



PARVATHAREDDY BABUL REDDY
VISVODAYA INSTITUTE OF TECHNOLOGY & SCIENCE

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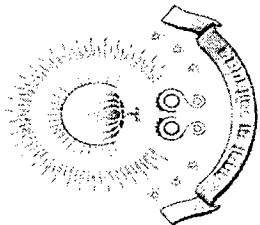
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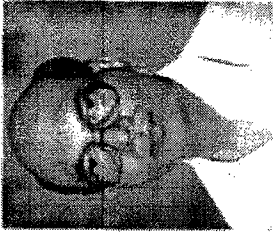
Late Dr. Dodla Ramachandra Reddy
Founder, Visvodaya.

2.6.1

Teachers and students are aware of the stated Programme and course outcomes of the Programmes offered by the institution.



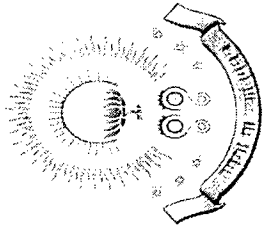
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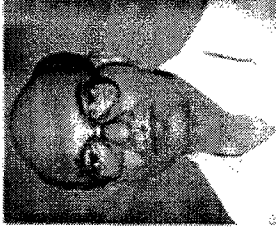
DEPARTMENT OF MASTER OF COMPUTER APPLICATIONS

2017 ADMITTED BATCH COURSE OUTCOMES

YEAR/SEM OF STUDY	SUBJECT NAME	JNTUA CODE	CO NUMBER	COURSE OUTCOMES	KNOWLEDGE LEVEL
I-I	Technical Communication Skills	17FHS101	C111.1	Use conversation skills for effective communication in English, academically and socially.	K3
			C111.2	Develop structure and written expressions useful for professional growth.	K3
			C111.3	Develop listening skills and enrich communication for daily conversations.	K3
			C111.4	Enunciate the latest trends of reading skills and writing reports.	K4
			C111.5	Develop communicative competence with emphasis in LSRW skills.	K3
	Probability and Statistics	17FBS101	C112.1	Analyze the mathematical knowledge to solve differential equations in engineering applications.	K4
			C112.2	Apply the linear D.E's Mechanical and Electrical Oscillatory circuits and Deflection of Beams	K3
			C112.3	Apply multiple integration and curve tracing to solve the real time problems in engineering.	K3
			C112.4	Use Laplace Transformations to solve engineering problems related to Mathematics.	K4
			C112.5	Convert the real time problems into vector calculus and then find its solution.	K2
	Introduction to	17F00102	C113.1	Develops basic understanding of computers, the concept of algorithm and	K3

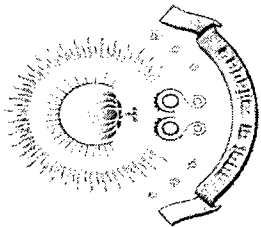


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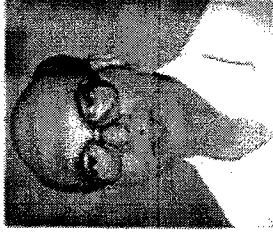


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Problem Solving and Programming			algorithmic thinking.		
			C113.2	Develops the ability to analyze problems like Finding Square root of a Number, The Smallest Divisor of an Integer, The GCD of two Integers.	K3
			C113.3	Write C programs for real world problems using simple and compound data types.	K4
			C113.4	Understanding a defensive programming concept. Ability to handle possible errors during program execution.	K2
			C113.5	Adapt programming experience and language knowledge to other programming language contexts.	K4
Accounting and Financial Management	17FHS102		C114.1	Apply the Accounting principles and skill to solve Accounting problems.	K3
			C114.2	Understand about the Financial Management and business techniques to raise funds.	k3
			C114.3	Gain knowledge in Cost Accounting and fixing MRP for their product.	k4
			C114.4	Handle the organization problems and sources and application of funds.	k3
			C114.5	Understand the importance of computerized Accounting in modern world.	k3
Mathematical Foundations for Computer Science	17F00101		C115.1	Construct simple mathematical proofs and possess the ability to verify them and Develop logical and Creative thinking to solve problems	k4
			C115.2	Manipulate and specify basic mathematical objects such as sets, functions, and relations and will also be able to verify simple mathematical properties that these objects possess.	k2
			C115.3	Analyze and model computational processes using analytic and combinatorial methods, Recurrence relations and generating functions.	k4
			C115.4	Reason mathematically about basic data types and structures such as numbers, sets, graphs, and trees used in computer algorithms and systems.	k4

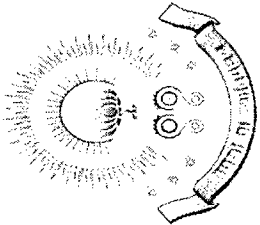


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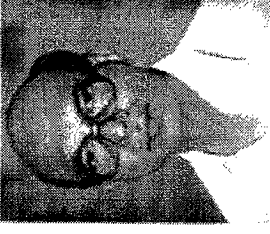


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English Language Communication Skills Lab	17FHS103	C116.1	Apply knowledge in seeking right pronunciation with better accent through stress, intonation and rhythm.	k3
		C116.2	Develop speaking skills, acquire Fluency, Appropriacy in Spoken English and neutralize Mother Tongue Influence.	k3
		C116.3	Enhance active participation in the learning process and become expert in Presentation Skills like Oral, Poster, Power Point and other necessary speaking skills	k2
		C116.4	Elevate proficiency to participate in Group Discussions, Debates, face Interviews and Public Speaking.	k4
		C116.5	Apply the knowledge in developing LSRW skills	k3
Computer Programming Lab	17F00103	C117.1	understand and trace the execution of programs written in C language.	k3
		C117.2	Write the C code for a given algorithm.	k3
		C117.3	Implement Programs with pointers and arrays, perform pointer arithmetic, and use the pre-processor.	k3
		C117.4	Write programs that perform operations using derived data types.	k3
IT Workshop	17F00104	C118.1	Develop skill in S/W and H/W trouble shooting	k2
		C118.2	Develop skill in using office suite.	k4
		C118.3	solve the problems of assembling and OS installation.	k4
Organization Structure and Human Resource Management	17FHS201	C121.1	Understand the management concept and various principles of management	k3
		C121.2	Understand about the organization structure and hierarchy of the organization	k3
		C121.3	Gain the practical knowledge about HR practices in the organization.	k3

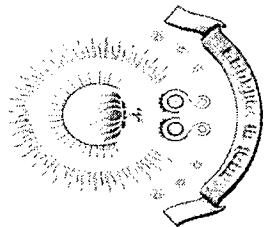


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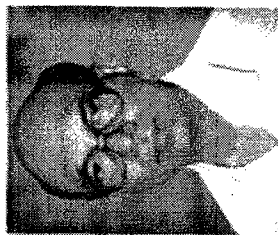


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			interfaces.	
		C124.1	Explain the knowledge of matrix calculation as an elegant and powerful mathematical language in connection with rank of a matrix.	k3
		C124.2	Discuss and solve non- linear equations with a single variable.	k3
	17F00203	C124.3	Apply and solve non- linear equations with a single variable.	k4
Operating Research		C124.4	Design curve-fitting techniques for data representations and computation in engineering problems.	k3
		C124.5	Compare numerical methods to obtain approximate solutions to mathematical problems for differentiation and integration	k4
		C125.1	Comprehend the concepts of environment and its importance in our daily life and develop and apply various water conservation methods and conservation of other natural resources also.	k3
		C125.2	Identify the importance of environmental education for protection of life cycles of various bio systems which are essential for bio sphere.	k3
	17F00204	C125.3	Develop new innovative methods for controlling of environmental pollution which may affect the human health.	k3
Java Programming		C125.4	Analyze environmental issues related to society and find solutions for environmental problems.	k4
		C125.5	Analyze the effects of increasing human population as well as health associated problems and develop measures to be taken to protect human health.	k4

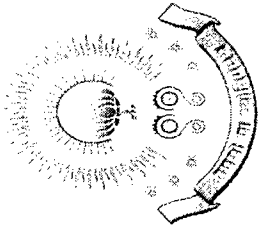


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Data Structures Lab	17F00205	C126.1	Analyze the time and space efficiency for the given algorithms.	k4
		C126.2	Apply operations like searching, insertion, deletion, and traversing mechanism etc. on various data structures.	k4
		C126.3	Identify appropriate concept in data structures to solve the specified problem.	k3
		C126.4	Apply the practical knowledge of data structures in real time applications.	k3
Java Programming Lab	17F00206	C127.1	Apply object oriented programming features and concepts for solving given problem.	k3
		C127.2	Use java standard API library to write complex programs and implement object oriented programming concepts using java.	k2
		C127.3	The students will be able to demonstrate programs on basic constructs like if-else, control structures, array, and strings, exceptions, multithreading and applets.	k3
Advanced Communication Skills Lab	17FHS202	C128.1	Better Understanding of nuances of language through audio-visual experience and be independent learners.	k4
		C128.2	The significance of paralinguistic features will be understood by the students and they will try to be intelligible.	k2
		C128.3	Become good at Inter-personal skills	k3
		C128.4	Achieve neutral accent and be free from mother tongue influence.	k2
		C128.5	Being an active participant in debates and group discussion, gathering own ideas.	k3
II-I	17F00301	C211.1	Interpret the different issues involved in the design and implementation of a database system	K3
		C211.2	Experiment data manipulation language to query, update, and manage a	K2

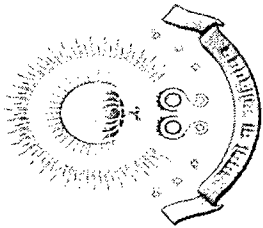


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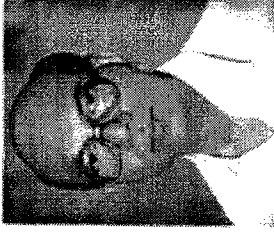


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		services used in transforming data	
Software Engineering	17F00304	C214.1	Understand the basics of software Engineering and different process Models. K3
		C214.2	Demonstrate various principles of Requirement Engineering. K2
		C214.3	Analyze different architectural designs for a software projects. K4
		C214.4	Analyze various guidelines for user interface and Webapp designs. K4
		C214.5	Apply different testing techniques on code and test the softwares. K2
Operating Systems	17F00305	C215.1	Understand the concepts of operating systems and use them effectively. k2
		C215.2	Design and Implement system and application programs to exploit operating system functionality. K3
		C215.3	Examine Deadlock handling methods and Apply the concepts of Memory management techniques. K4
		C215.4	Use File and Disk Management Schemes for effective Storage. K4
		C215.5	Examine different Protection and Security principles associated with Operating Systems. K4
Web Technologies Lab	17F00306	C216.1	Create dynamic and interactive web sites K2
		C216.2	Create a server side java application called Servlet and JSP to catch form data sent from client, process it and store it on database. K4
		C216.3	Understand and apply predefined HTML tags and CSS K2
		C216.4	Analyze and create a PHP program to a DBMS and perform insert, update and delete operations on table data. K2
		C216.5	Analyze and evaluate the structure and the content of XML data using XML Schema. K2

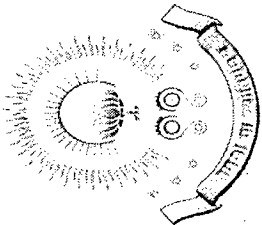


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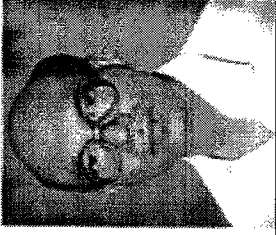


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Operating Systems Lab	17F00307	C217.1	Operate database tools to perform various operations for the given data.	k3
		C217.2	Sketch ER diagrams, map them to tables and normalize them.	k3
		C217.3	Construct database and retrieve information from database.	k3
		C217.4	Develop Procedures To Program The Data Access And Manipulation	k3
Database Management Systems Laboratory	17F00308	C218.1	Develop and employ different network models for elementary electrical and electronic components like resistors, sources, inductors, capacitors, diodes and transistors.	k5
		C218.2	Implement the knowledge about semiconductors devices and basic digital gates in designing a circuit	k4
		C218.3	Validate the knowledge of math, science and engineering while implementing it to the analysis of electrical engineering problems	k6
Object Oriented Analysis & Design	17F00401	C221.1	Describe the complex systems and its properties in object oriented perspective and understand the design of complex systems	k2
		C221.2	Identify and Classify the Objects, Classes and relationships among them to make the complex software system.	k3
		C221.3	Summarize the UML features and representation of classes, objects, relationships and common mechanisms and design the class and object diagrams for software systems using UML.	k4
		C221.4	Construct the structural models for software systems by drawing Package , Composite Structure , Component, Deployment, Profile Diagrams	k4
		C221.5	Develop the behavioural models for software systems by drawing Use Case, Activity, State Machine, Sequence, Communication, Timing and Interaction Overview Diagrams.	k3

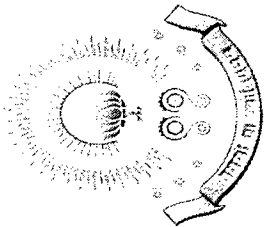


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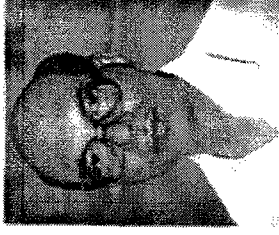


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Design of Analysis & Algorithms	17F00402	C222.1	Apply various algorithmic notations to divide and conquer strategy to solve various computing problems.	K2
		C222.2	Apply Greedy method and Dynamic programming techniques to solve the problems.	K3
		C222.3	Apply Backtracking technique to solve problems and use graph traversal techniques.	K4
		C222.4	Analyze Branch and Bound techniques to improve the efficiency of existing techniques.	K4
		C222.5	Find the limitations of complexity classes P, NP, and NP-Complete	K3
Linux Programming	17F00403	C223.1	Describe the architecture and features of Linux Operating System and distinguish it from other Operating System and Learn various command utilities in UNIX.	k3
		C223.2	Design shell scripts for simple tasks	k3
		C223.3	Demonstrate UNIX commands and system calls for file handling and process control	k3
		C223.4	Implement inter process communication applications using pipes, FIFO's, messages queues, semaphores and shared memory.	k4
		C223.5	Develop client/server applications using socket system calls and remote procedure call	k4
Computer Graphics & MultiMedia	17F00404a	C224.1	Collect information security requirements for a client and server.	K2
		C224.2	Compute cryptographic algorithms, authentication and security issues	K3
		C224.3	Develop algorithms and methods for web security with IPV4 and IPV6.	K3
		C224.4	Determine the Security and legal issues towards information security.	K3
		C224.5	test the secret and public cryptography and Design a secure network with	K4

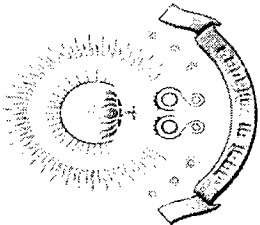


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			available solutions like PGP, SSL, etc.	
Internet of Things	17F00405b	C225.1	Understand the application areas of IoT.	k3
		C225.2	Understand the revolution of Internet in Mobile Devices, Cloud & Sensor Networks.	k3
		C225.3	Compare and Contrast the use of Devices, Gateways and Data Management in IoT.	k4
		C225.4	Apply building blocks of Internet of Things and characteristics for data analysis.	k4
		C225.5	Illustrate the application of IoT in Industrial Automation and identify Real World Design Constraints.	k3
Artificial Intelligence	17F00406c	C226.1	Use variant categories of search techniques to solve the given problem along with application of constraint satisfaction concepts.	k3
		C226.2	Illustrate the given problem using propositional logic and first order logic and their inferences.	k3
		C226.3	Apply different planning methodologies to solve problems in real world problems.	k4
		C226.4	Discriminate uncertain reasoning techniques to solve a problem and compare their efficiencies.	k3
		C226.5	Analyze the various learning methods to predict the rational behaviour of agent in the environment.	k4
BigData Analytics	17F00407a	C227.1	identify the characteristics of datasets and compare the trivial data and big data for various applications.	k3
		C227.2	Ability to select and implement machine learning techniques and computing environment that are suitable for the applications under	k3

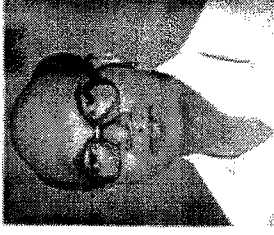


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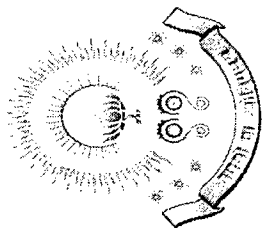
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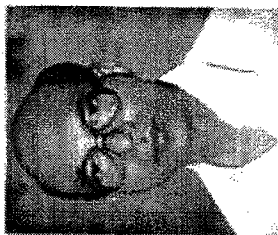


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			consideration.		
			Ability to solve problems associated with batch learning and online learning, and the big data characteristics such as high dimensionality, dynamically growing data and in particular scalability issues		k4
			Ability to understand and apply scaling up machine learning techniques and associated computing techniques and technologies		k3
			Examine various ways of selecting suitable model parameters for different machine learning techniques.		k3
			Describe the architecture and features of Linux Operating System and distinguish it from other Operating System and Learn various command utilities in UNIX.		k3
		17F00408b	Design shell scripts for simple tasks		k3
			Demonstrate UNIX commands and system calls for file handling and process control		k3
			Understand the implementation issues in LANS and PANS of wireless networks		k4
		17F00409c	Organizing and differentiating various MAC Protocols usage in AdhocWireless Networks		k3
			various Routing and Security Protocols in Wireless Networks		k2
			Expalin the Fundamentals of Distributed, Grid and Cloud Comuting		k2
		17F00501	Describe the Functionality Requirements, Architecture, Practical & Detailed View of OGSA		k4
			Demonstrate the Cloud Deployment, Service Models, and Virtualization of different Resources		k4
III-I	Cloud Computing				

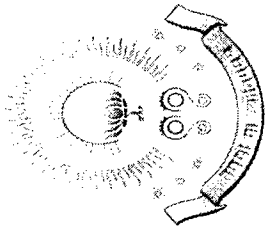


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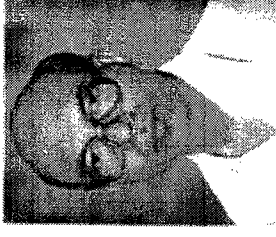


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		C311.4	Analyze the Programming Model of Globus Toolkit, and Hadoop Framework Concepts	K3
		C311.5	Discuss the Grid and Cloud Security Concepts	K4
Fundamentals of Data Science	17F00502	C312.1	identify the characteristics of datasets and compare the trivial data and big data for various applications.	k1
		C312.2	Ability to select and implement machine learning techniques and computing environment that are suitable for the applications under consideration.	k2
		C312.3	Ability to solve problems associated with batch learning and online learning, and the big data characteristics such as high dimensionality, dynamically growing data and in particular scalability issues	k3
		C312.4	Ability to understand and apply scaling up machine learning techniques and associated computing techniques and technologies	k3
		C312.5	Examine various ways of selecting suitable model parameters for different machine learning techniques.	k4
Software Testing	17F00503	C313.1	Understand the basic concepts of testing and using of flow graphs and path testing techniques	k3
		C313.2	Analyze transaction flow and data flow testing techniques and its strategies	k3
		C313.3	Analyze the types of domains in domain testing.	k2
		C313.4	Demonstrate different paths and path expressions to simplify testing	k3
		C313.5	Analyze states graphs, transition testing and graph matrices to solve testing problems	k3
Design Patterns	17F00504a	C314.1	Identify the different design patterns and their classifications.	K2
		C314.2	Analyze the different problems in case study (Lexi).	K2



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		C314.3	Discovers different creational patterns to different software designs.	K3
		C314.4	Apply structural patterns to construct system design.	K3
		C314.5	Compare the behavioral patterns to design system software.	K3
		C315.1	Identify mobile application development software development tools	K2
		C315.2	Analse various widgets in mobile applications	K4
		C315.3	Compare various layouts in mobile application design	K4
		C315.4	utilize multimedia, camera and Location based services in Android App.	K3
		C315.5	Build mobile application with dialogs and Fragments and Design and develop menus with database in mobile applications	K4
		C316.1	identify the characteristics of datasets and compare the trivial data and big data for various applications.	k3
		C316.2	Ability to select and implement machine learning techniques and computing environment that are suitable for the applications under consideration.	k3
		C316.3	Ability to solve problems associated with batch learning and online learning, and the big data characteristics such as high dimensionality, dynamically growing data and in particular scalability issues	k3
		C316.4	Ability to understand and apply scaling up machine learning techniques and associated computing techniques and technologies	k3
		C316.5	Examine various ways of selecting suitable model parameters for different machine learning techniques.	k4
		C317.1	Design and Implement Simulation Program to Create Grid Resources, Users and allocation of Jobs using GRIDSIM	k2

Mobile
Application
Development

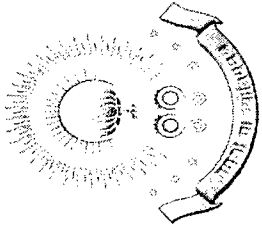
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Data Ware
Housing &
Mining

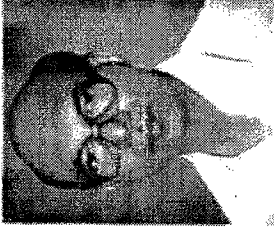
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Cloud
Computing Lab

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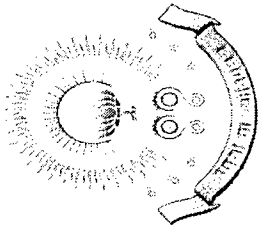


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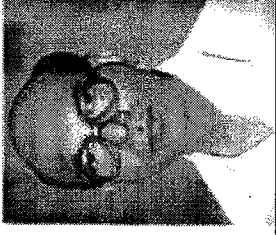


DEPARTMENT OF MASTER OF COMPUTER APPLICATIONS

			C317.2	Develop Programs on Grid Computing using Globus Toolkit	k4
			C317.3	Demonstrate programs on Software as a Service (SaaS) of Cloud using www.zoho.com and docs.google.com	k3
			C317.4	Develop programs on Platform as a Service (PaaS) of Cloud using Google App Engine and Microsoft Azure Cloud platforms	k4
			C317.5	Case Study on different examples of Public Cloud Platforms and Hadoop System	k5
			C318.1	Examine the applications on mobile application development environment	k4
			C318.2	Use mobile applications on handheld devices	k3
			C318.3	Develop various widgets in mobile applications	k3
			C318.8	Design mobile applications with various layouts	k4
			C319.1	Understand the basic concepts of society, family and channels of youth moments for National Building.	k2
			C319.2	Analyze the sociological, psychological factors influencing the youth crime, social harmony and national integration.	k4
			C319.3	Analyze the environmental issues and objectives of Civil and Self defense.	k4
			C319.4	Understand the gender sensitization and initiatives of Government schemes for prevention.	k2
			C319.5	Describe the importance and benefits of physical activities.	k3
			C424.1	Collect, Organize & Analyze information about upcoming technologies /market Demands/current trends.	k4
			C424.2	make use of effective communication skills, stage courage, and confidence	k3



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DEPARTMENT OF MASTER OF COMPUTER APPLICATIONS

			C424.3	Demonstrate intrapersonal skills		k2
			C424.4	Build in keeping with new innovations and inventions		k3
			C424.5	Develop skills in doing literature survey, technical presentation and report preparation		k3
			C425.1	Identify the problem by applying acquired knowledge.		k3
			C425.2	Analyze and categorize executable project modules after considering risks.		k4
			C425.3	Choose efficient tools for designing project modules.		k5
			C425.4	Inspect all the modules through effective team work after efficient testing.		k4
			C425.5	Examine the completed task and compile the project report.		k4
	Project Work	17F00602				

A. Sai Sundhara
 FACULTY INCHARGE

M. Jeyaraj
 HEAD OF THE DEPARTMENT

అధ్యక్షుడు
 DEPARTMENT OF COMPUTER APPLICATIONS
 విశ్వదయా ఇన్ స్టిట్యూట్ ఆఫ్ టెక్నాలజీ & సైన్స్
 కవాలి - 524201, నెల్లూరు జిల్లా, ఆంధ్రప్రదేశ్



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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
PROGRAM OUTCOMES


BATCH :2015-2019

PO NO	PO DESCRIPTION
1	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2	Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics,
3	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
4	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.
5	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.
6	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.
7	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.
8	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9	Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10	Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write
11	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.
12	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	
PSO NO	PSO DESCRIPTION
1	Apply Software Engineering Principles and Practices to provide software solutions.
2	Design and Develop Network, Mobile and Web-based Computational systems under realistic constraints.

IN-CHARGE




 Head of Department
COMPUTER SCIENCE ENGINEERING
 P.S. Vigneshwara Institute of Technology & Science
 KAVALI - 524 201, SPSR, Nellore Dt.



1. Attainment of Course Outcome (CO)

1. Write the COs based on the syllabus.
2. Map COs to POs/PSOs based on the level in which particular CO is addressing PO/PSO (High – 3, Moderate – 2, Low -1) (to be done by the subject expert/teacher)

Direct Attainment Tools- internal exams & external exams

Internal Exam

3. List out the question wise marks of all the students in the mid exams.

Roll No.	MID 1					MID 2				
	Q1	Q2	Q3	Q4	Q5	Q1	Q2	Q3	Q4	Q5

4. Total marks for each question – 10 Marks
Eligibility: 50% of total marks i.e. 5 Marks
5. Note the number of students who scored ≥ 5 marks in each question.
6. For each question, compute the total marks of the students who scored ≥ 5 in that question
7.
$$\left. \begin{array}{l} \text{Compute \% of attainment of Internal exam} \\ \text{(descriptive) marks for each question} \end{array} \right\} = \frac{\text{Total marks}(\geq 5)}{\text{No. of students attempted that question}} \times 100$$
8. Convert % into 3 point scale.

$\geq 70\%$	– 3
60% – 70%	– 2
50% – 60%	– 1
9. Compute the average attainment of each CO in Internal exam (descriptive) by considering all questions. This gives the CO direct attainment for internal marks in terms of percentage.

External exam

10. Calculate external marks of students who scored $\geq 40\%$ of total marks (i.e. 25 marks out of 70)
11. Note the number of students who scored more than 25 marks on the whole exam
12. Compute the total marks of the students who scored ≥ 25 marks
13. Compute % of attainment for external marks $= \frac{\text{Total marks} \geq 25}{\text{No. of students appeared}} \times 100$
14. Convert the external marks attainment % into 3 point scale

$\geq 60\%$	– 3
50% – 60%	– 2
40% – 50%	– 1

Indirect Attainment Tools- Course End Survey

17. Collect the course end survey for each CO and calculate the weighted average

$$= \frac{\text{No. of Highs} \times 3 + \text{No. of Moderates} \times 2 + \text{No. of Lows} \times 1}{\text{No. of students}}$$

CO	Excellent (3)	Good (2)	Poor (1)	Attainment Value	%
CO1	45	12	3	2.7	90
CO2					
CO3					
CO4					
CO5					

18. **CO attainment:** Compute the CO attainment (%) by giving 70% weightage to the direct tools and 30% of Course End Survey. This gives CO attainment in % .

CO	Mapping of COs						External Attainment level	Direct Attainment levels	Indirect (CES) Attainment Level	CO Attained	% CO Attained
	Mapping of Mid I & Mid II Term Examination										
CO1	2.00	3.00	3.00				2.00	2.50	2.7	2.75	91.66
CO2											
CO3											
CO4											
CO5											

19. Fix the target for each CO and compare with the attained values.

20. If CO is attained, suggest the actions for further improvement and if CO is not attained, analyze the reasons and suggest t actions.

CO ATTAINMENT ANALYSIS:

Target: LEVEL 2.25

Analysis: Based on the above result CO5 had not reached the target level.

ACTION SUGGESTED:

- For the gaps identified it was found that less number of students attempted this question and had an impact on attainment.
- For the gaps identified it was found that students had less preparation and had an impact on attainment
- For the gaps identified it was found that students had less basic knowledge and practice which impacted on the attainment.



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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING



REGULATION: R15

Code	COURSE OUTCOMES	K.Level
I B.TECH I SEM		
C111	Functional English	K.Level
C111.1	Practise conversational skills for effective communication in both social and academic contexts.	K3
C111.2	Apply the correct structure in written expressions required for their professional prospects.	K3
C111.3	Develop e-communication skills, listening skills and also writing skills required to prepare projects.	K3
C111.4	Take part in group discussions, writing reviews and develop critical thinking skills.	K4
C111.5	Develop communicative competence with emphasis on professional skills	K3
C112	Mathematics - I	K.Level
C112.1	Analyze the mathematical knowledge to solve differential equations in engineering applications.	K4
C112.2	Apply the linear D.E's Mechanical and Electrical Oscillatory circuits and Deflection of Beams	K3
C112.3	Apply multiple integration and curve tracing to solve the real time problems in engineering.	K3
C112.4	Apply Laplace Transformations to solve engineering problems related to Mathematics.	K3
C112.5	Convert the real time problems into vector calculus and then find its solution.	K2
C113	Computer Programming	K.Level
C113.1	Illustrate basics of computers, concepts of algorithm, flowchart, programming terminology and apply various C-tokens & Input and Output statements to solve simple problems.	K3
C113.2	Apply selection, loop, branch control statements and arrays to solve different applications.	K3
C113.3	Examine pointers for implementing direct access of memory locations and the necessity of modularity in programming.	K4
C113.4	Solve various data base related problems by using non-homogeneous data structures.	K3
C113.5	Utilize the concepts and need of files in programming and implement file operations.	K3

C115	Environmental Science	K.Level
C115.1	Comprehend the concepts of environment and its importance in our daily life and develop and apply various water conservation methods and conservation of other natural resources also.	K2
C115.2	Categorize an ability to reflect on their personal impacts on biodiversity in global perspective.	K2
C115.3	Develop new innovative methods for controlling of environmental pollution which may affect the human health.	K3
C115.4	Analyze environmental issues related to society and find solutions for environmental problems.	K4
C115.5	Determine the effects of increasing human population as well as health associated problems and develop measures to be taken to protect human health.	K4
C116	English Language Communication Skills Lab	K.Level
C116.1	Distinguish the speech sounds and acquire better pronunciation	K4
C116.2	Develop oral fluency and neutralize mother tongue influence.	K3
C116.3	Take part actively in the learning process and become expertise in Presentation Skills like Oral, Poster, Power Point and other necessary speaking skills	K4
C116.4	Apply language skills appropriately and effectively in interviews, group discussions and public speaking activities	K3
C116.5	Take part in group activities with more confidence thereby enhancing the employability skills	K4
C117	Engineering Chemistry Lab	K.Level
C117.1	Develop skills in determining the effects of hard water in water	K3
C117.2	Distinguish different types of titrations in the volumetric analysis	K4
C117.3	Apply Conductometry instrumental method in volumetric analysis to determine the concentration of a given HCL solution by titration against a Standard NaOH solution	K3
C117.4	Correlate the purity of water samples by doing D.O, Acidity and alkalinity estimations	K4
C117.5	Analyze the effect of temperature on viscosity by using Redwood viscometer	K4
C118	Computer Programming Lab	K.Level
C118.1	Demonstrate DOS and Linux Commands	K2
C118.2	Illustrate the syntax and semantics of C language for simple problem statements.	K2
C118.3	Develop the programs using arrays, strings operations	K3
C118.4	Write programs that perform operations using derived data types.	K3
C118.5	Develop C programming for a given application using file operations.	K3

C121	English for Professional Communication	K.Level
C121.1	Take part effectively in group discussions and debates.	K4
C121.2	Develop writing skills required in various professional contexts.	K3
C121.3	Employ presentation skills and creative writing skills effectively.	K3
C121.4	Analyse a variety of technical writing formats and styles.	K4
C121.5	Develop a proper level of language competence for employability.	K3
I B.TECH II SEM		
C122	Mathmatics II	K.Level
C122.1	Apply the Laplace Transform to solve the ordinary of first and second order	K3
C122.2	Find the fourie series representation of a one variablefunction	K4
C122.3	Demonstate their understanding of the dirichlet conditions by using them to evaluate infinite series	K2
C122.4	Attain the knowledge od partial differential equation and aplying in Mechanical problems	K4
C122.5	Apply Fourier and Z-transformers to find the solutions for engineering poblems	K3
C123	Network Analysis	K.Level
C123.1	Apply the various Circuit Analysis Techniques to the electrical circuits	K3
C123.2	Analyse the DC Transients in electrical networks	K4
C123.3	Analyse the Steady State sinsoidal quantities in electrical networks	K4
C123.4	Analyze series and parallel resonant circuits	K4
C123.5	Apply the various basics of filter techniques and two-port network principles	K3
C124	Engineering Physics	K.Level
C124.1	Apply the basic fundamentals of physics and their applications in both scientific and technological systems.	K3
C124.2	Describe the properties of crystals along with Ultrasonic non destrictive technique.	K2
C124.3	Analyze the physical properties of materials through Quantum mechanics along with band theory.	K4
C124.4	Apply the concepts of Semiconducting and magnetic materials to Engineering fields.	K3
C124.5	Discuss the importance of Superconducting and Nano materials in various fileds.	K2

C125	Engineering Drawing	K.Level
C125.1	Apply the geometrical constructions and classify the engineering /mathematical curves used in engineering applications	K3
C125.2	Explain various kinds of scales and their practical usage and basics of orthographic projections.	K3
C125.3	Analyze the geometrical objects in two dimensional objects.	K4
C125.4	Analyze the visualization of geometrical solids in three dimensional through exercise in orthographic projections.	K4
C125.5	Analyze the detailed views of the isometric and orthographic views of different objects.	K4
C126	Network Analysis Lab	K.Level
C126.1	Analyze the various network theorems	K4
C126.2	Evaluate the frequency response of series and parallel resonance circuits	K5
C126.3	Analyze the Transient response of series DC Circuits	K4
C126.4	Design the frequency response of various filters	K5
C127	Engineering Physics Lab	K.Level
C127.1	Analyze the importance of Interference & Diffraction of light	K4
C127.2	Apply Lasers & Fiber optics to measure various parameters	K3
C127.3	Calculate the Energy gap of Semiconductor laser diode	K3
C127.4	Apply the applications of magnetic materials in day to day science	K3
C128	Engineering and IT Workshop	K.Level
C128.1	Design the sheet metal objects by surface development and join the metals for obtaining desired shape.	K5
C128.2	Identify the internal parts of computer and its peripheral	K2
C128.3	Demonstrate Assemble and disassemble a Personal Computer and prepare the computer ready to use.	K2
C128.4	Develop skills in installation of Linux and Windows XP OS and to connect network for information sharing.	K3
C128.5	Illustrate how to Access the Internet and Browse it to obtain the required information.	K2

II B.TECH I SEM

C211	Mathematics – III	K.Level
C211.1	Solve engineering problems by applying the concept of matrices	K3
C211.2	Interpret and solve non- linear equations with a single variable.	K2
C211.3	Apply numerical methods for various mathematical operations such as Interpolation , Differentiation , Integration.	K3
C211.4	Apply curve-fitting techniques for data representations and computation in engineering analysis.	K3
C211.5	Compare numerical solutions of ordinary differential equations with the method of successive approximations.	K4
C212	Electronic Devices and Circuits	K.Level
C212.1	Construct electronic circuits using various diodes.	K3
C212.2	Develop LMPS(Linear Mode Power Supply) units using rectifiers, filters & regulators.	K3
C212.3	Demonstrate the construction, working and characteristics of BJT, JFET and MOSFET in various modes	K4
C212.4	Analyze DC bias circuits for BJT and FET Amplifiers.	K4
C212.5	Analyse transistor amplifier circuits using BJT & FET	K4
C213	Switching Theory & Logic Design	K.Level
C213.1	Utilize Boolean algebra, Number systems and logic gates in the development of logic circuits.	K3
C213.2	Apply K-Map & Tabular Methods to minimize logic functions.	K3
C213.3	Design different combinational Logic circuits.	K5
C213.4	Design different Sequential Logic circuits and their Applications.	K5
C213.5	Design different combinational logic circuits using PLDs.	K5
C214	Signals and Systems	K.Level
C214.1	Apply Fourier series to analyze periodic signals and their spectra.	K3
C214.2	Analyze continuous time signals using Fourier transform	K4
C214.3	Examine signal transmission through linear systems	K4
C214.4	Analyze discrete time signals using discrete time Fourier transform	K4
C214.5	Apply Laplace and z transform to analyze continuous & discrete time systems	K3

C215	Probability Theory & Stochastic Processes	K.Level
C215.1	Analyze various probability density functions of random variables.	K4
C215.2	Apply the concepts of Multiple random variables in communication systems.	K3
C215.3	Solve the engineering problems involving random processes.	K3
C215.4	Analyze the spectral characteristics of random process	K4
C215.5	Analyze the response of Linear system with random inputs and also compare different spectral band random process	K4
C216	Electrical Technology	K.Level
C216.1	Explain the operation and construction of DC generators using EMF equation	K3
C216.2	Explain the operation and construction of DC motor using torque equation.	K3
C216.3	Analyze the Operating Principle and design aspects of Single phase transformers.	K4
C216.4	Analyze the Operating Principle and design aspects of Three phase induction motors.	K4
C216.5	Interpret the principle, constructional features of different synchronous machines.	K2
C217	Electronic Devices & Circuits Lab	K.Level
C217.1	Compute the parameters of Diodes and transistors from the characteristics	K3
C217.2	Demonstrate the rectifier and voltage regulator circuits using diodes.	K3
C217.3	Construct various amplifiers using BJTs and FETs .	K3
C217.4	Analyze the characteristics of SCR and UJT.	K4
C218	Electrical Technology and Basic Simulation Laboratory	K.Level
C218.1	Explain the magnetization characteristics of DC generator & motor and find critical field resistance & efficiency	K3
C218.2	Demonstrate the OC & SC test of single phase transformer & find the efficiency	K3
C218.3	Apply the various operations on Continuous and Discrete time signals	K3
C218.4	Analyze the LTI systems using transforms	K4

II B.TECH II SEM

C221	Mathematics-IV	K.Level
C221.1	Apply the Frobenius method to obtain a series solution for the given linear second order Ordinary Differential equations.	K3
C221.2	Solve the engineering problems using Bessel functions and Legendre's polynomials.	K3
C221.3	Analyze the complex functions with reference to their analyticity.	K4
C221.4	Apply Taylor's & Laurent's series to solve complex functions.	K3
C221.5	Solve improper integrals by using residue method	K3
C222	Electronic Circuit Analysis	K.Level
C222.1	Analyze the various feedback Amplifiers & Oscillators.	K4
C222.2	Analyze the Small signal high frequency transistor Amplifier model for CE Configuration.	K4
C222.3	Apply the concepts of h-parameter to analyze the Multi stage amplifiers and differential amplifiers	K3
C222.4	Examine the design aspects of different power amplifiers	K3
C222.5	Examine the design aspects of different tuned amplifiers	K3
C223	Analog Communication Systems	K.Level
C223.1	Analyze the Amplitude modulation & demodulation systems in time & frequency domains	K4
C223.2	Analyze the Angle modulation & demodulation systems in time & frequency domains	K4
C223.3	Analyze the performance of analog communication system in the presence of noise.	K4
C223.4	Analyze different discrete modulation & demodulation techniques	K4
C223.5	Solve basic communication problems & calculate information rate and channel capacity of discrete communication channel.	K3
C224	Electromagnetic Theory & Transmission Lines	K.Level
C224.1	Analyze and solve the problems of electric and magnetic fields that vary with time and space	K4
C224.2	Apply Maxwell's equations in solving electromagnetic field equations.	K3
C224.3	Analyze electromagnetic wave propagation in different media.	K4
C224.4	Explain the concept of transmission lines and their applications.	K3
C224.5	Analyze and design various impedance matching techniques	K4

C225	Data Structures	K.Level
C225.1	Apply the concept of arrays with asymptotic notations in building linear and non linear data structures.	K3
C225.2	Analyze stacks, queues and linked list using dynamic memory allocation.	K4
C225.3	Develop algorithms for trees and graphs	K3
C225.4	Compare and implement different sorting techniques	K4
C225.5	Build different searching techniques and hashing methods.	K3
C226	Control Systems Engineering	K.Level
C226.1	Apply mathematical models , signalflow graph & Block diagram representation to determine transfer function of control systems .	K3
C226.2	Analyse the time domain responses of first and second-order systems.	K4
C226.3	Analyse control systems by applying Routh-Hurwitz and root-locus techniques.	K4
C226.4	Apply Bode plot, Polar & Nyquist plot concepts to analyze the control systems in frequency domain	K3
C226.5	Apply state space model for a given physical system and solve the state equations	K3
C227	Electronic Circuit Analysis Laboratory	K.Level
C227.1	Analyze the single and multistage amplifiers at low, mid and high frequencies using simulation software and Hardware.	K4
C227.2	Analyze the transistor oscillators using simulation software and Hardware.	K4
C227.3	Determine the efficiencies of power amplifiers using simulation software.	K3
C227.4	Analyze Frequency response of tuned amplifiers using hardware and multisim soft ware.	K4
C228	Analog Communication Systems Laboratory	K.Level
C228.1	Analyze behaviour of analog modulations systems in the time domain	K4
C228.2	Analyze behaviour of pulse modulations systems in the time domain	K4
C228.3	Illustrate the characteristics of radio receiver and antenna measurements	K3
C229	Comprehensive Online Exam I	K.Level
C229.1	Acquire fundamental engineering knowledge	K2
C229.2	Demonstrate the ability to navigate skills and online learning	K2
C229.3	Apply the concept of problem solving ability in competitive exams	K3

III BTECH I SEM

C311	Computer Organization	K.Level
C311.1	Analyze different functional units, bus structure and addressing modes in computer.	K4
C311.2	Explain the functional units of the processor such as register file and ALU	K3
C311.3	Differentiate the use of main memory, cache memory and virtual memory in the computer system.	K4
C311.4	Explain the input/output interfaces & memory organization	K3
C311.5	Apply the concepts of the pipelining and basic characteristics of multiprocessors.	K3
C312	Antennas and Wave Propagation	K.Level
C312.1	Explain the basics of antenna parameters & radiation pattern	K3
C312.2	Design VHF,UHF and Microwave antennas	K5
C312.3	Analyze the construction of micro strip, flat sheets, corner and parabolic reflector antennas.	K4
C312.4	Design the antenna arrays & Make use of antenna measurements to assess antenna's performance	K5
C312.5	Explain different modes of wave propagation in free space & mechanism of the atmospheric effects on radio wave propagation.	K3
C313	Digital Communication Systems	K.Level
C313.1	Apply the fundamentals concepts of sampling theorem along with different coding and modulation techniques in communication systems.	K3
C313.2	Differentiate the basic principles of baseband and passband digital modulation schemes.	K4
C313.3	Employ the Geometric Representation of Signals in Signal Space.	K3
C313.4	Analyze the different modulation & demodulation for band pass data transmission and their probability of error	K4
C313.5	apply different channel encoding techniques for error detection and correction.	K3
C314	Linear Integrated Circuits and Applications	K.Level
C314.1	Explain the construction and characteritics of the operational-amplifiers	K3
C314.2	Analyze the feedback and its effect on the performance of op-amp.	K4
C314.3	Develop knowledge on some linear applications of Op-amp and on the design of active filters using Op-amps	K3
C314.4	Design various waveform generators using Op-amp, 555 Timer and PLL	K5
C314.5	Analyze data converter (ADC and DAC) Circuits using Op amps.	K4

C315	Digital System Design	K.Level
C315.1	Construct the logic circuits using different types of logic families	K3
C315.2	Develop VHDL programs for digital circuits.	K3
C315.3	Design and implement various combinational circuits using basic IC structures and VHDL.	K5
C315.4	Design and implement various sequential circuits using basic IC structures and VHDL.	K5
C315.5	Develop VHDL programs for various complex combinational and Sequential circuits using VHDL	K3
C316	Linux Programming & Scripting	K.Level
C316.1	Apply LINUX utilities to manage simple file processing operations & organize directory structures with appropriate security.	K3
C316.2	Explain LINUX networking commands for establishing computer network communication.	K2
C316.3	Develop robust scripts in Perl Scripting Language.	K3
C316.4	Develop and run scripts using TCL	K3
C316.5	Develop and run scripts using Python.	K3
C317	IC Applications Laboratory	K.Level
C317.1	Design negative feedback amplifiers and analyze their characteristics using Op-amp.	K5
C317.2	Design multivibrator, integrator, differentiator using Op-amp	K5
C317.3	Design active filters and function generators and using Op-amp	K5
C317.4	Design VCO, AGC, PLL, AVC and regulators using linear ICs	K5
C318	Digital Communication Systems Laboratory	K.Level
C318.1	Analyze Time division multiplexing and demultiplexing techniques.	K4
C318.2	Analyze the PCM, DPCM, DM, ADCM using hardware & software	K4
C318.3	Analyze the different shift keying techniques using hardware & software	K4
C318.4	Analyze the QAM using signal space analysis	K4
C319.1	Audit course – Social Values & Ethics	K.Level
C319.1	Develop the capability of shaping themselves in the society & develop the roles and responsibility of NSS activity	K3
C319.2	Explain the features of constitution of India	K2
C319.3	Contribute to the development of the society around them and organization they work	K3
C319.4	Develop themselves into professionals & follow professional ethics	K3

III BTECH II SEM

C321	Managerial Economics & Financial Analysis	K.Level
C321.1	Analyze the consumer behaviour with regard to their product or services and measure demand of a particular product or services by applying various methods in given situation.	K4
C321.2	Compare concept of production & cost analysis	K4
C321.3	Determine the price of a product or services in given market condition.	K4
C321.4	Interpret the financial accounting and the financial ratios	K2
C321.5	Summarize Capital and its types and budget techniques.	K2
C322	Microprocessors & Microcontrollers	K.Level
C322.1	Explain the concepts of Intel x86 series of processors.	K2
C322.2	Apply the concept of addressing modes, instruction set and assembler directives for programming the 8086 microprocessor	K3
C322.3	Explain the concepts of MSP 430 low power microcontroller.	K3
C322.4	Analyze the concepts of interrupts, low power modes and RTC of MSP 430	K4
C322.5	Apply the different interfacing protocols to implement real time applications using MSP430	K3
C323	Electronic Measurements and Instrumentation	K.Level
C323.1	Explain the performance characteristics of AC & Dc meters used in instrumentation.	K3
C323.2	Explain the construction, principle and working of CRO and time period & voltage measurements.	K3
C323.3	Explain function generators, wave analyzers, logic analyzers and spectrum analyzers.	K3
C323.4	Analyze different DC & AC bridges for their application in measurement and also explain Q meter, EMI and EMC.	K4
C323.5	Explain the principles involved in sensors & transducers.	K3
C324	Digital Signal Processing	K.Level
C324.1	Analyze discrete time signals and systems in time domain and frequency domain	K4
C324.2	Calculate Fourier transform for discrete time signals by using various transformation techniques	K4
C324.3	Develop structures for realization of discrete time FIR and IIR systems	K3
C324.4	Design of linear phase FIR and IIR filters by various techniques	K5
C324.5	Explain basic concepts of interpolation and decimation	K3

C325	VLSI Design	K.Level
C325.1	Explain about IC fabrication and relation between different parameters of MOSFET showing its characteristics	K3
C325.2	Apply lamda based rules to develop layouts, stick diagrams of logic circuits and estimate sheet resistance , area capacitance and delays	K3
C325.3	Design digital system at gate level and physical level.	K5
C325.4	Design different sub systems using various VLSI design styles.	K5
C325.5	Explain about EDA tools & testing of logic circuits	K3
C326	Industrial Electronics	K.Level
C326.1	Construct electronic circuits using various diodes.	K3
C326.2	Construct and classify of different configurations of a transistor.	K3
C326.3	Explain the importance of filters in converters with necessary parameters along with regulators.	K3
C326.4	Illustrate various methods used in heating and welding process.	K3
C326.5	Illustrate the concept of ultrasonics	K3
C327	Microprocessors & Microcontrollers LAB	K.Level
C327.1	Write 8086 assembly language programs	K3
C327.2	Make use of programmable peripheral devices and their interfacing in assembly programming	K3
C327.3	Make use of MSP 430 and their Interfacing devices in CC Studio and simulate programs using embedded C for MSP 430	K3
C328	Digital Signal Processing Laboratory	K.Level
C328.1	Analyze discrete time signals & systems using MATLAB	K4
C328.2	Design & implement IIR & FIR filters for different specifications using MATLAB	K5
C328.3	Analyze discrete time signals & systems using floating point DSP processor kit with code composer studio(CCS)	K4
C328.4	Design & implement IIR & FIR filters using DSP processor kit with code composer studio(CCS)	K5
C329	Advanced English Language Communication Skills (AELCS) Laboratory (Audit Course)	K.Level
C329.1	Develop communication skills through comprehensive and vocabulary	K3
C329.2	Apply writing skills in preparing resume, email and technical reports	K3
C329.3	Bulid presentation skills through poster and oral	K3
C329.4	Analyze the students for job skills and professional development activities	K4
C329.5	Develop management skills and analyze problem solving techniques	K3


C3210	Comprehensive Online Exam II	K.Level
C229.1	Acquire fundamental engineering knowledge	K2
C229.2	Demonstrate the ability to navigate skills and online learning	K2
C229.3	Apply the concept of problem solving ability in competitive exams	K3
IV BTECH I SEM		
C411	Optical Fiber Communication	K.Level
C411.1	Explain the elements of optical fiber link and modes of optical fibers	K3
C411.2	Calculate the different types of losses and types of dispersions in the fibres	K3
C411.3	Discuss the principle of operation of various optical sources and their power launching into optical fibers	K3
C411.4	Calculate the SNR & BER of optical fiber Receiver	K4
C411.5	Construct analog and digital optical links	K4
C412	Embedded Systems	K.Level
C412.1	Explain fundamental concepts of embedded systems architecture and design process	K2
C412.2	Explain the architecture of ARM CORTEX -TM4C microcontrollers and addressing modes	K4
C412.3	Explain concept for interfacing of processor ,memory and I/O Devices and design metrics,tools.	K4
C412.4	Illustrate various modules(peripherals) of TM4C microcontroller	K3
C412.5	Design an IOT application using CC3100 network processor and serial communication protocols (SPI, UART , I2C)	K6
C413	Microwave Engineering	K.Level
C413.1	Analyze the waveguides using wave equations.	K4
C413.2	Illustrate the characteristics of microwave circuits through S- Parameters.	K3
C413.3	Analyse various microwave oscillators & amplifiers.	K4
C413.4	Analyze about M-type tubes & microwave solid state devices	K4
C413.5	Explain various methods of microwave measurements.	K3

C414	Data Communications and Networking	K.Level
C414.1	Explain about network hardware, software and reference models	K3
C414.2	Explain various transmission medium , switchings used in data communication networks	K3
C414.3	Analyze various Multiple Access Techniques & Wired LANs	K4
C414.4	Apply routing algorithms in network layer.	K3
C414.5	Analyze the various types of cryptography & network security techniques	K4
C415	Radar Systems (Elc)	K.Level
C415.1	Analyze the RADAR range equation	K4
C415.2	Summarize the principle of CW,FM-CW RADAR and describe its use in FM-CW altimeter.	K2
C415.3	Show the importance of delay line canceller in MTI and Pulse Doppler RADAR & its performance parameters.	K2
C415.4	Discriminate different tracking RADARS	K4
C415.5	Determine the importance of Matched Filter in RADAR receivers & analyse different beam formers & RADAR displays.	K4
C416	Digital Image Processing	K.Level
C416.1	Explain imaging techniques and basic concepts of digital image processing	K4
C416.2	Analyze the different image transformation techniques	K4
C416.3	Explain image enhancement for gray scale and color images in spatial and frequency domain	K4
C416.4	Apply various restoration and segmentation methods on images	K3
C416.5	Analyze the different compression methods and implement for better compression performance.	K4
C417	Microwave and Optical Communication Laboratory	K.Level
C417.1	Analyze the various parameters and characteristics of the various waveguide components.	K4
C417.2	Analyze working of the various tubes or sources for the transmission of the microwave.	K4
C417.3	Measure signal parameters at microwave frequencies	K5
C417.4	Analyze an optical fiber analog and digital communication link.	K4
C417.5	Illustrate the characteristics of LED, LASER.	K3

C418	VLSI & Embedded Systems Laboratory	K.Level
C418.1	Design and simulate combinational and sequential logic circuits using VHDL.	K5
C418.2	Design and Implement combinational and sequential logic circuits in FPGA kit	K5
C418.3	Analysis of simulation results and schematic diagram of combinational and sequential logic circuits	K4
C418.4	Develop programs for configuration of GPIO ports using TM4C 123GH6PM microcontroller	K5
C418.5	Design and develop programs for interface modules with TM4C 123GH6PM microcontroller	K5
IV B.TECH II SEM		
C421	Low Power VLSI Circuits & Systems	K.Level
C421.1	Explain low power design methodologie,structure and electrical characteristics	K2
C421.2	Analyze the MOS inverter configurations and MOS combinational circuits	K4
C421.3	Explain sources of power dissipation and voltage scaling approaches for lowpower design	K3
C421.4	Explain the minimizing of switched capacitance using various approaches	K3
C421.5	Analyze various approaches to minimize the leakage power	K4
C422	RF Integrated Circuits	K.Level
C422.1	Explain the individual blocks of basic architecture of RF IC, matching networks,passive RLC networks, interconnects, and passive IC components.	K3
C422.2	Analyze the High frequency Amplifiers and Bandwidth Estimation Techniques,Shunt-series amplifiers, tuned amplifiers, and Cascaded amplifiers sing MOS devices.	K4
C422.3	Explain the Noise present in the Active and Passive Elements, LNA and Mixers.	K3
C422.4	Analyze RF power amplifiers, Negative Resistance Oscillators and PLL.	K4
C422.5	Explain various frequency synthesizers and radio architectures.	K4
C423	Technical Seminar	K.Level
C423.1	Develop interest towards research oriented field with ability to search the literature and brief report preparation.	K6
C423.2	Develop the skills, competencies and points of view needed by professionals in the field most closely related to the course	K6
C423.3	Develop the discussion and critical thinking about topics of current intellectual importance.	K6
C423.4	Develop the interpersonal & communication skills and awareness.	K3
C423.5	Develop presentation skills.	K3

C424	Comprehensive Viva Voce	K.Level
C424.1	Recall the fundamentals of mathematics, science and Engineering	K1
C424.2	Relate comprehensive understanding of techniques applicable to their own area of professional practice	K2
C424.3	Develop their Communication skills and Build confidence to face the interviews	K6
C425	Project	K.Level
C425.1	Identify problems, formulate literature survey and analyze engineering problems.	K4
C425.2	Apply the theoretical concepts to solve industrial problems with teamwork and multidisciplinary approach	K3
C425.3	Design system component that acquire the needs for public health and environment consideration.	K6
C426.4	Form a team for carrying the project and perform documentation effectively.	K4

M-S 
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DEPARTMENT OF MECHANICAL ENGINEERING

II YEAR- I SEMESTER

19A54301 COMPLEX VARIABLES, TRANSFORMS & PARTIAL DIFFERENTIAL EQUATIONS

CO1	Understand the analyticity of complex functions and conformal mappings.	K2
CO2	Apply Cauchy's integral formula and Cauchy's integral theorem to evaluate improper integrals along contours.	K3
CO3	Understand the usage of Laplace Transforms.	K2
CO4	Evaluate the Fourier series expansion of periodic functions.	K2
CO5	Formulate/solve/classify the solutions of Partial differential equations and also find the solution of one dimensional wave equation and heat equation.	K6

19A05304T PYTHON PROGRAMMING

CO1	Apply the features of Python language in various real applications.	K3
CO2	Select appropriate data structure of Python for solving a problem.	K2
CO3	Design object oriented programs using Python for solving real-world problems.	K4
CO4	Apply modularity to programs.	K3

19A03301T MANUFACTURING PROCESSES

CO1	Demonstrate different metal casting processes and gating systems.	K2
CO2	Classify working of various welding processes.	K2
CO3	Evaluate the forces and power requirements in rolling process.	K5
CO4	Apply the principles of various forging operations.	K3
CO5	Outline the manufacturing methods of plastics, ceramics and powder metallurgy.	K1
CO6	Identify different unconventional processes and their applications.	K3



DEPARTMENT OF MECHANICAL ENGINEERING

19A03302 ENGINEERING MECHANICS

CO1	Resolve forces and couples in mechanical systems.	K3
CO2	Identify the frictional forces and its influence on equilibrium.	K3
CO3	Find the centre of gravity and moment of inertia for various geometric shapes	K3
CO4	Develop equations for different motions.	K4
CO5	Determine the displacement, velocity and acceleration relations in dynamic systems	K4
CO6	Relate the impulse and momentum	K4

19A03303T MATERIAL SCIENCE AND ENGINEERING

CO1	Explain the principles of binary phases.	K2
CO2	Select steels and cast irons for a given application.	K3
CO3	Apply heat treatment to different applications.	K3
CO4	Utilize nonferrous metals and alloys in engineering.	K3
CO5	Choose composites for various applications.	K3
CO6	Assess the properties of nano-scale materials and their applications.	K2

19A99303T DESIGN THINKING AND PRODUCT INNOVATION

CO1	summarize the importance of basic sciences in product development	K2
CO2	explain the historical developments in mechanical, electrical, communications and computational engineering	K3
CO3	apply systematic approach to innovative designs	K3
CO4	identify new materials and manufacturing methods in design	K3



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**19A99303P DESIGN THINKING AND PRODUCT INNOVATION
LAB**

CO1	To develop 3D models using 3D printing	K3
CO2	To design the system with measuring devices	K3
CO3	Design hydraulic / pneumatic circuits	K4

19A03301P MANUFACTURING PROCESSES LAB


CO1	Fabricate different types of components using various manufacturing techniques.	K6
CO2	Adapt unconventional manufacturing methods.	K6

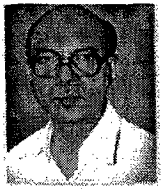
19A03303P MATERIAL SCIENCE & ENGINEERING LAB

CO1	Identify various microstructures of ferrous and non-ferrous metals and alloys.	K3
CO2	Visualize grains and grain boundaries.	K3
CO3	Importance of hardening of steels.	K2
CO4	Evaluate hardness of treated and untreated steels.	K4

19A99301 ENVIRONMENTAL SCIENCE

CO1	Grasp multidisciplinary nature of environmental studies and various renewable and nonrenewable resources.	K3
CO2	Understand flow and bio-geo- chemical cycles and ecological pyramids.	K3
CO3	Understand various causes of pollution and solid waste management and related preventive measures.	K2
CO4	About the rainwater harvesting, watershed management, ozone layer depletion and waste land reclamation.	K4
CO5	Casus of population explosion, value education and welfare programmes.	K4


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II YEAR- II SEMESTER

19A54304 NUMERICAL METHODS AND PROBABILITY THEORY

CO1	Apply numerical methods to solve algebraic and transcendental equations	K3
CO2	Derive interpolating polynomials using interpolation formulae	K3
CO3	Solve differential and integral equations numerically	K3
CO4	Apply Probability theory to find the chances of happening of events.	K3
CO5	Understand various probability distributions and calculate their statistical constants.	K2

19A03401 THERMODYNAMICS

CO1	Explain the importance of thermodynamic properties related to conversion of heat energy into work.	K3
CO2	Apply the laws of thermodynamics to boilers, heat pumps, refrigerators, heat engines, compressors and nozzles.	K3
CO3	Utilize steam properties to design steam based components.	K4
CO4	Compare thermodynamic relations and air standard cycles.	K4

19A03402T MECHANICS OF MATERIALS

CO1	Apply the concepts of stress and strain to machine members.	K3
CO2	Determine, shear forces, and bending moments in beams.	K4
CO3	Find the slope and deflection in beams.	K4
CO4	Estimate the stress in machine members such as shafts and springs.	K4
CO5	Apply Castigliano's theorem to determine displacements in beams.	K3
CO6	Analyse columns for buckling loads.	K4
CO7	Estimate the stresses in thin cylinders due to internal pressure.	K3



DEPARTMENT OF MECHANICAL ENGINEERING

19A01407 FLUID MECHANICS AND HYDRAULIC MACHINERY

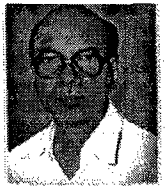
CO1	Understand characteristics of laminar and turbulent flows.	K2
CO2	Understand the energy losses in different types of pipes.	K2
CO3	Identify the performance of different types of turbines	K1
CO4	Identify the performance of centrifugal pumps..	KI

19A05406T INTERNET OF THINGS

CO1	Choose the sensors and actuators for an IoT application	K1
CO2	Select protocols for a specific IoT application	K2
CO3	Utilize the cloud platform and APIs for IoT applications	K3
CO4	Experiment with embedded boards for creating IoT prototypes	K3
CO5	Design a solution for a given IoT application	K6
CO6	Establish a startup	K4

19A03403 KINETICS OF MACHINERY

CO1	An understanding of concepts of different of mechanism with lower pairs and higher pairs.	K2
CO2	Gain the knowledge of different types of straight line motion mechanism and steering gear mechanisms.	K2
CO3	Obtain an in depth knowledge of finding displacement, velocity and acceleration of different points on different mechanisms using different methods(relative velocity, Instantaneous methods).	K3
CO4	Acquire the knowledge on different gear profiles and calculating the different parameters of gears.	K2
CO5	Gain the knowledge in designing of gear trains for the required purpose.	K2
CO6	Design and analyze different cam profile for different types of followers.	K4



DEPARTMENT OF MECHANICAL ENGINEERING

19A03404 COMPUTER AIDED MACHINE DRAWING


CO1	Demonstrate the conventional representations of materials and machine components.	K2
CO2	Model riveted, welded and key joints using CAD system.	K6
CO3	Create solid models and sectional views of machine components.	K6
CO4	Generate solid models of machine parts and assemble them.	K6
CO5	Translate 3D assemblies into 2D drawings.	K6
CO6	Create manufacturing drawing with dimensional and geometric tolerances.	K6

19A03402P MECHANICS OF MATERIALS LABORATORY

CO1	Understand the stress-strain behaviour of different materials.	K2
CO2	Identify the difference between compression and tension testing.	K2
CO3	Evaluate the hardness of different materials.	K5
CO4	Correlate the elastic constants of the materials.	K6
CO5	Explain the relation between elastic constants and hardness of materials.	K4

19A99302 BIOLOGY FOR ENGINEERS

CO1	How biology is applied for production of useful products for mankind.	K1
CO2	What are biosensors, biochips etc.	K2
CO3	Understand transgenic plants and animals and their production	K3


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DEPARTMENT OF MECHANICAL ENGINEERING

II YEAR- I SEMESTER

(15A01308) MECHANICS OF SOLIDS

CO1	Calculate stresses, strains and deformations of basic geometries under axial loading and thermal effects.	K3
CO2	Draw Shear Force and Bending Moment Diagrams for different types of beams and loading conditions	K3
CO3	Compute bending and shear stresses in beams under different loading conditions	K3
CO4	Calculate shear strength of shafts subjected to torsional loading and deflections of beams under different boundary and loading conditions	K3
CO5	Determine stresses and strains induced in the thin and thick cylinders subjected to fluid pressure	K3

15A54301 Mathematics - III

CO1	Solve the system of linear equations using matrix algebra with its specific rules	k3
CO2	Understand the various Numerical Methods for solving engineering Problems	k3
CO3	Understand the various Numerical differentiation & integration for solving engineering Problems	k3
CO4	use of Fourier Series and fourier Transformations	k2
CO5	Applications of partial differential Equations for solving Engineering problems.	k2

(15A52301) Managerial Economics & Financial Analysis

CO1	discuss the objectives ,nature and scope of Managerial Economics	K2
CO2	Analyze the demand of products and services by using different methods	K4
CO3	Explain the Cost concepts and Break Even Point.	K2
CO4	Classify. Different types of business organizations	K2
CO5	Apply the accounting principles for prepare Journal, Ledger, Trial Balance, Manufacturing A/c, Trading A/c., Profit & Loss A/c. and Balance Sheet of an enterprise Analyze, interpret	K3



DEPARTMENT OF MECHANICAL ENGINEERING

(15A03301) Engineering Drawing for Mechanical Engineers

CO1	Acquire basic skills in technical graphic communication and also get thorough knowledge of various geometrical elements used in Engineering practice. able to use the instruments required for Drawing. Be able to dimension, print letters which can be understood globally	K1
CO2	Gather good knowledge in various kinds of scales and their practical usage. understand positions of points and their projections	K1
CO3	understands position of lines, planes and their projections	K2
CO4	understands the position of solids and its projections and also able to develop surface for different solids to make	K2
CO5	able to view the different views of a solid and also able to draw isometric view for orthographic projections	K3

15A03303 Thermodynamics

CO1	Student will be able to understand first law of thermodynamics and interactions of heat and work.	K1
CO2	Student will be able to analyze working principles of various engineering devices.	K2
CO3	Student will be able to analyze the principle of steam power cycles & their efficiencies.	K4
CO4	Student will be able to execute the interrelationship between thermodynamic functions.	K3
CO5	Students will be able to implement the knowledge of Psychrometric in air conditioning units.	K3

15A03302 Engineering mechanics

CO1	Determine the equilibrium of a particle in space using principle of laws of mechanics	K4
CO2	Compute the equilibrium of rigid bodies in two dimensions and in three dimensions.	K3
CO3	Calculate the principal moment of inertia of plane areas.	K4
CO4	Solve the problems using equation of motions and analyze impact of elastic bodies on collision	K3
CO5	Solve the problems of simple system with sliding friction and calculate linear and angular acceleration of moving body in general plane motion	K3



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DEPARTMENT OF MECHANICAL ENGINEERING

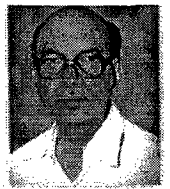
15A03304 Computer Aided drafting Laboratory

CO1	Develop Auto LISP programs for drawing machine elements.	K6
CO2	Develop codes for analytical and synthetic curves.	K3
CO3	Draw machine elements in sketcher, part and assembly modes	K4
CO4	Generate automated tool paths and G-codes for machining components.	K6
CO5	Validate DXF, IGES and STEP formats for exchange of CAD files.	K6

(15A99303) Mechanics of Solids Lab

CO1	Analyze the microstructure of various metals and alloys	K4
CO2	Analyze the micro structures & properties of different heat treated metals	K4
CO3	Analyze the behavior of the solid bodies subjected to various types of loading.	K4
CO4	Apply the concept of impact loading and to determine impact values for various materials.	K3
CO5	Compare the hardness values for various materials & their importance.	K5


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DEPARTMENT OF MECHANICAL ENGINEERING

II YEAR- II SEMESTER

MANUFACTURING TECHNOLOGY(15A03404)

CO1	Understand the elements of casting, moulding machines and solidification of castings of various metals	K2
CO2	Classify different types of special casting methods, design of risers and feeding systems, crucible melting, cupola operation and steel making process	K2
CO3	Classify different types of welding processes, welds and weld joints	K2
CO4	Understand about advanced welding process, heataffected zone(HAZ), Defects and Identification Methods	K2
CO5	Choose proper surface treatment processes for the given application	K3

15A03403 THERMAL ENGINEERING-I

CO1	Understanding the working of both S.I and C.I engines.	K2
CO2	Recognize the various auxiliary systems in functioning of an I.C engine.	K2
CO3	Interpret the properties of fuel on combustion phenomenon in I.C engines.	K3
CO4	Calculate the performance parameters of an I.C engine.	K3
CO5	Compute the performance of reciprocating and rotary air compressors.	K3

15A54401 PROBABILITY & STATISTICS

CO1	Analyze and Apply the concept of probability distribution and sampling theory to engineering problems	K4
CO2	Understand the Testing of hypothesis,	K2
CO3	Analyze and Apply ANOVA for engineering problems	K4
CO4	Apply Statistical Quality Control techniques	K3
CO5	Apply Queuing theory for real world weighting models and makes estimations	K3



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DEPARTMENT OF MECHANICAL ENGINEERING

(15A03402) KINEMATICS OF MACHINES

CO1	Identify different mechanisms and inversions of different kinematic chains.	K1
CO2	Calculate the velocity and power transmitted by belt, rope and chain drives.	K3
CO3	Draw velocity and acceleration diagrams for various mechanisms.	K3
CO4	Analyse the terminology of gears.	K4
CO5	Draw displacement diagrams and cam profile for different types of motion of follower.	K3

(15A03401) Machine Drawing

CO1	understand the concepts of I.S. conventions, methods of dimensioning, the title boxes	K2
CO2	understand the functionality of different machine elements	K2
CO3	understand the working principles of an assembly or subassembly to produce the final product	K2

15A99301 Basic Electrical and Electronics Engineering

CO1	Apply basic principles and circuit laws to solve network theorems and two port networks	K3
CO2	Describe the principles and operations of various DC and AC machines	K2
CO3	Analyze the operating principles of major electronic devices, its characteristics and applications	K4
CO4	Differentiate BJT and FETs	K4
CO5	Classify various sinusoidal oscillators based on application	K2
CO6	Develop OP-AMP based circuits to perform addition, difference, differentiation and integration operations	k5



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DEPARTMENT OF MECHANICAL ENGINEERING

(15A03405) Thermal engineering lab

CO1	Conduct the appropriate test on the reciprocating air compressor for various loads and determine the efficiencies.	K4
CO2	Conduct appropriate tests on Petrol and Diesel Engines and determine the input power, indicated power and brake power.	K4
CO3	Compare the performance of Engines with regard to SFC, BMEP and various efficiencies	K5
CO4	Prepare the heat balance chart of a multi cylinder petrol engine	K6
CO5	Illustrate the effect of varying the speed on the performance characteristics of engines	K3

(15A03406) Manufacturing Technology Lab

CO1	understand basic methods of manufacturing like casting, welding, mechanical press working	K2
CO2	Differentiate the different patterns used in casting	K4
CO3	Distinguish the quality of the weld obtained from different welding techniques	K4
CO4	Understand the simple, compound and progressive tools used in sheet metal work	K2
CO5	Apply the basic methods of processing the plastics to prepare the given models.	K3


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DEPARTMENT OF MECHANICAL ENGINEERING

III YEAR- I SEMESTER

15A03502 DYNAMICS OF MACHINERY

CO1	Apply the laws of friction to calculate the forces in pivots, collars brakes, clutches and dynamometers.	K3
CO2	Apply gyroscopic principles on Aero plane, ship, four wheel and two wheel vehicles.	K3
CO3	Design a flywheel for IC engine.	K5
CO4	Determining the speeds & forces acting on various governors.	K3
CO5	Estimating the Balancing mass of rotating, reciprocating masses in machines.	K2
CO6	Analysis free and forced vibrations, evaluate the critical speed of the shaft and vibration calculations of rotor systems.	K4

(15A03504) DESIGN OF MACHINE MEMBERS 1

CO1	Apply design procedures using theory of failures for different elements	k3
CO2	Analysing simple components under cyclic loading using Goodman's and Soderberg's criterions	k4
CO3	Designing Riveted and Bolted joints with different configuration	k6
CO4	Design cotter joint , knuckle joint and shafts for different loading conditions	k6
CO5	Design various Rigid and Flexible shaft couplings	k6

(15A01510) Fluid Mechanics and Hydraulic Machinery

CO1	Understand the fluid properties and the manometry	K2
CO2	Solve fluid flow problems in closed pipes using Bernoulli's equation	K3
CO3	Analyze the forces exerted by a jet of fluid on vanes of different shapes and study working principle of different hydraulic turbines	K4
CO4	Analyze the performance characteristic curves of hydraulic turbines and Pumps	K4
CO5	Understand the need of hydropower plants and identify the catchment area of hydro power stations.	K3



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DEPARTMENT OF MECHANICAL ENGINEERING

(15A03501) THERMAL ENGINEERING-II

CO1	Apply the Rankine cycle, Reheat and Regeneration cycles for steam power plants.	K3
CO2	able to understand the working of boilers, mountings and accessories	K2
CO3	Analyze the performance of steam nozzles & Steam condensers	K4
CO4	Estimating the efficiencies & performances of the steam turbines	K4
CO5	Apply the Brayton cycle to estimate the efficiency of a gas turbine & jet propulsion system	K3

(15A03503) MACHINE TOOLS

CO1	Analyze the nature of various forces involved in the machining operations.	K4
CO2	Illustrate the working of a lathe machine & its accessories	K2
CO3	Differentiate shaper, slotter & planer in respect of their working principle.	K4
CO4	understand the principle of milling, grinding, Lapping, Honing and Broaching operation	K2
CO5	Design assembly of jigs and fixtures on a simple work-piece using the principle minimum locating points principle.	K6

(15A03505) entrepreneurship

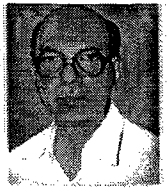
CO1	understand the need of entrepreneurship in the field of engineering	K2
CO2	understand about the business plan nature and implementation	K2
CO3	understand the source of capital and e-commerce	K2
CO4	understand the strategies of new venture expansion	K2
CO5	understand about quality control and marketing	K2



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DEPARTMENT OF MECHANICAL ENGINEERING

**(15A01511) FLUID MECHANICS AND HYDRAULIC MACHINERY
LAB**

CO1	Analyze a variety of practical fluid-flow devices like venturimeter & orificemeter.	K4
CO2	Analyze the performance of different types of turbines like impulse and reaction.	K4
CO3	Analyze the performance of different types of pumps like rotodynamic and positive displacement pumps.	K4
CO4	Evaluate the efficiency of different types of vanes (Flat & Semi circular)	K5
CO5	Analyze the different types of losses in fluid flow problems	K4

(15A03508) Machine Tools lab

CO1	Understand basic machining variables, such as RPM, feedrates, and infeeds	K2
CO2	Apply the fundamental knowledge and principles in material removal processes	K3
CO3	Identify cutting tool geometry of single point and multipoint cutting tool	K1
CO4	Create models as per the product design	K6
CO5	Develop practical knowledge in machine tools like lathe, drilling machine, shaper, slotter, milling & Grinding machines	K3


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DEPARTMENT OF MECHANICAL ENGINEERING

III YEAR- II SEMESTER

(15A03602) DESIGN OF MACHINE MEMBERS -II

CO1	Able to design crane hooks, C-clamps and various belt, rope chain drives and also power transmission elements by using design data book	K5
CO2	Able to design helical springs for two wheel vehicle and laminated springs for trucks and also design power screws by using design data book	K5
CO3	Able to design bearings by using design data book	K5
CO4	Able to design spur gear and helical gear by using design data book	K5
CO5	Examine various forces acting on I C engine parts and failure criteria to be adopted for various parts	K4

(15A03605) METAL FORMING PROCESSES

CO1	Solve various problem of theory of plasticity.	K3
CO2	Understand the principles of rolling and forging processes and their applications and defects	K2
CO3	Distinguish extrusion and wire drawing with their industrial applications.	K4
CO4	Analyse the nature of various forces to which a sheet metal may subjected to while it is forming.	K4
CO5	Understand the concept of plastic manufacturing process, rapid manufacturing process and its applications.	K2

(15A03603) HEAT TRANSFER

CO1	Analyze various methods of heat transfer for the bodies undergoing heat exchange using fundamental concepts of Conduction, Convection and Radiation.	K4
CO2	Estimate heat loss from the system to the surroundings for the concept of extended surfaces at an interval of time during its working e.g. IC Engines, Turbines etc.	K2
CO3	Apply correlations to compute heat loss due to convection for practical applications	K3
CO4	Analyze condensation, boiling and heat exchangers	K4
CO5	Estimate radiation heat transfer between bodies	K2



DEPARTMENT OF MECHANICAL ENGINEERING

15A03601 -OPERATIONS RESEARCH

CO1	Create mathematical modeling of real life situations and capable of obtaining best solution using graphical and simplex methods. Solving the LPPs using the concept of duality.	K5
CO2	Solving transportation and assignment models.	K3
CO3	Apply the concept of game theory for solving business problems.	K3
CO4	Apply queuing theory for real world waiting lines and make estimations like Average Waiting Times, Average Queue Length, Probability of Waiting in the queue etc.	K3
CO5	Determine the sequencing of Jobs in machine shop	K3

(15A03604) FINITE ELEMENT METHODS

CO1	Apply the basic principles and approaches for solving FEM problems in different fields	K3
CO2	evaluate the elementary stiffness matrices and engineering design quantities for simple structures using FEM.	K5
CO3	evaluate the interpolation functions for higher order isoparametric elements	K5
CO4	apply the concept of FEM to solve the axi-symmetric solid members.	K3
CO5	formulate the elementary stiffness matrices for heat transfer and fluid flow problems.	K6

15A03606 NON CONVENTIONAL SOURCE OF ENERGY

CO1	understand the need of alternative energy resources	K2
CO2	understand about the basics of solar energy collectors and generation of electricity from solar energy collector	K2
CO3	:understand the assessment of wind energy potential ,wind mills	K2
CO4	understand about geothermal, types and production of bio gas	K2
CO5	know about ocean energy and principles ,extraction of energy from waves.	K1



DEPARTMENT OF MECHANICAL ENGINEERING

15A03610 Computer Aided Engineering Laboratory

CO1	Utilize the analysis software for stress analysis of Mechanical components.	K3
CO2	Estimate the natural frequency of 2D component	K4
CO3	Predict the dynamic characteristics of 2D components and piping system	K5
CO4	Analyze the mode of heat transfer in piping system	K4
CO5	Make use of CAD software to simulate mechanical systems	K3
CO6	Solve simple problems in CFD	K3

(15A03609) Heat transfer lab

CO1	Apply the basic principles of heat transfer to estimate the thermal conductivity of metals/non metals	K3
CO2	Analyse the performance of heat exchanger	K4
CO3	Evaluate fin effectiveness/efficiency	K5
CO4	Evaluate the stefen boltzmen constant upon using the fundamentals of radiation	K5
CO5	Apply the basic principles of heat transfer to analyse the heat transfer with phase change(Boiling & Condensation)	K4

(15A52602) Advanced English Language Communication Skills Lab

CO1	Interpret difference contextual for factual information and useage	K3
CO2	Report the subject matter in coherence and style as well as projecting one's self-marketing	K2
CO3	Select diffirent data and present through Tele and Vedieo conferences	K5
CO4	Demonstrate the innate capabilities along with the external consciousness of display and interest	K3
CO5	Compare different concepts and express views among individuals and understanding stratgies for interviews	K4



DEPARTMENT OF MECHANICAL ENGINEERING

IV YEAR- I SEMESTER

(15A03701) AUTOMOBILE ENGINEERING

CO1	understand the function of each and every component of an automobile	k2
CO2	understand the emission standards, emission control techniques and electrical systems.	k2
CO3	analyse the power transmission systems by using the basic principles of an automobile	k4
CO4	understand purpose and methods of steering systems and their applications	k2
CO5	understand the function of suspension system and braking system of an automobile	k2

15A03703 METROLOGY & MEASUREMENTS

CO1	Understand the Limits, Fits and Tolerance, ISS – ISO system, linear and angular distance measuring instruments	K2
CO2	Illustrate the different types of Comparators, optical measuring instruments, flatness and surface roughness measuring methods	K3
CO3	Explain Screw thread elements and measuring methods, Gear tooth profile measurement, Alignment tests on lathe, milling and drilling machine tools	K2
CO4	Understand working of various instruments used for measuring displacement, speed, stress, strain, acceleration and vibration	K2
CO5	Illustrate working of various instruments used for measuring temperature, pressure, sound, force, torque and power	K3

15A03709 Production and Operations Management

CO1	Students are able to understand the basic concepts in operations and production activities	K2
CO2	Students can identify factors influencing plant location and plant layout	K4
CO3	Students can identify the production process and execute the customer order timely	K4
CO4	They can manage the materials, manpower effectively by using appropriate inventory and time study techniques.	K3
CO5	They can improve the productivity by using effective quality control standards and techniques	K3



DEPARTMENT OF MECHANICAL ENGINEERING

(15A03201) Management Science

CO1	Analyse the the effect of grain boundaries on the properties of metals.	K4
CO2	Explain iron-iron carbide phase diagram with isomorphous reactions	K2
CO3	Understand the effect of alloying elements on properties of steels	K2
CO4	Apply any heat treatment process for any specific application and requirement.	K3
CO5	Classify the composite materials based on their applications	K4

(15A03706) Modern Manufacturing Methods

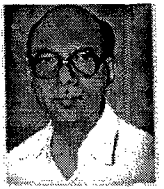
CO1	Analyse the main limitations of Conventional Machining.	K4
CO2	Classify rapid prototyping methods according to the principles of operation	K2
CO3	Explain the basic mechanism of material removal in ultrasonic, abrasive jet and waterjet machining	K2
CO4	Distinguish between the principles of operation in chemical and electro-chemical machining	K4
CO5	Select the appropriate process variables for thermal machining processes, viz.,EDM, EDG and plasma machining	K4
CO6	Compare the process mechanics and applications of Electron beam and Laser beam machining processes	K2

15A03702 CAD/CAM

CO1	Identify proper computer graphics techniques for geometric modelling.	K1
CO2	Transform, manipulate the object and understand rapid prototyping and tooling concept in any real life application	K2
CO3	Acquire fundamental knowledge of CAD/CAM.	K3
CO4	Solve numerical on transformation	K3
CO5	Understand modelling of curves, surfaces and solids	K2
CO6	Generate tool path for part and to create CNC manual part program and APT part program.	K6



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DEPARTMENT OF MECHANICAL ENGINEERING

15A03710 CAD/ CAM Laboratory

CO1	Create 2D and 3D models using modeling software.	K6
CO2	Understand the CNC control in modern manufacturing system.	K2
CO3	Prepare CNC part programming and perform manufacturing.	K6
CO4	Create the CL Data and Post process generation using CAM packages.	K6
CO5	Apply CAPP in Machining and Turning Centre.	K3

(15A03711) Metrology & Measurements Lab

CO1	Illustrate on different metrological tools and perform measurements in quality impulsion.	K2
CO2	Distinguish with the different instruments that are available for linear, angular, roundness and roughness measurements.	K4
CO3	Differentiate the accuracy of different instruments.	K4
CO4	Analyze the measurement data obtained from different measuring instruments for the same physical quantity	K4
CO5	Apply the basic physics principles to analyse the working principle of different measuring instruments.	K3,K4


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DEPARTMENT OF MECHANICAL ENGINEERING

IV YEAR- II SEMESTER

(15A03805) GAS TURBINES AND JET PROPULSION

CO1	Analyze the simple gas turbine cycle in determining the specific work and thermal efficiency.	K4
CO2	Apply the basic principles of jet propulsion to analyse the various pilotless and piloted propulsion devices.	K3,K4
CO3	Apply the basic thermodynamic cycle to understand the working of ram jet engine	K3
CO4	understand the working of rocket engine	K2
CO5	understand the importance of cryogenic engine	K2

15A03801 Industrial Engineering

CO1	Define and apply productivity concept to engineering applications	K1
CO2	Demonstrate techniques to increase productivity	K2
CO3	Describe the implementation of work and time study at a workplace	K2
CO4	Explain the Color models and psychology of seeing	K2
CO5	Apply the concepts of aesthetics at interiors and exteriors of a workplace	K3

15A03808 TECHNICAL SEMINAR

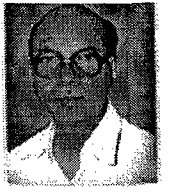
CO1	Identify and compare technical and practical issues related to the area of program specialization	K2
CO2	Outline annotated bibliography of research demonstrating scholarly skills.	K4
CO3	Prepare a well organized report employing elements of technical writing and critical thinking.	K4
CO4	Demonstrate the ability to describe, interpret and analyze technical issues and develop competence in presenting.	K3



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DEPARTMENT OF MECHANICAL ENGINEERING

15A03809 Project Work

CO1	Identify methods and materials to carry out experiments / develop code	K2
CO2	Reorganize the procedures with a concern for society, environment and ethics.	K4
CO3	Analyze and discuss the results to draw valid conclusions.	K4
CO4	Prepare a report as per recommended format and defend the work.	K3
CO5	Explore the possibility of publishing papers in peer reviewed journals/conference proceedings.	K3


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DEPARTMENT OF MECHANICAL ENGINEERING

R-13 COURSE OUTCOME (CO)

Communicative English

CO1	Compare Language nuances in humorous situations for better communication	K4
CO2	Evaluate possibilities of applying science and technology for building a new state with its natural resources	K5
CO3	Experimenting with the elixir properties of water and need for conservation	K4
CO4	Sketch human relationships with situations and feelings needed accordingly	K3
CO5	Dramatize a horrible incident to raise humanitarian values	K3

ENGINEERING&ITWORKSHOP

CO1	Discriminate the identification of internal parts of computer and its peripheral	K4
CO2	Identify the actual components for assembling pc back to normal condition	K2
CO3	Installation of Linux and Windows XP os and connected to network.	K3
CO4	Identify and use of various tools in different trades of Engineering workshop	K4
CO5	prepare different models in different trades of engineering workshop	K4

English Language Communication Skills Lab

CO1	Identify on the production and practice of English sounds for effective use	K2
CO2	Recognize the effectiveness of Listening for interpreting specific information.	K3
CO3	Evaluate various channels for honing up of presentation skills	K5
CO4	Select learner friendly modes for effective communication in various context	K4
CO5	Demonstrate the fluency of speaking with clarity and confidence	K3

ENGINEERING PHYSICS

CO1	Demonstrate the applications of Optics in both Scientific and Technological systems.	K3
CO2	Describe the properties of crystals along with Ultrasonic non destructive technique.	K2
CO3	Analyze the physical properties of materials through Quantum mechanics along with band theory.	K4
CO4	Apply the concepts of Semiconducting and magnetic materials to Engineering fields.	K3
CO5	Discuss the importance of Superconducting and Nano materials in various fields.	K2



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DEPARTMENT OF MECHANICAL ENGINEERING

ENGINEERING CHEMISTRY

CO1	Classify the Impure , potable and industrial water	K2
CO2	Choose required monomer for the production of particular polymer	K3
CO3	Demonstrate the concepts consisting with electroplating and electroless plating methods	K3
CO4	Recognize different fuels	K2
CO5	Choose various Engineering materials for social need with justification	K3

MATHEMATICS-I

CO1	Applying the LAPLACE TRANSFORM to solve the ordinary D.E of first and second order	K3
CO2	Find the Fourier series representation of a one variable	K2
CO3	Demonstrate their understanding of the dirichlet conditions by using them to evaluate infinite series	K3
CO4	Attain the knowledge of partial Differential equations and applying in Mechanical problems	K1
CO5	Compute the Z- Transforms and Inverse Z- Transforms	K4

(9A05101) PROGRAMMING IN C AND DATA STRUCTURES

CO1	Demonstrate the programming terminology and implement various C-tokens & Input and Output statements to solve simple problems.	K3
CO2	Use various looping, branching statements and array implementations.	K3
CO3	Illustrate different types of arrays and concept of strings.	K3
CO4	Describe the way of accessing memory locations, necessity of modularity in programming and solve various data base related problems by using user defined data types.	K2
CO5	Utilize the concepts and need of files in programming and implement file operations.	K3
CO6	Apply DS techniques including stack, queues and linked list using c programming language.	K3
CO7	Compare and implement sorting and searching algorithms.	K4

Engineering mechanics

CO1	Determine the equilibrium of a particle in space using principle of laws of mechanics	K4
CO2	Compute the equilibrium of rigid bodies in two dimensions and in three dimensions.	K3
CO3	Calculate the principal moment of inertia of plane areas.	K4
CO4	Solve the problems using equation of motions and analyze impact of elastic bodies on collision	K3
CO5	Solve the problems of simple system with sliding friction and calculate linear and angular acceleration of moving body in general plane motion	K3



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(13A03101)Engineering Drawing

CO1	Acquire basic skills in technical graphic communication and also get thorough knowledge of various geometrical elements used in Engineering practice.able to use the instruments required for Drawing.Be able to dimension, print letters which can be understood globally	K3
CO2	Gather good knowledge in various kinds of scales and their practical usage.understand positions of points and their projections	K4
CO3	understands position of lines ,planes and their projections	K2
CO4	understands the position of solids and its projections and also able to develop surface for different solids to make	K4
CO5	able to views the different views of a solid and also able to draw isometric view for ortho graphic projections	K4

(13A05102) C PROGRAMMING AND DATA STRUCTURES LAB

CO1	Demonstrate different problem solving techniques to find solutions to various problems.	K2
CO2	Apply C language features effectively and implement solutions.	K3
CO3	Use simple linear data structures such as linked lists.	K3

13A54301 Mathematics – II

CO1	Solve the system of linear equations using matrix algebra with its specific rules	k3
CO2	Understand the various Numerical Methods for solving engineering Problems	k3
CO3	Understand the various Numerical differentiation & integration for solving engineering Problems	k3
CO4	use of Fourier Series and fourier Transformations	k2
CO5	Applications of partial differential Equations for solving Engineering problems.	k2

(13A01308) MECHANICS OF SOLIDS

CO1	Calculate stresses, strains and deformations of basic geometries under axial loading and thermal effects.	K3
CO2	Draw Shear Force and Bending Moment Diagrams for different types of beams and loading conditions	K3
CO3	Compute bending and shear stresses in beams under different loading conditions	K3
CO4	Calculate shear strength of shafts subjected to torsional loading and deflections of beams under different boundary and loading conditions	K3
CO5	Determine stresses and strains induced in the thin and thick cylinders subjected to fluid pressure	K3



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DEPARTMENT OF MECHANICAL ENGINEERING

13A99302 Electrical and Electronics Engineering

CO1	Apply basic principles and circuit laws to solve network theorems and two port networks	K3
CO2	Describe the principles and operations of various DC and AC machines	K2
CO3	Analyze the operating principles of major electronic devices, its characteristics and applications	K4
CO4	Differentiate BJT and FETs	K4
CO5	Classify various sinusoidal oscillators based on application	K2
CO6	Develop OP-AMP based circuits to perform addition, difference, differentiation and integration operations	K5

(13A03301) MATERIAL SCIENCE AND ENGINEERING

CO1	Analyse the the effect of grain boundaries on the properties of metals.	K4
CO2	Explain iron-iron carbide phase diagram with isomorphous reactions	K2
CO3	Understand the effect of alloying elements on properties of steels	K2
CO4	Apply any heat treatment process for any specific application and requirement.	K3
CO5	Classify the composite materials based on their applications	K4

13A03302 Thermodynamics

CO1	Student will be able to understand first law of thermodynamics and interactions of heat and work.	K1
CO2	Student will be able to analyze working principles of various engineering devices.	K2
CO3	Student will able to analyze the principle of steam power cycles & their efficiencies.	K4
CO4	Student will able to execute the interrelationship between thermodynamic functions.	K3
CO5	Students will be able to implement the knowledge of Psychometric in air conditioning units.	K3

(13A03303) Machine Drawing

CO1	understand the concepts of I.S. conventions, methods of dimensioning, the title boxes	K2
CO2	understand the functionality of different machine elements	K2
CO3	understand the working principles of an assembly or subassembly to produce the final product	K2



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DEPARTMENT OF MECHANICAL ENGINEERING

(13A99303) Material Science Lab & Mechanics of Solids Lab

CO1	Analyze the microstructure of various metals and alloys	K4
CO2	Analyze the micro structures & properties of different heat treated metals	K4
CO3	Analyze the behavior of the solid bodies subjected to various types of loading.	K4
CO4	Apply the concept of impact loading and to determine impact values for various materials.	K3
CO5	Compare the hardness values for various materials & their importance.	K5

13A99304 Electrical and Electronics Engineering laboratory

CO1	Perform the load test, OCC, load characteristics and speed control of DC shunt and DC series motor	K4
CO2	Perform the load test, OC and SC test on a single phase transformer	K3
CO3	Examine the regulation of an alternator by EMF and MMF methods	K4
CO4	Conduct the load test, speed control on various phase of induction motor	K3
CO5	Explore the DC and AC starters	K3

13A01403 Environmental Science

CO1	Identify environmental problems arising due to engineering and technological activities and the science behind those problems	K2
CO2	Estimate the population - economic growth, energy requirement and demand.	K4
CO3	Analyse material balance for different environmental systems.	K4
CO4	Realize the importance of ecosystem and biodiversity for maintaining ecological balance.	K3
CO5	Identify the major pollutants and abatement devices for environmental management and sustainable development	K3



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DEPARTMENT OF MECHANICAL ENGINEERING

13A54303 PROBABILITY & STATISTICS

CO1	Analyze and Apply the concept of probability distribution and sampling theory to engineering problems	K4
CO2	<i>Understand the Testing of hypothesis,</i>	K2
CO3	<i>Analyze and Apply ANOVA for engineering problems</i>	K4
CO4	<i>Apply Statistical Quality Control techniques</i>	K3
CO5	<i>Apply Queuing theory for real world weighting models and makes estimations</i>	K3

(13A03401) KINEMATICS OF MACHINES

CO1	Identify different mechanisms and inversions of different kinematic chains.	K1
CO2	Calculate the velocity and power transmitted by belt, rope and chain drives.	K3
CO3	Draw velocity and acceleration diagrams for various mechanisms.	K3
CO4	Analyse the terminology of gears.	K4
CO5	Draw displacement diagrams and cam profile for different types of motion of follower.	K3

13A03402 THERMAL ENGINEERING-I

CO1	Understanding the working of both S.I and C.I engines.	K2
CO2	Recognize the various auxiliary systems in functioning of an I.C engine.	K2
CO3	Interpret the properties of fuel on combustion phenomenon in I.C engines.	K3
CO4	Calculate the performance parameters of an I.C engine.	K3
CO5	Compute the performance of reciprocating and rotary air compressors.	K3

(13A01408) Mechanics Of Fluids

CO1	Understand the fundamental properties of a fluids and study the fluid pressure measurement	K2
CO2	Exposes to fundamental equations,used in analysis of fluid flow problems like continuity,energy,momentum equations	K3
CO3	Understand the working principle of different devices used for mesurement of fluid flow	K4
CO4	Understand the concept of boundary layer theory and its significance	K2
CO5	Understand the effect of forces of fluid on a body and also exposed to engineering applications of drag and lift.	k2,K4



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DEPARTMENT OF MECHANICAL ENGINEERING

13A03403 MANUFACTURING TECHNOLOGY

CO1	Understand the elements of casting, moulding machines and solidification of castings of various metals	K2
CO2	Classify different types of special casting methods, design of risers and feeding systems, crucible melting, cupola operation and steel making process	K2
CO3	Classify different types of welding processes, welds and weld joints	K2
CO4	Understand about advanced welding process, heataffected zone(HAZ), Defects and Identification Methods	K2
CO5	Choose proper surface treatment processes for the given application	K3

(13A03404) Thermal engineering lab

CO1	Conduct the appropriate test on the reciprocating air compressor for various loads and determine the efficiencies.	K4
CO2	Conduct appropriate tests on Petrol and Diesel Engines and determine the input power, indicated power and brake power.	K4
CO3	Compare the performance of Engines with regard to SFC, BMEP and various efficiencies	K5
CO4	Prepare the heat balance chart of a multi cylinder petrol engine	K6
CO5	Illustrate the effect of varying the speed on the performance characteristics of engines	K3

(13A03405) Manufacturing Technology Lab

CO1	understand basic methods of manufacturing like casting, welding, mechanical press working	K2
CO2	Differentiate the different patterns used in casting	K4
CO3	Distinguish the quality of the weld obtained from different welding techniques	K4
CO4	Understand the simple, compound and progressive tools used in sheet metal work	K2
CO5	Apply the basic methods of processing the plastics to prepare the given models.	K3



DEPARTMENT OF MECHANICAL ENGINEERING

(13A03501) Hydraulic Machinery

CO1	Understand the fluid properties and the manometry	K2
CO2	Solve fluid flow problems in closed pipes using Bernoulli's equation	K3
CO3	Analyze the forces exerted by a jet of fluid on vanes of different shapes and study working principle of different hydraulic turbines	K4
CO4	Analyze the performance characteristic curves of hydraulic turbines and Pumps	K4
CO5	Understand the need of hydropower plants and identify the catchment area of hydro power stations.	K3

(13A03502) THERMAL ENGINEERING-II

CO1	Apply the Rankine cycle, Reheat and Regeneration cycles for steam power plants.	K3
CO2	able to understand the working of boilers, mountings and accessories	K2
CO3	Analyze the performance of steam nozzles & Steam condensers	K4
CO4	Estimating the efficiencies & performances of the steam turbines	K4
CO5	Apply the Brayton cycle to estimate the efficiency of a gas turbine & jet propulsion system	K3

13A03503 DYNAMICS OF MACHINERY

CO1	Apply the laws of friction to calculate the forces in pivots, collars, brakes, clutches and dynamometers.	K3
CO2	Apply gyroscopic principles on Aero plane, ship, four wheel and two wheel vehicles.	K3
CO3	Design a flywheel for IC engine.	K5
CO4	Determining the speeds & forces acting on various governors.	K3
CO5	Estimating the Balancing mass of rotating, reciprocating masses in machines.	K2
CO6	Analysis free and forced vibrations, evaluate the critical speed of the shaft and vibration calculations of rotor systems.	K4

(13A03504) METAL FORMING PROCESSES

CO1	Solve various problems of theory of plasticity.	K3
CO2	Understand the principles of rolling and forging processes and their applications and defects	K2
CO3	Distinguish extrusion and wire drawing with their industrial applications.	K4
CO4	Analyze the nature of various forces to which a sheet metal may be subjected while it is forming.	K4
CO5	Understand the concept of plastic manufacturing process, rapid manufacturing process and its applications.	K2



DEPARTMENT OF MECHANICAL ENGINEERING

(13A03505) DESIGN OF MACHINE MEMBERS 1

CO1	Apply design procedures using theory of failures for different elements	k3
CO2	Analysing simple components under cyclic loading using Goodman's and Soderberg's criterions	k4
CO3	Designing Riveted and Bolted joints with different configuration	k6
CO4	Design cotter joint , knuckle joint and shafts for different loading conditions	k6
CO5	Design various Rigid and Flexible shaft couplings	k6

13A03506 HEAT TRANSFER

CO1	Analyze various methods of heat transfer for the bodies undergoing heat exchange using fundamental concepts of Conduction, Convection and Radiation.	K4
CO2	Estimate heat loss from the system to the surroundings for the concept of extended surfaces at an interval of time during its working e.g. IC Engines, Turbines etc.	K2
CO3	Apply correlations to compute heat loss due to convection for practical applications	K3
CO4	Analyze condensation, boiling and heat exchangers	K4
CO5	Estimate radiation heat transfer between bodies	K2

(13A03507) Heat transfer lab

CO1	Apply the basic principles of heat transfer to estimate the thermal conductivity of metals/non metals	K3
CO2	Analyse the performance of heat exchanger	K4
CO3	Evaluate fin effectiveness/efficiency	K5
CO4	Evaluate the stefen boltzmen constant upon using the fundamentals of radiation	K5
CO5	Apply the basic principles of heat transfer to analyse the heat transfer with phase change(Boiling & Condensation)	K4

**(13A01509) FLUID MECHANICS AND HYDRAULIC MACHINERY
LAB**

CO1	Analyze a variety of practical fluid-flow devices like venturimeter & oificemeter.	K4
CO2	Analyze the performence of different types of turbines like impulse and reaction.	K4
CO3	Analyze the performence of different types of pumps like rotodynamic and positive displacement pumps.	K4
CO4	Evaluate the efficiency of different types of vanes (Flat & Semi circular)	K5
CO5	Analyze the different types of looses in fluid flow problems	K4



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DEPARTMENT OF MECHANICAL ENGINEERING

(13A52501) Managerial Economics & Financial Analysis


CO1	discuss the objectives ,nature and scope of Managerial Economics	K2
CO2	Analyze the demand of products and services by using different methods	K4
CO3	Explain the Cost concepts and Break Even Point.	K2
CO4	Classify. Different types of business organizations	K2
CO5	Apply the accounting principles for prepare Journal, Ledger, Trial Balance, Manufacturing A/c, Trading A/c., Profit & Loss A/c. and Balance Sheet of an enterprise Analyze, interpret	K3

13A03601 CAD/CAM

CO1	Identify proper computer graphics techniques for geometric modelling.	K1
CO2	Transform, manipulate the object and understand rapid prototyping and tooling concept in any real life application	K2
CO3	Acquire fundamental knowledge of CAD/CAM.	K3
CO4	Solve numerical on transformation	K3
CO5	Understand modelling of curves, surfaces and solids	K2
CO6	Generate tool path for part and to create CNC manual part program and APT part program.	K6

(13A03602) MACHINE TOOLS

CO1	Analyse the nature of various forces involved in the machining operations.	K4
CO2	Illustrate the working of a lathe machine & it's accessories	K2
CO3	Differentiate shaper, slotter & planner in respective of their working principle.	K4
CO4	understand the principle of milling, grinding, Lapping, Honing and Broaching operation	K2
CO5	Design assembly of jigs and fixtures on a simple work-piece using the principle minimum locating points principle.	K6


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DEPARTMENT OF MECHANICAL ENGINEERING

**(13A03603) REFRIGERATION AND AIR
CONDITIONING**

CO1	Understand the basic principles, methods and applications of refrigeration	k2
CO2	Understand the operation of vapour compression system, analyse the methods for improving performance, necessity of new refrigerants.(K2,K4)	k2,k4
CO3	Understand the operation of vapour absorption system, Steam Jet Refrigeration System	k2
CO4	Apply the psychrometric terms, and design air conditioning systems by cooling load calculations.	k6
CO5	know the various components of Air conditioning system and their working principles.	k2

(13A03604) DESIGN OF MACHINE MEMBERS -II

CO1	Able to design crane hooks, C-clamps and various belt, rope chain drives and also power transmission elements by using design data book	K5
CO2	Able to design helical springs for two wheel vehicle and laminated springs for trucks and also design power screws by using design data book	K5
CO3	Able to design bearings by using design data book	K5
CO4	Able to design spur gear and helical gear by using design data book	K5
CO5	Examine various forces acting on I C engine parts and failure criteria to be adopted for various parts	K4

13A03605 NON CONVENTIONAL SOURCE OF ENERGY

CO1	understand the need of alternative energy resources	K2
CO2	understand about the basics of solar energy collectors and generation of electricity from solar energy collector	K2
CO3	:understand the assessment of wind energy potential ,wind mills	K2
CO4	understand about geothermal, types and production of bio gas	K2
CO5	know about ocean energy and principles ,extraction of energy from waves.	K1



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DEPARTMENT OF MECHANICAL ENGINEERING

13A03606 CAD Laboratory

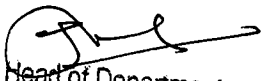
CO1	Develop Auto LISP programs for drawing machine elements.	K4
CO2	Develop codes for analytical and synthetic curves.	K2
CO3	Draw machine elements in sketcher, part and assembly modes	K2
CO4	Generate automated tool paths and G-codes for machining components.	K3
CO5	Validate DXF, IGES and STEP formats for exchange of CAD files.	K4

(13A03607) Machine Tools lab

CO1	Understand basic machining variables, such as RPM, feedrates, and infeeds	K2
CO2	Apply the fundamental knowledge and principles in material removal processes	K3
CO3	Identify cutting tool geometry of single point and multipoint cutting tool	K1
CO4	Create models as per the product design	K6
CO5	Develop practical knowledge in machine tools like lathe, drilling machine, shaper, slotter, milling & Grinding machines	K3

(13A52502) Advanced English Language Communication Skills Lab

CO1	Interpret difference contextual for factual information and useage	K3
CO2	Report the subject matter in coherence and style as well as projecting one's self-marketing	K2
CO3	Select diffirent data and present through Tele and Vedieo conferences	K5
CO4	Demonstrate the innate capabilities along with the external consciousness of display and interest	K3
CO5	Compare different concepts and express views among individuals and understanding stratgies for interviews	K4


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DEPARTMENT OF MECHANICAL ENGINEERING

13A03701 OPERATIONS RESEARCH

CO1	Create mathematical modeling of real life situations and capable of obtaining best solution using graphical and simplex methods. Solving the LPPs using the concept of duality.	K5
CO2	Solving transportation and assignment models.	K3
CO3	Apply the concept of game theory for solving business problems.	K3
CO4	Apply queuing theory for real world waiting lines and make estimations like Average Waiting Times, Average Queue Length, Probability of Waiting in the queue etc.	K3
CO5	Determine the sequencing of Jobs in machine shop	K3
CO6	Apply the Concept of CPM & PERT for Project scheduling.	K3
CO7	Apply Dynamic Programming technique to solve the complex problems.	K3
CO8	Apply the replacement policies to obtain optimum cost.	K3

(13A03702) AUTOMATION AND ROBOTICS

CO1	Understand the functions in manufacturing organizations and the need for automation	K2
CO2	Distinguish between different types of automation and the hardware components used	K4
CO3	Apply balancing techniques for manual and automated flow-lines	K3
CO4	Identify various configurations of industrial robots and their components	K1
CO5	Analyze the kinematics and dynamics of an industrial robot	K4
CO6	Compare different programming languages and their features	K2
CO7	Illustrate different applications of robots in manufacturing	K2

(13A03703) FINITE ELEMENT METHODS

CO1	Apply the basic principles and approaches for solving FEM problems in different fields	K3
CO2	evaluate the elementary stiffness matrices and engineering design quantities for simple structures using FEM.	K5
CO3	evaluate the interpolation functions for higher order isoparametric elements	K5
CO4	apply the concept of FEM to solve the axi-symmetric solid members.	K3
CO5	formulate the elementary stiffness matrices for heat transfer and fluid flow problems.	K6



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DEPARTMENT OF MECHANICAL ENGINEERING

METROLOGY & MEASUREMENTS(13A03704)

CO1	<i>Understand the Limits, Fits and Tolerance, ISS – ISO system, linear and angular distance measuring instruments</i>	K2
CO2	<i>Illustrate the different types of Comparators, optical measuring instruments, flatness and surface roughness measuring methods</i>	K3
CO3	<i>Explain Screw thread elements and measuring methods, Gear tooth profile measurement, Alignment tests on lathe, milling and drilling machine tools</i>	K2
CO4	<i>Understand working of various instruments used for measuring displacement, speed, stress, strain, acceleration and vibration</i>	K2
CO5	<i>Illustrate working of various instruments used for measuring temperature, pressure, sound, force, torque and power</i>	K3

(13A03705) AUTOMOBILE ENGINEERING

CO1	understand the function of each and every component of an automobile	k2
CO2	understand the emission standards, emission control techniques and electrical systems.	k2
CO3	analyse the power transmission systems by using the basic principles of an automobile	k4
CO4	understand purpose and methods of steering systems and their applications	k2
CO5	understand the function of suspension system and braking system of an automobile	k2

13A03708. Production and Operation Management

CO1	Students are able to understand the basic concepts in operations and production activities	K2
CO2	Students can identify factors influencing plant location and plant layout	K4
CO3	Students can identify the production process and execute the customer order timely	K4
CO4	They can manage the materials, manpower effectively by using appropriate inventory and time study techniques.	K3
CO5	They can improve the productivity by using effective quality control standards and techniques	K3



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DEPARTMENT OF MECHANICAL ENGINEERING

(13A03709) Metrology & Measurements Lab

CO1	Illustrate on different metrological tools and perform measurements in quality impulsion.	K2
CO2	Distinguish with the different instruments that are available for linear, angular, roundness and roughness measurements.	K4
CO3	Differentiate the accuracy of different instruments.	K4
CO4	Analyze the measurement data obtained from different measuring instruments for the same physical quantity	K4
CO5	Apply the basic physics principles to analyse the working principle of different measuring instruments.	K3,K4

13A03710 Computer Aided Engineering Laboratory

CO1	Utilize the analysis software for stress analysis of Mechanical components.	K3
CO2	Estimate the natural frequency of 2D component	K4
CO3	Predict the dynamic characteristics of 2D components and piping system	K5
CO4	Analyze the mode of heat transfer in piping system	K4
CO5	Make use of CAD software to simulate mechanical systems	K3
CO6	Solve simple problems in CFD	K3


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DEPARTMENT OF MECHANICAL ENGINEERING

(13A03802)Entrepreneurship

CO1	understand the need of entrepreneurship in the field of engineering	K2
CO2	understand about the business plan nature and implementation	K2
CO3	understand the source of capital and e-commerce	K2
CO4	understand the strategies of new venture expansion	K2
CO5	understand about quality control and marketing	K2

(13A03805) GAS TURBINES AND JET PROPULSION

CO1	Analyze the simple gas turbine cycle in determining the specific work and thermal efficiency.	K4
CO2	Apply the basic principles of jet propulsion to analyse the various pilotless and piloted propulsion devices.	K3,K4
CO3	Apply the basic thermodynamic cycle to understand the working of ram jet engine	K3
CO4	understand the working of rocket engine	K2
CO5	understand the importance of cryogenic engine	K2

(13A03807) Modern Manufacturing Methods

CO1	Analyse the main limitations of Conventional Machining.	K4
CO2	Classify rapid prototyping methods according to the principles of operation	K2
CO3	Explain the basic mechanism of material removal in ultrasonic, abrasive jet and waterjet machining	K2
CO4	Distinguish between the principles of operation in chemical and electro-chemical machining	K4
CO5	Select the appropriate process variables for thermal machining processes, viz.,EDM, EDG and plasma machining	K4
CO6	Compare the process mechanics and applications of Electron beam and Laser beam machining processes	K2



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DEPARTMENT OF MECHANICAL ENGINEERING

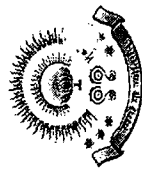
13A03810 TECHNICAL SEMINAR

CO1	Identify and compare technical and practical issues related to the area of program specialization	K2
CO2	Outline annotated bibliography of research demonstrating scholarly skills.	K4
CO3	Prepare a well organized report employing elements of technical writing and critical thinking.	K4
CO4	Demonstrate the ability to describe, interpret and analyze technical issues and develop competence in presenting.	K3

13A03811 Project Work

CO1	Identify methods and materials to carry out experiments / develop code	K2
CO2	Reorganize the procedures with a concern for society, environment and ethics.	K4
CO3	Analyze and discuss the results to draw valid conclusions.	K4
CO4	Prepare a report as per recommended format and defend the work.	K3
CO5	Explore the possibility of publishing papers in peer reviewed journals/conference proceedings.	K3


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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING



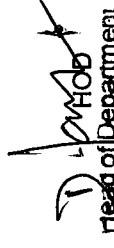
2015 ADMITTED BATCH CURRICULAM TABLE

YEAR-SEM OF STUDY	S.NO	COURSE CODE	JNTUA SUBJECT CODE	SUBJECT NAME
I-I	1	C111	15A52101	Functional English
	2	C112	15A52101	Mathematics - I
	3	C113	15A05101	Computer Programming
	4	C114	15A56101	Engineering Physics
	5	C115	15A03101	Engineering Drawing
I-II	6	C116	15A52102	English Language Communication Skills Lab
	7	C117	15A56102	Engineering Physics Lab
	8	C118	15A05102	Computer Programming Lab
	9	C121	15A52201	English for Professional Communication
	10	C122	15A54201	Mathematics-II
	11	C123	15A05201	Data Structures
	12	C124	15A51101	Engineering Chemistry
	13	C125	15A01101	Environmental Studies
	14	C126	15A05202	Data Structures Lab
	15	C127	15A51102	Engineering Chemistry Lab
II-I	16	C128	15A99201	Engineering & IT Workshop
	17	C211	15A54301	Mathematics - III
	18	C212	15A05301	Database Management Systems
	19	C213	15A05302	Discrete Mathematics
	20	C214	15A99301	Basic Electrical and Electronics Engineering
	21	C215	15A04306	Digital Logic Design
	22	C216	15A52301	Managerial Economics and Financial Analysis
	23	C217	15A05303	Database Management System Laboratory
	24	C218	15A99302	Basic Electrical and Electronics Laboratory

YEAR-SEM OF STUDY	SNO	COURSE CODE	JNTUA SUBJECT CODE	SUBJECT NAME
II-II	25	C221	15A54401	Probability and Statistics
	26	C222	15A05401	Software Engineering
	27	C223	15A05402	Computer Organization
	28	C224	15A04407	Microprocessors & Interfacing
	29	C225	15A05403	Object Oriented Programming using Java
	30	C226	15A05404	Formal Languages and Automata Theory
	31	C227	15A04408	Microprocessors & Interfacing Laboratory
	32	C228	15A05405	Java Programming Laboratory
	33	C229	15A05406	COE-I
	34	C311	15A05501	Operating Systems
III-I	35	C312	15A05502	Computer Networks
	36	C313	15A05503	Object Oriented Analysis and Design
	37	C314	15A05504	Principles of Programming Languages
	38	C315	15A05505	Software Testing
	39	C316	15A05507	R-Programming
	40	C317	15A05509	Object Oriented Analysis and Design & Software Testing Laboratory
	41	C318	15A05510	Operating Systems Laboratory
	42	C319	15A99501	Audit course – Social Values & Ethics
	43	C321	15A05601	Compiler Design
	44	C322	15A05602	Data Warehousing & Mining
III-II	45	C323	15A05603	Design Patterns
	46	C324	15A05604	Design and Analysis of Algorithms
	47	C325	15A05605	Web and Internet Technologies
	48	C326	15A05606	Artificial Intelligence
	49	C327	15A05609	Web and Internet Technologies Laboratory
	50	C328	15A05610	Data Warehousing & Mining Lab
	51	C329	15A52602	Advanced English Language communication Skills(AELCS)Laboratory
	52	C3210	15A05611	COE-II

YEAR-SEM OF STUDY	S.NO	COURSE CODE	JNTUA SUBJECT CODE	SUBJECT NAME
IV-I	53	C411	15A52601	Management Science
	54	C412	15A05701	Grid & Cloud Computing
	55	C413	15A05702	Information Security
	56	C414	15A05703	Mobile Application Development
	57	C415	15A05704	Software Architecture
	58	C416	15A05707	Software Project Management
	59	C417	15A05710	Grid & Cloud Computing Laboratory
	60	C418	15A05711	Mobile Application Development Laboratory
	61	C421	15A05802	Mobile Computing
IV-II	62	C422	15A05805	Enabling Technologies for Data Science
	63	C423	15A05807	Comprehensive Viva-Voce
	64	C424	15A05808	Technical Seminar
	65	C425	15A05809	Project Work

IN-CHARGE



Head of Department
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FOR B.TECH DEGREE IN COMPUTER SCIENCE & TECHNOLOGY
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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

2015 ADMITTED BATCH COURSE OUTCOMES

YEAR/SEM OF STUDY	SUBJECT NAME	JNTUA CODE	CO NUMBER	COURSE OUTCOMES	KNOWLEDGE LEVEL
	Functional English	15A52101	C111.1	Practise conversational skills for effective communication in both social and academic contexts.	K3
			C111.2	Apply the correct structure in written expressions required for their professional prospects.	K3
			C111.3	Develop e-communication skills, listening skills and also writing skills required to prepare projects.	K3
			C111.4	Take part in group discussions, writing reviews and develop critical thinking skills.	K4
			C111.5	Develop communicative competence with emphasis on professional skills	K3
	Mathematics - I	15A54101	C112.1	Analyze the mathematical knowledge to solve differential equations in engineering applications.	K4
			C112.2	Apply the linear D.E's Mechanical and Electrical Oscillatory circuits and Deflection of Beams	K3
			C112.3	Apply multiple integration and curve tracing to solve the real time problems in engineering.	K3
			C112.4	Apply Laplace Transformations to solve engineering problems related to Mathematics.	K3
			C112.5	Convert the real time problems into vector calculus and then find its solution.	K2
	Computer Programming	15A05101	C113.1	Illustrate basics of computers, concepts of algorithm, flowchart, programming terminology and apply various C-tokens & Input and Output statements to solve simple applications.	K3
			C113.2	Apply selection, loop, branch control statements and arrays to solve different applications.	K3
			C113.3	Examine pointers for implementing direct access of memory locations and the necessity of modularity in programming.	K4
			C113.4	Solve various data base related problems by using non-homogeneous data structures.	K3
			C113.5	Utilize the concepts and need of files in programming and implement file operations.	K3

YEAR/SEM OF STUDY	SUBJECT NAME	INTUA CODE	CO NUMBER	COURSE OUTCOMES	KNOWLEDGE LEVEL
I-I	Engineering Physics	15A56101	C114.1	Apply the basic fundamentals of physics and their applications in both scientific and technological systems.	K3
			C114.2	Describe the properties of crystals along with Ultrasonic non destructive technique.	K2
			C114.3	Analyze the physical properties of materials through Quantum mechanics along with band theory.	K4
			C114.4	Apply the concepts of Semiconducting and magnetic materials to Engineering fields.	K3
			C114.5	Discuss the importance of Superconducting and Nano materials in various fields.	K2
	Engineering Drawing	15A03101	C115.1	Apply the geometrical constructions and classify the engineering /mathematical curves used in engineering applications	K3
			C115.2	Explain various kinds of scales and their practical usage and basics of orthographic projections.	K3
			C115.3	Analyze the geometrical objects in two dimensional objects.	K4
			C115.4	Analyze the visualization of geometrical solids in three dimensional through exercise in orthographic projections.	K4
			C115.5	Analyze the detailed views of the isometric and orthographic views of different objects.	K4
	English Language Communication Skills Lab	15A52102	C116.1	Distinguish the speech sounds and acquire better pronunciation	K4
			C116.2	Develop oral fluency and neutralize mother tongue influence.	K3
			C116.3	Take part actively in the learning process and become expertise in Presentation Skills like Oral, Poster, Power Point and other necessary speaking skills	K4
			C116.4	Apply language skills appropriately and effectively in interviews, group discussions and public speaking activities	K3
			C116.5	Take part in group activities with more confidence thereby enhancing the employability skills	K4
Engineering Physics Lab	15A56102	C117.1	Analyze the importance of Interference & Diffraction of light	K4	
		C117.2	Apply Lasers & Fiber optics to measure various parameters	K3	
		C117.3	Calculate the Energy gap of Semiconductor laser diode	K3	
		C117.4	Apply the applications of magnetic materials in day to day science	K3	

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	Computer Programming Lab	15A05102	C118.1	Demonstrate DOS and Linux Commands	K2
			C118.2	Illustrate the syntax and semantics of C language for simple problem statements.	K2
			C118.3	Develop the programs using arrays, strings operations	K3
			C118.4	Write programs that perform operations using derived data types.	K3
			C118.5	Develop C programming for a given application using file operations.	K3
	English for Professional Communication	15A52201	C121.1	Take part effectively in group discussions and debates.	K4
			C121.2	Develop writing skills required in various professional contexts.	K3
			C121.3	Employ presentation skills and creative writing skills effectively.	K3
			C121.4	Analyse a variety of technical writing formats and styles.	K4
			C121.5	Develop a proper level of language competence for employability.	K3
	Mathematics – II	15A54201	C122.1	Apply the Laplace Transform to solve the ordinary of first and second order	K3
			C122.2	Find the fourie series representation of a one variablefunction	K4
			C122.3	Demonstrate their understanding of the dirichlet conditions by using them to evaluate infinite series	K2
			C122.4	Attain the knowledge od partial differential equation and aplying in Mechanical problems	K4
			C122.5	Apply Fourier and Z-transformers to find the solutions for engineering problems	K3
	Data Structures	15A05201	C123.1	Apply the concept of arrays with asymptotic notations in building linear and non linear data structures.	K3
			C123.2	Analyze stacks, queues and linked list using dynamic memory allocation.	K4
			C123.3	Develop algorithms for trees and graphs	K3
			C123.4	Compare and implement different sorting techniques	K4
			C123.5	Build different searching techniques and hashing methods.	K3

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I-II	Engineering Chemistry	15A51101	C124.1	Analyze water samples and develop suitable water treatment methods to use water domestically and industrially.	K4
			C124.2	Apply the knowledge of different polymers and their better usage in various fields of engineering.	K3
			C124.3	Apply the knowledge of various electrochemical cells and corrosion fundamentals for the development of new batteries and also for prevention of corrosion.	K3
			C124.4	Differentiate natural and derived fuels and also apply the knowledge for effective usage and conservation of fuels.	K4
			C124.5	Apply the knowledge of different materials used in engineering and also develop advanced materials and new forms of carbon to use for various engineering	K3
	Environmental Studies	15A01101	C125.1	Comprehend the concepts of environment and its importance in our daily life and develop and apply various water conservation methods and conservation of other	K2
			C125.2	Categorize an ability to reflect on their personal impacts on biodiversity in global perspective.	K2
			C125.3	Develop new innovative methods for controlling of environmental pollution which may affect the human health.	K3
			C125.4	Analyze environmental issues related to society and find solutions for environmental problems.	K4
			C125.5	Determine the effects of increasing human population as well as health associated problems and develop measures to be taken to protect human health.	K4
	Data Structures Lab	15A05202	C126.1	Calculate the time and space efficiency for the given algorithms.	K3
			C126.2	Apply operations like searching, insertion, deletion, and traversing mechanism etc. on various data structures.	K3
			C126.3	solve the specified problem by using appropriate concept in data structures	K3
			C126.4	Analyze the practical knowledge of data structures in real time problems	K4
			C127.1	Develop skills in determining the effects of hard water in water	K3
Engineering Chemistry Lab	15A51102	C127.2	Distinguish different types of titrations in the volumetric analysis	K4	
		C127.3	Apply Conductometry instrumental method in volumetric analysis to determine the concentration of a given HCL solution by titration against a Standard NaOH solution	K3	
		C127.4	Correlate the purity of water samples by doing D.O, Acidity and alkalinity estimations	K4	
		C127.5	Analyze the effect of temperature on viscosity by using Redwood viscometer	K4	

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	Engineering & IT Workshop	15A99201	C128.1	Design the sheet metal objects by surface development and join the metals for obtaining desired shape.	K5
			C128.2	Identify the internal parts of computer and its peripheral	K2
			C128.3	Demonstrate Assemble and disassemble a Personal Computer and prepare the computer ready to use.	K2
			C128.4	Develop skills in installation of Linux and Windows XP OS and to connect network for information sharing.	K3
			C128.5	Illustrate how to Access the Internet and Browse it to obtain the required information.	K2
	Mathematics III	15A54301	C211.1	Demonstrate the knowledge of matrix calculation as an elegant and powerful mathematical language in connection with rank of a matrix.	K3
			C211.2	Apply and solve the Solutions of Algebraic and Transcendental equations of different methods	K3
			C211.3	Examine the methods based on forward and backward interpolation formulas	K3
			C211.4	Design curve-fitting techniques for data representations and computation in engineering problems.	K4
			C211.5	Differentiate numerical methods to obtain approximate solutions to mathematical problems for differentiation and integration	K4
	Database Management Systems	15A05301	C212.1	Interpret the different issues involved in the design and implementation of a database system	K3
			C212.2	Examine data manipulation language to query, update, and manage a database	K3
			C212.3	Develop the logical design of the database using data modeling concepts such as entity-relationship diagrams	K3
			C212.4	Analyze Concurrency control strategies efficiently for indexed files.	K4
			C212.5	Illustrate ways to recover from system failures and design a relational database for small scale organization.	K3
	Discrete Mathematics	15A05302	C213.1	Demonstrate mathematical concepts and logical reasoning to solve problems in different fields of Computer science and information technology.	K3
			C213.2	Examine the basic applications of set theory and relations.	K3
			C213.3	Apply elementary properties of modular arithmetic applications in solving problems in Computer Science.	K3
			C213.4	Construct graph theory models of data structures and state machines to solve problems of connectivity and constraints.	K4
			C213.5	Evaluate basic counting techniques to solve combinatorial problems and permutations.	K4

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II-I	Basic Electrical & Electronics Engineering	15A99301	C214.1	Apply basic principles and circuit laws to solve network theorems and two port networks	K3
			C214.2	Demonstrate the principles and operations of various DC and AC machines	K3
			C214.3	Analyze the operating principles of major electronic devices, its characteristics and applications	K4
			C214.4	Differentiate BJT and FETs	K4
			C214.5	Classify various sinusoidal oscillators based on application	K4
			C214.6	Analyze OP-AMP based circuits to perform addition, difference, differentiation and integration operations	K4
	Digital Logic Design	15A04306	C215.1	Demonstrate number system and Boolean algebra to store the data in digital format.	K3
			C215.2	Apply minimization techniques in design of digital systems.	K3
			C215.3	Analyze and Design various combinational circuits in digital design applications.	K4
			C215.4	Analyze and Design sequential circuits in digital design applications.	K4
			C215.5	Design a digital circuit for memory organization using programmable logic devices.	K4
	Managerial Economics and Financial Analysis	15A52301	C216.1	Examine the impact of managerial decisions taken on business.	K3
C216.2			Demonstrate the operations of business and decisions on assumptions of profit and losses by cost of a production.	K3	
C216.3			Examine the business formulation and legal actions of a country and industrial policies.	K3	
C216.4			Illustrate the system of finance and accounting principles on following accounting ratios.	K3	
C216.5			Demkonstrate budget decision and capital utilization of an organisation.	K3	
Database Management Systems Laboratory	15A05303	C217.1	Examine database tools to perform various operations for the given data.	K3	
		C217.2	Construct ER diagrams, map them to tables and normalize them.	K3	
		C217.3	Illustrate database and retrieve information from database.	K3	
		C217.4	Develop Procedures and Triggers to Program The Data Access And Manipulation	K4	

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	Basic Electrical and Electronics laboratory	15A99302	C218.1	Develop and employ different network models for elementary electrical and electronic components like resistors, sources, inductors, capacitors, diodes and transistors.	K4
C218.2			Implement the knowledge about semiconductors devices and basic digital gates in designing a circuit	K4	
C218.3			Analyze the knowledge of math, science and engineering while implementing it to the analysis of electrical engineering problems	K4	
	Probability and Statistics	15A54401	C221.1	Apply the knowledge of the basic concepts of probability and random variables	K3
C221.2			Examine the Binomial, Poisson and Normal distribution to the appropriate model and find mean & variance of the distributions.	K3	
C221.3			Demonstrate Test of Hypothesis in Large and Small sample tests	K3	
C221.4			Analyze the techniques of control charts for describing the quality of a manufactured product.	K4	
C221.5			Evaluate queuing models to analyze real world systems and predict queues.	K4	
	Software Engineering	15A05401	C222.1	Apply the basic concepts of software engineering and different process models to develop software projects.	K3
C222.2			Examine various principles of Requirements Engineering to gather the requirements for project development.	K3	
C222.3			Analyze different architectural designs for a software projects.	K4	
C222.4			Analyze various guidelines of user interface and Webapp designs for testing the softwares.	K4	
C222.5			Apply different testing techniques on code and test the softwares.	K3	
	Computer Organization	15A05402	C223.1	Demonstrate the basic concepts of computers, machine instructions and programs.	K3
C223.2			Apply the arithmetic operations on basic processing unit of a computer.	K3	
C223.3			Examine the basic memory organizations and the uses of the memories.	K3	
C223.4			Analyze the different Input and output devices.	K4	
C223.5			Classify the pipelining and multiprocessors.	K4	

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II-II	Microprocessors & Interfacing	15A04407	C224.1	Illustrate the fundamental concepts and architecture of 8085 and 8086.	K4
			C224.2	Make use of 8086 instruction set for assembly language programming.	K3
			C224.3	Examine the interrupts, analyze the memory and I/O interfacing of 8086.	K3
			C224.4	Infer how to interface memory and I/O devices and program 8086 microprocessor.	K3
			C224.5	Analyze the architecture of 8051 and interfacing devices of 8051.	K4
	Object Oriented Programming using java	15A05403	C225.1	Apply OOPs concepts & solve real world problems using Java	K3
			C225.2	Choose OOP concepts to build java programs	K3
			C225.3	Analyze key concepts like inheritance, Packages, Interfaces and exception handling	K4
			C225.4	Experiment multithreaded programs with IO	K4
			C225.5	Apply AWT to Develop GUI applications	K3
	Formal Languages and Automata Theory	15A05404	C226.1	Construct finite state machine while solving problems of computer programming languages and computer hardware	K3
			C226.2	Utilise regular expressions and languages for constructing of Mathematical machines used to design computer languages.	K3
			C226.3	Compare and contrast the CFG and RG , CFL and RL	K4
			C226.4	Construct FA to recognize CFL and CSL.	K3
			C226.5	Classify TMs for languages and recognize the decidable/undecidable problems.k	K4
	Microprocessors & Interfacing Laboratory	15A04408	C227.1	Examine 8086 assembly language programs.	K3
			C227.2	Develop program for programmable peripheral devices and their Interfacing.	K3
			C227.3	Analyze 8051 assembly language programs.	K4
			C227.4	Illustrate and simulate programs using 8086 emulator software.	K3
			C227.5	Develop input operational codes into 8086 & 8051 trainer kits and execute programs.	K3

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	Java Programming Laboratory	15A05405	C228.1	Examine solutions for a range of problems using objects and classes	K3
			C228.2	Develop portable programs which work in all environments	K3
			C228.3	Develop user friendly interfaces	K3
			C228.4	Design & implement applications using file and exception handling	K4
			C228.5	Solve the problem using object oriented approach and design solutions which are robust	K3
	Comprehensive Online Examination-I	15A05406	C229.1	Examine the knowledge acquired during the earlier semesters in order to solve the technical problems.	K3
			C229.2	Apply comprehensive knowledge in Computer Science & Engineering related fields.	K3
			C229.3	Demonstrate and implement fundamental concepts in Engineering related fields.	K3
			C229.4	Analyze insights in Computer Science & Engineering related fields.	K4
	Operating Systems	15A05501	C311.1	Demonstrate the concepts of operating systems and use them effectively.	K3
			C311.2	Design and Implement system and application programs to exploit operating system functionality.	K4
			C311.3	Examine Deadlock handling methods and Apply the concepts of Memory management techniques.	K4
			C311.4	Use File and Disk Management Schemes for effective Storage.	K3
			C311.5	Classify different Protection and Security principles associated with Operating Systems.	K4
	Computer Networks	15A05502	C312.1	Demonstrate OSI and TCP/IP models and the responsibility of each layer, Define basic computer network technology	K3
			C312.2	Examine block coding techniques and different data link layer protocols, Define and explain Data Communications System and its components.	K3
			C312.3	Illustrate the Network Layer Design issues, Routing and congestion Control algorithms, Summarize the Network Layer in the Internet.	K3
			C312.4	Choose The Internet Transport Protocols and Performance problems in Network.	K3
			C312.5	Categorize a peer to peer file sharing application utilizing application layer protocols such as HTTP, DNS, and SNMP and transportation layer protocol.	K4

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	Object Oriented Analysis and Design	15A05503	C313.1	Examine the complex systems and its properties in object oriented perspective and understand the design of complex systems	K3
			C313.2	Determine the Objects, Classes and relationships among them to make the complex software system.	K3
			C313.3	Evaluate the UML features and representation of classes, objects, relationships and common mechanisms and design the class and object diagrams for software systems	K4
			C313.4	Construct the structural models for software systems by drawing Package , Composite Structure , Component, Deployment, Profile Diagrams	K3
			C313.5	Develop the behavioural models for software systems by drawing Use Case, Activity, State Machine, Sequence, Communication, Timing and Interaction Overview	K3
	Principles of Programming Languages	15A05504	C314.1	Demonstrate appropriate programming language for problem solving	K3
			C314.2	Illustrate imperative languages.	K3
			C314.3	Examine using object oriented languages.	K3
			C314.4	make use of functional programming languages	K3
			C314.5	Predict appropriate logical programming languages for specific kind of problem solving.	K3
III-I	Software Testing	15A05505	C315.1	Apply the basic concepts, Flow Graphs and Path Testing techniques to test the projects.	K3
			C315.2	Analyze transaction flow and data flow testing techniques and its strategies for testing the transactions and data flow in the projects	K4
			C315.3	Analyze the types of domains in domain testing and using that in testing domains in the project.	K4
			C315.4	Determine different paths and path expressions to simplify testing .	K3
			C315.5	Categorize state graphs, transition testing and graph matrices to solve testing problems	K4
	R-Programming	15A05507	C316.1	Demonstrate Import, review, manipulate and summarize data-sets in R	K3
			C316.2	Analyze data-sets to create testable hypotheses and identify appropriate statistical tests	K4
			C316.3	Analyze the data and results using R, a flexible and completely cross- platform.	K4
			C316.4	Analyze on a real life Project, implementing R Analytics to create Business Insights	K4
			C316.5	Use a wide range of analytical methods and produce presentation quality graphics.	K3

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	OOAD & ST Laboratory	15A05509	C317.1	Demonstrate the notations for representing various UML diagrams.	K3
			C317.2	Analyze and design the solutions by constructing UML diagrams for various applications.	K4
			C317.3	Design Manual Test cases for Software Project.	K3
			C317.4	Analyze the realistic problem for different category of software.	K4
			C317.5	Evaluate automation testing tools to test the code.	K4
	Operating Systems Laboratory	15A05510	C318.1	Apply basic data structures to implement operating system functionalities.	K3
			C318.2	Design and Develop various CPU scheduling Algorithms.	K4
			C318.3	Design and Develop Deadlock handling mechanisms	K4
			C318.4	Apply algorithms for File and disk allocation and Management.	K3
			C318.5	Analyze the insights of operating system to implement all its functions.	K4
	Social Values and ethics	15A99501	C319.1	Demonstrate the basic concepts of society, family and channels of youth moments for National Building.	K3
			C319.2	Examine the sociological, psychological factors influencing the youth crime, social harmony and national integration.	K3
			C319.3	Analyse the environmental issues and objectives of Civil and Self defense.	K4
			C319.4	Illustrate the gender sensitization and initiatives of Government schemes for prevention.	K3
			C319.5	Determine the importance and benefits of physical activities.	K3
	Compiler Design	15A05601	C321.1	Examine the phases of compiler and evaluate the output of each phase	K3
			C321.2	Analyse the Problems on Top Down and Bottom Up Parsing Techniques	K4
			C321.3	Construct Sytax Directed Definition and Intermediate Code Representations	K3
			C321.4	Evaluate the Storage Organization, Allocation Methods and Symbol Table Management for programming language	K4
			C321.5	Analyze the target Code generation Algorithm and Code Optimization Techniques	K4

YEAR/SEM OF STUDY	SUBJECT NAME	JNTUA CODE	CO NUMBER	COURSE-OUTCOMES	KNOWLEDGE LEVEL
III-II	Data Warehousing & Mining	15A05602	C322.1	Demonstrate the basic concepts of data warehouse and data Mining.	K3
			C322.2	Apply the preprocessing tools for data cleaning and data reduction.	K3
			C322.3	Analyze and Evaluate the performance of algorithms for association rules.	K4
			C322.4	Make Use data mining tools for classification and clustering .	K3
			C322.5	Compare and contrast different Mining techniques.	K4
	Design Patterns	15A05603	C323.1	Demonstrate the different design patterns and their classifications.	K3
			C323.2	Examine the different problems in case study (Lexi).	K3
			C323.3	Compare different creational patterns to different software designs.	K4
			C323.4	Apply structural patterns to construct system design.	K3
			C323.5	Classify the behavioral patterns to design system software.	K4
	Design and Analysis of Algorithms	15A05604	C324.1	Demonstrate various algorithmic notations to divide and conquer strategy to solve various computing problems.	K3
			C324.2	ExamineGreedy method and Dynamic programming techniques to solve the problems.	K3
			C324.3	Illustrate Backtracking technique to solve problems and use graph traversal techniques.	K3
			C324.4	Analyze Branch and Bound techniques to improve the efficiency of existing techniques.	K4
			C324.5	Analyze the limitations of complexity classes P,NP, and NP-Complete.	K4
Web and Internet Technologies	15A05605	C325.1	Demonstrate the basic installations of Web Servers.	K3	
		C325.2	Apply the Programming of Java Script. HTML & CSS	K3	
		C325.3	Examine the Servlet-JSP&JDBC Environment.	K3	
		C325.4	Analyze Servlet-jsp environment & php Environment -Designing Web Pages with PHP & Databases	K4	
		C325.5	Evaluate the use of xml with web environment - Classify various methods & services used in transforming data	K5	

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	Artificial Intelligence	15A05606	C326.1	make Use variant categories of search techniques to solve the given problem along with application of constraint satisfaction concepts.	K3
			C326.2	Illustrate the given problem using propositional logic and first order logic and their inferences.	K3
			C326.3	Apply different planning methodologies to solve problems in real world problems.	K3
			C326.4	Discriminate uncertain reasoning techniques to solve a problem and compare their efficiencies.	K4
			C326.5	Analyze the various learning methods to predict the rational behaviour of agent in the environment.	K4
	Web and Internet Technologies Laboratory	15A05609	C327.1	Create dynamic and interactive web sites	K6
			C327.2	Create a server side java application called Servlet and JSP to catch form data sent from client, process it and store it on database.	K6
			C327.3	Demonstrate and apply predefined HTML tags and CSS	K3
			C327.4	Analyze and create a PHP program to a DBMS and perform insert, update and delete operations on table data.	K4
			C327.5	Analyze and evaluate the structure and the content of XML data using XML Schema.	K4
	Data Warehousing & Mining Laboratory	15A05610	C328.1	build dataware house and explore weka	K3
			C328.2	Analyze the data pre-processing tasks and demonstrate performing association rule mining on data sets	K4
			C328.3	Analyze perform classification, clustering and regration on data sets	K4
			C328.4	Design data mining algorithms	K3
	AELCS Laboratory	15A52602	C329.1	Examine the students fluency in English through a well developed vocabulary.	K3
			C329.2	Demonstrate to communicate their ideas relevantly and coherently in writing Have achieved familiarity with variety technical reports.	K3
			C329.3	Apply Accomplishment of sound vocabulary and its proper use contextually.	K3
			C329.4	Analyze the students for job skills and professional development activities.	K4
			C329.5	Examin Flair in writing and felicity in written expression.	K3


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	Comprehensive Online Examination- II	15A05611	C3210.1	Examine the knowledge acquired during the earlier semesters in order to solve the technical problems.	K3
			C3210.2	Apply comprehensive knowledge in Computer Science & Engineering related fields.	K3
			C3210.3	Analyze fundamental concepts in Engineering related fields.	K4
			C3210.4	Demonstrate insights in Computer Science & Engineering related fields.	K3
	Management Science	15A52601	C411.1	Demonstrate the basic concepts of management in modern contexts.	K3
			C411.2	Examine organization structures and principles.	K3
			C411.3	Analyze production and marketing aspects.	K4
			C411.4	Categorize the roles and responsibilities of Human Resource Manager.	K4
			C411.5	Formulate strategies in the modern management and Compare the modern management practices based on the requirement of the projects.	K3
	Grid & Cloud Computing	15A05701	C412.1	Examine the Fundamentals of Distributed, Grid and Cloud Computing	K3
			C412.2	Demonstrate the Functionality Requirements, Architecture, Practical & Detailed View of OGSA	K3
			C412.3	Analyze the Cloud Deployment, Service Models, and Virtualization of different Resources	K4
			C412.4	Analyze the Programming Model of Globus Toolkit, and Hadoop Framework Concepts	K4
			C412.5	Illustrate the Grid and Cloud Security Concepts	K3
	Information Security	15A05702	C413.1	Demonstrate information security requirements for a client and server.	K3
			C413.2	Examine cryptographic algorithms, authentication and security issues	K3
			C413.3	Illustrate algorithms and methods for web security with IPV4 and IPV6.	K3
			C413.4	Determine the Security and legal issues towards information security.	K3
			C413.5	Analyze the secret and public cryptography and Design a secure network with available solutions like PGP, SSL, etc.	K4

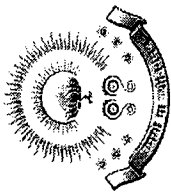
YEAR/SEM OF STUDY	SUBJECT NAME	INTUA CODE	CO NUMBER	COURSE OUTCOMES	KNOWLEDGE LEVEL
IV-I	Mobile Application Development	15A05703	C414.1	Demonstrate mobile application development software development tools	K3
			C414.2	Analyze various widgets in mobile applications	K4
			C414.3	Compare various layouts in mobile application design	K4
			C414.4	Examine multimedia, camera and Location based services in Android App.	K3
			C414.5	Build mobile application with dialogs and Fragments and Design and develop menus with database in mobile applications	K5
	Software Architecture	15A05704	C415.1	Examine major architectural styles, design patterns and frameworks	K3
			C415.2	Use architectural styles for problem and select among them for appropriate use.	K3
			C415.3	Categorize functional and nonfunctional requirements for the problem.	K4
			C415.4	Compare and contrast the views available to create documentation for the projects	K4
			C415.5	Examine ATAM and CBAM effectively in implementation of software projects	K3
	Software Project Management	15A05707	C416.1	Apply the concepts of Conventional Software Management Performances, models and Software Economics.	K3
			C416.2	Evaluate and improve the software processes to achieve required quality.	K5
			C416.3	Determine the concepts about principles of modern software management.	K3
			C416.4	Design and integrate life cycle phases and artifacts of various process model a software based architecture.	K3
			C416.5	Classify the process workflow, analyse about periodic status assessment, planning and project organization responsibilities and recognize about the project control and process	K4
Grid & Cloud Computing Laboratory	15A05710	C417.1	Design and Implement Simulation Program to Create Grid Resources, Users and allocation of Jobs using GRIDSIM	K4	
		C417.2	Develop Programs on Grid Computing using Globus Toolkit	K4	
		C417.3	Examine programs on Software as a Service (SaaS) of Cloud using www.zoho.com and docs.google.com	K3	
		C417.4	Develop programs on Platform as a Service (PaaS) of Cloud using Google App Engine and Microsoft Azure Cloud platforms	K5	
		C417.5	Case Study on different examples of Public Cloud Platforms and Hadoop System	K5	

YEAR/SEM OF STUDY	SUBJECT NAME	INTUA CODE	CO NUMBER	COURSE OUTCOMES	KNOWLEDGE LEVEL
			C418.1	Demonstrate the applications on mobile application development environment	K3
			C418.2	Evaluate mobile applications on handheld devices	K5
			C418.3	Develop various widgets in mobile applications	K3
			C418.4	Analyze mobile applications with various layouts	K4
			C418.5	Build mobile application along with Media	K6
			C418.6	Design and develop menus in mobile applications	K6
			C421.1	Demonstrate the implementation issues in LANS and PANS of wireless networks	K3
			C421.2	Differentiate various MAC Protocols usage in AdhocWireless Networks	K4
			C421.3	Examine various Routing and Security Protocols in Wireless Networks	K3
			C421.4	Classify QOS and Energy management in Wireless Networks	K4
			C421.5	Illustrate various Protocols in wireless Sensor Networks and their characteristics	K4
			C422.1	Demonstrate the application areas of IoT.	K3
			C422.2	Examine the revolution of Internet in Mobile Devices, Cloud & Sensor Networks.	K3
			C422.3	Compare and Contrast the use of Devices, Gateways and Data Management in IoT.	K4
			C422.4	Apply building blocks of Internet of Things and characteristics for data analysis.	K3
			C422.5	Illustrate the application of IoT in Industrial Automation and identify Real World Design Constraints.	K3
			C423.1	Demonstrate originality in the application of knowledge, together with a practical approach of established techniques	K3
			C423.2	Infer the students with the taxonomy and terminology of the computer Science and Engineering	K3
			C423.3	Analyze foundation knowledge in various subjects.	K4
			C423.4	Asses the students with sound skills to solve computational search problems.	K5
			C423.5	Examine of techniques applicable to their own area of professional practice.	K3
IV-II	Enabling Technologies for Data Science & Analytics : IoT	15A05805			
	Comprehensive Viva-Voce	15A05807			

YEAR/SEM OF STUDY	SUBJECT NAME	INTUA CODE	CO NUMBER	COURSE OUTCOMES	KNOWLEDGE LEVEL
	Technical Seminar	15A05808	C424.1	Collect, Organize & Analyse information about upcoming technologies /market Demands/current trends.	K4
			C424.2	Examine the use of effective communication skills, stage courage, and confidence	K3
			C424.3	Demonstrate intrapersonal skills	K3
			C424.4	Build in keeping with new innovations and inventions	K4
			C424.5	Develop skills in doing literature survey, technical presentation and report preparation	K4
	Project Work	15A05809	C425.1	Examine abstract preparatin for major project by identifying the requirements	K3
			C425.2	Collect the literature related to the project from various sources to analyse the project	K4
			C425.3	Design the Necessary modules of the project	K5
			C425.4	Choose efficient tools for project implementation	K5
			C425.5	Prepare project documentation as per given guidelines.	K4


IN-CHARGE


Head of Department
COMPUTER SCIENCE ENGINEERING
PES University Institute of Technology & Science
KAVAJI - 524 201,SPSR, Neelore Dt.



**PARVATHAREDDY BABUL REDDY
VISVODAYA INSTITUTE OF TECHNOLOGY & SCIENCE**
(Affiliated to J.N.T.U.A, Approved by AICTE and Accredited by NAAC with 'A' Grade)
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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

R15 BATCH COURSE OBJECTIVES (CO'S)

CODE	NAME OF THE COURSE	LEVEL
	Functional English	
C101	Compare Language nuances in humorous situations for better communication	K4
C101.1		
C101.2	Evaluate possibilities of applying science and technology for building a new state with its natural resources	K5
C101.3	Experimenting with the elixir properties of water and need for conservation	K4
C101.4	Sketch human relationships with situations and feelings needed accordingly	K3
C101.5	Dramatize a horrible incident to raise humanitarian values	K3
C102	Mathematics - I	
C102.1	Apply the linear D.E's Mechanical and Electrical Oscillatory circuits and Deflection of Beams	K3
C102.2	Study the functions of more than one independent variable and calculate partial derivatives along with their	K3
C102.3	To evaluate double and triple integrals with the continuous function of two or three variables over a bounded region	K4
C102.4	Applying the LAPLACE TRANSFORM to solve the ordinary D.E of first and second order	K3
C102.5	calculate line integral ,surface integral and volume integral and correlate them with the application of stokes, Greens	K5
C103	Computer programming	
C103.1	Demonstrate the programming terminology and implement various C-tokens & Input and Output statements to solve	K3
C103.2	Use various looping, branching statements and array implementations.	K3
C103.3	Illustrate different types of arrays and concept of strings.	K3
C103.4	Describe the way of accessing memory locations, necessity of modularity in programming and solve various data base	K2
C103.5	Apply DS techniques for linked list using c programming language.	K3

Engineering Physics		
C1041	Demonstrate the applications of Optics in both Scientific and Technological systems.	K3
C1042	Describe the properties of crystals along with Ultrasonic non destructive technique.	K2
C1043	Analyze the physical properties of materials through Quantum mechanics along with band theory.	K4
C1044	Apply the concepts of Semiconducting and magnetic materials to Engineering fields.	K3
C1045	Discuss the importance of Superconducting and Nano materials in various fields.	K2
C105	Engineering Drawing	
C1051	Drawing 2D and 3D diagrams of various objects.	K1
C1052	Learning conventions of Drawing, which is an Universal Language of Engineers.	K3
C1053	Drafting projections of points, planes and solids.	K3
C1054	Complete dimensions and details of object.	K2
C1055	Design a product and to understand the composition, which can be understood universally	K1
C106	English Language Comm. Skills Lab	
C1061	Identify on the production and practice of English sounds for effective use	K2
C1062	Recognize the effectiveness of Listening for interpreting specific information.	K3
C1063	Evaluate various channels for honing up of presentation skills	K5
C1064	Select learner friendly modes for effective communication in various context	K4
C1065	Demonstrate the fluency of speaking with clarity and confidence	K3
C107	Illustrate the basics of filters and their principles	K3
C1071	Engineering Physics Lab	
C1072	Analyze the importance of Interference & Diffraction of light	K4
C1073	Use Lasers & Fiber optics to measure various parameters	K3
C1074	Generate the magnetic field & study it's properties.	K5
C1075	Distinguish different types of titrations in the volumetric analysis	K4
C1076	Correlate the purity of water samples by doing Hardness, D.O, Acidity and alkalinity estimations	K4
C108	Computer Programming Lab	

C1081	Demonstrate different problem solving techniques to find solutions to	K2
C1082	Design and test programs to solve mathematical and scientific problems.	K3
C1083	Implement C language features with homogeneous data types.	K3
C1084	Implement modular programming functions	K3
C1085	Use simple linear data structures such as linked lists.	K3
C110	Mathematics-II	
C1101	Understanding different forms of matrices and define the nature of the quadratic forms.	K1
C1102	Utilize curve-fitting techniques for data representations and computation in engineering analysis.	K3
C1103	Derive numerical methods for various mathematical operations and algebraic transcendental equations	K3
C1104	Find the Fourier series, transformation representation of a one variable and Demonstrate their understanding of the	K2
C1105	Attain the knowledge of partial Differential equations and applying in Mechanical problems	K1
C111	English for professional communication	
C1111	Have acquired ability to participate effectively in group discussions	K2
C1112	Have acquired a proper level of competence for employability	K3
C1113	Have developed ability in writing in various contexts.	K3
C1114	Acquire structure and written expressions required for their profession	K3
C1115	Develop confidence in the students to use English in everyday situations	K3
C112	Engineering Chemistry	
C1121	Demonstrate the concepts consisting with electroplating and electroless plating methods	K3
C1122	Choose required monomer for the production of particular polymer	K3
C1123	Recognize different fuels	K2
C1124	Choose various Engineering materials for social need with justification	K3
C1125	Classify the Impure, potable and industrial water	K2
C116	Environmental Studies	
C1161	Identify the basic concepts of environment, different natural resources and their	K2
C1162	Choose an ability to reflect on their personal impacts on biodiversity in global	K3

CU1B3	Discriminate the various environmental problems	K4
CU1B4	Argue on social structure and how it influences on individual life and social	K5
CU1B5	Defend about the impact of population growth on the environment, both on	K5
CU1C	Electrical circuits-I	
CU1C1	Solve the various electric & magnetic circuits	K3
CU1C2	Analyze the 1ph. ac circuits, 3phase balanced and unbalanced ac circuits	K4
CU1C3	Analysis of electrical networks by graph theory, able to solve problems related to locus diagrams and resonance	K4
CU1C4	Apply network theorems to DC and AC circuits & able to calculate various parameters for given two port network	K3
CU1C5	Analyse the transient reponse of R-L, R-C, R-L-C circuits for D.C. and A.C. excitations , able to apply fourier series	K4
CU1C5	Engineering chemistry lab	
CU1C1	Demonstrate the concepts consisting with electroplating and electroless plating methods	K3
CU1C2	Choose required monomer for the production of particular polymer	K3
CU1C3	Recognize different fuels	K2
CU1C4	Choose various Engineering materials for social need with justification	K3
CU1C5	Classify the Impure , potable and industrial water	K2
CU1C6	Electrical circuits Lab	
CU1C61	Apply suitable theorems for circuit analysis and verify the results theoretically	K3
CU1C62	Experimental determination of two port network parameters and theoretical verification	K4
CU1C63	Measure active and reactive power experimentally and verify the theoretical values	K4
CU1C64	Experimentally determine self inductance, mutual inductance and coefficient of coupling	K3
CU1C65	Practically determine band width, Q-factor and verify with theoretical values.	K4
CU1C7	Engineering and IT Work Shop	
CU1C71	Discriminate the identification of internal parts of computer and its peripheral	K4
CU1C72	Identify the actual components for assembling pc back to normal condition	K2
CU1C73	Installation of Linux and Windows XP os and connected to network.	K3
CU1C74	Identify and use of various tools in different trades of Engineering workshop	K4

prepare different models in different trades of engineering workshop

Mathematics – III

C201.5			K4
C201			
C201.1	Apply knowledge to analysis the problems using the methods of special functions		K3
C201.2	Apply knowledge to analysis the problems using the methods of special functions(Bessel functions, Legendre polynom		K3
C201.3	Identify the analytic function, harmonic function, orthogonal trajectories		K3
C201.4	Apply bilinear transformations and conformal mappings		K3
C201.5	applications of complex integration and complex power series.		K3
C201.6	Applications of theorems and evaluate the contour integrals.		K3
C202	Electrical circuits-II		
C202.1	Solve the various electric & magnetic circuits		K3
C202.2	Analyze the 1ph. ac circuits, 3phase balanced and unbalanced ac circuits		K4
C202.3	Analysis of electrical networks by graph theory, able to solve problems related to locus diagrams and resonance		K4
C202.4	Apply network theorems to DC and AC circuits & able to calculate various parameters for given two port network		K3
C202.5	Analyse the transient reponse of R-L, R-C, R-L-C circuits for D.C. and A.C. excitations , able to apply fourier series		K4
C203	Electrical Machines - I		
C203.1	Demonstrate Principles of electromechanical energy conversion		K3
C203.2	construction of a dc machine analyse the phenomena of armature reaction and commutation		K4
C203.3	Sketch various characteristics of dc machines and list out its ApplicationsCalculate the e.m.f. generated and torque		K4
C203.4	Select suitable method and conditions for obtaining the required speed of DC motor and protection equipment		K4
C203.5	Calculate the losses and efficiency of DC generators and motors		K4
C204	Control Systems Engineering		
C204.1	Express the basic elements and structures of feedback control systems.		K2
C204.2	Examine the time response and steady state response of various inputs.		K4
C204.3	Apply Routh-Hurwitz criterion and Root Locus of the linear time-invariant systems .		K3
C204.4	Analyse the frequency response and various compensators.		K4
C204.5	Analyse state space models and state transition matrix.		K4

	Electronic Devices and Circuits	
C2051	Discuss about semiconductor physic for intrinsic and extrinsic semiconductors	K2
C2052	Describe different materials used for an electronic device and describe the characteristics of various diodes	K2
C2053	Describe the working of Rectifiers and Filters.	K2
C2054	Illustrate various characteristics of BJT, JFET and MOSFET.	K3
C2055	Design biasing Techniques for a transistor, FET and perform DC Analysis.	K5
C2056	Perform AC Analysis of a BJT and FET using small signal model.	K4
C206	Data Structures	
C2061	Understand different Data Structures	K3
C2062	Understand Searching and Sorting techniques	K4
C2063	Merging Unorder Files	K4
C2064	Sorting by selection	K4
C2065	Application of Graph Structures	K4
C207	Electric Circuits & Simulation Lab	
C2071	Analyzing Network theorems for Electrical circuits	K4
C2072	Develop Locus diagrams from practical results	K5
C2073	Examine resonance phenomenon experimentally	K4
C2074	Calculate and verify 2-port network parameters	K4
C2075	Measure active and reactive powers in 3-phase circuits	K6
C2076	Use SIMULINK software for Electric circuits' analysis	K4
C208	Electric devices and circuits laboratory	
C2081	Discuss about semiconductor physic for intrinsic and extrinsic semiconductors	K2
C2082	Describe different materials used for an electronic device and describe the characteristics of various diodes	K2
C2083	Describe the working of Rectifiers and Filters.	K2
C2084	Illustrate various characteristics of BJT, JFET and MOSFET.	K3
C2085	Design biasing Techniques for a transistor, FET and perform DC Analysis.	K5

C210.6	Perform AC Analysis of a BJT and FET using small signal model.		K4
C210	Mathematics-IV		
C210.1	The student achieves the knowledge to analyse the problems using the methods of special functions and complex		K4
C210.2	Complex integration		K4
C210.3	Conformal mapping		K4
C210.4	Functions of a complex variable		K4
C210.5	Evaluation of improper integrals		K3
C211	Managerial Economics and Financial Analysis		
C211.1	Explain basic postulates of Boolean algebra and the methods for simplifying Boolean expressions.		K2
C211.2	Simplify the Boolean expressions using K-map and Tabular method.		K3
C211.3	Design and explain different combinational circuits		K5
C211.4	Explain different Flip-Flops.		K2
C211.5	Design and explain different Sequential circuits.		K5
C211.6	Design different combinational circuits using PLDs.		K5
C212	Electrical Machines -II		
C212.1	Draw the equivalent circuit of transformer		K5
C212.2	Conduct O.C, S.C tests and predetermine the regulation and efficiency of transformer		K4
C212.3	Compute the load shared by each transformer when several transformers operate in parallel		K4
C212.4	Draw the circle diagram of a three phase Induction motor and predetermine the performance characteristics		K5
C212.5	Determine the starting torque, maximum torque, slip at maximum torque using given data		K5
C212.6			
C213	Electrical Power Generating Systems		
C213.1	Describe the working of thermal power station (TPS) using single line diagram.		K2
C213.2	Classify the various Non Renewable Energy sources		K2
C213.3	Sketch I-V characteristics and performance analysis of Solar cell/module/Array modelling.		K3
C213.4	Identify various components of Wind Energy Conversion system.		K2

C213.5	Illustrate the various principles of bio conversion systems.	K2
C213.6	Explain various components of Ocean Energy Conversion system.	K2
C213.7	Calculate various costs in power generation & different types of Tariffs.	K4
C213	Electromagnetic fields	
C214.1	Analyze electrostatics with different electric charge conditions	K4
C214.2	Distinguish behavior of conductor and insulator with electrical charges	K4
C214.3	Discriminate characteristics of static magnetic fields due to various electrical quantities	K4
C214.4	Outline various magnetic potentials with electrical and magnetic parameters	K4
C214.5	Predict time varying electric and magnetic fields along with wave propagation	K3
C215	Analog Electronic circuits	
C215.1	Design simple amplifier circuits using different methods of biasing transistors	K5
C215.2	Analyze mid band analysis of amplifier circuits using small signal equivalent circuits to determine gain, input	K4
C215.3	Calculate the cut off frequencies to determine bandwidth	K4
C215.4	Design different oscillator circuits	K5
C215.5	Design circuits for linear wave shaping and Multi vibrators	K5
C216	Electrical Machines Lab -I	
C216.1	experiments to obtain the no-load and load characteristics of D.C. Generators	K4
C216.2	experiments to tests on D.C. motors for predetermination of efficiency	K4
C216.3	experiments to tests on D.C. motors for determination of efficiency	K4
C216.4	Control the speed of D.C. motor in a given range using appropriate method	K4
C216.5	Identify the reason as to why D.C. Generator is not building up voltage	K5
C217	Control Systems and Simulation Lab	
C217.1	Ability to formulate transfer function for given control system problems.	K5
C217.2	Ability to examine time response of given control system model.	K4
C217.3	Ability to draw Root Locus and Bode plots for given control system model	K5
C217.4	Ability to design Lead, Lag, Lead-Lag systems in control systems	K5

C217.5	Ability to design PID controllers for given control system model	K5
C217.6	Use MATLAB/SIMULINK software for control system analysis and design.	K3
C218	Comprehensive Online Examination I	
C218.1	Evaluate the subject performance of student	K5
C218.2	Recognise the knowledge level of student	K3
C218.3	Develop the student to face competitive examinations	K5
C218.4	Illustrate the nature of conducting on-line examinations to the students	K3
C218.5	Describe the ability of a student awareness on On-line examinations	K2
C301	Electrical & Electronic Measuring Instruments	
C301.1	The basic principles of different types of electrical instruments for the Measurement of voltage, current, power factor, power and	K2
C301.2	Determine the R, L and C values using suitable bridges	K2
C301.3	Analyze the different characteristic features of periodic, and aperiodic signals using CRO.	K3
C301.4	The principles of magnetic measurements	K3
C301.5	Use CTs and PTs for measurement of very large currents and high voltages	K2
C302	Linear & Digital IC Applications	
C302.1	Classify the basic building blocks of linear integrated circuits and its characteristics	K2
C302.2	Analyze the linear, non-linear and specialized applications of operational amplifiers	K3
C302.3	Clarify the theory of DAC and ADC	K2
C302.4	Design and prototype with standard cell technology and programmable logic	K5
C302.5	Design tests for digital logic circuits and for testability	K5
C303	Electrical Power Transmission Systems	
C303.1	Calculate the transmission line parameters.	K4
C303.2	Develop Models a given transmission line.	K5
C303.3	Calculate the performance of a given transmission line.	K4
C303.4	Analyze the effect of over voltages on transmission lines.	K4
C303.5	Explain the construction, types and grading of underground cables	K2

C303.6	Analyze cable performance.		K4
C304		Power Electronics	
C304.1	Able to demonstrate the characteristics of various powersemiconductor devices		K3
C304.2	Analyse the performance of half wave, full wave, half controlled and fully controlled 1- Φ and 3- Φ bridge rectifiers for		K4
C304.3	Differentiate the step up & step down chopper operation for various types of loads		K4
C304.4	Apply learnt principles of operation of 1phase & 3phase Inverters, pulse width modulation control techniques, modes		K3
C304.5	Able to explain the operation of TRIAC, AC voltage controllers & Cycloconverters		K2
C305		Electrical Machines – III	
C305.1	Explain the structure of synchronous machines and design the various windings.		K2
C305.2	Calculate the regulation of alternators using different methods.		K4
C305.3	Develop power flow equations of both salient pole and non salient pole type alternators.		K5
C305.4	Analyze the performance characteristics of synchronous motors.		K4
C305.5	Identify different types of induction and special machines		K2
C306		Networks signals and systems	
C306.1	Given network, find the equivalent impedance by the concept of two port network		K2
C306.2	Analyse the frequency response of electrical network using Laplace transform		K4
C306.3	Apply concepts of Fourier series to simplify the electrical network		K5
C306.4	Synthesize the network using network functions		K4
C306.5	Study of graph theory and analysis of electrical networks		K2
C307		Electrical Machines Lab – II	
C307.1	Choose a suitable measuring instrument such as voltmeter, ammeter and watt-meter for a given application.		K6
C307.2	Analyze the characteristics of electrical machines like transformers, Induction Motors, Alternators and Synchronous		K4
C307.3	Test the performance of 1-Ph transformer and 3-Ph Induction Motors using direct and indirect methods.		K4
C307.4	Estimate the rating of Fuses, transformers, induction motors and synchronous machines.		K6
C307.5	Develop the equivalent circuits of 1-Ph Induction Motor and 1-Ph Transformer.		K5
C308		Electrical Measurements Lab	

C308.1	Calibrate various electrical measuring/recording instruments.	K6
C308.2	Accurately determine the values of inductance and capacitance using a.c bridges	K4
C308.3	Accurately determine the values of very low resistances	K4
C308.4	Measure reactive power in 3-phase circuit using single wattmeter	K6
C308.5	Determine ratio error and phase angle error of CT	K5
C309	Human Values & Professional Ethics (Audit course)	
C309.1	Apply the concepts of Kohlbergs and Gilligains theory in Engineering Ethics	K3
C309.2	Describing the various codes of Ethics in Engineering fields	K2
C309.3	Applications of Engineering to the context of safety and risk	K3
C309.4	Analysis of risk and benefits in Engineering research	K4
C309.5	Demonstrate the the knowledge of professional rights and managerial risks	k3
C309.6	Application of Ethical principles in multinational corporations	k3
C310	Management science	
C310.1	Define management concepts	K1
C310.2	Explain varies types of management principles	K2
C310.3	Compare different organization structures	K6
C310.4	Analyze varies net work techniques	K4
C310.5	Discuss varies strategic management concepts	K2
C311	Power Semiconductor Drives	
C311.1	Identify the choice of the electric drive system based on their applications	K2
C311.2	Illustrate the operation of single and multi quadrant electric drives	K3
C311.3	Analyze single phase and three phase rectifiers fed DC motors as well as chopper fed DC motors	K4
C311.4	Illustrate the speed control methods for AC-AC & DC-AC converters fed to Induction motors with closed loop, and	K3
C311.5	Explain the speed control methods of Synchronous motors with closed loop, and open loop operations.	K2
C312	Power System Protection	
C312.1	Illustrate the various protective relays that are employed for electrical power system protection	K3

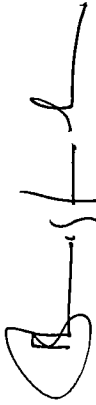
C312.2	Explain and estimate protection of generator, transformer and their required ratio under fault occurrence	K2
C312.3	Report the use of relays in protecting feeders, lines and bus bars	K2
C312.4	Solve different methods of testing circuit breakers	K3
C312.5	Outline how to protect the electrical power system from over voltages	K4
C313	Microprocessors and Microcontrollers	
C313.1		K2
C313.2	Classify various 8086 instruction set and assembler directivities	K5
C313.3	Illustrate how the different peripherals are interfaced with Microprocessor.	K3
C313.4	Calculate power factor improvement for a given system and load	K3
C313.5	Discuss the architecture of 8051 MICROCONTROLLER	K4
C314	Power System Analysis	
C314.1	Formulation of the Z bus and Y bus of a given power system network	K5
C314.2	Make fault calculations for various types of faults	K4
C314.3	Conduct load flow studies on a given power system network	K3
C314.4	Determine steady state stability power limit	K3
C314.5	Determine the transient stability by equal area criterion	K3
C316	Programmable logic controllers and its Applications	
C316.1	Program a PLC for a given application	K5
C316.2	Implement Ladder logic for various Industrial applications	K4
C316.3	Design control circuits for various applications	K3
C316.4	Understanding PLC logic oprations	K3
C316.5	studying PLC basic archetecture and opration	K3
C317	Microprocessors and Microcontrollers Laboratory	
C317.1	Write programs to run on 8086 microprocessor based systems. And also using MASM/TASM.	K5
C317.2	Design system using memory chips and peripheral chips for 16 bit 8086 microprocessor.	K5
C317.3	Design circuits for various applications using microcontrollers	K5

C317.4	Apply knowledge of the concepts on real- time applications	K3
C317.5	Design interfacing circuits of various devices with the microprocessor and microcontroller.	K5
C318	Power Electronics and Simulation Laboratory	
C318.1	Test the turn on –turn off characteristics of various power electronic devices.	K4
C318.2	Propose appropriate forced commutation techniques for SCRs	K5
C318.3	Differentiate characteristics of voltage controllers and converters with R and RL loads	K4
C318.4	Construct different types of single-phase Inverters with R and RL loads	K5
C318.5	Assess various 3-phase and single-phase converters using P-SPICE software	K5
C319	Advanced English Communication Skills Lab (Audit Course)	
C319.1	Identify on the production and practice of English sounds for effective use	K2
C319.2	Recognize the effectiveness of Listening for interpreting specific information.	K3
C319.3	Evaluate various channels for honing up of presentation skills	K5
C319.4	Select learner friendly modes for effective communication in various context	K4
C319.5	Demonstrate the fluency of speaking with clarity and confidence	K3
C320	Comprehensive Online Examination-II	
C320.1	Evaluate the subject performance of student	K5
C320.2	Recognise the knowledge level of student	K3
C320.3	Develop the student to face competitive examinations	K5
C320.4	Illustrate the nature of conducting on-line examinations to the students	K3
C320.5	Describe the ability of a student awareness on On-line examinations	K2
C401	Electrical Distribution Systems	
C401.1	Analyze the various factors associated with power distribution	K4
C401.2	Describe various A.C and D.C electrical distribution systems	K2
C401.3	Illustrate principles of substation maintenance and bus bar arrangements	K3
C401.4	Calculate power factor improvement for a given system and load	K4
C401.5	Explain the Implementation of SCADA for distribution automation	K2

Digital Signal Processing		
C402	Analyze digital and analog signals and systems	K4
C402.1	Design digital signal processing algorithms	K5
C402.2	Analyze the FIR and IIR filters to obtain their frequency response	K4
C402.3	Clarify the relationship between poles, zeros and stability and determine the spectrum of a signal using DFT, FFT	K5
C402.4	Design various digital and analog filters	K5
C403	Power System Operation and Control	
C403.1	Express economic operation of power system by posing different problem models	K2
C403.2	Discuss about thermal and hydro power plant operation in meeting the load	K2
C403.3	Analyse the mathematical models of turbine and governors	K4
C403.4	Discuss the load frequency control problem (Single area & Two area LFC)	K2
C403.5	Explain how shunt and series compensation helps in reactive power control	K2
C404	Utilization of Electrical Energy	
C404.1	Choose a lighting scheme for agiven practical scheme	K3
C404.2	Explain the performance of heating, welding methods, illumination schemes anelectric traction	K2
C404.3	Solve all numerical calculations associated with electric traction	K3
C404.4	Discuss technical knowledge of various control devices & their use in practical world	K2
C404.5	Analyse the economic aspects in utilisation of electrical energy	K4
C405	Energy Auditing & Demand Side Management	
C405.1	Understand and digest: energy is an important part of our lives. Using it effectively is critical to extending world	K2
C405.2	Describe different levels of energy audits (surveys, walk through, comprehensive) and when they might be used	K2
C405.3	Summarize, prioritize, and recommend energy saving ideas for implementation	K3
C405.4	Write and present an energy audit report	K3
C405.5	Understand the challenges facing in the implementation of demand side management techniques	K2
C406	Power Quality	
C406.1	Address power quality issues to ensure meeting of standards	K3

C406.2	Apply the concepts of compensation for sags and swells using voltage regulating devices	K3
C406.3	Assess harmonic distortion and its mitigation.	K4
C406.4	Explain the power measurement data according to standards	K4
C406.5	Using power quality enhancement devices	K3
C407	Digital Signal Processing laboratory	
C407.1	Formulate engineering problems in terms of DSP tasks.	K4
C407.2	Apply engineering problems solving strategies to DSP problems.	K5
C407.3	Design and test DSP algorithms.	K5
C407.4	Analyze digital and analog signals and systems, Analyze and compare different signal processing strategies	K4
C407.5	Encode information into signals, Design and simulate digital filters	K5
C408	Power Systems and Simulation Lab	
C408.1	Experimental determination of sequence impedance and sub transient reactance's of synchronous machine	K4
C408.2	Analyze the LG, LL, LLLG faults of three phase alternator by conducting suitable experiments	K4
C408.3	Examine the equivalent circuit of three winding transformer by conducting a suitable experiment.	K4
C408.4	Develop the MATLAB program for formation of Y and Z buses	K5
C408.5	Develop the MATLAB programs for Gauss-seidel and fast decoupled load flow studies.	K5
C410	Instrumentation	
C410.1	Classify the errors occurring in measurement systems	K2
C410.2	Summarize Characteristics of signals, their representation	K2
C410.3	Differentiate among the types of data transmission and modulation techniques	K3
C410.4	Analyze various digital techniques to measure variable electrical quantities	K4
C410.5	Employ suitable transducers for the measurement of non-electrical quantities	K3
C411	HVDC Transmission	
C411.1	Compare HVDC and HVAC transmission systems	K2
C411.2	Summarize various Types of DC Links in Electrical Power Transmission	K2
C411.3	Demonstrate the operation of various converters used in HVDC transmission systems and their control methods	K3

C4114	Analyze various types harmonics and its elimination methods with various filters	K4
C4115	Employ suitable protection schemes for faults in HVDC systems	K3
C412	Comprehensive Viva Voce	
C412.1	Evaluate the subject performance of student	K5
C412.2	Recognise the knowledge level of student	K3
C412.3	Develop the student to face competitive examinations	K5
C412.4	Illustrate the nature of conducting competitive examinations to the students	K3
C412.5	Describe the ability of a student aware of entire subject knowledge	K2
C413	Technical Seminar	
C413.1	Estimate the communication skills standard of the student	K4
C413.2	Describe the vocabulary, speaking and presentation skills of the student.	K4
C413.3	Test the technical knowledge of the student	K4
C413.4	Outline the presentation and body language of the student	K2
C413.5	Construct the person in such way that, to meet corporate needs and demands in society	K5
C414	Project Work	
C414.1	Demonstrate a sound technical knowledge of their selected project topic	K2
C414.2	Identification of problem, formulation and solution	K2
C414.3	Assess the engineering project	K5
C414.4	Design engineering solutions to the complex problems utilising a systems approach	K6
C414.5	Demonstrate the knowledge, skills and attitudes of a professional engineer.	K2



HEAD OF THE DEPARTMENT
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ELECTRICAL & ELECTRONICS ENGINEERING
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**PARVATHAREDDY BABUL REDDY
VISVODAYA INSTITUTE OF TECHNOLOGY & SCIENCE**



(Affiliated to J.N.T.U.A, Approved by AICTE and Accredited by NAAC with 'A' Grade)

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DEPARTMENT OF BUSINESS ADMINISTRATION

2017 ADMITTED BATCH COURSE-PO/PSO MAPPING

SUBJECT NAME	SUBJECT CODE	COURSE OUTCOMES	PROGRAM OUTCOMES				
Management & Organizational Behaviour	17E00101	Understand various managerial skills, roles, functions and levels	3	3	1		2
		Identifying various motivators through the knowledge of theories of motivation	2	1	2		
		Identifying various leadership styles and their suitability to the situation	3	2		2	
		Relate with the historical growth, factors and model of Organizational Behavior	3	2	2	2	
		Understand the determinants and various theories of personality development	2	2			
Business Environment & Law	17E00102	Understand Legal Aspects of Business with respect to Indian economy.	1	1	3		1
		Relate various legal provisions to relevant business aspects and situations		2	3		2
		Assess Business Environment in India		1	3		1
		Appraise Globalization trends a, challenges and environment for foreign trade and investments		2	3		2
		Familiarize with the requisites to be complied with in framing a valid contract	1		3		1
Managerial Economics	17E00103	Familiarize the students about managerial economics Practices			2		1
		Identification of different demand situations and critical variables determining the demand			1		
		Learning the production function and pricing practices.					1
		Awareness about market structure and price determination under different market situations					3
		Awareness about business cycles among the students		2	2		3
Financial Accounting for Managers	17E00104	Awareness about book keeping and accounting	1				3
		Know the process of accounting from the primary entry to the final statement		1			3
		Gain the knowledge on different accounting standards which were given by the					3
		Understand the application of different analytical tools like ratio analysis, cash flow statement & funds flow statement to evaluate			1		3
		Understand how to calculate about the value of Inventory, Goodwill, Depreciation .	1				3
Statistics for Managers	17E00105	Familiarize the students with the statistical techniques popularly used in managerial decision making.	3		1		
		Develop the computational skill of the students relevant for statistical analysis.		2			
		Familiarize the students for using various hypothesis testing measures.				1	1
		Awareness among students about various non parametric measures.	1				1

		Familiarize the students with the use of correlation and regression analysis in research.					1
Management Information Systems	17E00106	Provide the basic concepts of systems concepts and Management of Information System and utility of the systems for the managerial	2			3	
		Identify the process of decision making at different management levels in an organization.	2	2		2	
		Understand importance and need of Management Information System in monitoring and controlling the business transactions.				2	2
		Examine the role of different decision support systems in achieving strategic advantage.				3	
Information Technology for Managers	17E00107	Familiarize the student in information technology and their applications to business processes.		2		2	2
		Recognize different components of Information Technology.		2		1	2
		Understand E-commerce models used in a business.				1	2
		Analyze impact of E-banking on the business.				1	2
		Understand the need for Computer Security & Security Mechanisms					
		Understand the need for Computer Security & Security Mechanisms		2		1	2
Communication Lab	17E00108	Students need to prepare themselves for their careers which may require them to listen, to read, speak and write in English both for	1	2	2	3	
		Familiarize students on application of phonetics.	2			3	
		Improving listening skills among the students.		1		3	
		Improving reading and writing abilities of the students	2		1	3	
		Familiarize the students with presentation skills and interview techniques.		2		3	
Data Analytics Lab	17E00109	Understanding the applications of information technology and hands on experience to students in using computers for data organization	1	2		2	
		Familiarize the students with Microsoft word	2	1		1	
		Familiarize the students with Microsoft Power Point	2	1		2	
		Understanding about various functions in MS Excel	1	2		2	
		Computing regression, correlation, ANOVA, T-test and Z-test.	1			1	
Human Resource Management	17E00201	Understand the concept, objectives and changing role of HRM.	2	1			3
		Describe the objectives, benefits and process of HRD.	2	3	2		3
		Understand procurement process that includes; HRP, factors affecting Recruitment sources, selection process and placement.	2	3			3
		Differentiate training and development and understand methods of training.	2	3			3
		Analyze the need and problems of performance appraisal	1	2		1	3
Marketing Management	17E00202	Familiarize students with marketing, and its concepts	2			1	3
		Acquaint with new marketing trends and the marketing environment		1			3
		Knowledge about various components of the marketing mix.	2			2	3
		Work independently and collaboratively in inter and multidisciplinary and diverse environments.		1			3