

1.1.1-Curricula developed and implemented have relevance to the local, national, regional and global developmental needs which are reflected in Programme Outcomes (POs), Programme Specific Outcomes (PSOs) and Course Outcomes (COs) of the various Programmes offered by the Institution.

The curricula developed have relevance to the regional/national/global developmental needs with well-defined learning objectives and outcomes at programme and course level. The department and the institute are guided and monitored in the preparation of course curriculum by two bodies, namely Board of Studies and Academic Council and typically undergoes with the following: The Institute follows the guidelines issued by the regulatory bodies such as UGC, AICTE, affiliated university JNTUA, Anatapuram and Andhra Pradesh State Council of Higher Education (APSCHE) while designing the curricula. A series of all faculty meetings are conducted in correlation to the statedProgramme Outcomes (POs), Programme Specific Outcomes (PSOs) and Course Outcomes (COs). The set of courses which require modifications (deletion/addition) are prepared and programme curricula adopted at other leading academic institutes in India and abroad are compared.

For the effective design of curriculum structure feedback is collected from students, faculty, alumni, parents and employers. Also by conducting workshops, seminars and conferences periodically, faculties get an opportunity to interact with the academic and industrial experts which helps to design the curriculum more effectively. The recommendations of these committees are put up to Board of Studies and further recommendations of BoS are put up for Academic Council approval.



SRI VENKATESWARA COLLEGE OF ENGINEERING Karakambadi Road, Opposite LIC Training Centre, Tirupati – 517 507. Department of Electronics and Communication Engineering

PROGRAMME OUTCOMES

PO1: Engineering Knowledge

An ability to apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems as appropriate to the field of electronics & communication engineering practice.

PO2: Problem Analysis

Ability to Identify, formulates, review research literature, and analyze complex Engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3: Design/development of solutions

Ability to Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct investigations of complex problems

Apply research-based knowledge and research methods including design of experiments, analysis and interpretation of data pertaining to Electronics & Communication Engineering problems and arrive valid conclusions.

PO5: Modern tool usage

An ability to use the techniques, resources and modern engineering tools necessary for modeling the complex system design in Electronics and Communication Engineering.

PO6: The engineer and society

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability

An Ability to understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of need for sustainable development.

PO8: Ethics

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work

Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10: Communication

Communicate effectively in both verbal and written forms such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project management and finance

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member or a leader in a team, to manage projects in multidisciplinary environments.

PO12: Life-long learning

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES

PSO1: An ability to get an employment in Electronics and Communication Engineering field and related industries and to participate & succeed in competitive examinations like GRE, GATE, TOEFL, PSUs, etc.

PSO2: Should be able to design and test various electronic systems that perform analog and digital processing functions.

HEAD OF THE DEPARTMENT ELECTRONICS & COMMUNICATION ENGINEERING S.V. COLLEGE OF ENGINEERING KABAKAMBADI ROAD, TIRUPATI-517 507.

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	Linear Algebra &	cuis	Remiliarize with functions of an end walked functions.
	(MA20ABS101)	C1114	Annhy multiple integrals to it determine a statement of the second and and a statement of the second and a statement of the se
		011.5	Analyze the concepts of D Ha and Gamma special function for different functions.
)	C112.1	Analyze the intensity variation of light due to Interference, diffraction and polarization.
	Applied Physics	C112.2	Distinguish the types of the stand apply its principles in modern technology.
	(PH20AB\$103)	C112.3	Analyze the concept of dielectric and magnetic materials for potential applications in the emerging micro devices.
		C112.4	Apply the fundamentals of quantum mechanics and their applications to study the behaviour free electrons in solids.
		C112.5	Apply the basic concepts of semiconductor and superconductivity in Engineering applications.
		CIB.1	Understand the context, topic, and pieces of specific information from social or transactional dialogues spoken by native speakers of English.
	Communicative	C113.2	Apply grammatical structures to formulate sentences and correct word forms.
	English (EG20AH\$101)	C113.3	Analyze discourse markers to speak clearly on a specific topic in informal discussions.
		C113.4	Evaluate reading/listening texts and to write summaries based on global comprehension of these texts.
		C113.5	Create a coherent paragraph interpreting a figure/graph/chari/iable.
		C114 I	Given a network, able to find equivalent impedance by using network reduction techniques and determine the current through any element and voltage across and power through any element.
	Fundamentals of	C114.2	Given a circuit and the excitation, determine the real power, reactive power, power factor etc.
	Electrical Circuits (EE20AES103)	C114.3	Apply the network theorems suitably to analyze complex circuits and determine the effective voltages and currents in the circuit.
		C114.4	Determine the Dual of the Network, develop the Cut Set and Tie-set Matrices for a given Circuit.
	ſ	C114.5	Analyze the three-phase balanced and unbalanced circuits and to measure active and reactive powers in three phase circuits
	-	C115.1	Draw basic geometrical constructions, curves used in engineering practices.
	Engineering	C115.2	Understand the concept of projection and acquire visualization skills, projection of points, Lines and Planes.
	(ME20AES102)	C1153	Illustrate the projections of solids graphically.
		C115.4	Draw and explore the sectional views of right regular solids.
		C115.5	Draw the development of surfaces of solids.
	'	C116.1	Draw the basic views related to projections of Lines, Planes.
	Engineering	C116.2	Draw the basic views related to projections of Planes.
	Graphics Lab	C116.3	Unastrate orthographic views of simple objects.
	(MICLOAES 103)	C) 16.4	Unstruct isometric projections of simple solids.
		C116.5	Interpret and comprehend with drafting packages for engineering practice
		C117.1	Apply skill to find the wavelength of spectral lines using plane diffraction grating.
	Applied Disates tak	Ci 17.2	Analyze the usage of dielectric materials applications.
	(PH20AB\$104)	C117.3	Apply the concept of hysteresis curve of a ferromagnetic material to know the strength of magnetic material.
		C117.4	Analyze the working principles of semiconducting devices to study the applications of semiconducting technology.
		C117.5	Differentiate the patterns of spectrums using interference and diffraction phenomena.
	Į	C118 .1	Develop to handle and excel in a variety of self-instructional, learner-friendly modes of language learning
	Communicative	C118.2	Develop to employ better stress and intonation patterns and utter English sounds correctly.
	English Lab	C118.3	Develop to avoid the impact of mother tongue in English and neutralize their accent.
	(EG20AH\$101)	C1184	Develop to participate with skill and confidence in Group Discussions Interview and D. M. P

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Id Electronic Devices and CrouwEC20AES2 01) C124.2 Apply the basic principles for solving the problems related to Semiconductor diodes, BJTs, and MOSFETs. 14 CreatingEC20AES2 01) C124.3 Analyze diode circuits for different applications such as rectifiers, clippers and clampers also analyze biasing circuits of BJTs, and MOSFETs. 15 C124.4 Design diode circuits and amplifiers using BJTs, and MOSEETs. 16 Engineering (M220AES101) C124.2 Apply the basic principles for adving semiconductor devices. 16 IT Workshop (CS20AES102) C125.1 Apply wood working skills in real world applications for good strength. 16 IT Workshop (CS20AES102) C125.1 Jutic different types of fasic electric circuit concertions devices. 16 IT Workshop (CS20AES102) C125.1 Make plastic components using proper raw material. 16 IT Workshop (CS20AES102) C125.1 Inspect various parts of computers and Generation of Computers. 16 IT Workshop (CS20AES102) C126.1 Identify the Internal parts of computers and Generation of Computers. 16 IT Workshop (CS20AES102) C126.1 Identify the Internal parts of computers and Generation of Computers. 16 IT Workshop (CS20AES102) C126			C124.1	Understand principle of operation, characteristics and applications of Semi conductor diodes, Bipolar Junction Transistor and MOSFETs
14 Circuits/EC20AES2 01) C124 3 Analyze diode circuits for different applications such as rectifiers, clippers and clampers also analyze biasing circuits of BJTs, and MOSFETs. 01) C124 4 Design diode circuits and amplifiers using BJTs, and MOSFETs. C124 5 Compare the performance of various semiconductor devices. C125 7 Identify tools, work material, measuring instruments useful for domestic applications. C125 4 Apply mode working skills in real world applications. C125 5 Apply fitting operations in various semplications. C125 4 Apply fitting operations in various different specific circuit connections. C125 5 Amalyze different types of basic detertic circuit connections. C125 6 Make moulds for sand casting using standard equipment. C125 7 Develog different soft mation or components. C125 8 Insection parts of of components using proper raw material. C125 9 Make plastic components using standard equipment. C125 1 Identify the Internal parts of components C125 4 Apply fitternal parts of components C125 7 Develog different types of matine components C125 8 Make plastic components using proper raw material. C125		Electronic Devices	C124.2	Apply the basic principles for solving the problems related to Semiconductor diodes, BJTs, and MOSFETs.
16 C1244 Design diode circuits and amplifiers using BITs, and MOSFETs. 17 C1245 Compare the performance of various semiconductor devices. 18 C1251 Identify tools, work material, measuring instruments useful for domestic applications. 19 Engineering C125.3 Build different parts with metal sheets in real world applications. 10 C125.4 Apply fitting operations in various applications for good strength. 115 Workshop C125.5 Analyze different types of basic electric circuit connections. 115 Workshop C125.5 Analyze different types of basic electric circuit connections. 116 Inspect various parts of machine components. C125.5 117 Workshop C126.1 118 Inspect various parts of computers and generation of Computers. 119 C125.9 Make moulds for sand casting using proper raw material. 116 IT Workshop C126.1 116 IT Workshop C126.3 116 IT Workshop C126.4 116 Interconnect two or more computers for information sharing. 116 C126.3 <td< td=""><td>14</td><td>Circuits(EC20AES2 01)</td><td>C124 3</td><td>Analyze diode circuits for different applications such as rectifiers, clippers and clampers also analyze biasing circuits of BJTs, and MOSFETs,</td></td<>	14	Circuits(EC20AES2 01)	C124 3	Analyze diode circuits for different applications such as rectifiers, clippers and clampers also analyze biasing circuits of BJTs, and MOSFETs,
Image: Instance of Various semiconductor devices Image: Various semiconductor devices <td></td> <td></td> <td>C124.4</td> <td>Design diode circuits and amplifiers using BJTs, and MOSFETs.</td>			C124.4	Design diode circuits and amplifiers using BJTs, and MOSFETs.
15 Engineering Workshop C125 1 Identify tools, work material, measuring instruments useful for domestic applications. 15 Engineering Workshop C125 4 Apply wood working skills in real world applications. 15 Engineering Workshop C125 5 Analyze different types of basic electric circuit connections. 16 C125 7 Develop different weld joints for various material. C125 7 16 IT Workshop C126 1 Identify the Internal parts of computers and Generation of Computers. 16 IT Workshop C126 1 Identify the Internal parts of computers for information sharing. 16 IT Workshop C126 4 Installation process of different types Operating system for a computer ready to use. 16 IT Workshop C126 4 Internet two or more computers for information sharing. 16 C126 4 Internet and browse it for required information. C126 4 17 C126 4 Internet and browse it for required information. 16 C126 4 Internet and browse it for required information. 17 Workshop C126 4 Internet and browse it for required information.			C124.5	Compare the performance of various semiconductor devices.
15 C125.2 Apply wood working skills in real world applications. 15 Engineering Workshop (ME20AES101) C125.5 Analyze different parts with metal sheets in real world applications. 15 C125.4 Apply fitting operations in various applications for good strength. C125.5 Analyze different types of basic electric circuit connections. C125.6 Analyze different types of basic electric circuit connections. C125.7 Develop different types of basic electric circuit connections. C125.6 Make moulds for sand casting using standard equipment. C125.7 Develop different weld joints for various metals. C125.8 Inspect various parts of machine components. C125.9 Make plastic components using proper raw material. C125.9 Make plastic components and Generation of Computers. C126.1 Identify the Internal parts of computer sand generation of Computer seady to use. C126.1 Identify the Internal parts of outputer from its parts and prepare the computer ready to use. C126.1 Installation process of different types Operating system for a computer by their own. C126.4 Interconnect two or more computers for information. C126.5 Access the Internet and browse it for r			C125 I	Identify tools, work material, measuring instruments useful for domestic applications.
15 Build different parts with metal sheets in real world applications. 15 C125.4 Apply fitting operations in various applications for good strength. 15 C125.5 Analyze different types of basic electric circuit connections. (ME20AES101) C125.5 Demonstrate soldering and brazing in joining circuits. C125.6 Make moulds for sand casting using standard equipment. C125.7 Develop different weld joints for various metals. C125.8 Inspect various parts of machine components. C125.9 Make plastic components using proper raw material. C126.1 Identify the Internal parts of computers and Generation of Computers. C126.2 Assemble and disassemble a computer from its parts and prepare the computer ready to use. 16 IT Workshop (CS20AES10) C126.4 C126.5 Access the Internet and browse it for required information. C126.6 Prepare the documents using Word Processor, prepare spread sheets for calculations using Excel, and documents for LaTeX. C126.7 Prepare slide presentation using the presentation tool.			C125.2	Apply wood working skills in real world applications.
15 Engineering Workshop (ME20AES101) C125.5 Analyze different types of basic electric circuit connections. 15 (ME20AES101) C125.5 Demonstrate soldering and brazing in joining circuits. C125.6 Make moulds for send casting using standard equipment. C125.7 C125.8 Inspect various parts of machine components. C125.8 C125.9 Make plastic components using proper raw material. C125.9 Make plastic components using proper raw material. C126.1 Identify the Internal parts of computers and Generation of Computers. C126.2 Assemble at computer from its parts and prepare the computer ready to use. C126.3 Installation process of different types Operating system for a computer by their own. C126.4 Interconnect two or more computers for information sharing. C126.6 Prepare the documents using Word Processor, prepare spread sheets for calculations using Excel, and documents for LaTeX. C126.7 Prepare slide presentation using the presentation tool.			C125,3 C125.4	Build different parts with metal sheets in real world applications.
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16 IT Workshop (CS20AES10) C126.1 Identify the Internal parts of computers and Generation of Computers. 16 IT Workshop (CS20AES10) C126.2 Assemble and disassemble a computer from its parts and prepare the computer ready to use. 16 IT Workshop (CS20AES103) C126.4 Installation process of different types Operating system for a computer by their own. 16 C126.4 Interconnect two or more computers for information sharing. C126.5 Access the Internet and browse it for required information. C126.6 Prepare the documents using Word Processor, prepare spread sheets for calculations using Excel, and documents for LaTeX. C126.7 Prepare slide presentation using the presentation tool.			0125.9	Make plastic components using proper raw material
16 IT Workshop (CS20AES103) C126.3 Installation process of different types Operating system for a computer by their own. 16 C126.4 Interconnect two or more computers for information sharing. C126.5 Access the Internet and browse it for required information. C126.6 Prepare the documents using Word Processor, prepare spread sheets for calculations using Excel, and documents for LaTeX. C126.7 Prepare slide presentation using the presentation tool.		-	C126 1 C126.2	Identify the Internal parts of computers and Generation of Computers. Assemble and disassemble a computer from its parts and propose the computer so does not be accomputed on the second secon
16 IT Workshop (CS20AES103) C126.4 Interconnect two or more computers for information sharing. 16 C126.4 Interconnect two or more computers for information sharing. C126.5 Access the Internet and browse it for required information. C126.6 Prepare the documents using Word Processor, prepare spread sheets for calculations using Excel, and documents for LaTeX. C126.7 Prepare slide presentation using the presentation tool.		F	C126 3	Installation provers of different time Downline and a
(CS20AES103) C126.5 Access the Internet and browse it for required information. C126.6 Prepare the documents using Word Processor, prepare spread sheets for calculations using Excel, and documents for LaTeX. C126.7 Prepare slide presentation using the presentation tool.	16	IT Workshop	C126.4	Interconnect two or more contracting system for a computer by their own.
C126 6 Prepare the documents using Word Processor, prepare spread sheets for calculations using Excel, and documents for LaTeX. C126 7 Prepare slide presentation using the presentation tool.		(CS_0AES103)	C126.5	Access the Internet and browse it for required information
C126 7 Prepare slide presentation using the presentation tool.		, I	C126.6 1	Prepare the documents using Word Processor, prepare spread sheets for calculations using Excel, and documents for LaTeX.
		F	C126 7	Prepare slide presentation using the presentation tool

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S. No.	COURSE NAME	CQ1	COURSE OUTCOMES
		C127.1	Build algorithm and flowchart for simple problems.
	Building Build	Ç127.2	Use suitable control structures to solve problems.
17	Problem Solving Using C Lab	C127.3	Use suitable iterative statements, arrays and modular programming to solve the problems.
	(CS20AES102)	C127.4	Implement Programs using pointers and String handling Functions.
		Ç127.5	Develop code for complex applications using structures, unions and file handling features.
		C128.1	Demonstrate electro-analytical techniques for the chemical analysis.
		C128.2	Apply Beer-Lambert Law to know the concentration of unknown samples.
18	Chemistry Lab (CH20ABS104)	C128.3	Anshire the grafity and graminy of chemical assurance in given surgely
		0.20.3	Analyze the quality and quantity of chemical compounds in given samples.
		C128.4	Prepare different types of polyment.
		C129.1	Understand the basic characteristics and applications of basic electronic devices. (L1)
10	Electronic Devices	C129.2	Observe the characteristics of electronic devices by plotting graphs.
19	(EC20AES202)	C129.3	Analyze the Characteristics of U/T, B/T, MOSFET
		C129.4	Design MOSPET/ BJT based amplifiers for the given specifications.
		0129.5	
		CIZA.)	Understand the concepts of environment and natural resources.
	Enginemental	C12A.2	Classify the types of ecosystems and conservation methods of bio-diversity.
20	Science	C12A.3	Identify the causes and problems of pollution in their real life situations.
	(CH20AMC201)	C12A.4	Develop awareness on social issues such as global warming, acid rains, ozone layer depletion and sustainalibility.
		C12A.5	Determine the consequences of population exploitation in detail.
		C12B.1	Improve the neutral accent and be free from mother longue influence.
	Speech and Orsi	C12B 2	Hypothesizing small talks on general topics and learn criticating skills hy naticinating in Convergions
21	Communication	CUIRI	Amplian Voosbulary and using it in their day to day KG.
	(EG20AMC103)	C12B.5	
		C12B.4	Understanding and mastering in verbal and non-verbal communication.
		C211 .1	Apply Cauchy-Riemann equations to find the analyticity of complex functions.
		C211 2	Apply CauchY integral formuls and Cauchy Integral theorem to evaluate improper integrals along contours.
22	Complex Variables and Transforms	C211.3	Analyze the concepts of Laplace Transforms to solve ordinary differential equations.
	(MA20AB\$302)	C211.4	Examine the Fourier series for different functions in half and full range.
		C211.5	Analyze the concepts of Z transforms to solve Difference equations
		C211.6	Analyze the concepts of Z transforms to solve Difference equations
		C212 .1	Understand the properties of Boolean algebra, other logic operations, and minimization of Boolean functions using Karnaugh map.
		C212.2	Make use of the concepts to solve the problems related to the logic circuits.
23	Digital Logic Design	C212.3	Analyze the combinational and sequential logic circuits.
	(EC20APC301)	C212.4	Compare various Programmable logic devices.
		C212.5	Compare the concepts of RAM and ROM.
		C212.6	Understand the operation CMOS, TTL logic families, ECL logic families and interfacing between them
•	<u> </u>	C213.1	Understand the working principle of multistage amplifiers. Feedback amolifiers, power amplifiers and tuned amplifiers
		C213 2	Analyze multistage amplifiers, feedback amplifiers, power antibilitiers, and tuned amplifiers
24	Electronic Circuit Analysis & Design	C213.3	Design muhistage amplifiers, feedback amplifiers, oscillators, power amplifiers and funed amplifiers for the sizes coverification
-	(EC20APC302)	C213.4	Evaluate the efficiency of large signal (power) amplifiers.
		(2)13.5	Compare the frequency response of Single-stage. Double-stage amolifiers with Single hand, double toned and Stages and double-
		-213.3	Compare the dequery response of ougherstage, bounderstage amputers with Single funed, double funed and Stagger funed amplifiers
		C214.1	Understand the mathematical description and representation of continuous- time and discrete-time signals and systems. Also understand the concepts of various transform techniques.
	Signals & Susteme	C214.2	Apply sampling theorem to convert continuous-time signals to discrete-time signals and reconstruct back, different transform techniques to solve signals and system related problems.
25	(EC20APC303)	C214.3	Analyze the frequency spectra of various continuous-time signals using different transform methods.
		C214.4	Analyze the systems based on their properties and determine the response of them.
		C214.5	Analyze the frequency spectra of various discrete time signals using different transform methods
		0414,5	revery zo ne requertely spoore of venous disorder-unit signals using different transform methods.

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5.1	to COURSE NAM	12 0	<u>.</u> T	
			151	COURSE OUTCOMES
	Managerial	(C2)		Should be able to understand managerial economics and demand analysis.
20	Economics an		54 () ()	Srould be able to analyze decisions relating to production and cost analysis.
	(BA20AH\$30	(5)(5)(5)(5)(5)(5)(5)(5)(5)(5)(5)(5)(5)(Should be able to evaluate market structures and forms of business.
			2.9 2	Should be able to assess financial statements and ratios.
-	- 		>> 5	Should be able to apply capital budgeting methods.
		C21	6.1 L	cern how to use the MATLAB software and know syntax of MATLAB Programming.
	Basic Simularia	C210	6.2 U	inderstand how to simulate different types of signals and system response.
1 27	Lab (EC20APC)	(04) C210	6.3 A	Analyze signals using Fourier, Laplace and Z-transforms.
		C216	5.4 C	compute Fourier transform of a given signal and plot its magnitude and phase spectrum.
<u> </u>	<u> </u>	C216	5.5 V	erify Sampling theorem, Determine Convolution and Correlation between signals and sequences
1		C217	.1 U	Inderstand the pin configuration of various digital ICs used in the lab
28	Digital Logic Des	isn C217	2 C	onduct the experiment and verify the properties of various force circuits
	Eao (ECZUAPC)	C217	3 D	esign sequential circuits.
<u> </u>		C217	4 De	esign combinational circuits.
1		C218	.) Ur	nderstand the characteristics and frequency response of various amplifiers and determine its
	Electronic Circui		-	and bandwidth
29	Analysis & Desig	n	2 58	mulate and analyze the performance of negative feedback amplifier circuits, oscillators and Power amplifiers and single tuned amplifiers.
		C218.) De	sign a RC and LC oscillator circuits for a given frequency.
l		C218	4 Ca	doulate the efficiency of the power amplifier circuits.
	<u>†∙ — —</u>	C219.		sunguish the operating modes of various Power amplifier circuits.
	Antipolica	C219.3	2 U.s.	e Conditionals and Loops for Pothon Programs
30	Development Usin	8 C219.3	Cor	astruct custom modules and functions to bandle difference and in
	(IT20ASC301)	C219 4		Dement Object oriented concerns through and time
		C219.5	Des	sion different shaces and ablents intrough real time scenarios and handle errors,
	<u> </u>	C11A.1		
				uyze about cells and their structure and function. Different types of cells and basics for classification of living Organisms
	Biology for	C21A 2	Ana	dyze about biomolecules, their structure and function and their role in the living organisms. How biomolecules are useful in Industry.
31	Engineers (CH20AMC301)	C21A.3	Anal	lyze about human physiology
	,	C21A.4	Ала	lyze about genetic material, DNA, genes and RNA how they replicate, pass and preserve vital information in living Organisms.
		C21A.5	Appl	ly biological Principles in different technologies for the production of medicines and Pharmaceutical molecules through transgenic
				ionstrate knowledge basic mathematics to develop analytical skills to solving problems of HCP, LCM Factora and Simplification.
32	Logical Skills For Professionals-]]	C21B.2	Demo	onstrate knowledge basic mathematics to develop analytical skills to solving problems of Pipes, Alligation or Mixture.
	(MA20AMC301)	C21B 3	Дето	onstrate knowledge basic mathematics to develop analytical skills to solving problems of Table, Bar Graphs and Pie Chart.
		C21B.4	Analy	yze the techniques in Syflogism.
		C21B 5	Analy	ze the techniques in Calender, Clocks and Number Series Analogyconcepts
	(EC204MC200)	C21C	Use E	English language, both written and spoken, competently and correctly.
	Enhancing English	C21C.2	Impro	ove comprehension and fluency of speech.
\$3	Language Skills (Lateral Entry	C2IC.3	Hone	the communication skills to meet the challenges of their careers successfully.
	Students only)	C21C.4	Gain c	confidence in using English in verbal situations.
- +		C21C.5	Streng	then communication skills in different contexts like formal and informal.
	ļ	C221.1	Analyz	ze the problems using asymptotic notations.
,	Data Structure S	C221.2	Apply	Stack, Queues and linked list to solve different applications.
J9 	Using C (CS20AES401)	C221,3	Demor	nstrate suitable sorting techniques for the real world problem.
	ļ	C221.4	Implen	ment tree structures in different patterns of representation of data.
[C221.5	Analyz	the given problem using graph traversal techniques.

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S. No.	COURSE NAME	CO	COURSE OUTCOMES
		C222.1	Analyze and understand the concepts of Probability.
35		C222.2	Analyze the concept of Single Random Variable and evaluate the operations that may be performed on a single Random variable
	and Stochastic Processes	C222.3	Analyze the concepts of Multiple Random Variable and evaluate the operations that may be performed on a multiple Random variable.
	(MA20ABS402)	C222.4	Analyze the concepts of Random Process and evaluate the Temporal characteristics of Random Processes.
		C222.5	Analyze the concepts of Random Process and evaluate the Temporal characteristics of Random Processes.
		C223.1	Understand the concepts of various Amplitude, Angle and Pulse Modulation schemes.
		C223.2	Apply the concepts to solve problems in Analog and pulse modulation schemes
36	Analog Communications	C223.3	Analysis of Analog communication system in the presence of noise.
	(EC20APC401)	C223 4	Compare and contrast design issues, advantages, disadvantages and limitations of various modulation schemes in Analog communication systems.
		C223.5	Solve basic communication problems & calculate information rate and channel capacity of a discrete communication change!
		C224 1	Understanding the basic laws and applications of electromagnetic fields.
		C224.2	Evaluate the problems related to electromagnetic fields.
17	Electromagnetic Waves and	C224.3	Analyze Maxwell equations for static and time varying fields.
31	Transmission Lines	C224.4	Analyze electric and magnetic fields at the interface of different media.
	(00200070402)	C224.5	Evaluate electric and magnetic fields and calculates different angles.
		C224.6	Evaluate transmission lines with equivalent circuit and their characteristics with various lengths.
_		C225.1	List out the characteristics of Linear and Digital ICs.
		C225.2	Discuss the various applications of linear & Digital Ics.
	Linear & Digital	C225.3	Solve the application based problems related to linear and digital lcs.
38	and Applications	C225.4	Analyze various applications based clrcuits of linear and digital ICs.
	(EC20APC403)	C225.5	Design the circuits using either linear ICs or Digital ICs from the given specifications
		C225.6	Develop digital circuits using HDL.
		C226.1	Understand different analog modulation techniques & Radio receiver characteristics.
	Analog	C226.2	Analyze different analog modulation lechniques.
39	Communications Laboratory	C226.3	Design and implement different modulation and demodulation techniques.
	(EC20APC404)	C226,4	Observe the performance of system by plotting graphs & Measure radio receiver characteristics.
_		C226.5	Simulate all digital modulation and demodulation techniques.
		C227.1	Demonstrate the concept of Recursion for solving a problem.
40	Data Structures	C227.2	Choose and implement linear data structure to solve problems.
40	(CS20AES402)	C227.3	Develop programs for searching and sorting algorithms.
_		C227.4	Select and implement suitable non linear data structure for solving a problem.
_		C228.1	Understand the pin configuration of each linear/ digital IC and its functional diagram.
	Linear & Digital	C228.2	Conduct the experiment and obtain the expected results.
41	Integrated Circuits and Applications	C228.3	Analyze the given circuit/designed circuit and verify the practical observations with the analyzed results.
	Lab (EC20APC405)	C228.4	Design the circuits for the given specifications using linear and digital ICs.
		C228.5	Acquaintance with lab equipment about the operation and its use.
		C229.1	Memorize various elements of effective communicative skills.
		C229.2	Interpret people at the emotional level through emotional intelligence
42	Soft Skills (EG20ASO401)	C229.3	Apply critical thinking skills in problem solving.
		C229.4	Analyze the needs of an organization for team building.
		C229.5	Judge the situation and take necessary decisions as a leader.
43	NSS/Yoga/Cultural/ Games and Sports (SH20AMC401)	C22A .1	Develop social and work-life skills as well as personal and emotional well being.

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<u>- 5 N</u>	COURSE NAME	<u></u>	COURSE OUTCOMES
		C22B.1	Understanding the value of education to become more aware of themselves, and their surroundings (family, society, nature).
	Liniversal Human	C228 2	Utilize the concepts of human being-harmony in myself become more responsible in life, and in handling problems with sustainable.
44	Values (BA70AMC201)	C22B.3	Understanding the concepts of society-harmony in human for better oritical ability.
	(1)/204(4)(201)	C22B 4	Understanding the human values, human relationship and human society to become sensitive to their commitment
		C22B 5	Apply what they have learnt to their own self in different day-to-day settings in real life, at least a beginning would be made in this direction.
		C22C.1	Develop the use of matrix algebra techniques that is needed by engineers for oractical applications
	Engineering	C22C 2	Utilize mean value theorems to real life problems
45	(Lateral Entry	C22C 3	Solve the differential equations related to various engineering fields.
	Students only) (MA20AMC401)	C22C 4	Apply multiple integrals to find the area and volumes for different functions
L		C22C.5	Estimate the work done against a field, circulation and flux using vector calculus
		C311.1	Intrepret DC and AC characteristics of operational amplifiers & Op amp parameters
	Interneted Circultu	C311.2	Make use of Op-Amps to design circuits for various applications such as Amplificat. Active filters, Oscillators
46	and Applications	C311.3	Analyze Op-Amp based non linear applications such as Comparators. Waveform generators
	(198045011)	C311.4	Apply opamp basics to study and Compare different lynes of A/D and D/A Compares and the
[C311.5	Design various multi-vibrator circuits using IC 555 times and analyze cardial and the Converter circuits.
	·	C312.1	Discuss the various characteristics with the use of here and analyse special purpose ICs like PLL, VCO and voltage regulators
		C312.2	Discuss the field components of various dipole antennas and Analyze radiation pattern of various antenna arrays with some practical antennas.
47	Antennas and Wave	C312.3	Demonstrate the basic principles of Aperture and Long Antenna with Section and L
	(19A04502)	C3174	Demonstrate the heater state and the state a
		C1124	periodistrate the basic principles of antennas which are operated in microwave Frequency range.
		03123	Evaluate the antenna parameters in antenna measurements.
 -	<u> </u>	C312.6	Illustrate problems on inosphere propagations and discuss wave characteristics in different frequency ranges of propagations.
		C313-1	Facilitate active listening to enable inferential learning through expert lectures and talks.
		(31) 2	Impart critical reading strategies for comprehension of complex texts.
48	English Language Skills (19A52601T)	C313 3	Provide training and opportunities to develop fluencyin English through participation informal group discussions and presentations using audio-visual aids.
		C313.4	Demonstrate good writing skills for effective paraphrasing argumentative essays and formal correspondence.
	. <u> </u>	C313.5	Encourage use of a wide range of grammatical structures and vocabulary in speech and writing
		C314.1	Classify different source coding systems.
	 Digita!	C314.2	Analyze the concepts of baseband transmission for PAM.
49	Communication (19A04503T)	C314 3	Determine signal space analysis for Correlator.
	1	C314.4	Analyze the concepts of passband data transmission techniques for BPSK, QPSK, BFSK.
		C314.5	Evaluate various channel coding techniques.
		C3151	Compare different network architectures and reference models.
50	Date Communication and	C315.2	Select the approviate technology for data transmission based on the requirement.
	Networks (19A04504a)	C315.3	Analyze different flow and error control protocols.
		C315.4	Configure simple networks and assign IP addresses to hosts.
		515,5	Apply the concepts of different application layer protocols.
	Computer	C316	Analyze the importance of Computerization and IT applications in food industries and need for development of Computer operating environment and information system for various types of food industries.
51	Applications in Food	C316.2	Learn the basic concepts of 'C'.
	(19A27506b)	C316.3	Analyze the operation of branching and looping statements,
	ŀ	C316.4	Use the concept of functions, Arrays, strings.
		C)16.5	Apply the Concept of Pointers, Structures, Unions, data structures, linked lists

	COORAE MARKE	COL	COURSE OUTCOMIS
		C317.1	Simulate and Analyze the working of linear and non linear applications of opamp-741/TL082.
	Integrated Circuits	C317.2	Design and simulate astable and monostable multivibrator using IC\$55 timer.
52		C317.3	Simulate and Verify the working of ADC and DAC
	Lab (19A04501P)	C317.4	Study the opration and applications of Special purpose ICs PLL-IC 565, IC566,
	-	6317.5	Design and simplete fixed and variable voltage regulator using ICs 723 7805/7809
		0118.1	To sumare the students to unitate of all instructional learner friendly moder of instruct learning
		1310.1	
\$3	English Language Skills Lah	Ç318.2	To help the students cultivate the habit of reading passages from the computer monitor. Thus providing them with the required facility to face computer based competitive exams like GRE, TOEFL, and GMAT etc
	(19A52601P)	C318.3	To enable them to learn better pronunciation through stress, intonation and rhythm.
		C318.4	To train them to use language effectively to face interviews, group discussions, public speaking.
		C319.1	A aalyze difference Source Coding techniques using hardware implementation.
	Digital	C319.2	Analyze Source Coding techniques using MATLAB.
54	Communications Lab (19A04503P)	C319.3	Analyze the different Passband data transmission techniques using hardware implementation.
		C3194	Analyze passband data transmission using MATLAB.
• •		C31A.1	Understand the basic concepts of research and its methodologies
	Research	C31A.2	Analyze the research problem and apply appropriate sampling method for data collection.
55	Methodology	C31A3	Apply different methods for analysis purpose.
	(1909001)	C31A.4	Analyze various types of testing tools used in research.
		C31A.5	Dealgn a research paper by following research ethics.
		C31B.1	Identify the problem statement by observing the problems in the society, for which electronics engineers can propose a solution.
		C31B.2	Develop the design methodolgy for implementing the chosen project.
56	Socially Relevant Project (19A04507)	Ç31B.3	Apply appropriate modern tools for implementing the project work.
	,	Ç31B.4	Evaluate application of project work with appropriate societal consideration.
		C31B.5	Develop presentation and interpersonal communication skills through presentations and documentation.
		C321.1	Explain the architecture, interrupts and addressing modes of 8085 and 8086 microprocessors.
		C321.2	Develop Assembly Language Programs for various problems using 8086.
67	Microprocessors and	C321.3	Interface 8086 with different peripheral devices.
57	(19A04601T)	C321.4	Describe architecture and features of 8051 microcontroller and develop Assembly Language Programs to perform various operations using
		C321.5	Explain the architecture, instruction set and addressing modes of ARM Cortex MO+ Processor.
		C322.1	Analyze the concept of DFT & FFT Algorithms.
	Digital Signal	C322.2	Design IIR filters using various techniques & construct different forms of IIR filter realizations.
58	Processing (19A04602T)	C322.3	Design FIR filters using various techniques & construct different forms of FIR filter realizations .
		C322.4	Describe the Architecture details & instruction sets of programmable DSP.
		C322.5	Implement the signal processing algorithms in DSP.
		C323.1	Understand the architecture of FPGAs, tools used in modelling of digital design and modelling styles in VHDL.
		C323.2	Implement various arithmetic and logical operations in digital design using VHDL.
59	Digital System Design through	C323.3	Design various combinational logic circuits and analyze its operation; and implement various memory and data storage elements using VHDL.
	AUTYF (139(04003)	C323.4	Design various sequential logic circuits and analyze its operation using VHDL.
		C323.5	Design complex digital CPU, vending machine and washing machines etc. using VHDL and analyze the case studies.
	·	C324.1	Evaluate some important measurement parameters of electrical and electronic instruments.
	Electrical Measurement and	C324.2	Explain the basic working principle of different measuring meters.
60	Electronic	C324.3	Analyze performance of various electric and electronic instruments.
	Instruments (19A04605d)	C324.4	Apply the knowledge of CRO measuring instrument in real time measurements
	(1210-0004)	C324.5	Explain the basic working principle of different types of Transducers.

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5. No.	COURSE NAME	CO1	COURSE OUTCOMES
		C325.1	Develop awareness on the relevance and importance of soft skills.
		C325.2	Recognize the importance of verbal and non verbal skills.
61	Soft Skills (19457604a)	C325 3	Develop the interpersonal and intrapersonal skills.
	(177020014)	C325 4	Apply the knowledge in setting the SMART goals and achieve the set goals.
		C325.5	Create trust among people and develop employability skills.
		C326 1	Apply the concept of Entrepreneurship and challenges in the workl of competition.
		C326.2	Develop Knowledge in generating ideas for New Ventures.
62	Entrepreneurship & Incubation	C326.3	Analyze various sources of finance and subsidies to entrepreneur/women Entrepreneurs.
	(19A52602a)	C326.4	Evaluate the role of central government and state government in promoting Entrepreneurship.
		C326.5	Create and design business plan structure through incubations.
		¢327.1	Develop various DSP Algorithms using MATLAB Software.
-		C327.2	Evaluate Frequency response Characteristics of digital FIR & IIR filters.
67	Digital Signal		Implement basic signal processing algorithms such as convolution difference equation implementation and apply them in the construction
	(19A04602P)	C327.3	of FIR and IIR filters.
1		C327.4	Design various analog filters.
		C327.5	Analyze DSP algorithms using both fixed and floating point processors.
		Č 328.1	Write Assembly Language Programs for 8086, 8051 and execute programs using TASM/MASM Software.
	Microprocessors and	C328.2	Analyze the program execution process step by step.
64	Microcontrollers Lab (19A04601P)	C328.3	Interface different peripheral devices with 8051 microcontroller.
		C328.4	Execute programs using Keil MDK-ARM tool
		C328.5	Design some specific real time applications and implement the same.
		C329.1	Identify the problem statement by observing the problems in the society, for which electronics engineers can propose a solution.
	Socially Relevant	C329 2	Develop the design methodolgy for implementing the chosen project.
65	Project (19A04606)	C3293	Apply appropriate modern tools for implementing the project work.
]	C329.4	Evaluate application of project work with appropriate societal consideration.
		C329.5	Develop presentation and interpersonal communication skills through presentations and documentation.
		C32A 1	Analyze historical background of the constitution making and its importance for building a democratic India.
		C32A.2	Discriminate the functioning of three wings of the government ie., executive, legislative and judiciary.
66	Constitution of India	C32A.3	Analyze the decentralization of power between central, state and local self-government.
i	(19499501)	C32A.4	Explain the duties and powers of local self-government and become good citizen of India.
		C32A.5	Apply the knowledge in strengthening of the constitutional institutions like CAG, Election Commission and UPSC for sustaining democracy.
		C411 I	Demonstrate optical FiberTransmission links modes and structures.
	Ontest Fiber	C411 2	Analyze the different losses which causes signal degradation optical Fibers.
67	Communication	C411.3	Assess the Characteristics of Optical sources detectors.
1	(15804701)	C411.4	Compare various performance parameters of optical fiber receivers.
		C411.5	Compare Analog and Digital Systems in optical fiber communication.
		C412.1	Demonstrate the Concepts on Embedded System Memories and Programming Languages
		C412.2	Demonstrate the Concept of Embedded System Processors.
52	Embedded Systems (15A04702)	C412 3	Analyze the Development of Embedded System Design.
		C412.4	Demonstrate the Fundamentals of Embedded System Microcontrollers.
		C412.5	Apply the Communication Protocols using TM4C and TIVA microcontroller.

S. Nu	COURSENAME	COs	COURSE OUTCOMES
		C413.1	Demonstrate the concepts of Fields and Networks working principles of specific microwave devices.
		C413.2	Compare microwave components using S-parameters.
53	Microwave	C413.3	Apply concept of microwave tube for a given set of specifications.
~	(15A04703)	C413.4	Demonstrate concept of microwave solid state devices.
		C413 5	Measure the effect of microwaves on human body, impact of the professional engineering solutions on environment and society and the consequent responsibilities relevant to an EC engineer.
		C414.1	Illustrate OSI and TCP/IP Models in data communication networks.
	Data	C414.2	Classify various switching and transmission media in networks.
54	Communications and Networking	C414.3	Analyze various multiple access protocols and Ethernet standards.
	(15A04704)	C414.4	Model the various types of the networks.
		C414.5	Assess the various services of Transport Layer Protocol & Network Security Issues.
		Ç415.1	Understand of the performance of basic radar system w r t varoius parameters through the radar funadamentals.
		C415.2	Describe the working of various Doppler Radar systems and compare with pulase radar.
55	Radar Systems	C415.3	Catogorise MTI Radars and analyze its performance in comparison with doppler radar.
	(13704703)	C415.4	Analyze Tracking radar and its performance and evaluate the parameters.
		C415.5	Illustrate the design requirements of radar receivers and elements of radar system like Duplexer, Phased array antenna etc.,
		C416.I	Understand fundamental steps in digital image processing and apply engineering mathematics in processing of digital image
	Digital 1	C416.2	Compute 2D mathematical transormation properties w r t digital image processing.
56	Processing (15A04708)	C416.3	Analyze different image enhancement techniques in spatial and frquency domain.
		C416.4	Describe various mathematical techniques and algorithms in image restoration and segmentation.
		C416.5	Illustrate various techniques and algorithms to perform image compression.
		C417.1	Analyze the concepts of transmission and reception of microwave signals.
	Optical	C417.2	Analyze the characteristics of Microwave components.
57	Communication Laboratory	C417.3	Analyze the performance of LED and Laser Diode using optical fiber link.
	(15A04711)	C417.4	Analyze the performance of analog and digital optical fiber link.
••••		C418.1	Examine VHDL/Verilog HDL source code for various digital integrated circuits in Xilinx platform.
		C418.2	Evaluate the simulation results using necessary synthesizer.
58	VLSI & Embedded Systems Laboratory	C418.3	Develop source code for different applications using TM4C processor and perform the compilation.
	(15A04712)	C418.4	Create the required binary file which can be dumped into the controller.
		C418.5	Analyze the logic outputs with the necessary hardware.
•		C421.1	Interpret the concepts of velocity saturation, Impact Ionization and hot electron effect
		C421.2	Design CMOS inverters with specified noise margin and propagation delay.
59	Low Power VLS1 Circuits And	C421.3	Evaluate the power dissipation of various digital circuits.
	Systems (15A04802)	C421.4	Critique the realization of clock-gated FSMs.
		C421.5	Analyze the dependence of leakage power dissipation of CMOS circuits on the thresholdvoltage of the MOS transistors.
		C422.1	Describe basic RF architectures and to Analyze RLC circuits.
		C422.2	Evaluate Characterstics parameters of Transimission lines & RF amplifiers using tools like smith chart.
60	RF Integrated	C422.3	Classify different types of Noises and Determine related Noise parameters with respect to RF Systems.
-	Circuits (15A04804)	C477.4	Analyze Performance of RF power Amplifiers Oscillators PL
		C 433 5	Communities Controller of DE Interested structure and Elaborate and Vications of CICLE CILLER I DATE
		C422.5	Summarize requency synthesis of Kr Integrated circuits and Elaborate architectures of GSM, UDMA, UMTS.

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S. No. COURSE NAME CON COURSE OUTCOMES		COURSE OUTCOMES	
		C423.1	Interpret the recent technological updations.
61	Technical Seminar	C423.2	Prepare Presentation and seminar report on the specified technical topic.
	(15A04806)	C423.3	Develop knowledge, presentation and communication skills.
		C423.4	Defend or convince the audience during viva process.
		C424.1	Identify the socially relevant problems and define the problem statement.
		C424.2	Analyze and categorize executable project modules by applying acquired knowledge and skills with due consideration of constraints.
		C424.3	Use efficient resources/IT tools for designing project modules.
		C424.4	Combine all the modules through effective team work after efficient testing and simulation.
62	(15A04807)	C424.5	Improve the team building, communication and management skills.
		C424.6	Elaborate the completed task and demonstrate working of the model/module in most convincing manner.
		C424.7	Compile the project report with appropriate writing skills.
		C424.8	Predict the consequences of developed model in terms of safety, health hazards and ensure ethical values.
		C424.9	Verify the scope of transforming model/module into marketable product through proper financial management.

HEAD OF THE DEPARTMENT ELECTRONICS & COMMUNICATION ENGINEERING S.V. COLLEGE OF ENGINEERING KARAKAMBADI FOAD, TIRUPATI-517 507.



(Autonomous)

Karakambadi Road, Opposite LIC Training Centre, Tirupati – 517 507. Accredited by NBA (B.Tech – CSE, ECE, EEE, Mech., Civil and IT) & NAAC with 'A' Grade Approved by AICTE, New Delhi permanently affiliated to JNTUA, Ananthapuram.

DEPARTMENT OF MCA

PROGRAMME OUTCOMES

PO1: An ability to apply knowledge of mathematics, computer science and management in practice

PO2: An ability to identify, critically analyze, formulate and develop computer applications

PO3: An ability to select modern computing tools and techniques and use them with dexterity

PO4: An ability to design a computing system to meet desired needs within realistic constraints such as safety, security and applicability

PO5: An ability to devise and conduct experiments, interpret data and provide well informed conclusions

PO6: An ability to understand the impact of system solutions in a contemporary, global, economical, environmental, and societal context for sustainable development.

PROGRAMME SPECIFIC OUTCOMES

- **PSO1:** Understand, analyze and develop computer programs in the areas related to algorithms, Process and solutions for specific application Development using appropriate data modeling concepts.
- **PSO2:** Apply standard Software Engineering practices and strategies in software project development using open-source programming environment To deliver quality product for business success.
- **PSO3:** Be acquainted with the contemporary issues, latest trends in technological development and thereby innovate new ideas and solutions To existing problems.



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DEPARTMENT OF MCA

S. No	COURSE NAME	COs	COURSE OUTCOMES
		C111.1	Explain the organization of basic computer, its design & the design of control unit and trade-offs between hardware and software.
1	Computer Organization	C111.2	Students will formulate and solve problems, understand the performance requirement of the systems and the operations & languages of the register transfer, micro operations and input- output organization.
	(CA20FPC101)	C111.3	Students can understand how computer stores positive and negative numbers
		C111.4	Understand the organization of memory and memory management hardware.
		C111.5	Elaborate advanced concepts of computer architecture, Parallel Processing, inter- processor communication and synchronization.
		C112.1	Analyze the basic concepts of C Programming language.
		C112.2	Design applications in C, using functions, arrays, pointers and structures.
2	Data Structures Using C (CA20FPC102)	C112.3	Apply various operations of Stacks and Queues in solving the problems.
		C112.4	Explain operations on Linked lists.
		C112.5	Demonstrate various tree traversals and graph traversal techniques.
	Databasa Managamant	C113.1	Design a database for a real-world information system
3	Systems (CA20FPC103)	C113.2	Define transactions which preserve the integrity of the database
		C113.3	Generate tables for a database



		C113.4	Organize the data to prevent redundancy
		C113.5	Pose queries to retrieve the information from database
		C114.1	The student will be able to understand the basic accounting principles
4	Accounting and Financial Management(BA20FHS101)	C114.2	Get exposure to the fundamental concepts, techniques and tools of Financial Management,
		C114.3	Enable to prepare and analyze financial statements of business enterprises for taking sound financial decisions.
-	Mathematical Foundations for	C115.1	Able to apply mathematical concepts and logical reasoning to solve problems in different fields of Computer science and information technology.
5	Computer Science (CA20FPC104)	C115.2	Able to apply the concepts in courses like Computer Organization, DBMS, Analysis of Algorithms, Theoretical Computer Science, Cryptography, Artificial Intelligence
	Computer Networks (C116.1	Ability to choose the transmission media depending on the requirements.
6	CA20FPC105)	C116.2	Ability to design new protocols for computer network.
		C116.3	Ability to configure a computer network logically.
		C117.1	Design database for any real world problem
	Database Management	C117.2	Implement PL/SQL programs
7	Systems Lab	C117.3	Define SQL queries
	(CA20FPC106)	C117.4	Decide the constraints
		C117.5	Investigate for data inconsistency
		C118.1	Demonstrate basic concepts of C programming language.
8	Data Structures Using C	C118.2	Develop C programs using functions, arrays, structures and pointers.
	Lab (CA20FPC107)	C118.3	Illustrate the concepts Stacks and Queues.
		C118.4	Design operations on Linked lists.



		C118.5	Apply various Binary tree traversal techniques.
			Develop searching and sorting methods
		C119.1	Preparing a Govt. Order / Official Letter / Business Letter / Circular Letter Covering formatting commands - font size and styles - bold, underline, upper case, lower case, superscript, subscript, indenting paragraphs, spacing between lines and characters, tab settings etc.
		C119.2	Printing envelopes and mail merge. To print envelopes with from addresses and to addresses to use mail merge facility for sending a circular letter to many persons to use mail merge facility for printing mailing labels
9	Office Automation & Trouble shooting Lab	C119.3	Create an advertisement Prepare a resume. Prepare a Corporate Circular letter inviting the shareholders to attend the Annual Meeting
	(CA20FPC108)	C119.4	Using formulas and functions: To prepare a Worksheet showing the monthly sales of a company in different branch offices (Showing Total Sales, Average Sales). Prepare a Statement for preparing Result of 10 students in 5 subjects (using formula to get Distinction, I Class, II Class and Fail under Result column against each student
		C119.5	Creating a Chart: To create a chart for comparing the monthly sales of a company in different branch offices.
		C119.6	Troubleshoot the following OS problems Unable to copy and paste Replacing Windows Splash Screens Out of memory error Windows cannot find Program.exe to open Windows Installer error
	Mandatory	C11A.1	Understand verbal and non-verbal features of communication and hold formal / informal conversations
10	Course(Corporate Communication Skills)	C11A.2	The significance of paralinguistic features will be understood by the students and they will try to be intelligible.
	(CA20FMC101)	C11A.3	Become good at Inter-personal skills



		C124.5	Utilize the basic characteristic features of a queuing system and acquire skills in analyzing queuing models.
	Software Engineering (C125.1	Define and develop a software project from requirement gathering to implementation.
15	CA20FPC204)	C125.2	Ability to code and test the software
		C125.3	Ability to plan, Estimate and Maintain software systems
		C126.1	Possess the ability to formulate an efficient problem space for a problem expressed in English
16	Artificial Intelligence	C126.2	Possess the ability to select a search algorithm for a problem and characterize its time and space complexities.
10	(CA20FPC208)	C126.3	Possess the skill for representing knowledge using the appropriate technique
		C126.4	Possess the ability to apply AI techniques to solve problems of Game Playing, Expert Systems and Machine Learning.
17	Operating Systems Lab	C127.1	Ensure the development of applied skills in operating systems related areas.
1/	(CA20FPC210)	C127.2	Able to write software routines modules or implementing various concepts of operating system.
		C128.1	Use python basic concepts to develop problems to solve computational problems.
18	Python Programming Lab (CA20FPC211)	C128.2	Apply lists, dictionaries, sets and functions in python programming
		C128.4	Experiment module design and text files in python programming
		C129.2	Solve simple problems using the fundamental syntax and semantics of Java
19	Java Programming Lab	C129.3	Analyze and design Java programs using object-oriented principles
		C129.4	Develop simple GUI interfaces with event handling capabilities
		C129.5	Develop and debug java programs using an IDE



		C11A.4	Achieve neutral accent and be free from mother tongue influence
		C11A.5	Being an active participant in debates and group discussion, showing ability to express agreement, argument to summarize ideas to elicit the views of others and present own ideas.
		C121.1	Able to use operating systems effectively.
11	Operating Systems	C121.2	Write System and application programs to exploit operating system functionality.
	(CA20FPC201)	C121.3	Add functionality to the exiting operating systems
		C121.4	Design new operating systems
		C122.1	Apply the features of Python language in various real applications.
	Python Programming (C122.2	Select appropriate data structure of Python for solving a problem.
12	CA20FPC202)	C122.3	Design object-oriented programs using Python for solving real- world problems.
		C122.4	Apply modularity to programs.
	OOPS through IAVA	C123.1	Use object-oriented approach for solving problems and implementing them
13	(CA20FPC203)	C123.2	Ability to write Efficient programs that handle exceptions
		C123.3	Create user friendly interface
		C124.1	Make use of the concepts of probability and their applications
14	Probability and Statistics	C124.2	Apply discrete and continuous probability distributions to analyze statistical data.
14	(MA20FBS201)	C124.3	Design the components of a classical hypothesis test for large samples.
		C124.4	Infer the statistical inferential methods based on small sampling tests.



		C12A.1	Ability to analyse the performance of algorithms.
20	Design and Analysis of	C12A.2	Ability to choose appropriate algorithm design techniques for solving problems.
	Algorithmis (CA20FT C501)	C12A.3	Ability to understand how the choice of data structures and the algorithm design methods impact the performance of programs.
		C12B.1	Understand business intelligence and business and data analytics.
		C12B.2	To understand the business data analysis through the powerful tools of data application.
	Data Science & Analytics	C12B.3	Understand the methods of data mining.
21	(CA20FPC302)	C12B.4	Apply basic tools (plots, graphs, summary statistics) to carry out EDA.
		C12B.5	Understand the key elements of a data science project
		C12B.6	Identify the appropriate data science technique and/or algorithm to use for the major data science tasks
		C211.1	Ability to design websites and do client side validations
22	Web Technologies	C211.2	Share information over a network
	(CA20FPC303)	C211.3	Ability to write server side programs
23	Cloud Computing	C212.1	Understand the concepts of cloud computing and its related techniques.
	(CA20FPC304)	C212.2	Provide a pleasant and effective user interface
		C213.1	Understand the basic testing procedures.
	Software Testing	C213.2	Able to support in generating test cases and test suites.
24	(CA20FPC305)	C213.3	Able to test the applications manually by applying different testing methods and automation tools.
		C213.4	Apply tools to resolve the problems in Real time environment.
25	Big data Analytics	C214.1	Analyse the big data analytics techniques for useful business application.



	(CA20FPC312)	C214.2	Design efficient algorithms for mining the data from large volumes.
		C214.3	Analyse the HADOOP and Map Reduce technologies associated with big data analytics.
		C214.4	Explore on big data applications using Pig and Hive.
		C215.1	Ability to analyse the performance of algorithms.
26	Design and Analysis of Algorithms	C215.2	Ability to choose appropriate algorithm design techniques for solving problems.
	Lab(CA20FPC315)	C215.3	Ability to understand how the choice of data structures and the algorithm design methods impact the performance of programs.
		C216.1	Understand and use appropriate and relevant, fundamental and applied mathematical and statistical knowledge, methodologies and modern computational tools;
27	Data Science and Analytics Lab (CA20FPC316)	C216.2	Recognise and use research principles and methods applicable to data science.
		C216.3	Extract an interpretation of data using exploratory data analysis
		C216.4	Visualise and plot graphical representations of data.
		C217.1	Ability to apply object oriented concepts for programming and its use.
		C217.2	Practical WEB Development using java by using JDBC and ODBC connectivity.
28	Web Technologies Lab (CA20FPC317)	C217.3	Implementation of servlets and PHP connectivity by using MYSQL applications.
		C217.4	Learning how to use PHP in different operating systems with different editors like eclipse and net beans.
		C217.5	Acquire skills to develop final project by acquired knowledge during curriculum.
29	Mandatory	C218.1	Students are expected to become more aware of themselves, and their surroundings (family, society, nature)



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Course(Universal Human Values) (CA20FMC318)	C218.2	They would become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind.
	C218.3	They would have better critical ability.
	C218.4	They would also become sensitive to their commitment towards what they have understood (human values, human relationship and human society).
	C218.5	It is hoped that they would be able to apply what they have learnt to their own self in different day-to-day settings in real life, at least a beginning would be made in this direction.

H.O.D. M.C.A. S.V. COLLEGE OF ENGINEERING KARAKAMBADI ROAD, TIRUPATI - 517 507



SRI VENKATESWARA COLLEGE OF ENGINEERING Karakambadi Road, Opposite LIC Training Centre, Tirupati – 517 507. Department of Electronics and Communication Engineering

PROGRAMME OUTCOMES

PO1: Engineering Knowledge

An ability to apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems as appropriate to the field of electronics & communication engineering practice.

PO2: Problem Analysis

Ability to Identify, formulates, review research literature, and analyze complex Engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3: Design/development of solutions

Ability to Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct investigations of complex problems

Apply research-based knowledge and research methods including design of experiments, analysis and interpretation of data pertaining to Electronics & Communication Engineering problems and arrive valid conclusions.

PO5: Modern tool usage

An ability to use the techniques, resources and modern engineering tools necessary for modeling the complex system design in Electronics and Communication Engineering.

PO6: The engineer and society

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability

An Ability to understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of need for sustainable development.

PO8: Ethics

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work

Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10: Communication

Communicate effectively in both verbal and written forms such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project management and finance

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member or a leader in a team, to manage projects in multidisciplinary environments.

PO12: Life-long learning

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES

PSO1: An ability to get an employment in Electronics and Communication Engineering field and related industries and to participate & succeed in competitive examinations like GRE, GATE, TOEFL, PSUs, etc.

PSO2: Should be able to design and test various electronic systems that perform analog and digital processing functions.

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	COURSENANT	<u>со</u> .	
-		<u>cuu</u>	Solve the system of linear and a local data data data data data data data da
		C111.2	Annu mean value theorem is a start of the st
	Linear Algebra &	cuis	Remiliarize with functions of an end walked functions.
	(MA20ABS101)	C1114	Annhy multiple integrals to it determine a statement of the second and and a statement of the second and a statement of the se
		011.5	Analyze the concepts of D Ha and Gamma special function for different functions.
)	C112.1	Analyze the intensity variation of light due to Interference, diffraction and polarization.
	Applied Physics	C112.2	Distinguish the types of the stand apply its principles in modern technology.
	(PH20AB\$103)	C112.3	Analyze the concept of dielectric and magnetic materials for potential applications in the emerging micro devices.
		C112.4	Apply the fundamentals of quantum mechanics and their applications to study the behaviour free electrons in solids.
		C112.5	Apply the basic concepts of semiconductor and superconductivity in Engineering applications.
		CIB.1	Understand the context, topic, and pieces of specific information from social or transactional dialogues spoken by native speakers of English.
	Communicative	C113.2	Apply grammatical structures to formulate sentences and correct word forms.
	English (EG20AH\$101)	C113.3	Analyze discourse markers to speak clearly on a specific topic in informal discussions.
		C113.4	Evaluate reading/listening texts and to write summaries based on global comprehension of these texts.
		C113.5	Create a coherent paragraph interpreting a figure/graph/chari/iable.
		C114 I	Given a network, able to find equivalent impedance by using network reduction techniques and determine the current through any element and voltage across and power through any element.
	Fundamentals of	C114.2	Given a circuit and the excitation, determine the real power, reactive power, power factor etc.
	Electrical Circuits (EE20AE\$103)	C114.3	Apply the network theorems suitably to analyze complex circuits and determine the effective voltages and currents in the circuit.
		C114.4	Determine the Dual of the Network, develop the Cut Set and Tie-set Matrices for a given Circuit.
		C114.5	Analyze the three-phase balanced and unbalanced circuits and to measure active and reactive powers in three phase circuits
	-	C115.1	Draw basic geometrical constructions, curves used in engineering practices.
	Engineering	C115.2	Understand the concept of projection and acquire visualization skills, projection of points, Lines and Planes.
	(ME20AES102)	C1153	Illustrate the projections of solids graphically.
		C115.4	Draw and explore the sectional views of right regular solids.
		C115.5	Draw the development of surfaces of solids.
	'	C116.1	Draw the basic views related to projections of Lines, Planes.
	Engineering	C116.2	Draw the basic views related to projections of Planes.
	Graphics Lab	C116.3	Unastrate orthographic views of simple objects.
	(MICLOAES 103)	C) 16.4	Unstruct isometric projections of simple solids.
		C116.5	Interpret and comprehend with drafting packages for engineering practice
		C117.1	Apply skill to find the wavelength of spectral lines using plane diffraction grating.
	Applied Disates tak	Ci 17.2	Analyze the usage of dielectric materials applications.
	(PH20AB\$104)	C117.3	Apply the concept of hysteresis curve of a ferromagnetic material to know the strength of magnetic material.
		C117.4	Analyze the working principles of semiconducting devices to study the applications of semiconducting technology.
		C117.5	Differentiate the patterns of spectrums using interference and diffraction phenomena.
	Į	C118 .1	Develop to handle and excel in a variety of self-instructional, learner-friendly modes of language learning
	Communicative	C118.2	Develop to employ better stress and intonation patterns and utter English sounds correctly.
	English Lab	C118.3	Develop to avoid the impact of mother tongue in English and neutralize their accent.
	(EG20AH\$101)	C1184	Develop to participate with skill and confidence in Group Discussions Interview and D. M. P

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14 CE20425100 Contract, monitorial data day for yours, native parts and winty practically. 10 C1019 Contract, monitorial tandonasis in deving water, native parts and mitter parts have parts and the subfig problem. Ansature in the contract tandonasis in deving water and tandonasis. 10 C1143 Contract tandonasis in deving water, native parts and tails to solving problems of functorally. Simple later and tandonasis in deving water and tandonasis. 11 C1144 Analyza the relindings in devines. 12 C1144 Analyza the relindings in devines. 13 Cuprost static towned by task and tandon. C1144 14 C1144 Analyza the techniques in erise. Cuprost static towned by task and tandon. 15 C1144 Analyza the techniques in erise. Cuprost static towned by task and tandon. 16 C1144 Analyza the techniques in effection synthem on tage and analyza. Cuprost static towned by task and tandon. 17 Cuprost static towned towned task and tandon. Cuprost static towned task analyza eristic towned task and task and task and task and task and task analyza. 18 Cuprost static towned task and task and task analyza eristic task analyza. Cuprost static towned task analyza eris	9	Fundamentals O Electrical Circuit		Demonstration of the second and magnetic circuits and apply the principles to determine circuit parameters.
10 Control to Address data (in an address to device prover measurements in their phase balanced device. 10 Control to Remoting & Normality to Address to device analytical additis to advice problems of Partnersky - Simple Interest and Composed for Address to device analytical additis to advice problems of Farronsky - Simple Interest and Composed for Address to advice ad		Lab (EE20AES10	4)	Renember, understand and apply various theorems and verify practically.
10 Constraint involving state inductions to develop andyical alist to solving notices. Personal involving state inductions to develop andyical alist to solving notices of arranges. Personages: Faco. 10 Constraint involving state inductions to develop andyical alist to solving notices of arranges. Faco. (11.4) Developments involving state inductions to develop andyical alist to solving notices of arrange. (11.4) Developments involving state inductions to develop andyical alist to solving notices of arrange - Personages: Faco. (11.4) Developments involving state inductions in develop andyical alist to solving notices of arrange. (11.4) Development in the involving state induction of arranges. (11.4) Development in the involving induction of ages and analogo. (11.1) Development in the involving of different operation and involving processes. (11.1) Development in the involving of different operation and involving in one and analogo. (12.1) Development in the involving of different operation and involving in one and analogo. (12.2) Compare on analysis of different operation and involving in one and analogo. (12.2) Compare on analysis of different operation and involving in one and analogo. (12.2) Compare on analysis of different operation in the analysis of analysis of indintime and analogical indintin analogical indiving and indintime			C119	Understand and analyze active, reactive power measurements in three phase balanced & unbalanced circuit.
10 Class III Staff of Preferencial (NAZANC) Class III Demonstrate isocieding basic mathematics to develop analytical skills to activity problems of Preferencial (NAZANC) Class III Demonstrate isocieding basic mathematics to develop analytical skills to activity problems of time at work, problems on trains and Basis Class III. 11 Class III. Demonstrate isocieding basic mathematics to develop analytical skills to activity problems of time at work, problems on trains and Basis Class III. 11 Class III. Analyzes the techniques in develop. Equations of ages and exatigy. 11 Class III. Class III. Class III. 11 Class III. Solve the differential equations of adjased overloss engineering facts. 12 Class III. Solve the differential equations of adjased overloss engineering facts. 12 Class III. Engines the work does spands = 6.64, classification and the model physical process. 12 Class III. Class III. Class IIII. 13 Class III. Class IIII. Class IIII. Class IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII				Demonstrate knowledge basic mathematics to develop analytical skills to solving problem: Averages - Percentages - Ratio.
10 Preference CHARANC(2) CHARANCANANC(2) CHARANCANANC(2) CHARA		Logical Skills for		Demonstrate knowledge basic mathematics to develop analytical skills to solving problems of Partnership - Simple Interest and Compound Interest and time and distance.
14 Cristal A Analyzes the inclusions in decisions, mobilem on sages and makage. 11 Cristal A Analyzes the trachingues in decisions, mobilem on sages and makage. 11 Cristal A Socies the differential equations of share and makage. 11 Cristal A Socies the differential equations of share and makage. 11 Cristal A Socies the differential equations of share and makage. 11 Equations and Equations and Equations of share and share of the related or victos engineering fields. 11 Equations and Equations and Equations of share and share of the order related or victos engineering fields. 11 Equations and Equations and the order of the order related or victos engineering fields. 12 Cristal A Socies the share and three of the order of the order and order of phonology. 12 Creating the off three policies provide in the share and stage of inclusions of the order order order. 13 Creating the off three orders of diactor stapping in three chains and their inglicators. 13 Creating the off three orders of chaining any provide for solving a provide a start field and relation or diodes. 14 Creating the off three orders of chaining any provide for solving a provide and diversion forders. 14 Creating the off three order order order order orders. 14 Creating three off thr	10	Professionals (MA20AMC102)	CHAS	Demonstrate knowledge basic mathematics to develop analytical skills to solving problems of time ad work, problems on trains and Boats and streams.
11 C10.3.5 Adaptive the ensemingues in directions, problems on signs and analogy. 11 Solve the direction cogation of ediment or various engineering fields. 11 C10.1.5 Solve the direction cogation of ediment or various engineering fields. 11 Vector Coclust C10.1.5 Solve the linear differential equations that model bytical processes. 12 C10.1.5 Extern the work done spatian is field, circulation and flow using vector calcular. 12 C10.2.5 Extern the work done spatian is field, circulation and flow using vector calcular. 12 C10.2.5 Extern the work done spatian is field, circulation and flow using vector calcular. 12 C10.2.5 Extern the work done spatian is field, circulation and flow using vector calcular. 12 C10.2.5 Compare capacition completes in crystal field theory and develop to solvedge on super capacitions, term construction. 12 C10.2.5 Apply the basic concepts of detern analytical techniques that field theory and develop to solvedge on super capacitions, term construction. 13 Under the principle of instrumentation and value spatian is negative and train splications. C10.2.5 14 C10.2.5 Select the finances of C language appropriate for solving a problem. C12.4.1 <t< td=""><td></td><td></td><td>CHA.4</td><td>Analyze the techniques in series, coding and decoding and blood relations.</td></t<>			CHA.4	Analyze the techniques in series, coding and decoding and blood relations.
1 C121.1 Solve the differential equations related to various engineering fields. 11 C121.2 Solve the differential equations of higher offer related to various engineering fields. 11 C121.3 Solve the differential equations of higher offer related to various engineering fields. 12 C121.3 Identify solution methods for partial differential equations and add engines. 12 C121.5 Entime the work done signifies if different equations of higher offer relations and flow unigs vector calculat. 12 C122.1 Caragerize the differential equations of different equations and flow unigs vector calculat. 12 Chematry C122.3 Apply the basic concepts of discro analytical i exterts and usage of rechanology to improve the quality of water 13 Chematry C122.3 Apply the basic concepts of discro analytical i externiculat and biological components. 13 C122.4 Distriguish a polymerization reaction with mechanism and biological components. 13 C123.6 Solve comparison of discro analytical i externiculat and biological components. 14 C123.4 Distriguish a polymerization reaction with polymerization reactions with mechanism and biological components. 15 Urage C C123.4 Distriguish a polymer		<u> </u>	CITA.5	Analyze the techniques in directions, problems on ages and analogy.
Differential Formation C1212 Solve the linear differential equations of higher order related to various angineering fields 11 Foundations C1213 Identify studion methods for partial differential equations that model physical processa 12 C1214 Interpret the physical manning of different equations that model physical processa 12 C1213 Estimate the work does spains in field, diractions and flow sing vector relations. 12 Creaming C1223 Compare costsheld and tetrahedral completes in result and index sing vector relations. 12 Creaming C1223 Compare costsheld and tetrahedral completes in result and lines upid and relative essencessis. 13 Creaming C1224 Datinguith physical processing of discret analysis in explain and their splications. 13 Problem Striving C1223 Solve comparison any points for analysis in explain and brid splications of discret analysis in a physical processing. 14 Exercise Devices C1234 Design compare and working the problems. 15 Urang C C1234 Design compare and working the problems of discret analysis in a discret appropriate for solving a problem. 16 C1234 Design compare analysing the disol solving a problem.			C121.1	Solve the differential equations related to various engineering fields.
11 Contains and Weak Columbia (MADMASS00) C121.3 Identify solution methods for partial differential equations that model physical processes. 12 Contains (Calubia (MADMASS00) C121.3 Identify solution methods for partial differential equations that model physical means (C121.5) Ensines the work does against a field, circulation and flax using vector calculas. 12 Chemistry (CHR0ASS100) C122.1 Categorize the different problems present in the water and usage of freehology to improve the quality of water. 12 Chemistry (CHR0ASS100) C122.3 Apply the basic concepts of electro analytical isothifyes that foiling at evel-the knowledge on super capacitors, semi conductors, anonutriable. 13 User the principle of instrumentation to analyte the chemical and biological components. C122.3 Select the features of C language appropriate for solving a problem. 14 Cit23.4 Cit23.4 Design computer programs for real work problems solving a problem. 14 Electron: Device 010 Cit24.2 Apply the basic constant solving the problems diving a problem. 14 Electron: Device 010 Cit24 Apply the basic of contains or different applications action are coldered. Select the fautures of C language appropriate for solving a problem. 14 Electron: Device 010 Cit24 Organ		Differential	C121.2	Solve the linear differential equations of higher order related to various engineering fields.
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12 C1215 Estimate the work dose spainers if edd, direlation and has using vector calculas. 12 Creating C1221 Categorize the different problems present in the water and usage of rectinology to improve the quality of water. 12 Creating C1222 Categorize the different problems present in the water and usage of rectinology to improve the quality of water. 12 Creating C1223 Apply the basic concepts of dectro analytical techniques that fielditar rapid and reliable measurements. 13 Problem Solving C1223 Use the principle of instrumentation to analyze the chemical and biological components. 13 Problem Solving C1223 Select the features of C language appropriate for solving a problem. 14 C1234 Design of mean programs for real work of problems and their applications of Semi conductor diodes, Bipolar Junction Transition and MOSFET to C1244 14 C1244 Design diode dratits and applications and such as rectifiers, clippers and campers also analyze basing clicalis of BJTs, and MOSFET to C1245 14 C1244 Design diode dratits and applications and applications doeses 15 C1245 Comparise the performance of various semiconductor diodes. 16 C1244 Design diode dratits and anglitant using BTTs, and MOSFET to C1245<		(MA20ABS201)	C121.4	Interpret the physical meaning of different operators such as gradient, curl and divergence.
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12 Classical and setsthedral complexes in crystal field theory and develop knowledge on super capacitors, semi-conductors, semi-conductor, semi-c			C122.1	Categorize the different problems present in the water and usage of technology to improve the quality of water
12 (CH20ABS109) C122.3 Apply the basic concepts of electro analytical sectingues that facilitate rapid and reliable measurements. 13 C122.4 Destinguish polymerization reactions with mechanisms and their applications. 13 C122.5 Use the principle of instrumentation to analyze the chemical and biologial components. 13 C122.5 Use the principle of instrumentation to analyze the chemical and biologial components. 14 C122.4 Select the fatures of C language appropriate for solving a problem. 14 C123.4 Oragin compare programs for real workl problems for solving a problem. 14 C124.2 Apply the basic principles of postation, characteristic and applications of disces. Biologic Juncion Transistor and MOSFETs. 14 C124.1 Understand principle of operation. Characteristic and applications such as rectifiens, clippers and clompers allo analyze basing circuits of BJTs, and 14 Circum/EC2AAES2 C124.2 Apply the basic principles of virius semiconductor diodes. 15 Energonering (ME20AES101) C124.2 Apply wood working skills in real worki applications. C124.5 Compare the performance of virius semiconductor diodes. Electronic clipper semicons in various applications of various applications. C125.4 <		Chamirta	C122.2	Compare octahedral and tetrahedral complexes in crystal field theory and develop knowledge on super capacitors, semi conductors, nanomaterials.
10 C1224 Distinguish polymerization reactions with mechanisms and their applications. 113 C1223 Use the principle of instrumentation to analyze the chemical and biological components. 113 Problem Solving C1232 Solve computational problems. C1231 Solve computational problems. C1232 Select the features of C language appropriate for solving a problem. C1233 Organize the data which is more appropriate for solving a problem. C1234 Organize the data which is more appropriate for solving a problem. C1234 Organize the data which is more appropriate for solving a problem. C1234 Organize the data which is more appropriate for solving a problem. C1244 Understand principle of operation, characteritaties and applications of Semi conductor diodes, BUTs, and MOSFETs. C1244 Design dodd circuits and amplifiers using BTTs, and MOSFETs. C1245 Compare the performance of various as find for domesic applications. C1245 Identify tools, work matching sheets in real world applications. C1245 Apply finding operation in various applications. C1245 Identify tools, work matching in pointig circuits. C1245 Mate plasto components and world applications.	12	(CH20ABS103)	C122.3	Apply the basic concepts of electro analytical techniques that facilitate rapid and reliable measurements
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15 Engineering Workshop C125 1 Identify tools, work material, measuring instruments useful for domestic applications. 15 Engineering Workshop C125 4 Apply wood working skills in real world applications. 15 Engineering Workshop C125 5 Analyze different types of basic electric circuit connections. 16 C125 7 Develop different weld joints for various material. C125 7 16 IT Workshop C126 1 Identify the Internal parts of computers and Generation of Computers. 16 IT Workshop C126 1 Identify the Internal parts of computers for information sharing. 16 IT Workshop C126 4 Installation process of different types Operating system for a computer ready to use. 16 IT Workshop C126 4 Internet two or more computers for information sharing. 16 C126 4 Internet and browse it for required information. C126 4 17 C126 4 Internet and browse it for required information. 16 C126 4 Prepare the documents using Word Processor, prepare spread sheets for calculations using Excel, and documents for LaTeX. 16 Prepare tide presentation using the presentation tool. C126 7 <td></td> <td>C124.5</td> <td>Compare the performance of various semiconductor devices.</td>			C124.5	Compare the performance of various semiconductor devices.
15 C125.2 Apply wood working skills in real world applications. 15 Engineering Workshop (ME20AES101) C125.5 Analyze different parts with metal sheets in real world applications. 15 C125.4 Apply fitting operations in various applications for good strength. C125.5 Analyze different types of basic electric circuit connections. C125.6 Analyze different types of basic electric circuit connections. C125.7 Develop different types of basic electric circuit connections. C125.6 Make moulds for sand casting using standard equipment. C125.7 Develop different weld joints for various metals. C125.8 Inspect various parts of machine components. C125.9 Make plastic components using proper raw material. C125.9 Make plastic components and Generation of Computers. C126.1 Identify the Internal parts of computer sand generation of Computer sand proper the computer ready to use. C126.1 Installation process of different types Operating system for a computer by their own. C126.4 Interconnect two or more computers for information. C126.5 Access the Internet and browse it for required information. C126.6 Prepare the documents using Word Processor, prep			C125 I	Identify tools, work material, measuring instruments useful for domestic applications.
15 Build different parts with metal sheets in real world applications. 15 C125.4 Apply fitting operations in various applications for good strength. 15 C125.5 Analyze different types of basic electric circuit connections. (ME20AES101) C125.5 Demonstrate soldering and brazing in joining circuits. C125.6 Make moulds for sand casting using standard equipment. C125.7 Develop different weld joints for various metals. C125.8 Inspect various parts of machine components. C125.9 Make plastic components using proper raw material. C126.1 Identify the Internal parts of computers and Generation of Computers. C126.2 Assemble and disassemble a computer from its parts and prepare the computer ready to use. 16 IT Workshop (CS20AES10) C126.4 C126.5 Access the Internet and browse it for required information. C126.6 Prepare the documents using Word Processor, prepare spread sheets for calculations using Excel, and documents for LaTeX. C126.7 Prepare slide presentation using the presentation tool.			C125.2	Apply wood working skills in real world applications.
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16 IT Workshop (CS20AES103) C125.6 Make moulds for sand casting using standard equipment. 16 IT Workshop (CS20AES103) C126.7 Develop different weld joints for various metals. 16 IT Workshop (CS20AES103) C126.4 Interconnect two or more computers for information sharing. 16 C126.5 Access the Internet and browse it for required information. C126.6 Prepare the documents using Word Processor, prepare spread sheets for calculations using Excel, and documents for LaTeX.		(ME20AES101)	C125.5	Demonstrate soldering and brazing in joining circuits.
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16 IT Workshop (CS20AES103) C126.4 Interconnect two or more computers for information sharing. C126.5 Access the Internet and browse it for required information. C126.6 Prepare the documents using Word Processor, prepare spread sheets for calculations using Excel, and documents for LaTeX. C126.7 Prepare slide presentation using the presentation tool.		F	C126 3	Installation provers of different time Downline and a
(CS20AES103) C126.5 Access the Internet and browse it for required information. C126.6 Prepare the documents using Word Processor, prepare spread sheets for calculations using Excel, and documents for LaTeX. C126.7 Prepare slide presentation using the presentation tool.	16	IT Workshop	C126.4	Interconnect two or more contracting system for a computer by their own.
C126 6 Prepare the documents using Word Processor, prepare spread sheets for calculations using Excel, and documents for LaTeX. C126 7 Prepare slide presentation using the presentation tool.		(CS_0AES103)	C126.5	Access the Internet and browse it for required information
C126 7 Prepare slide presentation using the presentation tool.			C126.6 1	Prepare the documents using Word Processor, prepare spread sheets for calculations using Excel, and documents for LaTeX.
		F	C126 7	Prepare slide presentation using the presentation tool

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S. No.	COURSE NAME	CQ1	COURSE OUTCOMES
		C127.1	Build algorithm and flowchart for simple problems.
	Building Build	Ç127.2	Use suitable control structures to solve problems.
17	Problem Solving Using C Lab	C127.3	Use suitable iterative statements, arrays and modular programming to solve the problems.
	(CS20AES102)	C127.4	Implement Programs using pointers and String handling Functions.
		Ç127.5	Develop code for complex applications using structures, unions and file handling features.
		C128.1	Demonstrate electro-analytical techniques for the chemical analysis.
		C128.2	Apply Beer-Lambert Law to know the concentration of unknown samples.
18	Chemistry Lab (CH20ABS104)	C128.3	Anshire the grafity and graminy of chemical assurance in given surgely
		0.20.3	Analyze the quality and quantity of chemical compounds in given samples.
		C128.4	Prepare different types of polyment.
		C129.1	Understand the basic characteristics and applications of basic electronic devices. (L1)
10	Electronic Devices	C129.2	Observe the characteristics of electronic devices by plotting graphs.
19	(EC20AES202)	C129.3	Analyze the Characteristics of U/T, B/T, MOSFET
		C129.4	Design MOSPET/ BJT based amplifiers for the given specifications.
		C129.5	
		CIZA.)	Understand the concepts of environment and natural resources.
	Enginemental	C12A.2	Classify the types of ecosystems and conservation methods of bio-diversity.
20	Science	C12A.3	Identify the causes and problems of pollution in their real life situations.
	(CH20AMC201)	C12A.4	Develop awareness on social issues such as global warming, acid rains, ozone layer depletion and sustainalibility.
		C12A.5	Determine the consequences of population exploitation in detail.
		C12B.1	Improve the neutral accent and be free from mother longue influence.
	Speech and Orsi	C12B.2	Hypothesizing small talks on general topics and learn criticating skills hy naticinating in Convergions
21	Communication	CUIRI	Amplian Voosbulary and using it in their day to day KG.
	(EG20AMC103)	C12B.5	
		C12B.4	Understanding and mastering in verbal and non-verbal communication.
		C211 .1	Apply Cauchy-Riemann equations to find the analyticity of complex functions.
		C211 2	Apply CauchY integral formuls and Cauchy Integral theorem to evaluate improper integrals along contours.
22	Complex Variables and Transforms	C211.3	Analyze the concepts of Laplace Transforms to solve ordinary differential equations.
	(MA20AB\$302)	C211.4	Examine the Fourier series for different functions in half and full range.
		C211.5	Analyze the concepts of Z transforms to solve Difference equations
		C211.6	Analyze the concepts of Z transforms to solve Difference equations
		C212 .1	Understand the properties of Boolean algebra, other logic operations, and minimization of Boolean functions using Karnaugh map.
		C212.2	Make use of the concepts to solve the problems related to the logic circuits.
23	Digital Logic Design	C212.3	Analyze the combinational and sequential logic circuits.
	(EC20APC301)	C212.4	Compare various Programmable logic devices.
		C212.5	Compare the concepts of RAM and ROM.
		C212.6	Understand the operation CMOS, TTL logic families, ECL logic families and interfacing between them
•	<u> </u>	C213.1	Understand the working principle of multistage amplifiers. Feedback amolifiers, power amplifiers and tuned amplifiers
		C213 2	Analyze multistage amplifiers, feedback amplifiers, power antibilitiers, and tuned amplifiers
24	Electronic Circuit Analysis & Design	C213.3	Design muhistage amplifiers, feedback amplifiers, oscillators, power amplifiers and funed amplifiers for the sizes coverification
-	(EC20APC302)	C213.4	Evaluate the efficiency of large signal (power) amplifiers.
		C213.5	Compare the frequency response of Single-stage. Double-stage amolifiers with Single hand, double toned and Stages and double-
		-213.3	Compare the dequery response or ougherstage, bounderstage amputers with Single funed, double funed and Stagger funed amplifiers
		C214.1	Understand the mathematical description and representation of continuous- time and discrete-time signals and systems. Also understand the concepts of various transform techniques.
	Signals & Susteme	C214.2	Apply sampling theorem to convert continuous-time signals to discrete-time signals and reconstruct back, different transform techniques to solve signals and system related problems.
25	(EC20APC303)	C214.3	Analyze the frequency spectra of various continuous-time signals using different transform methods.
		C214.4	Analyze the systems based on their properties and determine the response of them.
		C214.5	Analyze the frequency spectra of various discrete time signals using different transform methods
		0414,5	revery zo ne requertely spoore of venous disorder-unit signals using different transform methods.

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5.1	to COURSE NAM	12 0	<u>.</u> T	
			151	COURSE OUTCOMES
	Management	(C2)		Should be able to understand managerial economics and demand analysis.
26	Economics an		54 () ()	Srould be able to analyze decisions relating to production and cost analysis.
	(BA20AH\$30	(5)(5)(5)(5)(5)(5)(5)(5)(5)(5)(5)(5)(5)(Should be able to evaluate market structures and forms of business.
			2.9 2	Should be able to assess financial statements and ratios.
-	- 		>> 5	Should be able to apply capital budgeting methods.
		C21	6.1 L	cern how to use the MATLAB software and know syntax of MATLAB Programming.
	Basic Simularia	C210	6.2 U	inderstand how to simulate different types of signals and system response.
1 27	Lab (EC20APC)	(04) C210	6.3 A	Analyze signals using Fourier, Laplace and Z-transforms.
		C216	5.4 C	compute Fourier transform of a given signal and plot its magnitude and phase spectrum.
<u> </u>	<u> </u>	C216	5.5 V	erify Sampling theorem, Determine Convolution and Correlation between signals and sequences
1		C217	.1 U	Inderstand the pin configuration of various digital ICs used in the lab
28	Digital Logic Des	isn C217	2 C	onduct the experiment and verify the properties of various force circuits
	Eato (EC20APC)	C217	3 D	esign sequential circuits.
<u> </u>		C217	4 De	esign combinational circuits.
1		C218	.) Ur	nderstand the characteristics and frequency response of various amplifiers and determine its
	Electronic Circui		-	and bandwidth
29	Analysis & Desig	n	2 58	mulate and analyze the performance of negative feedback amplifier circuits, oscillators and Power amplifiers and single tuned amplifiers.
		C218.) De	sign a RC and LC oscillator circuits for a given frequency.
l		C218	4 Ca	doulate the efficiency of the power amplifier circuits.
	<u>†∙ — —</u>	C219.		sunguish the operating modes of various Power amplifier circuits.
	Antipolica	C219.3	2 U.s.	e Conditionals and Loops for Pothon Programs
30	Development Usin	8 C219.3	Cor	astruct custom modules and functions to bandle difference and in
	(IT20ASC301)	C219 4		Dement Object oriented concerns through and time
		C219.5	Des	sion different shaces and ablents intrough real time scenarios and handle errors,
	<u> </u>	C11A.1		
				uyze about cells and their structure and function. Different types of cells and basics for classification of living Organisms
	Biology for	C21A 2	Ana	dyze about biomolecules, their structure and function and their role in the living organisms. How biomolecules are useful in Industry.
31	Engineers (CH20AMC301)	C21A.3	Anal	lyze about human physiology
	,	C21A.4	Ала	lyze about genetic material, DNA, genes and RNA how they replicate, pass and preserve vital information in living Organisms.
		C21A.5	Appl	ly biological Principles in different technologies for the production of medicines and Pharmaceutical molecules through transgenic
				ionstrate knowledge basic mathematics to develop analytical skills to solving problems of HCP, LCM Factora and Simplification.
32	Logical Skills For Professionals-]]	C21B.2	Demo	onstrate knowledge basic mathematics to develop analytical skills to solving problems of Pipes, Alligation or Mixture.
	(MA20AMC301)	C21B 3	Дето	onstrate knowledge basic mathematics to develop analytical skills to solving problems of Table, Bar Graphs and Pie Chart.
		C21B.4	Analy	yze the techniques in Syflogism.
		C21B 5	Analy	ze the techniques in Calender, Clocks and Number Series Analogyconcepts
	(EC204MC200)	C21C	Use E	English language, both written and spoken, competently and correctly.
	Enhancing English	C21C.2	Impro	ove comprehension and fluency of speech.
33	Language Skills (Lateral Entry	C2IC.3	Hone	the communication skills to meet the challenges of their careers successfully.
	Students only)	C21C.4	Gain c	confidence in using English in verbal situations.
- +		C21C.5	Streng	then communication skills in different contexts like formal and informal.
	ļ	C221.1	Analyz	ze the problems using asymptotic notations.
,	Data Structure S	C221.2	Apply	Stack, Queues and linked list to solve different applications.
J9 	Using C (CS20AES401)	C221,3	Demor	nstrate suitable sorting techniques for the real world problem.
	ļ	C221.4	Implen	ment tree structures in different patterns of representation of data.
[C221.5	Analyz	the given problem using graph traversal techniques.

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S. No.	COURSE NAME	CO	COURSE OUTCOMES
		C222.1	Analyze and understand the concepts of Probability.
	Probability Theory and Stochastic Processes (MA20ABS402)	C222.2	Analyze the concept of Single Random Variable and evaluate the operations that may be performed on a single Random variable
35		C222.3	Analyze the concepts of Multiple Random Variable and evaluate the operations that may be performed on a multiple Random variable.
		C222.4	Analyze the concepts of Random Process and evaluate the Temporal characteristics of Random Processes.
		C222.5	Analyze the concepts of Random Process and evaluate the Temporal characteristics of Random Processes.
		C223.1	Understand the concepts of various Amplitude, Angle and Pulse Modulation schemes.
		C223.2	Apply the concepts to solve problems in Analog and pulse modulation schemes
36	Analog Communications	C223.3	Analysis of Analog communication system in the presence of noise.
	(EC20APC401)	C223 4	Compare and contrast design issues, advantages, disadvantages and limitations of various modulation schemes in Analog communication systems.
		C223.5	Solve basic communication problems & calculate information rate and channel capacity of a discrete communication change!
		C224 1	Understanding the basic laws and applications of electromagnetic fields.
37		C224.2	Evaluate the problems related to electromagnetic fields.
	Electromagnetic Waves and	C224.3	Analyze Maxwell equations for static and time varying fields.
	Transmission Lines	C224.4	Analyze electric and magnetic fields at the interface of different media.
	(00200070402)	C224.5	Evaluate electric and magnetic fields and calculates different angles.
	ľ	C224.6	Evaluate transmission lines with equivalent circuit and their characteristics with various lengths.
_		C225.1	List out the characteristics of Linear and Digital ICs.
		C225.2	Discuss the various applications of linear & Digital Ics.
	Lincar & Digital	C225.3	Solve the application based problems related to linear and digital lcs.
38	and Applications	C225.4	Analyze various applications based clrcuits of linear and digital ICs.
	(EC20APC403)	C225.5	Design the circuits using either linear ICs or Digital ICs from the given specifications
		C225.6	Develop digital circuits using HDL.
		C226.1	Understand different analog modulation techniques & Radio receiver characteristics.
	Analog	C226.2	Analyze different analog modulation lechniques.
39	Communications Laboratory	C226.3	Design and implement different modulation and demodulation techniques.
	(EC20APC404)	C226,4	Observe the performance of system by plotting graphs & Measure radio receiver characteristics.
_		C226.5	Simulate all digital modulation and demodulation techniques.
		C227.1	Demonstrate the concept of Recursion for solving a problem.
40	Data Structures	C227.2	Choose and implement linear data structure to solve problems.
40	(CS20AES402)	C227.3	Develop programs for searching and sorting algorithms.
_		C227.4	Select and implement suitable non linear data structure for solving a problem.
_		C228.1	Understand the pin configuration of each linear/ digital IC and its functional diagram.
	Linear & Digital	C228.2	Conduct the experiment and obtain the expected results.
41	Integrated Circuits and Applications	C228.3	Analyze the given circuit/designed circuit and verify the practical observations with the analyzed results.
	Lab (EC20APC405)	C228.4	Design the circuits for the given specifications using linear and digital ICs.
		C228.5	Acquaintance with lab equipment about the operation and its use.
		C229.1	Memorize various elements of effective communicative skills.
		C229.2	Interpret people at the emotional level through emotional intelligence
42	Soft Skills (EG20ASO401)	C229.3	Apply critical thinking skills in problem solving.
		C229.4	Analyze the needs of an organization for team building.
		C229.5	Judge the situation and take necessary decisions as a leader.
43	NSS/Yoga/Cultural/ Games and Sports (SH20AMC401)	C22A .1	Develop social and work-life skills as well as personal and emotional well being.

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<u>- 5 N</u>	COURSE NAME	<u></u>	COURSE OUTCOMES
		C22B.1	Understanding the value of education to become more aware of themselves, and their surroundings (family, society, nature).
	Liniversal Human	C228 2	Utilize the concepts of human being-harmony in myself become more responsible in life, and in handling problems with sustainable.
44	Values (BA70AMC201)	C22B.3	Understanding the concepts of society-harmony in human for better oritical ability.
	(1)/204(4)(201)	C22B 4	Understanding the human values, human relationship and human society to become sensitive to their commitment
		C22B 5	Apply what they have learnt to their own self in different day-to-day settings in real life, at least a beginning would be made in this direction.
		C22C.1	Develop the use of matrix algebra techniques that is needed by engineers for oractical applications
	Engineering	C22C 2	Utilize mean value theorems to real life problems
45	(Lateral Entry	C22C 3	Solve the differential equations related to various engineering fields.
	Students only) (MA20AMC401)	C22C 4	Apply multiple integrals to find the area and volumes for different functions
L		C22C.5	Estimate the work done against a field, circulation and flux using vector calculus
		C311.1	Intrepret DC and AC characteristics of operational amplifiers & Op amp parameters
	Interneted Circultu	C311.2	Make use of Op-Amps to design circuits for various applications such as Amplificat. Active filters, Oscillators
46	and Applications	C311.3	Analyze Op-Amp based non linear applications such as Comparators. Waveform generators
	(198045011)	C311.4	Apply opamp basics to study and Compare different lynes of A/D and D/A Compares and the
[C311.5	Design various multi-vibrator circuits using IC 555 times and analyze cardial and the Converter circuits.
—	·	C312.1	Discuss the various characteristics with the use of here and analyse special purpose ICs like PLL, VCO and voltage regulators
		C312.2	Discuss the field components of various dipole antennas and Analyze radiation pattern of various antenna arrays with some practical antennas.
47	Antennas and Wave	C312.3	Demonstrate the basic principles of Aperture and Long Antenna with Section and L
	(19A04502)	C3174	Demonstrate the heater state and the state a
		C1124	periodistrate the basic principles of antennas which are operated in microwave Frequency range.
		03123	Evaluate the antenna parameters in antenna measurements.
 -	<u> </u>	C312.6	Illustrate problems on inosphere propagations and discuss wave characteristics in different frequency ranges of propagations.
		C313.1	Facilitate active listening to enable inferential learning through expert lectures and talks.
		(31) 2	Impart critical reading strategies for comprehension of complex texts.
48	English Language Skills (19A52601T)	C313 3	Provide training and opportunities to develop fluencyin English through participation informal group discussions and presentations using audio-visual aids.
		C313.4	Demonstrate good writing skills for effective paraphrasing argumentative essays and formal correspondence.
	······	C313.5	Encourage use of a wide range of grammatical structures and vocabulary in speech and writing
		C314.1	Classify different source coding systems.
	 Digita!	C314.2	Analyze the concepts of baseband transmission for PAM.
49	Communication (19A04503T)	C314 3	Determine signal space analysis for Correlator.
	1	C314.4	Analyze the concepts of passband data transmission techniques for BPSK, QPSK, BFSK.
		C314.5	Evaluate various channel coding techniques.
		C3151	Compare different network architectures and reference models.
50	Date Communication and	C315.2	Select the approviate technology for data transmission based on the requirement.
	Networks (19A04504a)	C315.3	Analyze different flow and error control protocols.
		C315.4	Configure simple networks and assign IP addresses to hosts.
		515,5	Apply the concepts of different application layer protocols.
	Computer	C316	Analyze the importance of Computerization and IT applications in food industries and need for development of Computer operating environment and information system for various types of food industries.
51	Applications in Food	C316.2	Learn the basic concepts of 'C'.
	(19A27506b)	C316.3	Analyze the operation of branching and looping statements,
	ŀ	C316.4	Use the concept of functions, Arrays, strings.
		C)16.5	Apply the Concept of Pointers, Structures, Unions, data structures, linked lists

	COURSE MARKE	CO1	COURSE OUTCOMAS
		C317.1	Simulate and Analyze the working of linear and non linear applications of opamp-741/TL082.
52	Ì	C317.2	Design and simulate astable and monostable multivibrator using IC\$55 timer.
	Integrated Circuits and Applications	C317.3	Simulate and Verify the working of ADC and DAC
	Lab (19A04501P)	C317.4	Study the opration and applications of Special purpose ICs PLL-IC 565, IC566,
		6317.5	Design and simplete fixed and variable voltage regulator using ICs 723 7805/7809
			To sumare the students to unitate of all instructional learner friendly moder of instruct learning
	-		
\$3	English Language Skills Lah	Ç318.2	To help the students cultivate the habit of reading passages from the computer monitor. Thus providing them with the required facility to face computer based competitive exams like GRE, TOEFL, and GMAT etc
	(19A52601P)	C318.3	To enable them to learn better pronunciation through stress, intonation and rhythm.
		C318.4	To train them to use language effectively to face interviews, group discussions, public speaking.
		C319.1	A aalyze difference Source Coding techniques using hardware implementation.
	Digital	C319.2	Analyze Source Coding techniques using MATLAB.
54	Communications Lab (19A04503P)	C319.3	Analyze the different Passband data transmission techniques using hardware implementation.
	1	C3194	Analyze passband data transmission using MATLAB.
• •		C31A.1	Understand the basic concepts of research and its methodologies
	Research	C31A.2	Analyze the research problem and apply appropriate sampling method for data collection.
55	Methodology	C31A3	Apply different methods for analysis purpose.
	(10066941)	C31A.4	Analyze various types of testing tools used in research.
		C31A.5	Dealgn a research paper by following research ethics.
		C31B.1	Identify the problem statement by observing the problems in the society, for which electronics engineers can propose a solution.
		C31B.2	Develop the design methodolgy for implementing the chosen project.
56	Socially Relevant Project (19A04507)	Ç31B.3	Apply appropriate modern tools for implementing the project work.
		Ç31B.4	Evaluate application of project work with appropriate societal consideration.
		C31B.5	Develop presentation and interpersonal communication skills through presentations and documentation.
		C321.1	Explain the architecture, interrupts and addressing modes of 8085 and 8086 microprocessors.
		C321.2	Develop Assembly Language Programs for various problems using 8086.
67	Microprocessors and	C321.3	Interface 8086 with different peripheral devices.
57	(19A04601T)	C321.4	Describe architecture and features of 8051 microcontroller and develop Assembly Language Programs to perform various operations using
		C321.5	Explain the architecture, instruction set and addressing modes of ARM Cortex MO+ Processor.
		C322.1	Analyze the concept of DFT & FFT Algorithms.
	Digital Signal	C322.2	Design IIR filters using various techniques & construct different forms of IIR filter realizations.
58	Processing (19A04602T)	C322.3	Design FIR filters using various techniques & construct different forms of FIR filter realizations .
		C322.4	Describe the Architecture details & instruction sets of programmable DSP.
		C322.5	Implement the signal processing algorithms in DSP.
		C323.1	Understand the architecture of FPGAs, tools used in modelling of digital design and modelling styles in VHDL.
		C323.2	Implement various arithmetic and logical operations in digital design using VHDL.
59	Digital System Design through	C323.3	Design various combinational logic circuits and analyze its operation; and implement various memory and data storage elements using VHDL.
	AUDE (18904603)	C323.4	Design various sequential logic circuits and analyze its operation using VHDL.
		C323.5	Design complex digital CPU, vending machine and washing machines etc. using VHDL and analyze the case studies.
	·	C324.1	Evaluate some important measurement parameters of electrical and electronic instruments.
	Electrical	C324.2	Explain the basic working principle of different measuring meters.
60	Electronic	C324.3	Analyze performance of various electric and electronic instruments.
	Instruments (19A04605d)	C324.4	Apply the knowledge of CRO measuring instrument in real time measurements
		C324.5	Explain the basic working principle of different types of Transducers.

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5. No.	COURSE NAME	CO1	COURSE OUTCOMES
<u> </u>		C325.1	Develop awareness on the relevance and importance of soft skills.
		C325.2	Recognize the importance of verbal and non verbal skills.
61	Soft Skills (19457604a)	C325 3	Develop the interpersonal and intrapersonal skills.
	(198320048)	C325 4	Apply the knowledge in setting the SMART goals and achieve the set goals.
		C325.5	Create trust among people and develop employability skills.
		C326 1	Apply the concept of Entrepreneurship and challenges in the workl of competition.
	Entrepreneurship & Incubation (19A52602a)	C326.2	Develop Knowledge in generating ideas for New Ventures.
62		C326.3	Analyze various sources of finance and subsidies to entrepreneur/women Entrepreneurs.
		C326.4	Evaluate the role of central government and state government in promoting Entrepreneurship.
		C326.5	Create and design business plan structure through incubations.
		¢327.1	Develop various DSP Algorithms using MATLAB Software.
-		C327.2	Evaluate Frequency response Characteristics of digital FIR & IIR filters.
67	Digital Signal		Implement basic signal processing algorithms such as convolution difference equation implementation and apply them in the construction
	(19A04602P)	C327.3	of FIR and IIR filters.
1		C327.4	Design various analog filters.
		C327.5	Analyze DSP algorithms using both fixed and floating point processors.
		Č 328.1	Write Assembly Language Programs for 8086, 8051 and execute programs using TASM/MASM Software.
	Microprocessors and	C328.2	Analyze the program execution process step by step.
64	Microcontrollers	C328.3	Interface different peripheral devices with 8051 microcontroller.
	,	C328.4	Execute programs using Keil MDK-ARM tool
		C328.5	Design some specific real time applications and implement the same.
		C329.1	Identify the problem statement by observing the problems in the society, for which electronics engineers can propose a solution.
	Socially Relevant	C329 2	Develop the design methodolgy for implementing the chosen project.
65	Socially Relevant Project (19A04606)	C3293	Apply appropriate modern tools for implementing the project work.
		C329.4	Evaluate application of project work with appropriate societal consideration.
		C329.5	Develop presentation and interpersonal communication skills through presentations and documentation.
	Constitution of India (19A99501)	C32A 1	Analyze historical background of the constitution making and its importance for building a democratic India.
		C32A.2	Discriminate the functioning of three wings of the government ie., executive, legislative and judiciary.
66		C32A.3	Analyze the decentralization of power between central, state and local self-government.
i		C32A.4	Explain the duties and powers of local self-government and become good citizen of India.
		C32A.5	Apply the knowledge in strengthening of the constitutional institutions like CAG, Election Commission and UPSC for sustaining democracy.
		C411 I	Demonstrate optical FiberTransmission links modes and structures.
	Ontwat Fiber	C411 2	Analyze the different losses which causes signal degradation optical Fibers.
67	Communication	C411.3	Assess the Characteristics of Optical sources detectors.
	(15A04701)	C411.4	Compare various performance parameters of optical fiber receivers.
		C411.5	Compare Analog and Digital Systems in optical fiber communication.
	Embedded Systems (15A04702)	C412.1	Demonstrate the Concepts on Embedded System Memories and Programming Languages
		C412.2	Demonstrate the Concept of Embedded System Processors.
52		C412 3	Analyze the Development of Embedded System Design.
		C412.4	Demonstrate the Fundamentals of Embedded System Microcontrollers.
1		C412.5	Apply the Communication Protocols using TM4C and TIVA microcontroller.

S. Nu	COURSENAME	COs	COURSE OUTCOMES
		C413.1	Demonstrate the concepts of Fields and Networks working principles of specific microwave devices.
		C413.2	Compare microwave components using S-parameters.
53	Microwave Engineering	C413.3	Apply concept of microwave tube for a given set of specifications.
55	(15A04703)	C413.4	Demonstrate concept of microwave solid state devices.
	ſ	C413 5	Measure the effect of microwaves on human body, impact of the professional engineering solutions on environment and acciety and the consequent responsibilities relevant to an EC engineer.
	Data Communications and Networking (15A04704)	C414.1	Illustrate OSI and TCP/IP Models in data communication networks.
		C414.2	Classify various switching and transmission media in networks.
54		C414.3	Analyze various multiple access protocols and Ethernet standards.
		C414.4	Model the various types of the networks.
		C414.5	Assess the various services of Transport Layer Protocol & Network Security Issues.
		C415.1	Understand of the performance of basic radar system w r t varoius parameters through the radar funadamentals.
		C415.2	Describe the working of various Doppler Radar systems and compare with pulase radar.
55	Radar Systems	C415.3	Catogorise MTI Radars and analyze its performance in comparison with doppler radar.
	(15A04705)	Ç415.4	Analyze Tracking radar and its performance and evaluate the parameters.
		C415.5	Illustrate the design requirements of radar receivers and elements of radar system like Duplexer, Phased array antenna etc.,
		C416.I	Understand fundamental steps in digital image processing and apply engineering mathematics in processing of digital image
	Digital Image	C416.2	Compute 2D mathematical transormation properties w r t digital image processing.
56	Processing (15 A 04708)	C416.3	Analyze different image enhancement techniques in spatial and frquency domain.
	(15764708)	C416.4	Describe various mathematical techniques and algorithms in image restoration and segmentation.
		C416.5	Illustrate various techniques and algorithms to perform image compression.
		C417.1	Analyze the concepts of transmission and reception of microwave signals.
-	Optical	C417.2	Analyze the characteristics of Microwave components.
57	Communication Laboratory	C417.3	Analyze the performance of LED and Laser Diode using optical fiber link.
	(15A04711)	C417.4	Analyze the performance of analog and digital optical fiber link.
		C418.1	Examine VHDL/Verilog HDL source code for various digital integrated circuits in Xilinx platform.
		C418.2	Evakuate the simulation results using necessary synthesizer.
58	VLSI & Embedded Systems Laboratory	C418.3	Develop source code for different applications using TM4C processor and perform the compilation.
	(15A04712)	C418.4	Create the required binary file which can be dumped into the controller.
		C418.5	Analyze the logic outputs with the necessary hardware.
		C421.1	Interpret the concepts of velocity saturation, Impact Ionization and hot electron effect
		C421.2	Design CMOS inverters with specified noise margin and propagation delay.
59	Low Power VLS1 Circuits And	C421.3	Evaluate the power dissipation of various digital circuits.
	Systems (15A04802)	C421.4	Critique the realization of clock-gated FSMs.
		C421.5	Analyze the dependence of leakage power dissipation of CMOS circuits on the thresholdvoltage of the MOS transistors.
		C472 1	Describe basic RF architectures and to Analyze RLC circuits.
	RF Integrated Circuits (15A04804)	C422.1	Evaluate Characteristics parameters of Transmission lines & RF amplifiers using tools like smith chart
60		C422.3	Classify different types of Naises and Determine related Noise natameters with seconds to BF Systems
		C404.4	
		C422.4	Analyze restormance of the power Anapanets, Useriations, PLL.
		C422.5	Summarize frequency synthesis of RF Integrated circuits and Elaborate architectures of GSM,CDMA,UMTS.

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S. No.	COURSE NAME	COs	COURSE OUTCOMES
	Technical Seminar (15A04806)	C423.1	Interpret the recent technological updations.
61		C423.2	Prepare Presentation and seminar report on the specified technical topic.
		C423.3	Develop knowledge, presentation and communication skills.
		C423.4	Defend or convince the audience during viva process.
	Project (15A04807)	C424.1	Identify the socially relevant problems and define the problem statement.
		C424.2	Analyze and categorize executable project modules by applying acquired knowledge and skills with due consideration of constraints.
		C424.3	Use efficient resources/IT tools for designing project modules.
		C424.4	Combine all the modules through effective team work after efficient testing and simulation.
62		C424.5	Improve the team building, communication and management skills.
		C424.6	Elaborate the completed task and demonstrate working of the model/module in most convincing manner.
		C424.7	Compile the project report with appropriate writing skills.
		C424.8	Predict the consequences of developed model in terms of safety, health hazards and ensure ethical values.
		C424.9	Verify the scope of transforming model/module into marketable product through proper financial management.

HEAD OF THE DEPARTMENT ELECTRONICS & COMMUNICATION ENGINEERING S.V. COLLEGE OF ENGINEERING KARAKAMBADI FOAD, TIRUPATI-517 507. **S V COLLEGE OF ENGINEERING**

(AUTONOMOUS) Karakambadi Road, Tirupati - 517507 Branch: Civil Engineering

PROGRAM OUTCOMES (POs)

Engineering Graduates will be able to:

PO1:	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2:	Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO3:	Design/development of solutions : Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO4:	Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO5:	Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO6:	The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO7:	Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO8:	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9:	Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10:	Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

S V COLLEGE OF ENGINEERING

(AUTONOMOUS) Karakambadi Road, Tirupati - 517507 Branch: Civil Engineering

Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM SPECIFIC OUTCOMES (PSOs)

PO11:

A graduate of the Computer Science and Engineering Program will be able to:

PSO1: Graduates can analyze the Civil Engineering problems by applying the knowledge of basic sciences, engineering skills, mathematics and computational tools. Graduates shall demonstrate sound knowledge in planning, analysis, design, laboratory investigations, cost estimations and construction aspects of all kinds of civil engineering

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Karakambadi Road, Opposite LIC Training Centre, Tirupati – 517 507. PROGRAM OUTCOMES(POs)

	Engineering knowledge: Apply the knowledge of mathematics, science, engineering
	fundamentals, and an engineering specialization to the solution of complex
PO1	engineering problems.
	Problem analysis: Identify, formulate, review research literature, and analyze
	complex engineering problems reaching substantiated conclusions using first
PO2	principles of mathematics, natural sciences, and engineering sciences
	Design/development of solutions: Design solutions for complex engineering
	problems and design system components or processes that meet the specified
PO3	needs with appropriate consideration for the public health and safety, and the
	Conduct investigations of complex problems: Use research-based knowledge and
	research methods including design of experiments, analysis and interpretation of
PO4	data, and synthesis of the information to provide valid conclusions.
	Modern tool usage: Create, select, and apply appropriate techniques, resources,
	and modern engineering and IT tools including prediction and modeling to complex
PO5	engineering activities with an understanding of the limitations.
	The engineer and society: Apply reasoning informed by the contextual knowledge
	to assess societal, health, safety, legal and cultural issues and the consequent
PO6	responsibilities relevant to the professional engineering practice.
	Environment and sustainability: Understand the impact of the professional
	engineering solutions in societal and environmental contexts, and demonstrate
PO7	the knowledge of, and need for sustainable development.
	Ethics: Apply ethical principles and commit to professional ethics and
PO8	responsibilities and norms of the engineering practice.
	Individual and team work: Function effectively as an individual, and as a member
PO9	or leader in diverse teams, and in multidisciplinary settings.
105	Communication: Communicate effectively on complex engineering activities with
	the engineering community and with society at large, such as, being able to
PO10	comprehend and write effective reports and design documentation, make effective
FOID	Project management and finance: Demonstrate knowledge and understanding
	of the engineering and management principles and apply these to one's own work,
DO11	as a member and leader in a team, to manage projects and in multidisciplinary
1011	Life-long learning: Recognize the need for, and have the preparation and
	ability to engage in independent and life-long learning in the broadest context of
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HEAD OF THE DEPARTMENT **COMPUTER SCIENCE & ENGINEERING** S.V. COLLEGE OF ENGINEERING KABAKAMBADI ROAD, TIRUPATI-517 507.



Karakambadi Road, Opposite LIC Training Centre, Tirupati – 517 507.

Department of Computer Science and Engineering (AI & ML, CYBER SECURITY & DATA SCIECE)

	CODE	COURSE NAME	YEAR/SEMESTER	
	C111.1	Linear Algebra & Calculus	1-1	Develop the use of matrix algebra techniques that is needed by engineers for practical applications
1	C111.2			Utilize mean value theorems to real life problems
	C111.3			Familiarize with functions of several variables which are useful in optimization
	C111.4			Apply multiple integrals to find the area and volumes for different functions
	C111.5			Analyze the concepts of Beta and Gamma special function for different functions
	C111.6			
2	C112.1	Chemistry		Estimate the amount of hardness and DO present in water
	C112.2			Compare the materials of construction for battery and electrochemical sensors
	C112.3			Explain the preparation, properties, and applications of thermoplastics & thermosetting, elastomers & conducting polymers
1	C112.4			Explain the principles of spectrometry
ĺ	C112.5			Apply the principle of Band diagrams in application of conductors and semiconductors
	C113.1	Problem Solving Using C		Solve computational problems
	C113.2	_		Select the features of C language appropriate for solving a problem
3	C113.3	•		Design computer programs for real world problems
	C113.4			Organize the data which is more appropriated for solving a problem
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	C114.1	Basic Electrical & Electronics Engineering		Explain the theory, construction, and operation of electronic devices.
	C114.2			Apply the concept of science and mathematics to explain the working of diodes and its applications, working of transistor and to solve
				the simple problems based on the applications
	C114.3	_		Analyze small signal amplifier circuits to find the amplifier parameters
	C114.4	_		Design small signal amplifiers using proper biasing circuits to fix up proper Q point
	C114.5			Distinguish features of different active devices including Microprocessors
				· · · · · · · · · · · · · · · · · · ·
	C115.1	Engineering Workshop		Identify tools, work material, measuring instruments useful for domestic applications
	C115.2	_		Apply wood working skills in real world applications
	C115.3			Build different parts with metal sheets in real world applications
	C115.4			Apply fitting operations in various applications for good strength
	C115.5			Analyze different types of basic electric circuit connections
5	C115.6			Demonstrate soldering and brazing in joining circuits
	C115.7	4		Make moulds for sand casting using standard equipment
	C115.8	4		Develop different weld joints for various metals
	C115.9	4		Inspect various parts of machine components
I	C115.10	J I	-	Make plastic components using proper raw material
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	C116.1	IT Workshop	Identify the Internal and a Communication of the Co	
	C116.2		According and discussion of the second	
	C116.3		Assemble and obsessemble a computer from its parts and prepare the computer ready to use	
	C116.4	<u> </u>	Instantation process of online entry types Operating system for a computer by their own	
6	C116.5	—	Access the later and learning	
	C116.6	—	Precess the internet and browse in for required information	
	C116.7		Prepare the documents using word Processor, prepare spread sheets for calculations using Excel, and documents for LaTeX	
			repare side presentation using the presentation tool	
-	C117.1	Chemistry Lab	Determine the cell constant and conductance of colutions	
	C117.2		Prenare advanced polymer, Bakelite	
-,	C117.3		Measure the strength of an acid present in secondary batteries	
11	C117.4		Analyse the IR of some organic compounds	
	C117.5	—	Estimate the amount of dissolved avven in water	
		-		
	C118.1	Problem Solving Using C Lab	Build algorithm and flowchart for simple problems	
	C118.2		Use suitable control structures to solve problems	
8	C118.3		Use suitable iterative statements, arrays and modular programming to solve the problems	
ľ	C118.4		Implement Programs using pointers and String handling Functions	
	C118.5		Develop code for complex applications using structures, unions and file handling features	
	C119.1	Basic Electrical & Electronics	Verify Kirchoff's Laws & Superposition theorem	
	C119.2	Engineering Lab	Perform testing on AC and DC Machines	
	C119.3		Study I – V Characteristics of PV Cell.	
19	<u>C119.4</u>	_	Learn the characteristics of basic electronic devices like PN junction diode, Zener diode & BJT	
	C119.5		Construct the given circuit in the lab	
	<u> </u>		Analyze the application of diode as rectifiers, clippers and clampers and other circuits	
	C119.7		Design simple electronic circuits and verify its functioning	
10	C1110.1	Speech and Oral Communication		
	C1110.1		Improve the neutral accent and be free from mother tongue influence.	
	C1110.2		Applies that takes on general topics and learn critiquing skills by participating in Conversations	
	C1110.5		Applying Vocabulary and using it in their day-to-day life.	
			Understanding and mastering in verbal and non-verbal communication	
-	C121.1	Differential Equations & Vector	-II Solve the differential equations related to various angineering fields	
	C121.2	Calculus	Solve the linear differential equations of higher order related to various engineering fields	
1,,	C121.3		Identify solution methods for partial differential equations that model physical processes	
111	C121.4	[Interpret the physical meaning of different operators such as and jet and divergence	
1			Entry of the protocol meaning of different operators such as gradient, cut and divergence.	

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	C122.1	Applied Physics	Apply the different realms of physics and their applications in both scientific and technological systems through physical optics
	C122.2		Understand the mechanisms of emission of light, the use of lasers as light sources for low and high energy applications
	C122.3		Understands the response of dielectric and magnetic materials to the applied electric and magnetic fields
12	C122.4 ·		Apply the quantum mechanical picture of subatomic world along with the discrepancies between the classical estimates and laboratory observations of electron transportation phenomena by free electron theory and band theory
_	C122.5		Elaborate the physical properties exhibited by materials through the understanding of properties of semiconductors and superconductor
	C123.1	Communicative English	Understand the context, topic, and pieces of specific information from social or transactional dialogues spoken by native speakers of English
	C123.2		Apply grammatical structures to formulate sentences and correct word forms
13	C123.3		Analyze discourse markers to speak clearly on a specific topic in informal discussions
	C123.4		Evaluate reading/listening texts and to write summaries based on global comprehension of these texts
	C123.5		Create a coherent paragraph interpreting a figure/graph/chart/table.
	C124.1	Data Structures	Analyze the problems using asymptotic notations
	C124.2		Apply Stack, Queues and linked list to solve different applications
14	C124.3		Demonstrate suitable sorting techniques for the real world problem.
	C124.4		Implement tree structures in different patterns of representation of data.(
			Analyze the given problem using graph traversal techniques
	C125.1	Engineering Drawing	Draw basic geometrical constructions, curves used in engineering practices
	C125.2		Understand the concept of projection and acquire visualization skills, projection of points, Lines and Planes
15	C125.3		Illustrate the projections of solids graphically
15	C125.4		Draw and explore the sectional views of right regular solids
			Draw the development of surfaces of solids.
	C126.1	Engineering Graphics Lab	Draw the basic views related to projections of Lines, Planes
	C126.2		Draw the basic views related to projections of Planes
16	C126.3		Illustrate orthographic views of simple objects
	C126.4	·	Illustrate isometric projections of simple solids
			Interpret and comprehend with drafting packages for engineering practice
	C127.1	Communicative English Lab	Develop to handle and excel in a variety of self-instructional, learner-friendly modes of language learning
	C127.2		Develop to employ better stress and intonation patterns and utter English sounds correctly
17	C127.3		Develop to avoid the impact of mother tongue in English and neutralize their accent
	C127.4	_ L	Develop to participate with skill and confidence in Group Discussions, Interviews and Public Speaking
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	C128.1	Applied Physics Lab		Utilize optical instruments like microscope and spectrometer
	C128.2			Determine thickness of a hair/paper with the concept of interference
	C128.3			Estimate the wavelength of different colors using diffraction grating and resolving power
	C128.4			Organize the intensity of the magnetic field of circular coil carrying current with distance
18	C128.5			Evaluate the acceptance angle of an optical fiber and numerical aperture
				Determine the resistivity of the given semiconductor using four probe method
				Identify the type of semiconductor i.e., n-type or p-type using hall effect
				Determine the band gap of a given semiconductor.
	C129.1	Data Structures Lab		Demonstrate the concept of Recursion for solving a problem
	C129.2		_	Choose and implement linear data structure to solve problems
19	C129.3			Develop programs for searching and sorting algorithms
	C129.4			Select and implement suitable nonlinear data structure for solving a problem.
	C1210.1	Universal Human Values		Understanding the value of education to become more aware of themselves, and their surroundings (family, society, nature)
	C1210.2			Utilize the concepts of human being-harmony in myself become more responsible in life, and in handling problems with sustainal solutions, while keeping human relationships and human nature in mind
20	C1210.3			Understanding the concepts of society-harmony in human for better critical ability
20				Understanding the human values, human relationship and human society to become sensitive to their commitment
				Apply what they have learnt to their own self in different day-to-day settings in real life, at least a beginning would be made in th direction
	C1211.1	Logical Skills for Professionals-I		Demonstrate knowledge basic mathematics to develop analytical skills to solving problems of Averages - Percentages - Patio
	C1211.2			Demonstrate knowledge basic mathematics to develop analytical skills to solving problems of Partnership - Simple Interest and Compared Ratio
21	C1211.3			Demonstrate knowledge basic mathematics to develop analytical skills to solving problems of time ad work, problems on trains a Boats and streams
	C1211.4			Analyze the techniques in series coding and decoding and blood relations
	C1211.5			Analyze the techniques in directions, roblems on ages and analogy
	C211.1	Discrete Mathematics & Graph Theory		Apply mathematical concepts and logical reasoning to solve problems in different fields of Computer science and information technology
	C211.2			Apply the properties of Set theory to find Equivalence and Partial Ordering relations and Hasse Diagrams for different functions
22	C211.3	┥ ⊢		Analyse the properties of Algebraic Structures to find the given sets are Semi group. Monoids and Groups
	C211.4			the design of the second of the design of th

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	C212.1	Design & Analysis of Algorithms	Analyze the complexity of the algorithms.
	C212.2		Make use of various design techniques like divide and conquer, greedy, dynamic programming, backtracking, branch and bound to solv the problems
23	· C212.3		Identify and analyze criteria and specifications appropriate to new problems, and choose the appropriate algorithmic design technique for their solution
F	C212.4		Able to prove that a certain problem is NP-Complete
	C213.1	Computer Organization &	Understand the computer organization concepts related to design of modern processors, memories and I/Os
	C213.2	Architecture	Identify the hardware requirements for cache memory and virtual memory
24	C213.3 ·		Understand the importance and tradeoffs of different types of memories
27	C213.4		Design algorithms to exploit pipelining and multiprocessors
_			Identify pipeline hazards and possible solutions to those hazards
	C214.1	Database Management Systems	Design a database for a real world informationsystem
25	C214.2		Define transactions which preserve the integrity of thedatabase
	C214.3		Generate tables for a database
²³	C214.4		Organize the data to prevent redundancy
	C214 5		Pose queries to retrieve the information fromdatabase

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C215.1 Python Programming Apply the features of Python Iasguage in various real applications C215.2 Select appropriate core data structure of Python for solving a problem C215.3 Select appropriate core data structure of Python for solving real-world problems C215.4 Design object-oriented programs using Python for solving real-world problems C215.4 Algorithms Lab C215.2 Algorithms Lab C215.3 C215.4 C215.4 Algorithms Lab C215.2 Analyze the efficiency of Greedy and Dynamic Programming design techniques to solve the optimizationproblems C217.1 Database Management Systems C217.2 Lab C217.3 C218.1 C217.4 Database Management Systems C217.4 Database Management Systems C217.5 Lab C217.1 Database Management Systems C217.2 Lab C218.1 Python Programming Lab C218.1 Python Programming Lab C218.1 Python Programming Lab C219.2 Criented Course C219.3 Criented Course C219.4 Criented Course <tr< th=""><th></th><th></th><th></th><th></th></tr<>				
C215.1 Python Programming Apply the features of Python funguage in various real applications 26 C215.3 Select appropriate core data structure of Python for solving a problem 27 C215.4 Design object-oriented programs using Python for solving a problem 28 C215.3 Apply mobilizity to programs Design object-oriented programs (Python for solving problems) 27 C216.2 Algorithms Lab Apply the Divide andConquer strategy to solve scarching, sorting problems 28 C217.1 Database Management Systems Work with the concepts of DDL, DML, DCL Commands 28 C217.4 Lab Design of databases for real life systems using Oracle 217 C218.1 Python Programming Lab Design of database for ral life systems using Oracle 217.1 Database Management Systems Work with the concepts of DDL, DML, DCL Commands 2217.2 Lab Design of databases for real life systems using Oracle 2217.4 Earning of SQL queries on runnerical and text-based problems C218.1 Python Programming Lab Design solutions to mathematical problems C219.1 Linux Administration(Skill Understand bell script to create files and handle text documents C219.1 Linux Administratio				
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32 C2111.3 Hone the communication skills to meet the challenges of their careers successfully		2111 2	Skills	Improve comprehension and fluency of speech
32 Gain confidence in using English in verbal situations		2111 3	———	Hone the communication skills to meet the challenges of their corears successfully
	32	· · · · · · · · · · · · · · · · · · ·		Coin confidence in using English in verbal situations

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		Numerical Methods Probability		Apply different methods to find roots of algebraic and termson dented equations	
ŀ	C221.1	& Statistics	11-11	Apply different methods to find noncomputed existing additional differential equations.	
ŀ	C221.2	-		Apply different intendes to me apply contract sources of orderary differential equations and reducted integration	
33	C221.5			Analyse the concepts of provability distributions in practical problems	
	C221.4		•	Apply discrete and commons provided hand on anelling of large semiling tests	
ŀ				Anaryse the statistical interential methods based on small and large sampling tests.	
	C222.1	Object Oriented Programming		To solve real world problems using OOP techniques	
	C222.2	Through Java		To apply code reusability through inheritance, packages and interfaces	
24	C222.3			To solve problems using java collection framework and I/O classes	
	· C222.4			To develop applications by using parallel streams for better performance	
	C222.5			To build GUIs and handle events generated by user interactions	
\rightarrow	C223.4	Onorating Systems		Understand the OC designs designed in a surface of a Des	
ŀ	C223.1	Operating Systems		Understand the OS design structures, its services and basics of a Process	
}				Analyze various scheduling algorithms and examine concurrency mechanisms in Operating Systems.	
35 -	C223.3			Apply memory management techniques in the design of operating systems	
-				Compare and contrast various structures and organization of the file system and secondary storage structure	
-				Apply different concepts of Protection and Security services in OS	
	C224.1	Digital Electronics &		To understand the concept of Logic circuits and analyze various Boolean algebra functions	
Ĩ	C224.2	Microprocessors		To understand the concept of CombinationalLogicand SequentialLogic Circuits	
. [C224.3			To create combinational circuits using PLD's	
30	C224.4	-		To understand the concepts of 8085, 8086 Microprocessor and 8051 Microcontroller	
				Apply knowledge and demonstrate programming proficiency using various addressing modes and instruction sets of 8086 & 8051	
		Object Originated Programming			
-	C225.1	Through Java Lab		Recognize the Java programming environment	
-	C225.2			Select appropriate programming construct to solve a problem	
37 -	C225.5			Develop encient programs using multithreading	
				Design renable programs using Java exception nandling reatures	
ŀ	·····			Extend the programming functionality supported by Java	
	C226.1	Operating Systems Lab		Trace different CPU Scheduling algorithm	
·[C226.2			Implement Bankers Algorithms to Avoid and prevent the Dead Lock.	
Γ	C226.3			Evaluate Page replacement algorithms.	
38	C226.4		-	Illustrate the file organization techniques	
				Illustrate shared memory process.	
				Design new scheduling algorithms	
		1			
	C227 1	Digital Electronics &		Analyze the sevenests off agis Cotogrand Bashan functions	
	C227.1	Digital Electronics &		Analyze the concepts of Logic Gatesand Boolean functions	
	C227.1 C227.2	Digital Electronics & Microprocessors Lab		Analyze the concepts of Logic Gatesand Boolean functions Analyze CombinationalLogicand SequentialLogic Circuits Analyze the logic size of the logic of the logic Circuits	

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	C228.1	Operating Systems Laboratory	Analize differnt types of CPU scheduling algorithms which makes always CPU busy.			
10	C228.2		Analyze and apply different types of file system management.			
40	C228.3		Implement various process synchronization techniques for operating system.			
	C229.1	Exploratory Data Analysis with R	Install and use R for simple programming tasks			
	C229.2	—	Extract data from files and other sources and perform various data manipulation tasks on them			
41	C229.3		Explore statistical functions in R			
41	C229.4		Use R Graphics and Tables to visualize results of various statistical operations on data			
	C229.5		Apply the knowledge of R gained to data Analytics for real-life applications			
	C2210.1	Design Thinking for Innovation	Generate and develop different design ideas			
	C2210.2		Appreciate the innovation and benefits of design thinking			
42	2 C2210.3		Experience the design thinking process in IT and agile software development			
	C2210.4		Understand design techniques related to variety of software services.			
	C2211.1	Engineering Mathematics	Develop the use of matrix algebra techniques that is needed by engineers for practical applications			
	C2211.2	-	Utilize mean value theorems to real life problems			
12	C2211.3		Solve the differential equations related to various engineering fields			
45	C2211.4		Apply multiple integrals to find the area and volumes for different functions			
	C2211.5		Estimate the work done against a field, circulation and flux using vector calculus.			

HEAD OF THE DEPARTMENT COMPUTER SCIENCE & ENGINEERING S.V. COLLEGE OF ENGINEERING KARAKAMBADI ROAD, TIRUPATI-517 507.

.

(AUTONOMOUS)

Course Structure for Computer Science & Engineering

B.Tech Course

R20 Regulation

I B.Tech – I Sem

S.No	CourseNo	CourseName	Categ ory	L-T-P	Credits
1.	MA20ABS101	Linear Algebra and Calculus	BS	3-0-0	3
2.	CH20ABS103	Chemistry	BS	3-0-0	3
3.	CS20AES101	Problem Solving using C	ES	3-0-0	3
4.	EE20AES101	Basic Electrical& Electronics Engineering	ES	3-0-0	3
5.	ME20AES101	EngineeringWorkshop	ES	0-0-3	1.5
6.	CS20AES103	ITWorkshop	ES	0-0-3	1.5
7.	CH20ABS104	ChemistryLab	BS	0-0-3	1.5
8.	CS20AES102	ProblemSolvingusingCLab	ES	0-0-3	1.5
9.	EE20AES102	BasicElectrical&Electronics EngineeringLab	ES	0-0-2	1.5
10.	EG20AMC101	Speech&OralCommunication	MC	2-0-0	0
				Total	19.5

Sl.No	Subject with code	Course Outcomes
1	LINEAR ALGEBRA & CALCULUS	Develop the use of matrix algebra techniques that is needed by
	(MA20ABS101)	engineers for practical applications
		Utilize mean value theorems to real life problems
		Familiarize with functions of several variables which are useful in
		optimization
		Apply multiple integrals to find the area and volumes for different
		functions
		Analyze the concepts of Beta and Gamma special function for
		different functions
2	CHEMISTRY (CH20ABS103)	Estimate the amount of hardness and DO present in water.
		Compare the materials of construction for battery and
		electrochemical sensors.
		thermonlastics & thermosotting electomers & conducting
		nolymers
		Explain the principles of spectrometry.
		Apply the principle of Band diagrams in application of conductors
		and semiconductors.
3	PROBLEM SOLVING USING C	Solve computational problems
	(CS20AES101)	Select the features of C language appropriate for solving a problem
		Design computer programs for real world problems
		Organize the data which is more appropriated for solving a
		problem
4	BASIC ELECTRICAL &	Apply concepts of KVL/KCL in solving DC circuits
	ELECTRONICS ENGINEERING	Choose correct rating of a transformer for a specific application
	Part A: BASIC ELECTRICAL	Illustrate working principles of induction motor - DC Motor
	ENGINEERING (EEZOAESIOI)	Identify type of electrical machine based on their operation.
		Describe working principles of protection devices used in electrical
		circuits.
	BASIC ELECTRICAL &	Explain the theory, construction, and operation of electronic
		devices.
	FIGINFERING (FE20AFS101)	Apply the concept of science and mathematics to explain the
		working of diodes and its applications, working of transistor and to
		solve the simple problems based on the applications.
		Analyze small signal ampliner circuits to find the ampliner
		Design small signal amplifiers using proper biasing circuits to fix up
		proper O point.
		Distinguish features of different active devices including
		Microprocessors.
5	EngineeringWorkshop	Identify tools, work material, measuring instruments useful for
	ME20AES101	domestic applications
		Apply wood working skills in real world applications
		Build different parts with metal sheets in real world applications.
		Apply fitting operations in various applications for good strength.

		Analyze different types of basic electric circuit connections.				
		Demonstrate soldering and brazing in joining circuits.				
		Make moulds for sand casting using standard equipment				
		Develop different weld joints for various metals				
		Inspect various parts of machine components.				
		Make plastic components using proper raw material.				
6	IT Workshop	Identify the Internal parts of computers and Generation of				
	(CS20AES103)	Computers.				
		Assemble and disassemble a computer from its parts and prepare				
		the computer ready to use				
		Installation process of different types Operating system for a				
		computer by their own.				
		Interconnect two or more computers for information sharing				
		Access the Internet and browse it for required information				
		Prepare the documents using Word Processor, prepare spread				
		sheets for calculations using Excel, and documents for LaTeX				
		Prepare slide presentation using the presentation tool.				
7	CHEMISTRY LAB	Determine the cell constant and conductance of solutions				
	(CH20ABS104)	Prepare advanced polymer- Bakelite.				
		Measure the strength of an acid present in secondary batteries.				
		Analyse the IR of some organic compounds				
		Estimate the amount of dissolved oxygen in water				
8	PROBLEM SOLVING USING C	Build algorithm and flowchart for simple problems				
	LAB (CS20AES102)	Use suitable control structures to solve problems				
		Use suitable iterative statements, arrays and modular				
		programming to solve the problems				
		Implement Programs using pointers and String handling Functions				
		Develop code for complex applications using structures, unions and				
		file handling features				
9	(EE20AES102) BASIC ELECTRICAL	Verify Kirchoff's Laws & Superposition theorem				
	LAB	Perform testing on AC and DC Machines.				
	Part A: Electrical Engineering	Study I – V Characteristics of PV Cell				
	Lab					
	Part B: Electronics Engineering	Learn the characteristics of basic electronic devices like PN junction				
	Lab	diode, Zener diode & BJT				
		Construct the given circuit in the lab				
		Analyze the application of diode as rectifiers, clippers and clampers				
		and other circuits				
		Design simple electronic circuits and verify its functioning				
10		Improve the neutral accent and be free from mother tongue				
	(EG20AMC101)	Influence				
	(,	nypothesizing small talks on general topics and learn critiquing				
		Applying Vocabulary and using it in their day to day life				
		Apprying vocabulary and using it in their udy-to-udy life				
		communication				

(AUTONOMOUS)

Course Structure for Computer Science & Engineering

B.Tech Course

R20 Regulation

I B.Tech – II Sem

S.N o	CourseNo	CourseName	Cat ego ry	L-T- P/D	Credits
1.	MA20ABS201	Differential Equations and Vector Calculus	BS	3-0-0	3
2.	PH20ABS103	Applied Physics	BS	3-0-0	3
3.	EG20AHS101	Communicative English	HS	3-0-0	3
4.	CS20AES201	Data Structures	ES	3-0-0	3
5.	ME20AES102	Engineering Drawing	ES	1-0- 0/2	2
6.	ME20AES103	Engineering Graphics Lab	ES	0-0-2	1
7.	EG20AHS102	Communicative English Lab	HS	0-0-3	1.5
8.	PH20ABS104	Applied Physics Lab	BS	0-0-3	1.5
9.	CS20AES202	Data Structures Lab	ES	0-0-3	1.5
10.	BA20AMC201	Universal Human Values	MC	3-0-0	0
11	BA20AHS201	Mandatory course (AICTE Suggested): Universal Human Values	HS	3-0-0	*3
12.	MA20AMC101	Logical Skills for Professionals – I	MC	2-0-0	0
				Total	19.5

SI.No	Subject with code	Course Outcomes		
1	DIFFERENTIAL EQUATIONS AND	Solve the differential equations related to various engineering		
	VECTOR CALCULUS	fields		
	(MA20ABS201)	Solve the linear differential equations of higher order related		
		to various engineering fields.		
		Identify solution methods for partial differential equations		
		that model physical processes.		
		Interpret the physical meaning of different operators such as		
		gradient, curl and divergence		
		Estimate the work done against a field, circulation and flux		
		using vector calculus		
2	APPLIED PHYSICS	Apply the different realms of physics and their applications in		
	(PH20ABS103)	both scientific and technological systems through physical		
		optics		
		understand the mechanisms of emission of light, the use of		
		lasers as light sources for low and high energy applications		
		Understands the response of dielectric and magnetic		
		materials to the applied electric and magnetic fields		
		Apply the quantum mechanical picture of subatomic world		
		along with the discrepancies between the classical estimates		
		and laboratory observations of electron transportation		
		phenomena by free electron theory and band theory		
		Elaborate the physical properties exhibited by materials		
		through the understanding of properties of semiconductors		
2		and superconductors		
3		Understand the context, topic, and pieces of specific		
	(EGZUARSIUI)	normation from social of transactional dialogues spoken by		
		Apply grammatical structures to formulate sentences and		
		correct word forms		
		Analyze discourse markers to speak clearly on a specific tonic		
		in informal discussions		
		Evaluate reading/listening texts and to write summaries based		
		on global comprehension of these texts.		
		Create a coherent naragraph interpreting a		
		figure/granh/chart/table		
1		Analyze the problems using asymptotic notations		
4		Analyze the problems using asymptotic notations		
		apply stack, queues and linked list to solve different		
		Demonstrate suitable sorting techniques for the real world		
		problem		
		Implement tree structures in different natterns of		
		representation of data.		
		Analyze the given problem using graph traversal techniques		
5	ENGINEERING DRAWING	Draw basic geometrical constructions curves used in		
	(MF20AFS102)	engineering practices		
	(Understand the concept of projection and acquire		
		visualization skills, projection of points. Lines and Planes		

		Illustrate the projections of solids graphically			
		Draw and evelore the costional views of right regular calide			
		Draw and explore the sectional views of right regular solids			
		Draw the development of surfaces of solids			
6	ENGINEERING GRAPHICS LAB	Draw the basic views related to projections of Lines, Planes			
	(ME20AES103)	Draw the basic views related to projections of Planes			
		Illustrate orthographic views of simple objects			
		Illustrate isometric projections of simple solids			
		Interpret and comprehend with drafting packages for			
		engineering practice			
7	COMMUNICATIVE ENGLISH LAB	Develop to handle and excel in a variety of self-instructional,			
	(EG20AHS102)	learner-friendly modes of language learning			
		Develop to employ better stress and intonation patterns and			
		utter English sounds correctly			
		Develop to avoid the impact of mother tongue in English and			
		neutralize their accent			
		Develop to participate with skill and confidence in Group			
		Discussions, interviews and Public Speaking			
		otilize the technical skills to prepare resume, report-writing,			
0		And format-making etc			
0	(PH20ARS104)	Determine thickness of a bair/namer with the concent of			
	(1120703104)	interference			
		Interference			
		grating and resolving power			
		Organize the intensity of the magnetic field of circular coil			
		carrying current with distance			
		Evaluate the acceptance angle of an optical fiber and			
		numerical aperture			
		Determine the resistivity of the given semiconductor using			
		four probe method			
		Identify the type of semiconductor i.e., n-type or p-type using			
		hall effect			
		Determine the band gap of a given semiconductor			
9	DATA STRUCTURES LAB	Demonstrate the concept of Recursion for solving a problem			
	(CS20AES202)	Choose and implement linear data structure to solve			
		problems			
		Develop programs for searching and sorting algorithms			
		Select and implement suitable nonlinear data structure for			
		solving a problem			
10	UNIVERSAL HUMAN VALUES	Understanding the value of education to become more aware			
	(BA20AHS201)	of themselves, and their surroundings (family, society,			
		nature).			
		Utilize the concepts of numan being-narmony in myself			
		with sustainable solutions, while keeping human relationships			
		and human nature in mind			
		Understanding the concents of society-barmony in human for			
		better critical ability			
		Understanding the human values human relationship and			
1					

		human society to become sensitive to their commitment.			
		Apply what they have learnt to their own self in different day-			
		to-day settings in real life, at least a beginning would be made			
		in this direction			
11	LOGICAL SKILLS FOR	Demonstrate knowledge basic mathematics to develop			
	PROFESSIONALS –I	analytical skills to solving problems of Averages - Percentages			
	(MA20AMC101)	- Ratio			
		Demonstrate knowledge basic mathematics to develop			
		analytical skills to solving problems of Partnership - Simple			
		Interest and Compound Interest and time and distance			
		Demonstrate knowledge basic mathematics to develop			
		analytical skills to solving problems of time ad work, problems			
		on trains and Boats and streams			
		Analyze the techniques in series, coding and decoding and			
		blood relations			
		Analyze the techniques in directions, problems on ages and			
		analogy			

(AUTONOMOUS)

Course Structure for Computer Science & Engineering

B.Tech Course

R20 Regulation

II B.Tech – I Sem

S. No	Course No	Course Name	Catego ry	L-T- P	Credit s
1	MA20ABS303	Discrete Mathematics & Graph Theory	BS	3-0-0	3
2	EC20AES301	Digital Electronics & Microprocessors	ES	3-0-0	3
3	CS20APC305	Software Engineering	PC	3-0-0	3
4	CS20APC303	Database Management Systems	PC	3-0-0	3
5	IT20APC301	Python Programming	PC	3-0-0	3
6	EC20AES302	Digital Electronics & Microprocessors Lab	ES	0-0-3	1.5
7	CS20APC304	Database Management Systems Lab	PC	0-0-3	1.5
8	IT20APC302	Python Programming Lab	PC	0-0-3	1.5
9	AM20ASC301	Skill oriented course-I Linux Administration	SC	1-0-2	2
10	CH20AMC201	Mandatory non-credit course- II Environmental Science	MC	2-0-0	0
11	EG20AMC302	Enhancing English Language Skills (Lateral Entry Students Only)	MC	2-0-0	0
12	BA20AHS201	Mandatory course (AICTE Suggested): Universal Human Values (Lateral Entry Students Only)	HS	3-0-0	*3
				Total	21.5

SI.No	Subject with code	Course Outcomes	
1	DISCRETE MATHEMATICS	Apply mathematical concepts and logical reasoning to	
	AND GRAPH THEORY	solve problems in different fields of Computer science	
	(MA20ABS303)	and information technology	
		Apply the properties of Set theory to find Equivalence	
		and Partial Ordering relations and HasseDiagrams for	
		different functions	
		Analyse the properties of Algebraic Structures to find the	
		given sets are Semi group, Monoids and Groups	
		Analyse the concepts of Generating and Recurrence	
		relations for solving Homogeneous and In-Homogeneous	
		equations	
		Investigate the graphs are Isomorphic Graphs, Euler and	
		Hamilton Graphs	
2	DIGITAL ELECTRONICS &	To understand the concept of Logic circuits and analyze	
	MICROPROCESSORS	various Boolean algebra functions	
	(EC20AES301)	To understand the concept of Combinational Logic and	
		Sequential Logic Circuits	
		To create combinational circuits using PLD's	
		To understand the concepts of 8085, 8086	
		Microprocessor and 8051 Microcontroller	
		Apply knowledge and demonstrate programming	
		proficiency using various addressing modes and	
		instruction sets of 8086 & 8051	
3	SOFTWARE ENGINEERING	Obtain basic software life cycle activity skills	
	(CSZUAPC305)	Design software requirements specification for given	
		problems	
		Implement structure, object oriented analysis and design	
		for given problems	
		Design test cases for given problems	
		Apply quality management concepts at the application	
		level	
4	DATABASE MANAGEMENT	Design a database for a real world information system	
	SYSTEMS	Define transactions which preserve the integrity of the	
	(CS20APC303)	database	
		Generate tables for a data base	
		Organize the data to prevent redundancy	
		Pose queries to retrieve the information from database	
5	PYTHON PROGRAMMING	Apply the features of Python language in various real	
	(IT20APC301)	applications	
		Select appropriate core data structure of Python for	
		solving a problem	
		Design object-oriented programs using Python for solving	
		real-world problems	
		Apply modularity to programs	
		Design graphics using turtle module	
6	DIGITAL ELECTRONICS &	Analyze the concepts of Logic Gates and Boolean	

		functions		
	(EC20AES202)	Analyse Combinational Logic and Convertial Logic Cinevita		
		Analyze Combinational Logic and Sequential Logic Circuits		
		Analyze the logic circuits using Programmable Logic		
		Devices		
		Apply knowledge and demonstrate programming		
		instruction sets of 2026 & 2051		
7		Mark with the concents of DDL DML DCL Commands		
/		Work with the concepts of DDL, DML, DCL commands		
	(CS20APC204)	Design of databases for real life systems using Oracle		
		Learning of SQL queries on the real-life systems		
		Execution of PL/SQL programs for different problems		
		Implementation of procedure, function, trigger and		
		cursor concepts in PL/SQL		
8	PYTHON PROGRAMMING LAB	Design solutions to mathematical problems		
	(IT20APC302)	Organize the data for solving the problem		
		Develop Python programs for numerical and text-based		
		problems		
		Select appropriate programming construct for solving the		
		problem		
		Illustrate object-oriented concepts		
9	LINUX ADMINISTRATION	Understand shell script to create files and handle text		
	(AM20ASC301)	documents.		
		Analyze various methodologies in Linux administration		
		Implementation of IPC through shell programming in the		
		Linux environment		
		Create child processes and background processes		
10	ENVIRONMENTAL SCIENCE	Understanding multidisciplinary nature of environmental		
	(CH20AWC201)	studies and various renewable and non renewable		
		Linderstand flow and bio-geo- chemical cycles and		
		ecological pyramids		
		Understand various causes of pollution and solid waste		
		management and related preventive measures		
		Apply the rainwater harvesting, watershed management.		
		ozone laver depletion and waste land reclamation		
		Apply the concepts of population explosion, value		
		education and welfare programmes in society		
11	ENHANCING ENGLISH	Use English language, both written and spoken,		
	LANGUAGE SKILLS	competently and correctly		
	(EG20AMC302)	Improve comprehension and fluency of speech		
		Hone the communication skills to meet the challenges of		
		their careers successfully		
		Gain confidence in using English in verbal situations		
		Strengthen communication skills in different contexts like		
		formal and informal		

(AUTONOMOUS)

Course Structure for Computer Science & Engineering

B.Tech Course

R20 Regulation

II B.Tech – II Sem

S. No	Course No	Course Name	Catego ry	L-T- P	Credit s	
1	MA20ABS401	Numerical Methods, Probability and Statistics	BS	3-0- 0	3	
2	CS20APC401	Object Oriented Programming Through Java	PC	3-0- 0	3	
3	CS20APC301	Computer Organization and Architecture	PC	3-0- 0	3	
4	AM20APC301	Design and Analysis of Algorithms	PC	3-0- 0	3	
5	BA20AHS301	Humanities Elective-I Managerial Economics and Financial Analysis	HS	3-0-	3	
	BA20AHS302 Business Environment BA20AHS303 Organizational Behavior			0		
6	CS20APC402	Object Oriented Programming Through Java Lab	PC	0-0- 3	1.5	
7	CS20APC302	Computer Organization and Architecture Lab	PC	0-0- 3	1.5	
8	AM20APC302	Algorithms Lab	PC	0-0- 3	1.5	
9	IT20ASC401	Skill Oriented Course-II Exploratory Data Analysis With R	SC	1-0- 2	2	
10	CS20AMC401	Mandatory non-credit course-III Design Thinking for Innovation	MC	2-0- 0	0	
11	SH20AAC401	NSS/YOGA/Cultural Activities/Sports	AC	0-0- 2	0	
12	MA20AMC401	Engineering Mathematics (Lateral Entry Students Only)	MC	2-0- 0	0.0	
				Total	21.5	
Com	Community Service Project – After the end of IV Semester – 4 Weeks – 1.5 Credits					
Hon	Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also) 0-0-2 0					

SI.No	Subject with code	Course Outcomes
1	NUMERICAL METHODS,	Apply different methods to find roots of algebraic and
	PROBABILITY AND	transcendental equations
	STATISTICS	Apply different methods to find approximate solution of
	(MA20ABS401)	ordinary differential equations
		and Numerical Integration
		Analyse the concepts of probability and their applications
		Apply discrete and continuous probability distributions in
		practical problems
		Analyse the statistical inferential methods based on small
		and large sampling tests
2	OBJECT ORIENTED	To solve real world problems using OOP techniques
	PROGRAMMING THROUGH	To apply code reusability through inheritance, packages
	JAVA	and interfaces
	(CS20APC401)	To solve problems using java collection framework and I/O
		classes
		To develop applications by using parallel streams for better
		performance
		To build GUIs and handle events generated by user
		interactions
3	COMPUTER ORGANIZATION	Understand the computer organization concepts related to
	AND ARCHITECTURE	design of modern processors, memories and I/Os
	(CS20APC301)	Identify the hardware requirements for cache memory and
		virtual memory
		Understand the importance and tradeoffs of different
		types of memories
		Design algorithms to exploit pipelining and multiprocessors
		Identify pipeline hazards and possible solutions to those
		hazards
4	DESIGN AND ANALYSIS OF	Analyze the complexity of the algorithms
	ALGORITHMS	Make use of various design techniques like divide and
	(AMIZUAPC301)	conquer, greedy, dynamic programming, backtracking,
		branch and bound to solve the problems
		Identify and analyze criteria and specifications appropriate
		docign technique for their solution
		Able to prove that a contain problem is ND Complete
		Able to prove that a certain problem is NP-complete
5		
		Select appropriate programming construct to solve a
	(CS20APC402)	Problem Develop officient programs using multithreading
		Develop enicient programs using multitrireading
		Design reliable programs using Java exception handling
		Extend the programming functionality supported by lave
	Computer Organization and	Linderstand various components of computer systems
Ö	Architocture Lab	Decisional various components of computer system
		Design adder circuit using basic gates
	(LJZUAPLJUZ)	Analyze arithmetic operation on binary

		Analyze the behavior of logic gates
7	ALGORITHMS LAB	Apply the Divide and Conquer strategy to solve searching,
	(AM20APC302)	sorting problems
		Analyze the efficiency of Greedy and Dynamic
		Programming design techniques to solve the optimization
		problems
		Relate Back tracking technique for solving constraint
		satisfaction problems
8	EXPLORATORY DATA	Install and use R for simple programming tasks
	ANALYSIS WITH R	Extract data from files and other sources and perform
	(IT20ASC401)	various data manipulation tasks on them
		Explore statistical functions in R
		Use R Graphics and Tables to visualize results of various
		statistical operations on data
		Apply the knowledge of R gained to data Analytics for real-
		life applications
9	DESIGN THINKING FOR	Generate and develop different design ideas
	INNOVATION	Appreciate the innovation and benefits of design thinking
	(CS20AMC401)	Experience the design thinking process in IT and agile
		software development
		Understand design techniques related to variety of
		software services
10	ENGINEERING	Develop the use of matrix algebra techniques that is
	MATHEMATICS	needed by engineers for practical applications
	(MA20AMC401)	Utilize mean value theorems to real life problems
		Solve the differential equations related to various
		engineering fields
		Apply multiple integrals to find the area and volumes for
		different functions
		Estimate the work done against a field, circulation and flux
		using vector calculus

(AUTONOMOUS)

Course Structure for Computer Science & Engineering

B.Tech Course

R20 Regulation

III B.Tech – I Sem

IIIB. Tech-I Semester(Theory-5,lab-2,SOC-1MC-3)						
S. No	Course No	Course Name	Category	L-T-P	Cred its	
1	CS20APC501	Computer Networks	PC	3-0-0	3	
2	CS20APC502	Formal Languages and Compiler Design	PC	3-0-0	3	
3	CS20APC504	Operating Systems	PC	3-0-0	3	
4	CE20AOE501 EC20AOE501 EE20AOE501 ME20AOE502	Open Elective-I Basics of civil engineering Basic VLSI Design Introduction to control SystemsSolar and wind energy systems	OE	3-0-0	3	
5	CS20APE501 CS20APE502 CS20APE503 CS20APE504 CS20APE505	Professional Elective-I Advanced Computer Architecture Data Warehousing and Data mining Digital Image Processing Object Oriented Analysis Design& Testing Principles of Programming Languages	PE	3-0-0	3	
6	CS20APC503	Computer Networks Lab	PC	0-0-3	1.5	
7	CS20APC505	Operating Systems Lab	PC	0-0-3	1.5	
8	EG20ASC301	Skill Oriented Course-IIISoft Skills	SC	1-0-2	2	
9	BA20AMC502	Mandatory non-credit course-IV Intellectual Property Rights	MC	2-0-0	0	
10	CH20AMC301	Mandatory non-credit course-V Biology for Engineers	MC	2-0-0	0	
11	CS20AIP501	Evaluation of Summer Internship (4 Weeks)	IP		1.5	
12	CS20ATS501	Technical SeminarPresentation- I	TS		0.5	
13	IT20AMC501	Problem Solving and Programming (Lateral Entry Students only)	MC	2-0-0	0	
				Total	22	
14	Honors/Minor con also)	urses (The hours distribution can be 3-0-2	or3-1-0	4-0-0	4	
15	15Honors/Minor courses (NPTEL/MOOCS)2-0-0			2		

SI.No	Subject with code	Course Outcomes	
1	COMPUTER NETWORKS	Identify the software and hardware components of a	
	(CS20APC501)	Computer network	
		Develop new routing, and congestion control algorithms	
		Assess critically the existing routing protocols	
		Explain the functionality of each layer of a computer	
		network	
		Choose the appropriate transport protocol based on the	
		application requirements	
2	FORMAL LANGUAGES AND	Employ finite state machines to solve problems in	
	COMPILER DESIGN	computing and classify machines by their power to	
	(CS20APC502)	recognize languages	
		Understand the basic concept of compiler design, and its	
		different phases which will be helpful to construct new	
		tools like LEX, YACC, etc	
		Ability to implement semantic rules into a parser that	
		detection and correction methods	
		Apply the code optimization techniques to improve the	
		space and time complexity of programs while	
		programming	
		Ability to design a compiler for a concise programming	
		language	
3	OPERATING SYSTEMS	Understand the OS design structures, its services and	
	(CS20APC504)	basics of a Process	
		Analyze various scheduling algorithms and examine	
		concurrency mechanisms in Operating Systems	
		Apply memory management techniques in the design of	
		operating systems	
		Compare and contrast various structures and organization	
		of the file system and secondary storage structure	
		Apply different concepts of Protection and Security	
		services in US	
4	Computer Networks Laboratory	Design scripts for Wired network simulation	
	(CS20APC503)	Design scripts of static and mobile wireless networks	
		simulation	
		Design JAVA programs for client-server communication	
		Construct a wired and wireless networks using the real	
		nardware	
Э	CCSONDCENE		
	(CJZUAPCJUJ)	Implement Bankers Algorithms to Avoid and prevent the	
		Dedu LUCK	
		Evaluate Page replacement algorithms	
		inustrate the file organization techniques	
		Illustrate shared memory process	
		Design new scheduling algorithms	

6	SOFTSKILLS SOC –I	Recognize the importance of verbal and non verbal skills			
	(EG20ASC301)	Develop the interpersonal and intrapersonal skills			
		Apply the knowledge in setting the SMART goals and			
		achieve the set goals			
		Analyze difficult situations and solve the problems in			
		stress-free environment			
		Create trust among people and develop employability skills			
7	BIOLOGY FOR ENGINEERS	Explain about cells and their structure and function.			
	(CH20AMC301)	Different types of cells and basics for classification of living			
		Organisms			
		Explain about biomolecules, their structure and function			
		and their role in the living organisms. How bio molecules			
		are useful in Industry			
		Briefly about human physiology			
		Explain about genetic material, DNA, genes and RNA how			
		they replicate, pass and preserve vital information in living			
		Organisms			
		Know about application of biological Principles in different			
		technologies for the production of medicines and			
		Pharmaceutical molecules through transgenic microbes,			
		plants and animals			
8	PROBLEM SOLVING AND	Solve computational problems			
	PROGRAMMING FOR LE	Select the features of C language appropriate for solving a			
	(IT20AMC501)	problem			
		Design computer programs for real world problems			
		Organize the data which is more appropriated for solving a			
		problem			

SRI VENKATESWARA COLLEGE OF ENGINEERING (AUTONOMOUS) Course Structure for Computer Science & Engineering

Course Structure for Computer Science & Engineering B.Tech Course R20 Regulation III B.Tech – II Sem

	III B. lech-II Semester (Theory-5, lab=3, SOC-IMC-2)						
S. No	Course No	Course Name	Categor y	L-T-P	Credits		
1	CS20APC601	Cryptography and Network Security	PC	3-0-0	3		
2	CS20APC603	Machine Learning	PC	3-0-0	3		
3	CS20APC605	Web and Internet Technologies	PC	3-0-0	3		
4	4 CS20APE601 CS20APE602 CS20APE603 CS20APE603 CS20APE604 CS20APE605 CS20APE605 CS20APE605 CS20APE605 CS20APE605 CS20APE605 CS20APE605 CS20APE605 CS20APE605 CS20APE602 CS20APE602 CS20APE602 CS20APE602 CS20APE602 CS20APE602 CS20APE602 CS20APE602 CS20APE602 CS20APE603 CS20APE603 CS20APE603 CS20APE604 CS20APE605 CS20APE60		PE	3-0-0	3		
5	ME20AOE501 EE20AOE503 EC20AOE602 CE20AOE603	Open Elective-II Introduction to Automation Renewable Energy ResourcesSignal Processing Water Resources Planning & Management	OE	3-0-0	3		
6	CS20APC602	Cryptography and Network Security Lab	PC	0-0-3	1.5		
7	CS20APC604	Machine Learning Lab	PC	0-0-3	1.5		
8	CS20APC606	Web and Internet Technologies Lab	PC	0-0-3	1.5		
9	CS20ASC601	Skill Oriented Course-V Dev Ops	SC	1-0-2	2		
10	BA20AMC501	Mandatory non-credit course-V Constitution of India	МС	2-0-0	0		
11	CS20ATS601	Technical Seminar Presentation-II	TS		0.5		
12	AM20AMC601	AI Tools Techniques & Applications for LE	MC	2-0-0	0		
13.	MA20AMC301	Logical Skills for Professionals - II	MC	2-0-0	0		

SI.No	Subject with code	Course Outcomes
1	Cryptography and	Identify various type of vulnerabilities of a computer
	Network Security	network
	(CS20APC601)	Outline various security algorithms
		Design secure systems
		Investigate the threats and identify the solutions for threats
2	MACHINE LEARNING (CS20APC603)	Identify machine learning techniques suitable for a given problem
		Solve the real world problems using various machine learning techniques
		Apply Dimensionality reduction techniques for data pre- processing
		Explain what is learning and why it is essential in the design of intelligent machines
		Implement Advanced learning models for language, vision, speech, decision making etc
3	WEB AND INTERNET TECHNOLOGIES	Construct a basic website using HTML and Cascading Style Sheets
	(CS20APC605)	Build dynamic web page with validation using Java Script objects and by applying different event handling mechanisms
		Develop server side programs using Servlets and JSP
		Construct simple web pages in PHP and represent data in XML format
		Utilize AJAX and web services to develop interactive web applications
4	Cryptography and	Design scripts for Wired network simulation
	Network Security Lab (CS20APC602)	Design scripts of static and mobile wireless networks simulation
		Analyze the data traffic using tools
		Design JAVA programs for client-server communication
		Construct a wired and wireless networks using the real hardware
5	Machine Learning lab (CS20APC604)	understand complexity of Machine Learning algorithms and their limitations
		understand modern notions in data analysis-oriented computing
		be capable of confidently applying common Machine Learning algorithms in practice and implementing their own
		Be capable of performing experiments in Machine Learning using real-world data
6	WEB AND INTERNET	Ability to create dynamic and interactive web sites
	TECHNOLOGIES LABORATORY	Gain knowledge of client side scripting using java sript and DHTML
	(CS20APC606)	Demonstrate understanding of what is XML and how to parse and use XML data
		Able to do server side programming with Java Servelets, JSP and PHP

	(
	(CS20ASC601) Dev Ops	SDLC
		Demonstrate how DevOps improves the collaboration and
		productivity by automation
		Adapt DevOps in real time projects
		Illustrate the continuous integration tools and monitoring
		tools
8	MANDATORYCOURSE:	Understand historical background of the constitution making
	CONSTITUTION OF INDIA	and its importance for Building a democratic India
	(BA20AMC501)	Understand the functioning of three wings of the
		government ie., executive, legislative and judiciary
		Understand the value of the fundamental rights and duties
		for becoming good citizen of India
		Analyze the decentralization of power between central,
		state and local self- government
		Apply the knowledge in strengthening of the constitutional
		institutions like CAG, Election Commission and UPSC for
		sustaining democracy
9	ARTIFICIAL INTELLIGENCE	Demonstrate various AI applications, languages and
	TOOLS TECHNIQUES &	Intelligent Agents
	APPLICATIONS	Solve problems using search strategies and understand the
	(AM20AMC601)	basic process of Machine Learning
		Apply classification and regression algorithms on real world
		data
		Develop an expert system
		Comprehend the structure of an artificial neural network
		and identify the building blocks of a convolutional neural
		network
10	Logical Skills for	Demonstrate knowledge basic mathematics to develop
	Professionals-II	analytical skills to solving problems of HCF, LCM Factors and
	(MA20AMC301)	Simplification
		Demonstrate knowledge basic mathematics to develop
		analytical skills to solving problems of Pipes, Alligation or
		Mixture
		Demonstrate knowledge basic mathematics to develop
		analytical skills to solving problems of Table, Bar Graphs and
		Pie Chart
		Analyze the techniques in Syllogism
		Analyze the techniques in Calendar, Clocks and Number
		Series Analogy concepts

SRI VENKATESWARA COLLEGE OF ENGINEERING (AUTONOMOUS)

Course Structure for Computer Science & Engineering B.Tech Course R20 Regulation IV B.Tech – I Sem

IV B.Tech-I Semester(Theory-6, lab-0, SOC-1) S. No Categor L-T-P Credits Course No Course Name y **Professional Elective-III** Block Chain Technologies CS20APE701 CS20APE702 Data Science ΡE 3-0-0 3 1 CS20APE703 Data Visualization TechniquesDistributed Computing Service oriented Architecture CS20APE704 CS20APE705 Professional Elective-IV CS20APE706 Advanced Language Processors Cyber Security CS20APE707 2 ΡE 3-0-0 3 CS20APE708 Deep Learning CS20APE709 Full Stack Development CS20APE710 Software Project Management **Professional Elective-V** CS20APE711 Aaile Methodologies Cloud CS20APE712 Computing Malware 3 ΡE 3-0-0 3 CS20APE713 Analysis CS20APE714 Natural language processing Reinforcement Learning CS20APE715 **Open Elective-III** CE20AOE701 Air Pollution and Quality Control Optimization EE20AOE603 4 OE 3-0-0 3 Techniques Through MATLABPower Generation ME20AOE602 Techniques EC20AOE702 Principles of Communication Engineering **Open Elective-IV** EE20AOE701 Embedded Systems 5 EC20AOE705 OE 3-0-0 3 Introduction to Image Processing CE20AOE705 Low Cost Housing Techniques ME20A0E702 Robotics in Industrial Engineering **Humanities Elective-II** BA20AHS701 6 HS 3-0-0 3 Business Ethics and Corporate Governance BA20AHS705 Management Science BA20AHS706 Strategic Management CS20ASC701 **Skill Oriented Course-V** 7 1-0-2 SC 2 MOOC-2 (NPTEL)/Digital Marketing Industrial/Research Internship 1 Month CS20AIP701 8 IΡ 0-0-0 3 **Evaluation Mini Project** CS20APW701 **Project Work Stage-I** 9 PW 2 CS20ATS701 Technical SeminarPresentation- III 10 ΤS 0.5 25.5 Total Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-4-0-11 4 Oalso) 0

(AUTONOMOUS)

Course Structure for Computer Science & Engineering

B.Tech Course

R20 Regulation

IV B.Tech – I Sem

S. No	Course No	Course Name	Category	L- T-P	Credits
1	CS20APW801	Project Work Stage – II / Full Internship in Industry	PW	0- 0-0	8.5
			-	Total	8.5



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DEPARTMENT OF MCA

PROGRAMME OUTCOMES

PO1: An ability to apply knowledge of mathematics, computer science and management in practice

PO2: An ability to identify, critically analyze, formulate and develop computer applications

PO3: An ability to select modern computing tools and techniques and use them with dexterity

PO4: An ability to design a computing system to meet desired needs within realistic constraints such as safety, security and applicability

PO5: An ability to devise and conduct experiments, interpret data and provide well informed conclusions

PO6: An ability to understand the impact of system solutions in a contemporary, global, economical, environmental, and societal context for sustainable development.

PROGRAMME SPECIFIC OUTCOMES

- **PSO1:** Understand, analyze and develop computer programs in the areas related to algorithms, Process and solutions for specific application Development using appropriate data modeling concepts.
- **PSO2:** Apply standard Software Engineering practices and strategies in software project development using open-source programming environment To deliver quality product for business success.
- **PSO3:** Be acquainted with the contemporary issues, latest trends in technological development and thereby innovate new ideas and solutions To existing problems.



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DEPARTMENT OF MCA

S. No	COURSE NAME	COs	COURSE OUTCOMES
1	Computer Organization (CA20FPC101)	C111.1	Explain the organization of basic computer, its design & the design of control unit and trade-offs between hardware and software.
		C111.2	Students will formulate and solve problems, understand the performance requirement of the systems and the operations & languages of the register transfer, micro operations and input- output organization.
		C111.3	Students can understand how computer stores positive and negative numbers
		C111.4	Understand the organization of memory and memory management hardware.
		C111.5	Elaborate advanced concepts of computer architecture, Parallel Processing, inter- processor communication and synchronization.
	Data Structures Using C (CA20FPC102)	C112.1	Analyze the basic concepts of C Programming language.
		C112.2	Design applications in C, using functions, arrays, pointers and structures.
2		C112.3	Apply various operations of Stacks and Queues in solving the problems.
		C112.4	Explain operations on Linked lists.
		C112.5	Demonstrate various tree traversals and graph traversal techniques.
	Databasa Managamant	C113.1	Design a database for a real-world information system
3	Systems (CA20FPC103)	C113.2	Define transactions which preserve the integrity of the database
		C113.3	Generate tables for a database



		C113.4	Organize the data to prevent redundancy
		C113.5	Pose queries to retrieve the information from database
4	Accounting and Financial Management(BA20FHS101)	C114.1	The student will be able to understand the basic accounting principles
		C114.2	Get exposure to the fundamental concepts, techniques and tools of Financial Management,
		C114.3	Enable to prepare and analyze financial statements of business enterprises for taking sound financial decisions.
5	Mathematical Foundations for Computer Science (CA20FPC104)	C115.1	Able to apply mathematical concepts and logical reasoning to solve problems in different fields of Computer science and information technology.
		C115.2	Able to apply the concepts in courses like Computer Organization, DBMS, Analysis of Algorithms, Theoretical Computer Science, Cryptography, Artificial Intelligence
	Computer Networks (CA20FPC105)	C116.1	Ability to choose the transmission media depending on the requirements.
6		C116.2	Ability to design new protocols for computer network.
		C116.3	Ability to configure a computer network logically.
	Database Management Systems Lab (CA20FPC106)	C117.1	Design database for any real world problem
		C117.2	Implement PL/SQL programs
7		C117.3	Define SQL queries
		C117.4	Decide the constraints
		C117.5	Investigate for data inconsistency
8		C118.1	Demonstrate basic concepts of C programming language.
	Data Structures Using C Lab (CA20FPC107)	C118.2	Develop C programs using functions, arrays, structures and pointers.
		C118.3	Illustrate the concepts Stacks and Queues.
		C118.4	Design operations on Linked lists.



		C118.5	Apply various Binary tree traversal techniques.
:			Develop searching and sorting methods
9	Office Automation & Trouble shooting Lab (CA20FPC108)	C119.1	Preparing a Govt. Order / Official Letter / Business Letter / Circular Letter Covering formatting commands - font size and styles - bold, underline, upper case, lower case, superscript, subscript, indenting paragraphs, spacing between lines and characters, tab settings etc.
		C119.2	Printing envelopes and mail merge. To print envelopes with from addresses and to addresses to use mail merge facility for sending a circular letter to many persons to use mail merge facility for printing mailing labels
		C119.3	Create an advertisement Prepare a resume. Prepare a Corporate Circular letter inviting the shareholders to attend the Annual Meeting
		C119.4	Using formulas and functions: To prepare a Worksheet showing the monthly sales of a company in different branch offices (Showing Total Sales, Average Sales). Prepare a Statement for preparing Result of 10 students in 5 subjects (using formula to get Distinction, I Class, II Class and Fail under Result column against each student
		C119.5	Creating a Chart: To create a chart for comparing the monthly sales of a company in different branch offices.
		C119.6	Troubleshoot the following OS problems Unable to copy and paste Replacing Windows Splash Screens Out of memory error Windows cannot find Program.exe to open Windows Installer error
	Mandatory Course(Corporate Communication Skills) (CA20FMC101)	C11A.1	Understand verbal and non-verbal features of communication and hold formal / informal conversations
10		C11A.2	The significance of paralinguistic features will be understood by the students and they will try to be intelligible.
		C11A.3	Become good at Inter-personal skills



		C124.5	Utilize the basic characteristic features of a queuing system and acquire skills in analyzing queuing models.
15	Software Engineering (CA20FPC204)	C125.1	Define and develop a software project from requirement gathering to implementation.
		C125.2	Ability to code and test the software
		C125.3	Ability to plan, Estimate and Maintain software systems
	Artificial Intelligence (CA20FPC208)	C126.1	Possess the ability to formulate an efficient problem space for a problem expressed in English
16		C126.2	Possess the ability to select a search algorithm for a problem and characterize its time and space complexities.
10		C126.3	Possess the skill for representing knowledge using the appropriate technique
		C126.4	Possess the ability to apply AI techniques to solve problems of Game Playing, Expert Systems and Machine Learning.
17	Operating Systems Lab (CA20FPC210)	C127.1	Ensure the development of applied skills in operating systems related areas.
1/		C127.2	Able to write software routines modules or implementing various concepts of operating system.
	Python Programming Lab (CA20FPC211)	C128.1	Use python basic concepts to develop problems to solve computational problems.
18		C128.2	Apply lists, dictionaries, sets and functions in python programming
		C128.4	Experiment module design and text files in python programming
	Java Programming Lab (CA20FPC212)	C129.2	Solve simple problems using the fundamental syntax and semantics of Java
19		C129.3	Analyze and design Java programs using object-oriented principles
		C129.4	Develop simple GUI interfaces with event handling capabilities
		C129.5	Develop and debug java programs using an IDE



		C11A.4	Achieve neutral accent and be free from mother tongue influence
		C11A.5	Being an active participant in debates and group discussion, showing ability to express agreement, argument to summarize ideas to elicit the views of others and present own ideas.
	Operating Systems	C121.1	Able to use operating systems effectively.
		C121.2	Write System and application programs to exploit operating system functionality.
	(CA20FPC201)	C121.3	Add functionality to the exiting operating systems
		C121.4	Design new operating systems
		C122.1	Apply the features of Python language in various real applications.
	Python Programming (CA20FPC202)	C122.2	Select appropriate data structure of Python for solving a problem.
12		C122.3	Design object-oriented programs using Python for solving real- world problems.
		C122.4	Apply modularity to programs.
	OOPS through JAVA (CA20FPC203)	C123.1	Use object-oriented approach for solving problems and implementing them
13		C123.2	Ability to write Efficient programs that handle exceptions
		C123.3	Create user friendly interface
		C124.1	Make use of the concepts of probability and their applications
14	Probability and Statistics (MA20FBS201)	C124.2	Apply discrete and continuous probability distributions to analyze statistical data.
		C124.3	Design the components of a classical hypothesis test for large samples.
		C124.4	Infer the statistical inferential methods based on small sampling tests.



20	Design and Analysis of Algorithms (CA20FPC301) —	C12A.1	Ability to analyse the performance of algorithms.
		C12A.2	Ability to choose appropriate algorithm design techniques for solving problems.
		C12A.3	Ability to understand how the choice of data structures and the algorithm design methods impact the performance of programs.
		C12B.1	Understand business intelligence and business and data analytics.
		C12B.2	To understand the business data analysis through the powerful tools of data application.
	Data Science & Analytics	C12B.3	Understand the methods of data mining.
21	(CA20FPC302)	C12B.4	Apply basic tools (plots, graphs, summary statistics) to carry out EDA.
		C12B.5	Understand the key elements of a data science project
		C12B.6	Identify the appropriate data science technique and/or algorithm to use for the major data science tasks
	Web Technologies (CA20FPC303)	C211.1	Ability to design websites and do client side validations
22		C211.2	Share information over a network
		C211.3	Ability to write server side programs
23	Cloud Computing (CA20FPC304)	C212.1	Understand the concepts of cloud computing and its related techniques.
		C212.2	Provide a pleasant and effective user interface
		C213.1	Understand the basic testing procedures.
	Software Testing	C213.2	Able to support in generating test cases and test suites.
24	(CA20FPC305)	C213.3	Able to test the applications manually by applying different testing methods and automation tools.
		C213.4	Apply tools to resolve the problems in Real time environment.
25	Big data Analytics	C214.1	Analyse the big data analytics techniques for useful business application.



	(CA20FPC312)	C214.2	Design efficient algorithms for mining the data from large volumes.
		C214.3	Analyse the HADOOP and Map Reduce technologies associated with big data analytics.
		C214.4	Explore on big data applications using Pig and Hive.
	Design and Analysis of Algorithms Lab(CA20FPC315)	C215.1	Ability to analyse the performance of algorithms.
26		C215.2	Ability to choose appropriate algorithm design techniques for solving problems.
		C215.3	Ability to understand how the choice of data structures and the algorithm design methods impact the performance of programs.
	Data Science and Analytics Lab (CA20FPC316)	C216.1	Understand and use appropriate and relevant, fundamental and applied mathematical and statistical knowledge, methodologies and modern computational tools;
27		C216.2	Recognise and use research principles and methods applicable to data science.
		C216.3	Extract an interpretation of data using exploratory data analysis
		C216.4	Visualise and plot graphical representations of data.
	Web Technologies Lab (CA20FPC317)	C217.1	Ability to apply object oriented concepts for programming and its use.
		C217.2	Practical WEB Development using java by using JDBC and ODBC connectivity.
28		C217.3	Implementation of servlets and PHP connectivity by using MYSQL applications.
		C217.4	Learning how to use PHP in different operating systems with different editors like eclipse and net beans.
		C217.5	Acquire skills to develop final project by acquired knowledge during curriculum.
29	Mandatory	C218.1	Students are expected to become more aware of themselves, and their surroundings (family, society, nature)


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	Course(Universal Human Values) (CA20FMC318)	C218.2	They would become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind.
		C218.3	They would have better critical ability.
		C218.4	They would also become sensitive to their commitment towards what they have understood (human values, human relationship and human society).
		C218.5	It is hoped that they would be able to apply what they have learnt to their own self in different day-to-day settings in real life, at least a beginning would be made in this direction.

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