goal in life.
30	VR19	58	Computer Science and	2025191270	Through Life		The person who has studied Geeta will lead the nation and mankind to peace
			Engineering		Enlightenment	CO ₂	and prosperity Study of Neetishatakam will help in developing versatile
					Skills (Audit	001	personality of students.
			M.Tech-			COI	Demonstrate the basic concepts fundamental learning techniques and layers.
31	VR19	58	Computer Science and	2058192150	Deep Learning	CO2	Discuss the Neural Network training, various random models. Explain different types of deep learning network models.
			Engineering			CO4	Classify the Probabilistic Neural Networks.
			M.Tech-			COI	Demonstrate social network analysis and measures.
32	VR19	58	Computer	2058192151	Social Network	CO2	Analyze random graph models and navigate social networks data
32	VK19	38	Science and	2038192131	Analysis	CO3	Apply the network topology and Visualization tools.
			Engineering			CO4	Analyze the experiment with small world models and clustering models.
			M.Tech-			COI	Connect openly on a global scale, with global learners and instructors.
33	VM 10	50	Computer	2050102152	1,000	CO2	Develop high quality learning using multimedia platform.
33	VR19	58	Science and	2058192152	MOOCs-1	CO3	Self assessment of their performance and learning process.
			Engineering			CO4	Develop a life long learning culture and updating the knowledge according with emerging trends.
			M.Tech-			COI	Connect openly on a global scale, with global learners and instructors.
34	VR19	58	Computer	2058192160	M000-2	CO2	Develop high quality learning using multimedia platform.
24	VKIS	30	Science and	2038192100	MOOCs-2	CO3	Self assessment of their performance and learning process. Develop a life long learning culture and updating the knowledge according
			Engineering			CO4	with emerging trends.
							apply the software engineering principles in planning, formulating an
						CO1	innovative design/ approach and computing the requirements appropriate to
			M.Tech-				chosen topic within the context of legal, societal and environment constraint.
2.5	1/010		Computer	2050102150	Dissertation-I/	CO2	Ability to perform individually accepting responsibility, taking initiative, and
35	VR19	58	Science and	2058192170	Industrial Project #		providing leadership, necessary to ensure project success.
			Engineering			CO3	Ability to use formal and informal communications with guide, make
							presentations and prepare technical document. Develop/implement the solutions with appropriate techniques, resources and
						CO4	contemporary tools for social relevent issues/problems.
							apply the software engineering principles in planning, formulating an
						COI	innovative design/ approach and computing the requirements appropriate to
			M.Tech-				chosen topic within the context of legal, societal and environment constraint.
3.	110.5		Computer			CO2	Ability to perform individually accepting responsibility, taking initiative, and
36	VR19	58	Science and	2058192270	Dissertation-II		providing leadership, necessary to ensure project success.
	,		Engineering			CO3	Ability to use formal and informal communications with guide, make presentations and prepare technical document.
							Develop/implement the solutions with appropriate techniques, resources and
					1	CO4	

							FION TECHNOLOGY (A) MMUNICATION ENGINEERING
							on Engineering Course Outcomes
S.NO	Regulatio n	Program me Code	Programme Name	Course Code	Course Name	COs	Course Outcomes (COs):Upon completion of the course student will be able
			M.Tech - Electronics and			COI	Understand the basic concepts of a Karnaugh Map ("K-map") for a 2-, 3-, 4- or 5-variable logic function and to identify the prime implicates, essential prime implicates, and nonessential prime implicates of a function depicted or a K-map.Perform the minimization of a Boolean function using tabular method, QM algorithm and CAMP algorithm and determine the Adjacencies DA, CSC, SSMs, EPCs and SPCs.
1	VR19	70	Communication Engineering	2070191100	Digital System Design	CO2	Perform the minimization of PLA using IISc algorithm and folding using COMPACT algorithm.
						CO3	Design a digital circuit by steps involving ASM chart and understand the digital system design approaches using CPLDs, FPGAs and ASICs.
						CO4	Rectify a single fault and multiple faults in combinational circuits using Path sensitization method, Boolean difference method and Kohavi algorithm and also perform fault diagnosis in sequential circuits.
						COI	Model digital communication system using appropriate mathematical techniques (error probability, constellation diagrams, pharos diagrams).
	2 VR19		M.Tech -			CO2	Understanding the basic concepts of how digital data is transferred across computer networks. Independently understand basic computer network technology.
2		70	Electronics and Communication Engineering	2070191101	Digital Data Communication	CO3	Understand and explain Data Communications System and its components a identification of the different types of network topologies and protocols.
						CO4	Enumerate the layers of the OSI model and TCP/IP. Explain the function(s) each layer. Identify the different types of network devices and their functions within a network and finally network design and implementation.
			M.Tech -		-	COI	learn basics of two-dimensional transforms.
3	3 VR19 70	70	Electronics and	2070191150	Transform Techniques	CO2	Understand the definition, properties and applications of various two- dimensional transform.
	VKIY	,,,	Communication Engineering	20/0191130	Transform Techniques	CO3	Understandthebasicconceptsofwavelettransform.
						CO4	Understand the special topics such as wavelet packets, Bi-orthogonal wavelets e.t.
	17710	70	M.Tech - Electronics and		VLSI Technology and	CO1	ReviewofFET fundamentalsforVLSIdesign. Toacquiresknowledgeaboutstickdiagramsandlayouts.
4	VR19	70	Communication	2070191151	Design	CO3	EnabletodesignthesubsystemsbasedonVLSIconcepts
			Engineering			CO4	Analyse the floor planning methods UnderstandtheoperationofRadarandcharacteristicsofMatchedfilter fornon-
5	VR19	70	M.Tech - Electronics and	2070101152	Radar Signal	COI	whitenoise.
,	VKI9	70	Communication Engineering	2070191152	Processing	CO2	Knowthesignificanceandtypes of pulsecompression techniques for analogand digital signals and phase coding in Radarand various polyphase codes used for phase coding.
						COI	Generalize the properties of statistical models in the analysis of signals using Stochastic processes.
6	VR19	70	M.Tech - Electronics and	2070101162	Statistical Signal	CO2	Differentiate the prominence of various spectral estimation techniques for Achieving higher resolution in the estimation of power spectral density.
Ü	VKIS	/0	Communication Engineering	2070191153	Processing	CO3	Outline various parametric estimation methods to accomplish the signal
			Engineering			CO4	modeling even at higher order statistics. Design and development of optimum filters using classical and adaptive algorithms.
						COI	Abletoanalyzecharacteristicsofopticalfiber
			M.Tech -				andsignalpropagationthroughopticalfibers Know the commonly used components and subsystems in optical
7	VR19	70	Electronics and Communication	2070191154	Optical Communication Technology	CO2	communication and network systems ,Working principle of optical communication components ,amplifiers, filters
			Engineering			CO3	Analyze Transmission system model
						CO4	Understand the importance of wavelength division multiplexing (WDM) and de-multiplexing,
-			M.Tech -			COI	Identify and utilize different forms of cryptography techniques.
8	VR19	70	Electronics and	2070191155	Network Security &	CO2	Incorporate authentication and security in the network applications. Distinguish among different types of threats to the system and handle the
			Communication Engineering		Cryptography	CO3	same.
			M.Tech -			CO4	Analyze and design hash and MAC algorithms, and digital signatures. Identify, formulate, solve and implement problems in signal processing,
9	VR19	70	Electronics and	2070191110	System Design Using	CONTRACTOR	communication systemsetc using RTL design tools.
9	VKI9	/0	Communication	2070191110	VHDL Lab	CO2 CO3	Use EDA tools like Cadence, Mentor Graphics and Xilinx. Design different digital circuits and simulate using Xilinx
			Engineering			CO4	Apply verilog programming tools to implement different applications.
			M.Tech -			COI	Understand the basics of data communication, networking, internet and their
10	VR19	70	Electronics and Communication	2070191111	Data Communications Lab	CO2	Analyze the services and features of various protocol layers in data network
			Engineering			CO3	Differentiate wired and wireless computer networks
		L				CO4	Analyse TCP/IP and their protocols.

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						COI	Understandresearchproblemformulation and analyzeresearch relatedinformationFollowresearchethics
			M.Tech -			CO2	Understand that today's world is controlled by Computer, Information Technology, buttomorrowworldwill beruled byideas, concept, andcreativity.
11	VR19	70	Electronics and Communication Engineering	2000191100	Research Methodology and IPR	CO3	UnderstandingthatwhenIPRwouldtakesuchimportantplaceingrowthofindividual s& nation, it is needless to emphasis the need of information about Intellectual PropertyRighttobepromotedamongstudentsingeneral& engineeringinparticular.
						CO4	Understand that IPR protection provides an incentive to inventors for further researchworkandinvestmentinR&D,whichleadstocreationofnewandbetterproducts,andintum brings about, economicgrowth andsocialbenefits.
			M.Tech -			COI	prepare project title.
12	VR19	70	Electronics and	2000191130	Soft Skills (Audit	CO2	prepare a project report.
	100000000000000000000000000000000000000		Communication		course 1)	CO3	Identify gaps in literature.
			Engineering			CO4	Improve writing and presentation skills of the project.
						COI	Know digital image, representation of digital image, importance of image resolution, applications in image processing, the advantages of representation of digital images in transform domain, application of various image transforms.
			M.Tech -			CO2	Understand and analyze the image enhancement and image degradation, image
13	VR19	70	Electronics and Communication Engineering	2070191200	Image and video processing	CO3	restoration techniques using spatial filters and frequency domain. Understand and analyze the detection of point, line and edges in images, edge linking and various segmentation techniques and the redundancy in images, various image compression techniques.
			CO4	Describe the video technology from analog color TV systems to digital video systems, how video signal is sampled and filtering operations in video processing as well as describing the general methodologies for 2D motion			
						201	estimation, various coding used in video processing.
			M.Tech -		Wireless	CO1	UnderstandCellularcommunicationconcepts Studythemobileradiopropagation
14	VR19	70	Electronics and	2070191201	Communications and	CO3	Studythewireless networkdifferent typeof MAC protocols
5505	100000	/0	Communication	2070191201	Networks		Determine the type and appropriate model of wireless fading channel based on
			Engineering			CO4	the system parameters and the property of the wireless medium.
			M.Tech -			COI	Analyze, design, optimize and simulate analog and digital circuits using CMOS constrained by the design metrics.
15	VR19	70	Electronics and	2070191250	CMOS Analog &	CO2	Connect the individual gates to form the building blocks of asystem.
	SPEED TO	2027	Communication	2070171230	Digital IC Design	CO3	Use EDA tools like Cadence, Mentor Graphics and other open source
			Engineering			10000000	software tools like Ngspice.
					-	CO4	Design Analog and digital circuits using CMOS
			M.Tech -			COI	Understand parallelism and pipelining concepts, the design aspects and challenges.
16	VR19	70	Electronics and	2070191251	Advanced Computer	CO2	Evaluate the issues in vector and array processors.
			Communication Engineering		Architecture	CO3	Study and analyze the high performance scalable multithreaded and
			Engineering			CO4	multiprocessor systems Interpret the different architecture models
						COI	Understand the basic concepts of Artificial neural network systems as well as understand the McCulloch-Pitts neuron model, simple and multilayer Perception, Adeline and Madeline concepts.
17	VR19	70	M.Tech - Electronics and	2070191252	Soft Computing	CO2	Data processing, Hopfield and self-organizing network and difference between crisp sets to fuzzy sets, fuzzy models, fuzzification, inference, membership functions, rule based approaches and defuzzification and Self – organizing fuzzy logic control, non linear time delay systems.
			Communication Engineering		Techniques	CO3	Understand the concept of Genetic Algorithm steps. Tabu, anD-colony search
							techniques for solving optimization problems. GA applications to power system optimization problems, identification and
						CO4	control of linear and nonlinear dynamic systems using MATLAB-Neural network toolbox and also know the application and importance stability analysis
						COI	Analyze and evaluate the cyber security needs of an organization.
18	VR19	70	M.Tech - Electronics and	2070101252	Cubas Sana San	CO2	Conduct a cyber security risk assessment.
10	VICIO	70	Communication Engineering	2070191253	Cyber Security	CO3	Measure the performance and troubleshoot cyber security systems.
						CO4	Implement cyber security solutions.

						COI	Understand the basics concepts of Digital Signal Processing (DSP) and transforms.
			M.Tech - Electronics and	×.	DCD D	CO2	Distinguish between the architectural features of General purpose processors and Programmable DSP processors
19	VR19	70	Communication Engineering	2070191254	DSP Processors and Architectures	CO3	Understand the architectures of TMS320C54xx devices.
						CO4	Understand the architectures of ADSP 2100 DSP devices and Black fin Processor and interfacing various devices to DSP Processors as well as able to write simple assembly language programs using instruction set of TMS320C54xx.
					COI	Understand the electromagnetic environment the definitions of EMI and EMC, history of EMI some examples of practical experiences due to EMI such as mains power supply, switches and relays etc.	
20	VR19	70	M.Tech - Electronics and Communication	2070191255	EMI/EMC	CO2	Understand the celestial electromagnetic noise the occurrence of lightning discharge and their effects, the charge accumulation and discharge in an electrostatic discharge, model ESD wave form, the various cases of nuclear explosion and the transients.
	Engineering	Engineering			CO3	Understand the methods to measure RE and RS in the open are test sites	
,						CO4	Understand the measurement facilities and procedures using anechoic chamber, TEM cell, reverberating chamber GTEM cell.
						CO1	The model of object oriented programming: abstract data types, encapsulation, inheritance and polymorphism
7,		70	M.Tech - Electronics and Communication Engineering		Object Oriented	CO2	Fundamental features of an object oriented language like Java: object classes and interfaces, exceptions and libraries of object collections
21	VR19	,,		2070191256	Programming	CO3	How to take the statement of a business problem and from this determine suitable logic for solving the problem; then be able to proceed to code that logic as a program written in Java.
						CO4	How to test, document and prepare a professional looking package for each business project using java doc.
				2070191210	Advanced Communications Lab	COI	Identify the different types of network devices and their functions within anetwork.
22	VR19	70	M.Tech - Electronics and Communication Engineering			CO2	Understand and build the skills of sub-netting and routingmechanisms.
22	VKI	70				CO3	Understand basic protocols of computer networks, and how they can be used to assist in network design andimplementation
						CO4	Implement the digital filters using DSP Trainer kit
					w.	COI	Perform and analyze image and video enhancement and restoration
23	VR19	70	M.Tech - Electronics and	2070191211	Advanced Image	CO2	Perform and analyze image and video segmentation and compression
25	VKI	70	Communication Engineering	20/0191211	Processing Lab	CO3	work and process viz., detection, extraction on the image/video
						CO4	Extract the information from the image using boundary and regional features.
						COI	Identify, discuss and justify the technical aspects of the chosen project with a comprehensive and systematic approach.
24	VR19	70	M.Tech - Electronics and	2070191270	Mini Project(Seminar)	CO2	Reproduce, improve and refine technical aspects for engineering projects.
	24 VR19	,0	Communication Engineering	2070191270	Tran Froject(Schillar)	CO3	Work as an individual or in a team in development of technical projects.
						CO4	Communicate and report effectively project related activities and findings.

						COI	Have general knowledge and legal literacy and thereby to take up competitive examinations.
25	VR19	70	M.Tech - Electronics and	2000191230	Constitution of India	CO2	Understand state and central policies, fundamental duties.
25	VIII)	,,,	Communication Engineering	2000191230	(Audit course)	CO3	Understand Electoral Process, special provisions.
						CO4	Understand powers and functions of Municipalities, Panchayats and Cooperative Societies
						COI	Understand the mathematical background of signal detection an destination
26	VR19	70	M.Tech - Electronics and	2070192150	Detection & Estimation	CO2	Use classical and Bayesian approaches to formulate and solve problems for signal detection and parameter estimation from noisy signals.
	Communication Engineering	2070172130	Theory	CO3	Derive and apply filtering methods for parameter estimation.		
						CO4	Estimate the Parameters of Random Processes from Data
						COI	Understand theory of different filters and algorithms
27	VR19 70 M.Tech - Electronics and Communication Engineering 2070192151	Advanced Digital	CO2	Understand theory of multirate DSP, solve numerical problems and writealgorithms			
		,0	ACTUAL DESCRIPTION OF STREET	2070172131	Signal Processing	CO3	Understand theory of prediction and solution of normal equations
				W.		CO4	Estimate the Parametric Methods of Power Spectrum
	VR19				Coding Theory and Applications	COI	Learning the measurement of information and errors.
28		70	M.Tech - Electronics and	2070192152		CO2	Obtain knowledge in designing Linear Block Codes and Cyclic codes.
			Communication Engineering	2010172132		CO3	Construct tree and trellies diagrams for convolution codes
						CO4	Design the Turbo codes and Space time codes and also their applications
				2070192160	MOOCs-2	COI	Connect openly on a global scale, with global learners and Instructors
29	VR19	70	M.Tech - Electronics and			CO2	Develop high quality learning using multimedia platform
			Communication Engineering			CO3	Self assesment of their performance and learning process.
						CO4	Adapt a life long learning culture and updating the knowledge according with emerging trends
						COI	Apply knowledge of Electronics and communication engineering fundamentals to solve the complex Engineering problems
33	VR19	70	M.Tech - Electronics and	2070192170	Dissertation Phase -I	CO2	Design prototypes and solutions to solve the specific needs related with public health, safety, society and environment leading to sustainable development following ethical values
			Communication Engineering	3.72.170	- Isos anon i hase -1	CO3	Adapt appropriate techniques, resources and modern engineering tools during the implementation of project
						CO4	Develop a multidisciplinary project leading to the ability of engagement in lifelong learning and self-development
						COI	Apply knowledge of Electronics and communication engineering fundamentals to solve the complex Engineering problems
34	VR19	70	M.Tech - Electronics and Communication Engineering	2070192270	Dissertation Phase -II	CO2	Design prototypes and solutions to solve the specific needs related with public health, safety, society and environment leading to sustainable development following ethical values
	VR19					CO3	Adapt appropriate techniques, resources and modern engineering tools during the implementation of project
						CO4	Develop a multidisciplinary project leading to the ability of engagement in lifelong learning and self-development

VIGNAN'S INSTITUTE OF INFORMATION TECHNOLOGY (A) DEPARTMENT OF MASTER OF BUSINESS ADMINISTRATION VR19- MBA COURSE OUTCOMES

		VR19- MBA COURSE OUTCOMES								
S NO	Programm e Code	Programme Name	Course Code	Course Name	со	Course Outcome: After the completion of the course student will be able to				
					COI	Extract Managerial skills of the students				
		MBA-Master of			CO2	Identify the external and internal factors that influence on organizational structure behaviors				
1	1 E-00	Business Administration	3099191100	Principles of Management	CO3	Analyze how an organization's leaders/managers utilize job design, positional power, and goal setting/performance management to motivate employees.				
					CO4	Discuss leadership characteristics that produce high performing organizations.				
					COI	Identify the objectives, nature, scope, role & responsibilities of a				
					CO2	manager of a business undertaking. Predict the demand for a product or product mix of a company & to				
2	1 E-00	MBA-Master of Business	3099191101	Managerial		analyze various factors influencing demand elasticity. Examine optimum production & cost functions with the help of				
		Administration		Economics	CO3	mathematical equations & by developing graphical solutions through linear programming applications.				
					CO4	Discuss the concept of equilibrium price and output in different market situations i.e., perfect, monopoly, monopolistic & Oligopoly competition with the help of graphs.				
					COI	Identify the types of Accounts and Principles.				
, 1		MBA-Master of	********	Accounting for	CO2	Prepare Financial Statement.				
3	1 E-00	Business	3099191102	Managers	CO3	Analyze the Financial Position of the Organization.				
		Administration			CO4	Evaluate Cost and Cost behaviour.				
			-		COI	Discuss communication theories.				
		MBA-Master of		Managerial	CO2	Display Verbal and Non-Verbal Communication				
4	1 E-00	Business	3099191103	Communication & Soft Skills	CO3	Develop Presentation Skills				
		Administration			CO4	Design Business Report.				
			****		COI	Interpret business environment and its impact				
_	1 E-00	MBA-Master of Business	3099191104	Business Environment	CO2	Discuss the comprehensive structure of Indian economy				
5					CO3	Debate on various Policies				
		Administration			CO4	Analyze the legal Regulations pertaining to business environment				
				Operations Research for Business Decision	COI	Calculate descriptive statistical measures and appreciate the uses and limitations of the measures.				
					CO2	Formulate basic concepts of probability and theoretical probability (binomial, normal but not poisson) distributions.				
6	1 E-00	MBA-Master of Business Administration	3099191105		CO3	To solve a simple ordinary least squares regression model with one explanatory variable, apply the model, and calculate the correlation				
					CO4	coefficient between two variables. Apply quantitative models (linear programming and network analysis) at an introductory level, with emphasis on relevant data and				
					CO1	the limitations of the techniques. Identify the softwares required for analysis.				
		MBA-Master of		Information		Apply the Financial Modelling Techniques.				
7	1 E-00	Business	3099191110	Technology	CO3	Evaluate data using statistical techniques.				
		Administration		Lab	CO4	Design the presentation using charts.				
					CO1	Application of consumer behavior in marketing				
	1.5.00	MBA-Master of		Employability	CO2	Analyze Individual and group determinants of consumer behavior				
8	1 E-00	Business	3099191180	Skills-I	CO3	Evaluate Environmental influences on consumer behavior				
		Administration		Paris 177 17	CO4	Analyze Consumer decision making process				
		MD4 M			COI	Identify the sources of Finance.				
	1 5 00	MBA-Master of	2000101200	Financial	CO2	Evaluate Profitable Investment Proposals.				
9	1 E-00	Business	3099191200	Management	CO3	Analyze proportions of Retention and Dividend Payout Ratio.				
		Administration			CO4	Design Credit Policies for Business.				
		MDA Master C		T.T	COI	Identify the roles of HR Manager.				
10	1 E 00	MBA-Master of Business	2000101201	Human	CO2	Interpret current trends and practices in the field of HR				
10	1 E-00		3099191201	Resource	CO3	Evaluate employee performance and organizational effectiveness				
		Administration		Management	CO4	Design Compensation system for an organization.				

		MBA-Master of			COI	Identify core concepts of marketing and the role of marketing in business and society
11	1 E-00	Business	3099191202	Marketing	CO2	Apply the Segmentation, Targeting and Positioning.
		Administration		Management	CO3	Create an integrated marketing communications plan.
		18 - Faller Strate College Col			CO4	Analyze marketing problems and implement marketing plans.
					COI	Identify the core features of the operations and production management.
		MBA-Master of		Production and	CO2	Interpret the various parts of the operations and production
12	1 E-00	Business Administration	3099191203	Operations Management	CO3	management processes. Develop an integrated framework for strategic thinking and decision
		Administration		ivianagement		making. Illustrate operational methodologies to assess and improve an
					CO4	organizations performance.
1		MBA-Master of		Business	CO1	Discuss the major types of Research and designs.
13	1 E-00	Business	3099191204	Research	CO2	Formulate Research problems and measurements.
		Administration		Methodology	CO3	Interpret Research reports.
-					CO4	Caluculate Business Problems using appropriate methods.
		MBA-Master of		0	COI	Identify the roles and responsibilities of Organizational Behaviour.
14	1 E-00	Business	3099191205	Organizational	CO2	Display Leadership skills in an Organization.
		Administration		Behaviour	CO3	Analyze behavioural dimensions.
-					CO4	Apply Interpersonal Communication skills for Team Building.
1		MBA-Master of			COI	Conduct field survey on
15	1 E-00	Business	3099191270	Mini Project	COL	society/corporate/business/government/NGO.
13	1 L-00	Administration	3099191270	Mini Project	CO2	Apply the theortical concept
- 1		Administration		1	CO3	Analyze and interpret the data
-					0.75	Prepare and present the report
		MBA-Master of		Employability	CO1	Identify the importance of Comprehension & Speech Fluency Display of Time Management Skills
16	1 E-00	Business	3099191280	Skills-II	CO3	
		Administration			CO4	Interpret ideas and information
_		 			CO4	Development of writen and oral communication
200000	1.5.00	MBA-Master of	2000122-2	Strategic	COI	Identify the practical and integrative model of strategic management.
17	1 E-00	Business	3099192100	Management	CO2	Apply the Environmental Scanning Techniques
- 1		Administration		Management	CO3	Analyze the formulation and structure of Organizational Strategy.
					CO4	Design the Organizational Strategy.
					COI	Outline the Indian Contract Act.
		MBA-Master of		Legal Aspects	CO2	Identify the rights of Unpaid Seller.
18	1 E-00	Business Administration	3099192101	Of Business	CO3	Discuss various aspects of Negotiable Instruments and Companies Act.
			502		CO4	Debate on various Cyber Laws.
					COI	Identify the role of Ethical Values of an Organization.
		MBA-Master of		Business Ethics	CO2	Debate the global perspective of Unethical practices.
19	1 E-00	Business	3099192102	& Corporate	CO3	Discuss the Ethical practices in Functional areas.
		Administration		Governance	CO4	Relate the role of Corporate Governance practices in Indian Industries.
		MBA-Master of		Product	CO1	Infer the basic concepts of Product.
20	1 E-00	Business	3099192150	Management	CO2	Design Development of New Product.
_	. 2 00	Administration	3077172130	(Marketing)	CO3	Build the brand positioning.
		. idiiiiii stratioli		(Marketing)	CO4	Discuss the Channels of Distribution and Packaging.
				Promotion And	COI	List out the various concepts of Promotion and Distribution.
	G 000 1 W11000	MBA-Master of		Distribution	CO2	Outline the challenges of Distibution System.
21	1 E-00	Business	3099192151	Management	CO3	Discuss the various Channels of Distribution.
		Administration		(Marketing)	CO4	Debate the various ethical and social issues in Distribution
						Management.
				Investment	COI	Identify different segments of Financial Markets.
	g as 1000	MBA-Master of		Analysis And	CO2	Evaluation of various Asset Valuation Models.
22	1 E-00	Business	3099192152	Portfolio	CO3	Apply various Investment Analysis Tools.
		Administration		Management (Fin) (Elective)	CO4	Adopt and apply portfolio evaluation models for the realistic situations
		MDA Master C			COI	Identify the fundamental concepts of Banking System in India.
,,	1 E 00	MBA-Master of	2000102152	Banking And	CO2	Discuss the various types of Banking Funds.
23	1 E-00	Business	3099192153	Insurance (Fin)	CO3	Evaluate the latest regulations and innovations in Banking.
- 1		Administration		(Elective)	CO4	Analyze the LIC and GIC.

						Internal control of the control of t
				Compensation	COI	Discuss concepts of compensation and designing of effective
		MBA-Master of		And	CO2	compensation system. List out various Wage payment systems.
24	1 E-00	Business	3099192154	Performance	CO ₂	Evaluate administration of wage and salary.
		Administration		Management		Analyze effectiveness of performance management in an
				(Hr) (Elective)	CO4	organization.
				Management	COI	Identify the essential concepts of industrial relations.
25	1 5 00	MBA-Master of	2000102155	Of Industrial	CO2	Discuss the Trade Unions and Work-Life Balance.
25	1 E-00	Business	3099192155	Relations (Hr)	CO3	Design the Wage and Salary Administration.
		Administration		(Elective)	CO4	Interpret and Solve the Grievances in Industries.
					001	Conduct field survey on
		MBA-Master of			COI	society/corporate/business/government/NGO.
26	1 E-00	Business	3099192170	Case Study	CO2	Apply the theortical concept
		Administration			CO3	Analyze and interpret the data
					CO4	Prepare and present the report
					COI	
		MBA-Master of			COI	Discuss and discover barriers to effective communication techniques.
27	1 E-00	Business	3099192180	Employability	CO2	Develop effective writing skills in academic and professional
-		Administration	3077172100	Skills-III	CO2	contexts.
					CO3	Make Use English language in business communication
					CO4	demostrate skills in listening comprehension, GDs and Interview.
					COI	Acquires knowledge of the functional components within logistics to
		MDANG				the interrelationships in the integrated supply chain.
20	1 5 00	MBA-Master of	2000102200	Logistic and	CO2	Analyze the difference between logistics and supply chain
28	1 E-00	Business Administration	3099192200	Supply Chain		management & gain knowledge on Benchmarking.
		Administration		Management	CO3	Evaluate warehousing and transportation options and recommend
					004	appropriate solutions for business requirement
					CO4	Make use of technology in logistics and supply chain management.
		MBA-Master of			COI	Discuss Growth and Importance of Entrepreneurship
29	1 E-00	Business	3099192201	Entrepreneurshi	CO2	Explain the concept of entrepreneurship and Women entrepreneurship
2)	1 L-00	Administration	3077172201	p Development	CO3	Extract the essence of entrepreneurial motivation
		/ Idininistration			CO4	Elucidate the problems of women entrepreneurship
					COI	Discuss concepts and components of Services Marketing
		MBA-Master of		Services	CO2	Identify key dimensions of Services Marketing
30	1 E-00	Business	3099192250	Marketing	CO3	Develop service marketing mix strategies
		Administration		(MARKETING		Evaluate the behavior of the customer and the strategies to retain
)	CO4	them.
					COI	Discuss consumer behavior, models and learning process.
					CO2	Analyze consumer attitude formation, change and consumer
		MBA-Master of		Consumer	CO2	communication.
31	1 E-00	Business	3099192251	Behavior	CO3	Identify psychological factors affecting consumer behavior and post
		Administration		(Marketing)	CO3	purchase process.
					CO4	
-						Create awareness about consumerism and consumer protection acts.
					COI	Demonstrate the understanding of international financial theory
				International	CO2	Illustrate applications pertaining to exchange rate determinants.
20	1 5 00	MBA-Master of	200010555	Financial		
32	1 E-00	Business	3099192252	Management	CO3	Develop a frame of reference through which to identify, evaluate, and
		Administration		(Fin) (Elective)		solve problems pertaining to international financial management.
					CO4	Interpret the international taxation methods and management of
				-	entitate to	External Indebtness.
		MBA-Master of		Financial Risk	COI	Discuss risk management concepts in present business situations.
33	1 E-00	Business	3099192253	Management	CO2	Evaluate financial risk measurement methods Demonstrate financial risk measurement tools
		Administration		(Fin)	CO ₃	
					CO4	Apply advanced financial risk management techniques
					COI	Demonstrate across a broad knowledge of HRM strategies, Policies
		MBA-Master of		Global Human		and practices across a range of cultural and nations.
34	1 E-00	The service is considered and	3000102254	Resource	CO2	Differentiate intentional and domestic dimension of the operational aspects of HRM.
54	1 12-00	Business Administration	3099192254	Management	CO3	
				(HR) (Elective)		Discuss the concepts of expatriation To analyze and apply international HRM concepts in relation to
					CO4	global ethical issues in the work place
				1		Igroom chircai issues in the work place

				Management of Change and	COI	Discuss the relevance of change management approaches and models to a variety of situations where appropriate
		MBA-Master of			CO2	Identify range of skills relevant to the change management process
35	1 E-00	Business Administration	3099192255	Development (HR)	CO3	Articulate management competencies in Organizational Development
				(IIIC)	CO4	Apply tools and models to explore underlying organizational and behavioural issues that may affect the change process
	I E-00	MBA-Master of			COI	Connect openly on a global scale, with global learners and Instructors
36		Business Administration	3099192256	MOOCs	CO2	Develop high quality learning using multimedia platform
					CO3	Self assesment of their performance and learning process.
					CO4	Adapt a life long learning culture and updating the knowledge
					CO4	according with emerging trends
				Major Project	COI	Conduct field survey on
		MBA-Master of		&	COI	society/corporate/business/government/NGO.
37	1 E-00	Business	3099192270	Comprehensive	CO2	Apply the theortical concept
		Administration		Viva	CO3	Analyze and interpret the data
				7174	CO4	Prepare and present the report
		MBA-Master of			CO1	Develop value based leadership
38	1 E-00	Business	3099192280	Employability	CO2	Analyze and effective communication in the aspects of business.
	1 L-00	Administration	3077172280	Skills-IV	CO3	Apply the knowledge of effective writing skills in business context.
					CO4	Critical thinking abilities for decision making.

VIGNAN'S INSTITUE OF INFORMATION TECHNOLOGY DEPARTMENT OF MCA

VR19 - MCA COURSE OUTCOMES

S. NO.	Program me Code	Programme Name	Course Code	Course Name	со	Course Outcome: After the completion of the course student will be able to
					COI	Analyze problems and develop solutions by writing algorithms.
1	1F-00	MCA-Master of Computer	4010191101	C Programming and	CO2	Design various dynamic allocation memory programs.
		Applications		Data Structures	CO3	Develop simple real-time applications to get familiarity of the programming environment.
					CO4	Solve problems using various data structures like linear list, stack, queue, tress and graphs
					CO1	Identify the logic gates and their functionality.
		MCA-Master of		Digital Computer	CO2	Perform number conversions from one system to another system.
2	1F-00	Computer Applications	4010191102	Digital Computer Fundamentals	CO3	Design basic electronic circuits (combinational circuits).
)					CO4	Perform a comparative analysis of the components of different memory units.
					CO1	Analyze logical structure and able to Apply
	15.00	MCA-Master of	4010191103	Discrete Mathematical Structures and Graph Theory	CO2	inference theory to verify the consistence of data. Construct Hasse diagram and Understand concept of recursive functions
3	1F-00	Computer			CO3	Understand different counting techniques.
		Application			CO4	Apply different methods to solve homogeneous and non-homogeneous recurrence relations.
					CO5	Apply graph theory concepts in core subjects such as data structures and network theory effectively.
					COI	To identify the need and the role of accounting in present modern business.
		MCA-Master of			CO2	To have capabilities to preparation of trail balance - Final accounts.
4	1F-00	Computer Application	4010191104	Accounting and Financial Management	CO3	Financial management role and objectives of the business.
					CO4	To explain the Importance of the cost behavior
					CO5	Use of the standard costing and budgeting in present business level.
					CO1	The students will be able to read, understand and interpret material on Environment, Science and Technology, tourism, Energy Sources, Social Awareness
5	1F-00	MCA-Master of Computer Application	4010191105	Professional Communication	CO2	The students will be able to analyze the functions of language and grammar in spoken and written forms.
					CO3	The students will be able to write effectively on various domains.
					CO4	The students will be able to prepare and exhibit oral presentation skills by using ICT.(Individual/Team)

						CO1	Use English language fluently, accurately and appropriately.
			MCA-Master of		English Language	CO2	Demonstrate skills in Reading, listening
-	6	1F-00	Computer	4010191121	Communication Skills -	CO2	comprehension, GDs and Interview.
	Ŭ	11 00	Application			CO3	Read and answer questions (orally and in writing) based on passages.
						CO4	Show effective writing skills in academic and
ŀ							professional contexts.
						CO1	Able to write programs in C Language
1			MCA-Master of		C D	CO2	Develop logical and analytical thinking in C
	7	1F-00	Computer	4010191122	C Programming and Data Structures Lab	CO3	Knowledge in writing programs in various concepts like arrays, functions, pointer etc.
1			Application			CO4	
ł							How to read and write contents from or into a file
1						CO1	Identify the basic peripherals, assembling a
						COI	Personal Computer, Installation of system
1						CO2	software like MS Windows, device drivers. Troubleshoot Hardware and software.
						CO2	
1							Analyze different ways of hooking the PC on to
						CO3	the internet from home and workplace effectively, Usage of the internet, web browsers, email,
1			MCA-Master of				newsgroups and discussion forums.
_	8	1F-00	Computer Application	4010191123	IT Workshop Lab		newsgroups and discussion forums.
							Get awareness about "Cyber hygiene" (protecting
1						CO4	the personal computer from getting infected with
							viruses), worms and other cyber-attacks.
							Crafting professional word documents, Excel
1						CO5	spread sheets, Power point presentations and
							personal web sites using the Microsoft suite of
							office tools.
			MCA-Master of Computer Application	4010191201	OOPS Through JAVA	CO1	Apply OOP concepts and basics of Java
						COI	programming.
	9	1F-00				CO2	Use the concepts of Java programming in problem
							solving.
						CO3	Extend the knowledge of Java programming in
ŀ							developing futuristic applications.
1						CO1	Apply optimization techniques for the
						000	improvement of system performance.
ı			MCA-Master of			CO2	Design and solve synchronization problems. Learn about minimization of turnaround time,
1	10	1F-00	Computer	4010191202	Operating Systems		waiting time and response time and also
1	10	11 00	Application	4010171202	Operating Systems	CO3	maximization of throughput by keeping CPU as
1		w.	rippiication				busy as possible.
-						CO4	Change access controls to protect files.
						CO5	Analyze the different operating systems.
İ							Prepare a Software Requirement Specification
						CO1	(SRS) document for any software project.
						000	Identify the importance of system analysis and
			MCA-Master of			CO2	design in solving complex problems.
	11	1F-00	Computer	4010191203	Software Engineering		Distinguish between object-oriented approach and
			Application			CO3	traditional approach in system analysis and design.
						CO4	Analyze various metrics to measure software
							product size and complexity.

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						CO1	Analyze Different transportation models
	10	15.00	MCA-Master of			CO2	Design inventory and queueing theroy models for optimal decisions
	12	1F-00	Computer	4010191204	Operations Research		Apply optimal strategy to real time applications
1			Application			CO3	using dynamic programming and game theory
						CO4	understand the basic s of Computer Graphics
Γ					·	COL	give a description of the Architecture of Database
						CO1	Management Systems
						CO2	understand the applications of Databases and functions of DBA
						CO3	know the advantages and disadvantages of the
	12	15.00	MCA-Master of	4010101005	Database Management		different models
	13	1F-00	Computer Application	4010191205	Systems	CO4	compare relational model with the structured query language (SQL)
						CO5	know the various constraints associated with
1							relational database model
						CO6	know the rules guiding transaction ACID
- [CO7	understand the concept of data planning and
ŀ							database design
			MCA-Master of Computer Application	4010191221	OOPS Through JAVA Lab	CO1	write simple programs in Java Language
		1F-00				CO2	Develop logical and analytical thinking in Java Knowledge in writing programs in various
	14					CO3	concepts like Exception Handling, applets, swings
						003	etc.
			, in the second second				Design to read and write contents from or into a
			, and the second			CO4	file
Ī				4010191222	Database Management Systems Lab	CO1	Demonstrate knowledge of artistic and design
			MCA-Master of Computer Application				components that are used in the creation of a web
1							site
							Utilize and apply the technical, ethical and
	15	1F-00				CO2	interpersonal skills needed to function in a
							cooperative environment
						CO3	Experiment Unix utilities and perform basic shell
1							control of the utilities
						CO4	Create effective file access control methods for
ŀ							handling Unix file system. Implement CPU scheduling algorithms and
		*	MCA-Master of			CO1	Bankers algorithm used for deadlock avoidance
	16	1F-00	Computer	4010191223	Operating System Lab		and the available avoidable
			Application			CO2	Implement CPU scheduling algorithms and
							Bankers algorithm used for deadlock prevention.
						CO1	Implement web based applications using features
						COI	of HTML.
						CO2	Develop reusable component for Graphical User
			MCA-Master of		Advanced Java & Web		Interface applications
	17	1F-00	Computer	4010192101	Technologies	CO3	Apply the concepts of server side technologies for
			Application		0.22		dynamic web applications.
						004	Implement the web based applications using
						CO4	effective data base access with rich client
L			L	L			interaction.

					,	CO3	& make a reusable software component, using Java Bean. Understand the multi-tier architecture of webbased enterprise applications.
	22	1F-00	MCA-Master of Computer Application	4010192121	Advanced Java & Web Technologies Lab	CO2	Learn to access database through Java programs, using Java Data Base Connectivity (JDBC). Create dynamic web pages, using Servlets and JSP
						CO1	Implement sophisticated Java applications and well-organized, complex computer programs with both command line and graphical user interfaces.
						CO4	Able to design algorithm
			Application		1 ngoritimis	CO3	Analysis of different type of complexity and its applicable condition
	21	1F-00	MCA-Master of Computer	4010192105	Design and Analysis of Algorithms	CO2	Basic functionality of different type of algorithms and its usage
						COI	Basic data structure and it working topological design.
		1F-00				CO5	organizations
			MCA-Master of Computer Application	4010192103 4010192104	Principles and Practices of Management		Coordination and control process in the
						CO4	Theories of motivation and leadership styles
	20					CO2	organizations Process of organizing and delegation of authority
						COI	management thought Importance of planning and decision making in
ŀ						CO5	TCP or UDP Protocols Understand what is management and evolution of
			MCA-Master of Computer Application		UNIX Programming	CO4	File Structure Design Various Client Server Applications Using
7		1F-00					Connection less Network Communication Understands the Concept of Process Threads and
	19					CO3	Shell Scripting Differentiate Connection Oriented and
						CO2	Principles Understand All the Unix Utilities, and Implement
						COI	Understand Fundamental Network Design
					×	CO4	representation using tools, such as IBM's Rational Rose or Microsoft's Vision.
							Software design, and implementation (solution space). Show an ability to use the graphical UML
			Application		Thiarysis and Design	CO3	software development problems: software requirements, specification (problem space),
	18	1F-00	MCA-Master of Computer	4010192102	Object Oriented Analysis and Design		design experiments using UML, as well as to analyze and evaluate their Models. Display an ability to identify, formulate and solve
		i.				CO2	Have a working ability and grasping attitude to design and conduct object-oriented analysis and
						CO1	software engineering methods, such as object- oriented analysis and design methods with a clear emphasis on UML
							Possess an ability to practically apply knowledge

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					CO1	Understand the Case studies and design the Model.
		MCA-Master of		Object Oriented	CO2	Understand how design patterns solve design
23	1F-00	Computer	4010192122	Analysis and Design Lab	CO2	problems.
		Application	.010172122		CO3	Develop design solutions using creational
						patterns.
					CO4	Construct design solutions by using structural and
	-				,	behavioral patterns
						You will be able to run various UNIX commands
					CO1	on a standard UNIX/LINUX Operating System (We will be using Ubuntu flavor of the Linux
		100111				operating system).
24	1F-00	MCA-Master of Computer	4010192123	UNIX Programming	200	You will be able to run C / C++ programs on
24	11-00	Application	4010192123	Lab	CO2	UNIX.
		ripplication			CO3	You will be able to do shell programming on
					CO3	UNIX OS.
					CO4	You will be able to understand and handle UNIX
					-00 years 150	system calls
					COI	Students will able to understand the network
	1F-00					topology and its structure Students will able to understand different types of
4		MCA-Master of			CO2	network standards and protocols
25		Computer	4010192201	Computer Networks	602	Students will able design new routing technique
		Application			CO3	base on exiting study
						Students will able to understand the application
					CO4	of networks in MANETS, Adhoc Networks,
						Wireless Sensors network etc.
		MCA-Master of	4010192202	Python Programming	CO1	Construct Software easily right out of the box
26	1F-00	Computer			CO2 CO3	Experiment with an interpreted Language Build software for real needs
		Application			CO3	Explain to testing Orielly
		MCA-Master of Computer Application	4010192203	Data warehousing and	004	Ability to identify, understand and investigate
					CO1	various patterns that can be extracted from
						different types of data.
						Apply various pre-processing techniques and
27	1F-00				CO2	classification algorithms on different domains of
				Mining		data
					CO3	Build decision making systems using data mining
						algorithms for a given real time data set. Construct models using modern tools such as
)					CO4	WEKA, R and python etc.
					CO1	Understand the basics of R programming
		MCA-Master of		Statistical Description		Knowledge on R programming control statements
28	1F-00	Computer	4010172404	Statistical Programming with R	CO2	
		Application		with K	CO3	Knowledge on Graphics
					CO4	Awareness on statistical concepts
					CO1	Ability to understand and reason out the working
						of network Systems. To teach students the use of basic socket
					CO2	programming Utilities.
		MCA-Master of				To teach students the principles of socket
29	1F-00	Computer	4010172405	Network Programming	CO3	programming
		Application				
					CO4	To familiarize students with the concepts, design,
						and structure of the TCP/UDP programming.
					CO5	To be able to build an application of UNIX
						programming in socket.

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İ					CO1	Understand the systems, protocols and
Ì		an socialist in the six				mechanisms to support cloud computing.
		MCA-Master of			CO2	Develop applications for cloud computing by
30	1F-00	Computer	4010172406	Cloud Computing	CO2	using platforms and technologies.
		Application			CO3	Understand the hardware requirements for cloud
					CO3	computing.
					CO4	Understand the cloud security risks
		MCA-Master of		Software Project	CO1	Basic Knowledge on software Engineering
31	1F-00	Computer	4010172407	Management	CO2	Basic knowledge on project goals
		Application		ivianagement	CO3	Implement basic AI algorithms
					CO1	Describe the modern view of AI as the study of
						agents that receive percepts and perform Actions
					000	Apply AI search Models and Generic Search
					CO2	strategies
		MCA-Master of			000	Inspect and analyze Logic for representing
32	1F-00	Computer	4010172408	Artificial Intelligence	CO3	Knowledge and Reasoning of AI systems.
		Application		· ·	004	Evaluate the searching strategies for given
					CO4	situation to achieve the goal.
					G0.5	Design different learning algorithms for
					CO5	improving the performance of AI systems.
					001	Conduct investigation and implement projects
7					CO6	using different AI learning techniques
						Get familiarity with the Android operating system
		MCA-Master of		N. 1.11 A 11	COI	development environment.
33	1F-00	Computer Application	4010172409	Mobile Application		Create user-friendly mobile user interfaces and
				Development	CO2	views.
					CO3	Develop basic Android applications for mobiles.
		MCA-Master of Computer Application	4010192221	Python Programming - Lab	601	understand and reason out the working of network
					COI	Systems
					CO2	Implement basic socket programming Utilities
34	1F-00				202	familiarize students with the concepts, design, and
					CO3	structure of the TCP/UDP programming.
					201	build an application of UNIX programming in
					CO4	socket
		MCA-Master of			CO1	Construct Software easily right out of the box
35	1F-00	Computer	4010192222	Data Warehousing and	CO2	Experiment with an interpreted Language
33	117-00	Application	4010192222	Mining Lab	CO3	Build software for real needs
		Application			CO4	develop database applications in Python
						Use English language fluently, accurately and
)					COI	appropriately.
1					000	Discuss and discover barriers to effective
		MCA-Master of			CO2	communication.
36	1F-00		4010103333	0-60111 1	000	Demonstrate skills in listening comprehension,
36	117-00	Computer	4010192223	Soft Skills Lab	CO3	GDs and Interview.
		Application			001	Read and answer questions (orally and in writing)
					CO4	based on passages.
					005	Show effective writing skills in academic and
				,	CO5	professional contexts
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						CO1	Develop skills in distinguishing various types of computer crimes and identify the digital fingerprints associated with criminal activities
	37	1F-00	MCA-Master of Computer	4010192231	Mini Project/ Online Certification Course form NPTEL or	CO2	Illustrate how to apply different forensic analysis tools to recover important evidence for identifying computer crimes
			Application		equivalent on any programming language	CO3	Explain about threats and compare various threats.
						CO4	Summarize the need for surveillance and list the tools used
						CO1	Preparing for data summarization, query, and analysis.
	38	1F-00	MCA-Master of Computer	4010193101	Big Data Analytics	CO2	Applying data modeling techniques to large data sets
1			Application			CO3	Creating applications for Big Data analytics
						CO4	Building a complete business data analytic Solution
			MCA Magtan of			COI	Understand the IOT connectivity principles and application areas.
	39	1F-00	MCA-Master of Computer Application	4010193102	Internet of Things	CO2	Conceptually identify revolution of IOT in cloud, wireless sensors including recent attacks involving the Internet of Things.
-)					CO3	Build a real time IOT application.
Ī			MCA-Master of Computer Application	4010193103	Cryptography and Network Security	COI	Understand the concepts of need of security in real time applications
						CO2	To analyze the use of different security techniques in diverse applications
	40	1F-00				CO3	Students will get the knowledge of advance security algorithm with respect to applications security
		a.				CO4	Awareness of different types of security threats and virtual enemy with possible solutions
				4010173504		CO1	Understand the basics Concepts of Cyber threats and security with forensics procedure
	41	1F-00	MCA-Master of Computer		Cyber Security	CO2	Students will get the Knowledge of Cyber forensic standard procedures and policy
			Application	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Syour Security	CO3	To get the knowledge the cyber threats and cyber law
						CO4	To understand the specific circumstances of cyber threats
)						CO1	Create Image Gallery for online Shopping in Grid view.
						CO2	Create menus for any one standard mobile application.
	42	1F-00	MCA-Master of Computer	4010173505	Advanced Mobile	CO3	Design and develop contacts mobile application using SQLite Database.
	72	11.00	Application	4010173505	Application Development	CO4	Implement an Android program for HTTP Connection
						CO5	Design and develop simple charting mobile appusing socket programming
						CO6	Create the APK file for all the above mobile experiments and create signature certificates

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	43	1F-00	MCA-Master of Computer Application	4010173506	E-Commerce	CO1	To know and understand the critical success
						COI	factors in implementing an ecommerce system.
						CO2	To know how to plan and how to manage e-
							commerce solutions.
						CO3	To apply processes of e-commerce.
						CO4	To analyze and understand the human,
							technological and business environment
							associated with e-commerce.
	44	1F-00	MCA-Master of Computer Application	4010173507	Web Scripting Through PHP & MYSQL	COI	To know how to use technologies to build e- commerce websites.
1							Work with HTML forms and handling HTML
1						CO ₂	forms using PHP
-							Familiar with MYSQL database and perform
						CO3	insert, update and delete operations on DBMS
							tables.
						CO4	Implement and debug programs in PHP and
							MYSQL for a specific application.
1		1F-00	MCA-Master of Computer Application	4010173508	Multimedia Application Development	CO1	To learn and understand technical aspect of
							Multimedia Systems.
1							To understand the standards available for different
١	45						audio, video and text applications.
						CO3	To Design and develop various Multimedia
							Systems applicable in real time.
						CO4	To learn various multimedia authoring systems.
						CO5	To understand various networking aspects used for multimedia applications.
						CO6	To develop multimedia application and analyze
							the performance of the same.
Ī		1F-00	MCA-Master of Computer Application	4010173509	Human Computer Interaction	COI	Design and Development processes and life cycle
1							of Human Computer Interaction
						002	Analyze product usability evaluations and testing
						CO2	methods.
1	46					CO3	Apply the interface design standards/guidelines
							for cross cultural and disabled users.
						CO4	Categorize, Design and Develop Human
							Computer Interaction in proper architectural
	47	1F-00	MCA-Master of Computer Application	4010193121	Big Data Analytics Lab		structure.
						COI	To understand the basic principles, concepts of
							Big Data Analyze and interpret data using an ethically responsible approach.
7						-	Collect, manage, store, query, and analyze various
1						CO2	form of big data
							Torm or org data
						CO3	Gain hands-on experience on large-scale analytics
							tools to solve some open big data problems
						CO4	Understand the impact of big data for business
							decisions and strategy.

	48	1F-00	MCA-Master of Computer Application	4010193122	IOT Lab	COI	Identify problems that are amenable to solution by various methods, and which different methods may be suited to solving a given problem.
						CO2	Formalize a given problem in the language/framework of different methods (e.g., as a search problem, as a constraint satisfaction problem, as a planning problem, as a Markov decision process, etc).
						CO3	Implement basic algorithms (e.g., standard search algorithms or dynamic programming).
						CO4	Design and carry out an empirical evaluation of different algorithms on problem formalization, and state the conclusions that the evaluation supports.
	49	1F-00	MCA-Master of Computer Application	4010193123	Network Security & Cryptography Lab	COI	Develop solutions for encryption and decryption algorithms
						CO2	Develop solutions for public key encryption techniques
						CO3	Develop solutions for private key encryption techniques
C						CO4	Develop a solutions for real time cryptographic problems.
	50	1F-00	MCA-Master of Computer Application	4010193232	Technical Seminar on Latest Technologies/Certificat ion Course	CO1	Identify and understand assumptions, theses, and arguments that exist in the work of authors.
						CO2	Extend intellectual discovery and unravel complexities of thought.
						CO3	Evaluate initial hypotheses in light of evidence and collaborative discussion with the goal of making considered judgments.
						CO4	Improve reflective listening and inclusive, respectful conversation
	51	1F-00	MCA-Master of Computer Application	4010193237	Internship	COI	Apply domain knowledge during the course of internship
						CO2	Develop/implement the solutions with appropriate techniques, resources and contemporary tools.
						CO3	Work independently and in a collaboration in multidisciplinary environment and to allocate time effectively and manage to complete the work allotted within stipulated time.
						CO4	Exhibit integrity and ethical behavior while carrying out the internship and for the preparation of internship report and to demonstrate effective oral and written communication skills
	52	1F-00	MCA-Master of Computer Application	4010193238	Internship /Major Project	CO1	Analyze a complex computing problem and to apply software engineer principles in design and investigation of optimized solutions.
						CO2	Investigate and develop computing-based solution using mordern tools that help in sustaining environment and society.
						CO3	Use formal and informal discussions with team members and guide, make presentations and
						CO4	prepare technical document. Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
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