Department of Electrical and Electronics Engineering

Faculty and students are aware of the stated Programme and course outcomes of the Programmes

To create awareness about **Programme and course outcomes** of the department, it has been published and disseminated among the stake holders.

The extent of student awareness about the POs and COs and their actual performance reflecting these would be the real indicators of success or outcome of the programme. In this regard our Institution has taken certain measures to educate and to create the awareness about the program outcomes and course outcomes among the faculty members and students.

Stakeholder	Purpose
Faculty	Implementer (Contributor) of Policies. Key contributor in developing/implementing growth Plan. Responsible for producing competent graduates/product of the Institution.
Student	Product of the Institution, responsible for creating Image of the institution while serving the society.

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Dr. PARTHASARATHY E.
Professor and HOD
Dept. of Electrical & Electronics Engineering
ATME College of Engineering, Mysuru

Department of Electrical and Electronics Engineering

Programme and Course Outcomes Dissemination

SL.No.	Particulars	Programme Outcomes	Course Outcomes
1.	College Website	✓	✓
2.	Corridors	✓	✓
3.	Notes & Lab Manual	✓	✓
4.	Course Module, Lesson Plan	--	✓
5.	IA Question Paper	--	✓
6.	Classroom, Seminar Hall, Laboratory	✓	--
7.	Faculty Office, Dept. Office	✓	--
8.	Magazine	✓	--
9.	College Enterprise Resource Planning(CERP) Portal	✓	--
10.	Student Handbook	✓	✓
11.	Faculty Handbook	✓	✓
12.	Flipped Classroom(Mail) through CERP/MS Teams	--	✓

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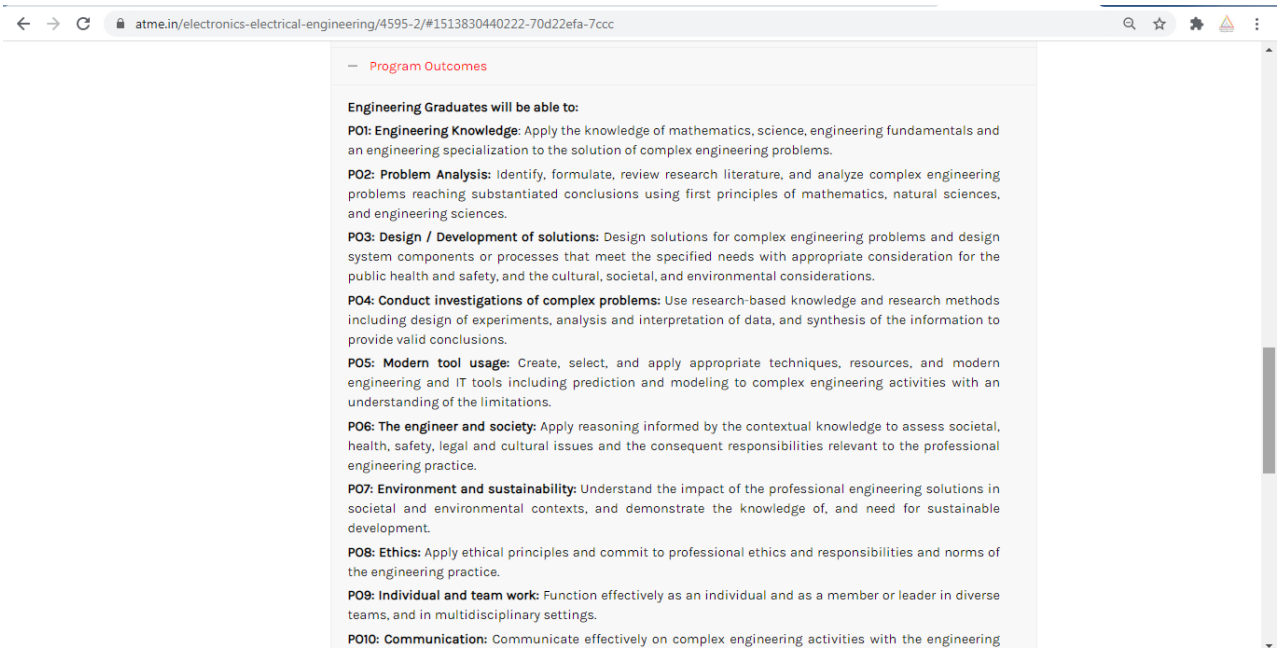
A. College Website Dissemination

Link : https://atme.in/electronics-electrical-engineering/4595-2/#1513830440222-70d22efa-7ccc



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Program Outcomes

Engineering Graduates will be able to:

PO1: Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.

PO2: Problem Analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3: Design / Development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work: Function effectively as an individual and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10: Communication: Communicate effectively on complex engineering activities with the engineering

http://atme.in/electronics-electrical-engineering/resources/

E & E

About The Department
Infrastructure
Faculty Details
Student Learning Centric
Achievements
Research Initiatives
Industry Interface
Placement & Higher Studies
Co-curricular & Extracurricular Activities
Teachers Teaching Analysis
Counselling Module
E News Letter

Academic Year - 2020-2021

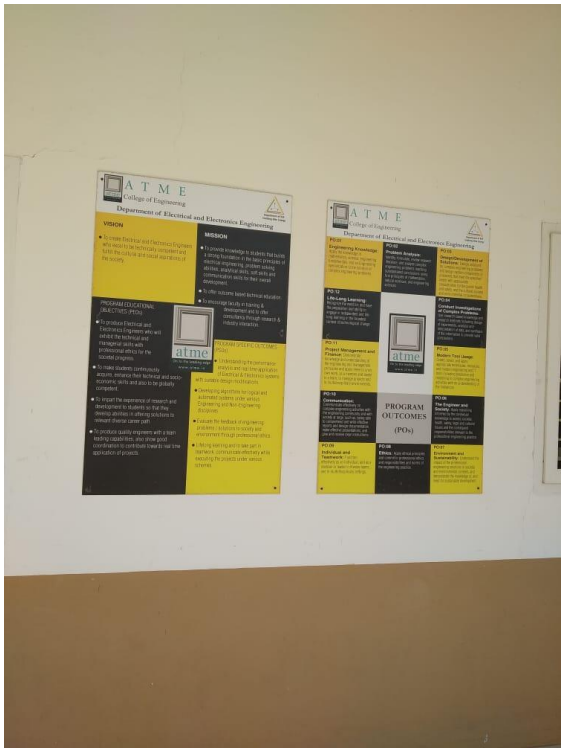
List of Subjects-EEE			
		3RD SEMESTER SUBJECTS	
Sl. No.	Subject/Lab Code	Subject/ Lab Name	Course Coordinator
1	18MAT31	TRANSFORM CALCULUS, FOURIER SERIES AND NUMERICAL TECHNIQUES	Mrs Divya K
2	18EE32	ELECTRIC CIRCUIT ANALYSIS	Mrs Lakshmi K
3	18EE33	TRANSFORMERS AND GENERATORS	Mrs Maria Sushma
4	18EE34	ANALOG ELECTRONIC CIRCUITS	Mr Rajesh K S
5	18EE35	DIGITAL SYSTEM DESIGN	Ms Swapna H
6	18EE36	ELECTRICAL AND ELECTRONIC MEASUREMENTS	Mr Sathish K R
7	18 EE L37	ELECTRICAL MACHINES LABORATORY -1	Mrs Maria Sushma
8	18 EE L38	ELECTRONICS LABORATORY	Mr Rajesh K S
9	18KVK39/49	VYAVAHARIKA KANNADA (KANNADA FOR COMMUNICATION)/	Mr Nandeesh
		5TH SEMESTER SUBJECTS	
Sl. No.	Subject/Lab Code	Subject/ Lab Name	Course Coordinator
1	18 EE51	MANAGEMENT AND ENTREPRENEURSHIP	Mr Vinod Kumar P
2	18 EE52	MICROCONTROLLER	Mr Shreeshayana R
3	18 EE53	POWER ELECTRONICS	Mr Sathish K R
4	18 EE54	SIGNALS AND SYSTEMS	Ms Swapna H
5	18 EE55	ELECTRICAL MACHINE DESIGN	Dr Parthasarathy L
6	18 EE56	HIGH VOLTAGE ENGINEERING	Mr Praveen Kumar
7	18 EEL57	MICROCONTROLLER LABORATORY	Mr Shreeshayana R
8	18 EEL58	POWER ELECTRONICS LABORATORY	Mr Sathish K R

Department of Electrical and Electronics Engineering

atme.in/electronics-electrical-engineering/resources/

Course Details & Content								
3rd Semester								
Sl. No.	Subject/Lab Code	Subject/ Lab Name	Course Coordinator	CM	LP	NOTES / HANDOUT / LABMANUAL	PPT	IA Scheme
1	18MAT31	TRANSFORM CALCULUS, FOURIER SERIES AND NUMERICAL TECHNIQUES	Mrs Divya K	CLICK	CLICK	CLICK	CLICK	CLICK
2	18EE32	ELECTRIC CIRCUIT ANALYSIS	Mrs Lakshmi K	CLICK	CLICK	CLICK	CLICK	CLICK
3	18EE33	TRANSFORMERS AND GENERATORS	Mrs Maria Sushma	CLICK	CLICK	CLICK	CLICK	CLICK
4	18EE34	ANALOG ELECTRONIC CIRCUITS	Mr Rajesh K S	CLICK	CLICK	CLICK	CLICK	CLICK
5	18EE35	DIGITAL SYSTEM DESIGN	Ms Swapna H	CLICK	CLICK	CLICK	CLICK	CLICK
6	18EE36	ELECTRICAL AND ELECTRONIC MEASUREMENTS	Mr Sathish K R	CLICK	CLICK	CLICK	CLICK	CLICK
7	18 EE L37	ELECTRICAL MACHINES LABORATORY -1	Mrs Maria Sushma	CLICK	CLICK	CLICK	CLICK	CLICK
8	18 EE L38	ELECTRONICS LABORATORY	Mr Rajesh K S	CLICK	CLICK	CLICK	CLICK	CLICK
5th Semester								
Sl. No.	Subject/Lab Code	Subject/ Lab Name	Course Coordinator	CM	LP	NOTES / HANDOUT / LABMANUAL	PPT	IA Scheme
1	18 EE51	MANAGEMENT AND ENTREPRENEURSHIP	Mr Vinod Kumar P	CLICK	CLICK	CLICK	CLICK	CLICK
2	18 EE52	MICROCONTROLLER	Mr Shreeshayana R	CLICK	CLICK	CLICK	CLICK	CLICK
3	18 EE53	POWER ELECTRONICS	Mr Sathish K R	CLICK	CLICK	CLICK	CLICK	CLICK
4	18 EE54	SIGNALS AND SYSTEMS	Ms Swapna H	CLICK	CLICK	CLICK	CLICK	CLICK
5	18 EE55	ELECTRICAL MACHINE DESIGN	Dr Parthasarathy L	CLICK	CLICK	CLICK	CLICK	CLICK
6	18 EE56	HIGH VOLTAGE ENGINEERING	Mr Praveen Kumar	CLICK	CLICK	CLICK	CLICK	CLICK

B. Department Corridor



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C. Notes, Lab Manual, Course Module, Lesson Plan

NOTES SAMPLE

ATME COLLEGE OF ENGINEERING

13th KM Stone,Mysuru- Kanakapura-Bengaluru Road, Mysuru- 560 028

ATME College of Engineering

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

(ACADEMIC YEAR 2020-2021)

NOTES

Prepared By: Mr.Shreeshayana R
Assistant Professor

COURSE: HIGH VOLTAGE ENGINEERING
COURSE CODE: 17EE73
SEMESTER: VII

Vision & Mission of ATME College of Engineering

Vision

Development of academically excellent, culturally vibrant, socially responsible and globally competent human resources.

Mission

- To keep pace with advancements in knowledge and make the students competitive and capable at the global level.
- To create an environment for the students to acquire the right physical, intellectual, emotional and moral foundations and shine as torchbearers of tomorrow's society.
- To strive to attain ever-higher benchmarks of educational excellence.

Vision & Mission of Department of Electrical & Electronics Engineering

Vision of the Department

To create Electrical and Electronics Engineers who excel to be technically competent and fulfill the cultural and social aspirations of the society.

Mission of the Department

- To provide knowledge to students that builds a strong foundation in the basic principles of electrical engineering, problem solving abilities, analytical skills, soft skills and communication skills for their overall development.
- To offer outcome based technical education.
- To encourage faculty in training & development and to offer consultancy through research & industry interaction.

Course Outcomes:

At the end of the course the student will be able to:

CO-1: Interpret the conduction and breakdown phenomenon in dielectrics. (L2) **Module 1**
CO-2: Apply the principles of generation of high voltage, currents and Impulse voltages. (L2) **Module 2**
CO-3: Apply measurement techniques for High Voltage, current and Impulse voltages. (L3) Module 3
CO-4: Interpret overvoltage phenomenon and insulation coordination in electric power systems. (L2) **Module 4**
CO-5: Solve the dielectric properties and interpret the testing methods of surge arrestors and switchgear. (L3) **Module 5**

PROGRAMME OUTCOMES:

Engineering Graduates will be able to:

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PO4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of EXPERIMENTs, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

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PO9. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes (PSO's)

Graduates will develop the abilities to:

PSO1: Apply the concepts of Electrical & Electronics Engineering to evaluate the performance of power systems and also to control industrial drives using power electronics.

PSO2: Demonstrate the concepts of process control for Industrial Automation, design models for environmental and social concerns and also exhibit continuous self- learning.

Department of Electrical and Electronics Engineering

LAB MANUAL SAMPLE

ATME COLLEGE OF ENGINEERING

13th KM Stone,Mysuru- Kanakapura-Bengaluru Road, Mysuru- 560 028

ATME College of Engineering

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

(ACADEMIC YEAR 2020-2021)

LABORATORY MANUAL

Prepared By: Mr.Shreeshayana R
Assistant Professor
Instructor: Mr.Somashekar M

SUBJECT: MICROCONTROLLERS LABORATORY
SUB CODE: 18EEL57
SEMESTER: V

Course Outcomes:

At the end of the course the student will be able to:

CO-1: Evaluate the output for data transfer, arithmetic, Boolean, logical instructions using Assembly Language Programming. **L5 Expt. 1, 2, 4**

CO-2: Evaluate the output for code conversions using Assembly Language Programming **L5 Expt 6**

CO-3: Evaluate the output for subroutines for generation of delays, counters, configuration of SFRs, serial communication and timers using Assembly Language Programming. **L5 Expt 3,5,7**

CO-4: Evaluate the interfacing of PMDC motors using C programming. **L5 Expt.8,9**

CO-5: Evaluate the interfacing of ADC, Elevator(Board Simulator) and LCD using C Programming. **L5 Expt.10,12,13**

CO-6: Evaluate different waveforms using DAC interface. **L5 Expt.11**

PROGRAMME OUTCOMES:

Engineering Graduates will be able to:

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PO2. Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

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Department of Electrical and Electronics Engineering

COURSE MODULE

ATME College of Engineering

Department of Electrical &Electronics Engineering

COURSE MODULE OF THECOURSE TAUGHT FOR THE SESSION SEP-DEC 2020-2021(ODD SEM)

Course Syllabi with CO's

Faculty Member: **SHREESHAYANA R**			Academic Year: 2020-2021				
Department: Electrical & Electronics Engineering							
Course Code	Course Title	Core/Elective	Prerequisite	Contact Hours			Total Hrs/ Sessions
				L	T	P	
17EE73	**High Voltage Engineering**	**Core**	Basic Electrical, Physics, Measuring Instruments	4	-	-	**50**
Objectives	1. To discuss conduction and breakdown in gases, liquid dielectrics. 2. To discuss breakdown in solid dielectrics. 3. To discuss generation of high voltages and currents and their measurement. 4. To discuss overvoltage phenomenon and insulation coordination in electric power systems. 5. To discuss non-destructive testing of materials and electric apparatus. 6. To discuss high-voltage testing of electric apparatus						

Topics Covered as per Syllabus

Module-1
Conduction and Breakdown in Gases: Gases as Insulating Media, Collision Process, Ionization Processes, Townsend's Current Growth Equation, Current Growth in the Presence of Secondary Processes, Townsend's Criterion for Breakdown, Experimental Determination of Coefficients α and γ, Breakdown in Electronegative Gases, Time Lags for Breakdown, Streamer Theory of Breakdown in Gases, Paschen's Law, Breakdown in Non-Uniform Fields and Corona Discharges. Conduction and Breakdown in Liquid Dielectrics: Liquids as Insulators, Pure Liquids and Commercial Liquids, Conduction and Breakdown in Pure Liquids, Conduction and Breakdown in Commercial Liquids. Breakdown in Solid Dielectrics: Introduction, Intrinsic Breakdown, Electromechanical Breakdown, Thermal Breakdown. **10Hours**

L1 – Remembering, L2 – Understanding

Module-2
Generation of High Voltages and Currents: Generation of High Direct Current Voltages, Generation of High Alternating Voltages, Generation of Impulse Voltages, Generation of Impulse Currents, Tripping and Control of Impulse Generators. **10Hours**

L1 – Remembering, L2 – Understanding, L3 – Applying

Module-3
Measurement of High Voltages and Currents: Measurement of High Direct Current Voltages, Measurement of High AC and Impulse Voltages, Measurement of High Currents – Direct, Alternating and Impulse, Cathode Ray Oscillographs for Impulse Voltage and Current Measurements. **10Hours**
L1 – Remembering, L2 – Understanding, L3 – Applying

Module-4:
Overvoltage Phenomenon and Insulation Coordination in Electric Power Systems: National Causes for Over voltages - Lightning Phenomenon, Overvoltage due to Switching Surges, System Faults and Other Abnormal, Principles of Insulation Coordination on High Voltage and Extra High Voltage Power Systems. **10Hours**
L1 – Remembering, L2 – Understanding

Module- 5:
Non-Destructive Testing of Materials and Electrical Apparatus: Introduction, Measurement of Dielectric Constant and Loss Factor, Partial Discharge Measurements.

High Voltage Testing of Electrical Apparatus: Testing of Insulators and Bushings, Testing of Isolators and Circuit Breakers, Testing of Cables, Testing of Transformers, Testing of Surge Arrestors, Radio Interference Measurements, Testing of HVDC Valves and Equipment. **10Hours**
L1 – Remembering, L2 – Understanding

List of Text Books

TEXT BOOKS:
1. High Voltage Engineering, M.S. Naidu, V. Kamaraju, McGraw Hill, 5th Edition, 2013

List of Reference Books

1. High Voltage Engineering Fundamentals, E. Kuffel, W.S. Zaengl, J. Kuffel, Newnes, 2 nd Edition, 2000
2. High Voltage Engineering, Wadhwa C.L., New Age International, 3 rd Edition, 2012.
3. High-Voltage Test and Measuring Techniques, Wolfgang Hauschild • Eberhard Lemke, Springer, 1st Edition 2014.
4. High Voltage Engineering, Farouk A.M. Rizk, CRC Press, 1st Edition2014

List of URLs, Text Books, Notes, Multimedia Content, etc

1. http://electrical-engineering-portal.com
2. http://nptel.ac.in/courses/108104048/
3. Fundamentals of High Voltage Engineering By S.K.Singh, Dhanpat Rai& Co.

Graduate Attributes (As per NBA)
Engineering Knowledge, Problem Analysis, Design/ Development of Solutions, Modern Tool Usage, Ethics, Individual and Team Work, Communication, Life-long Learning

Course Outcomes	At the end of the course the student will be able to:
	CO-1: Interpret the conduction and breakdown phenomenon in dielectrics. (L2) **Module 1**
	CO-2: Apply the principles of generation of high voltage, currents and Impulse voltages. (L2) **Module 2**
	CO-3: Apply measurement techniques for High Voltage, current and Impulse voltages. (L3) **Module 3**
	CO-4: Interpret overvoltage phenomenon and insulation coordination in electric power systems. (L2) **Module 4**
	CO-5: Solve the dielectric properties and interpret the testing methods of surge arrestors and switchgear. (L3) **Module 5**

Internal Assessment Marks: 30 (3 Session Tests are conducted during the semester and marks allotted based on average of all three performances) + 10 Marks for Assignment.

The Correlation of Course Outcomes (CO's) and Program Outcomes (PO's)

Course Code:	17EE73	TITLE: High Voltage Engineering							Faculty Member: SHREESHAYANA R			
List of Course Outcomes	Program Outcomes											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO-1	3	2	-	-	-	2	-	-	-	-	-	2
CO-2	3	2	-	-	-	2	-	-	-	-	-	2
CO-3	3	2	-	-	-	2	-	-	-	-	-	2
CO-4	3	2	-	-	-	2	-	-	-	-	-	2
CO-5	3	2	-	-	-	2	-	-	-	-	-	2

Note: 3 = Strong Contribution 2 = Average Contribution 1= Weak Contribution - = No Contribution

Course Code:	17EE73	TITLE: HIGH VOLTAGE ENGINEERING
List of Course Outcomes	Program Specific Outcomes	
	PSO1	PSO2
CO-1	3	-
CO-2	3	-
CO-3	3	-
CO-4	3	-
CO-5	3	-

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Department of Electrical and Electronics Engineering

D. IA QP and Scheme

SAMPLE IA QP & SCHEME

ATME College of Engineering

Department of Electrical and Electronics Engineering

IA TEST - 1 USN

Semester	V	Date:12.09.2019	Time:9.30 to 11.00 AM
Course Code	17EE51	Max. Marks	50
Course Title	Management & Entrepreneurship		

Sl. NO	PART-A Answer any Three Full Questions of 10 Marks Each		CO's	Bloom's Taxonomy Level
1.	a) Explain various principles of Organization. b) Explain Maslow's theory of Motivation.	5M 5M	CO2 CO2	L2 L2
2	a) Distinguish between Centralization & Decentralization. b) Define staffing. Explain the steps involved in selection procedure.	4M 6M	CO2 CO2	L1 L2
3	a) What are essentials for sound control systems in an organization? b) Explain the meaning and importance of coordination.	5M 5M	CO2 CO2	L2 L1
4	a) Define committee. Explain different types of committee. b) What is communication? Discuss the purpose of communication.	5M 5M	CO2 CO2	L2 L1
5	a)What are advantages of MBO & MBE? b)Explain decentralization of authority	5M 5M	CO2 CO2	L2 L1
	PART B Answer any Two Question of 10 Marks			
6.	a) Define 'Management' precisely. Briefly explain the levels of management. b) Distinguish between management and administration.	6M 4M	CO1 CO1	L1 L2
7.	a) Explain different types of planning. b) Discuss the importance of planning.	5M 5M	CO1 CO1	L1 L2
8.	a) Explain the steps involved in decision making. b) Explain single use plans and standing plans.	7M 3M	CO1 CO1	L2 L1

CO1	**Apply** the principles and concepts of management, planning for decision making
CO2	**Interpret** the concepts of organizing, staffing, directing and controlling
CO3	**Interpret** the concepts and characteristics of entrepreneur and business for capacity building and corporate Governance
CO4	**Extend** the concepts of small scale industries and **receive** institutional supports for industries
CO5	**Apply** the ideas in the development and execution of the project by considering Technical, Economical, Administrative and relevant aspects

Bloom's Taxonomy Level	L1-Remembering	L2-Understanding	L3-Applying	L4-Analyzing	L5-Evaluating	L6-Creating

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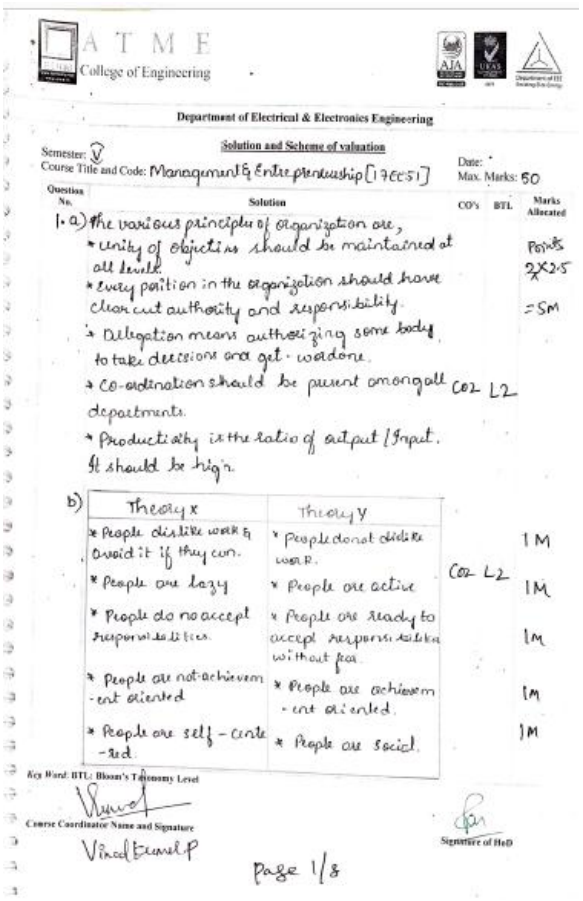

ATME College of Engineering

Department of Electrical & Electronics Engineering

Solution and Scheme of valuation

Semester: V
Course Title and Code: Management & Entrepreneurship [17EE51]
Date:
Max. Marks: 50

Question No.	Solution	CO's	BTL	Marks Allocated
1.a)	The various principles of organization are, * Unity of objectives should be maintained at all levels. * Every position in the organization should have clear cut authority and responsibility. * Delegation means authorizing some body to take decisions and get work done. * Co-ordination should be present amongall departments. * Productivity is the ratio of output / Input. It should be high.	CO2	L2	Points 2X2.5 = 5M
b)	Theory X: * People dislike work & avoid it if they can. * People are lazy * People do no accept responsibilities. * People are not achievement oriented * People are self-centered. Theory Y: * People do not dislike work. * People are active * People are ready to accept responsibilities without fear. * People are achievement oriented. * People are social.	CO2	L2	1M, 1M, 1M, 1M, 1M

Key Word: BTL: Bloom's Taxonomy Level

Course Coordinator Name and Signature
Vinod Kumar P

Signature of HoD

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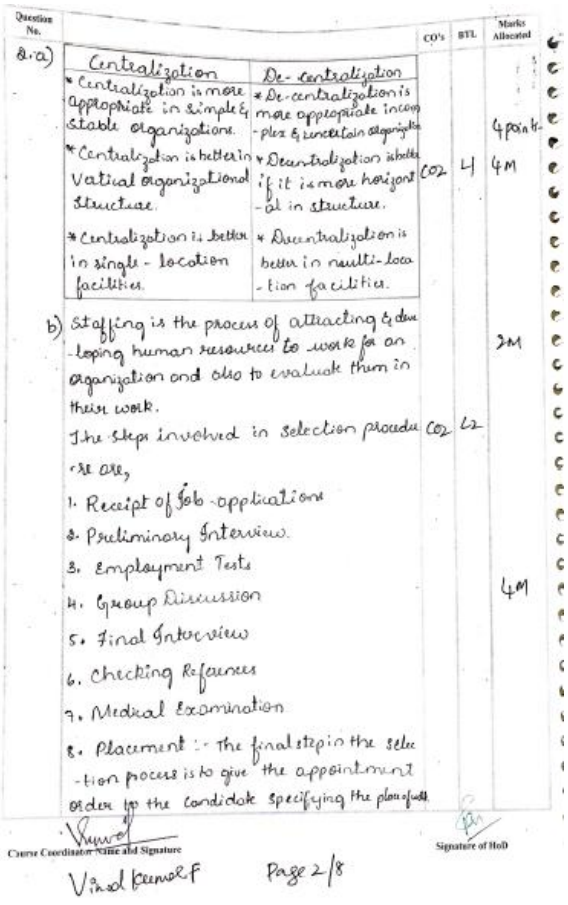

Question No.		CO's	BTL	Marks Allocated
8.a)	Centralization: * Centralization is more appropriate in simple & stable organizations. * Centralization is better in Vertical organizational Structure. * Centralization is better in single-location facilities. De-centralization: * De-centralization is more appropriate in complex & uncertain organizations. * Decentralization is better if it is more horizontal in structure. * Decentralization is better in multi-location facilities.	CO2	L1	4 points 4M
b)	Staffing is the process of attracting & developing human resources to work for an organization and also to evaluate them in their work. The steps involved in selection procedure are, 1. Receipt of Job-applications 2. Preliminary Interview. 3. Employment Tests 4. Group Discussion 5. Final Interview 6. Checking References 7. Medical Examination 8. Placement :- The final step in the selection process is to give the appointment order to the candidate specifying the place of	CO2	L2	3M 4M

Course Coordinator Name and Signature
Vinod Kumar P

Signature of HoD

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Department of Electrical and Electronics Engineering

3.a) Essentials of a sound control process
* Clear definition of objectives and standards.
* Selection of appropriate control techniques.
* it should focus on the right areas
* it should be reasonable, practical and attainable.
* it should encourage self-control.
* it should be acceptable to all people who would be affected by it.
* control technique should be simple & easy to understand.

Sports - 1 mark each
CO2 L2
5X1 = 5M

b) Co-ordination implies deliberate action on the part of managers to bring about harmony and unity of action.
1M
CO2 L1
Importance of co-ordination.
* it increases human efficiency and optimization of resources.
* it improves relationships between individuals.
* it makes all divisions of an organization to have a joint focus.
* it facilitate sharing of scarce resources.
* it sustains and attracts talents.

4 points 1 mark
4X1 = 4M

Course Coordinator Name and Signature
Vinod Kumar.P
Signature of HoD
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4.a) A Committee is not exactly a type of organization structure different from the other types.
1M
The different types of committe are,
1. Ad-hoc committee :- it is a temporary committee formed for a short period to solve a solitary and usually a minor problem.
2. Standing or permanent committee.
3. Advisory committee.
4. Educational committe :- this is a committee which guards the company policies and procedures.
CO2 L2
4X1 = 4M
C4 Committee

b) Communication is defined as the process by which instructions, ideas, thoughts, or information are transmitted, received & understood by people working in an organization.
1M
CO2 L1
The purpose of communication are,
* it is a fundamental skill required by every one.
* it helps planning and decision-making.
* Better co-ordination is achieved through communication.
* it improves relationship among employees.
* Managers can become more efficient with good communication skills.

4X1 = 4M
4 points

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5.a)

MBO	MBE
* MBO is high.	* MBE is low.
* Employee participation is high on decision making.	* Employee participation is minimal on decision making.
* Dependency is low	* Dependency is high
* Experienced manger	* Experienced executives.
* whole organization take place in decision making, so it reduces efficiency.	* High efficiency.

Sports
CO2 L2
5X1 = 5M

b) * If the organization encourages lower level personnel to participate in the decision-making process by giving them greater freedom, the organization is called decentralized authority.
2M
CO2 L1
* De-centralized authority is preffered if education and experience are spread over the hierarchy.
1M
* De-centralized authority is preffered if the lower level managers are competent to take decisions.
1M
* Decentralization is better in multi-location facilities.
1M

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6. a) "Management is a multipurpose organ that manages a business, manages a manager and manages workers and work.
2M
The levels of management are,
1. Top management :-
(a) Board of Directors - Determine the goals of the organization.
(b) Managing director - establish policies.
1M
CO1 L1
2. Middle Management :-
(a) superintendents - To plan details of all operations.
1M
(b) Departmental heads.
3. Lowest management :-
(a) foreman
(b) Supervisors.
1M

b)

Management	Administration
* Leading, Motivating and controlling.	* planning, organising and staffing.
* Act as owner	* Act as an agency
* Top level	* Lower level
* Managing Director, Owners, CEO etc	* Managers, supervisors foreman etc.
* No direct involvement in production or services	* Directly involves in the execution of plans and achieving goals

4 points
4X1 = 4M
CO1 L2

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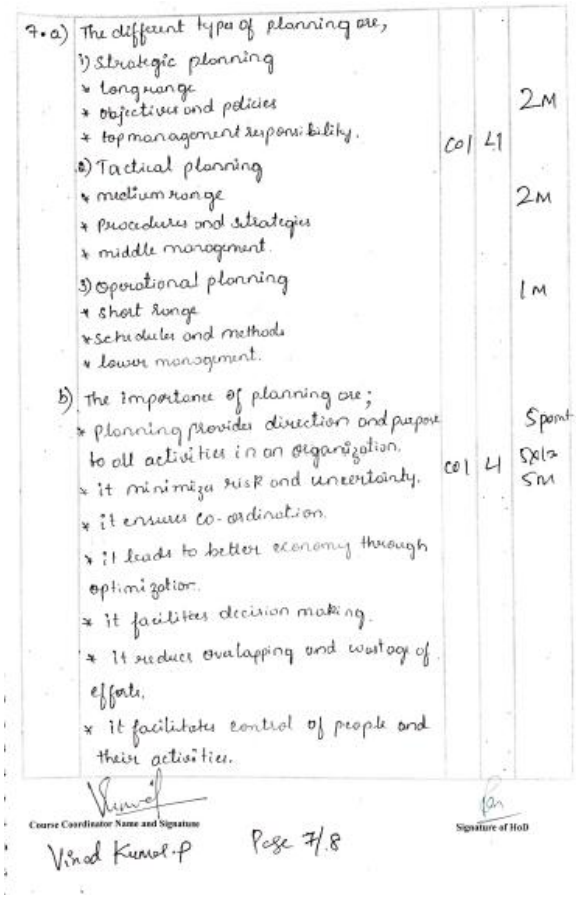

7.a) The different type of planning are,

1) Strategic planning — 2M
* long range
* objectives and policies
* top management responsibility.

2) Tactical planning — 2M
* medium range
* Procedures and strategies
* middle management.

3) Operational planning — 1M
* short range
* schedules and methods
* lower management.

CO1 L1

b) The importance of planning are; — 5 points

* planning provides direction and purpose to all activities in an organization.
* it minimize risk and uncertainty.
* it ensures co-ordination.
* it leads to better economy through optimization.
* it facilitates decision making.
* It reduce overlapping and wastage of efforts.
* it facilitates control of people and their activities.

CO1 L1 5X1=5M

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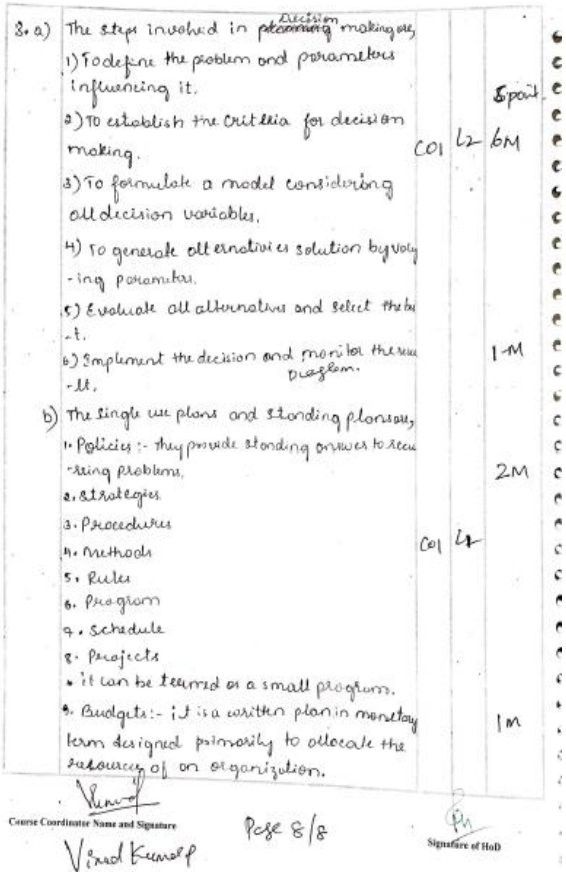

8.a) The steps involved in decision making are,

1) To define the problem and parameters influencing it.
2) To establish the criteria for decision making.
3) To formulate a model considering all decision variables.
4) To generate alternatives solution by varying parameter.
5) Evaluate all alternatives and select the best.
6) Implement the decision and monitor the result. Diagram.

CO1 L2 6M — 5 points — 1M

b) The single use plans and standing plans are,

1. Policies :- they provide standing answers to recurring problems.
2. Strategies
3. Procedures
4. Methods
5. Rules
6. Program
7. Schedule
8. Projects
* it can be termed as a small program.
9. Budgets :- it is a written plan in monetary term designed primarily to allocate the resources of an organization.

2M — CO1 L4 — 1M

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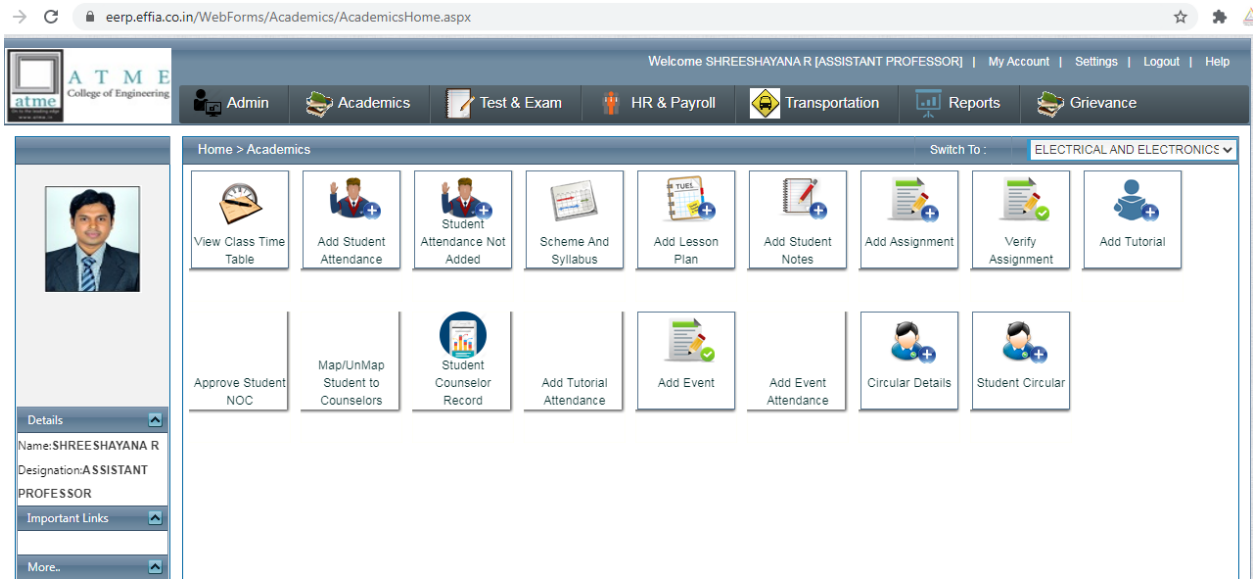
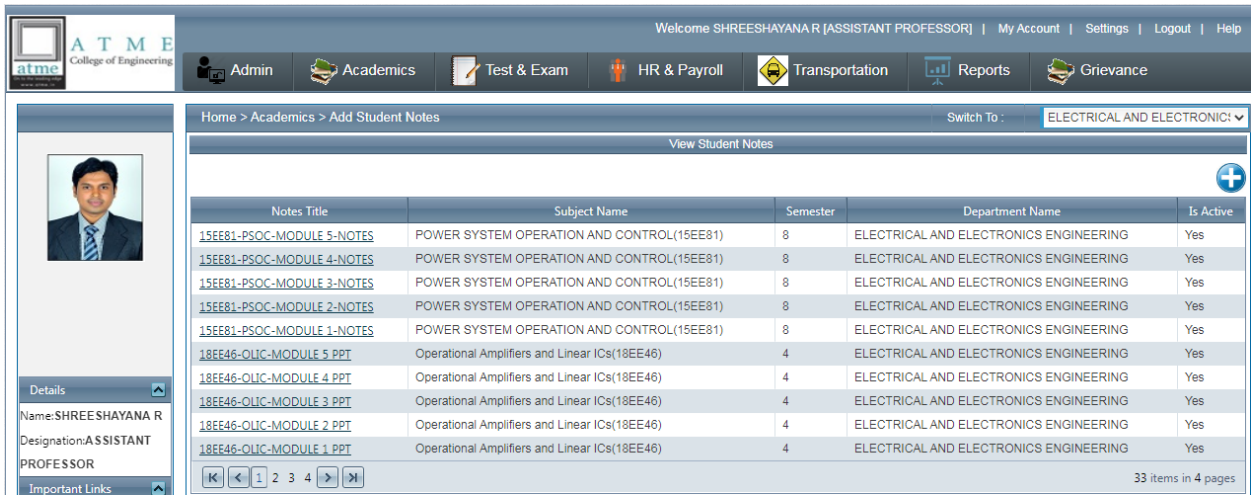
HoD
Dr. PARTHASARATHY
Professor and HOD
Dept. of Electrical & Electronics Engineering
ATME College of Engineering, Mysuru

Department of Electrical and Electronics Engineering

E. CERP Link : https://eerp.effia.co.in/Webforms/frmLogin.aspx

Note: Only authorised access





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Professor and HOD
Dept. of Electrical & Electronics Engineering
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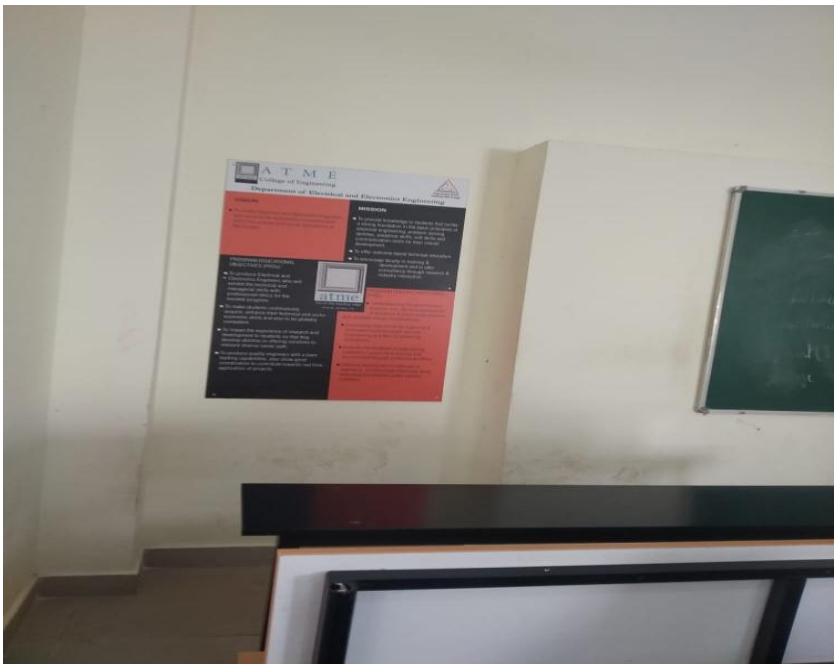
Department of Electrical and Electronics Engineering

F. Classroom, Seminar Hall, Laboratory



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Professor and HOD
Dept. of Electrical & Electronics Engineering
ATME College of Engineering, Mysuru

G. HoD and Department Office

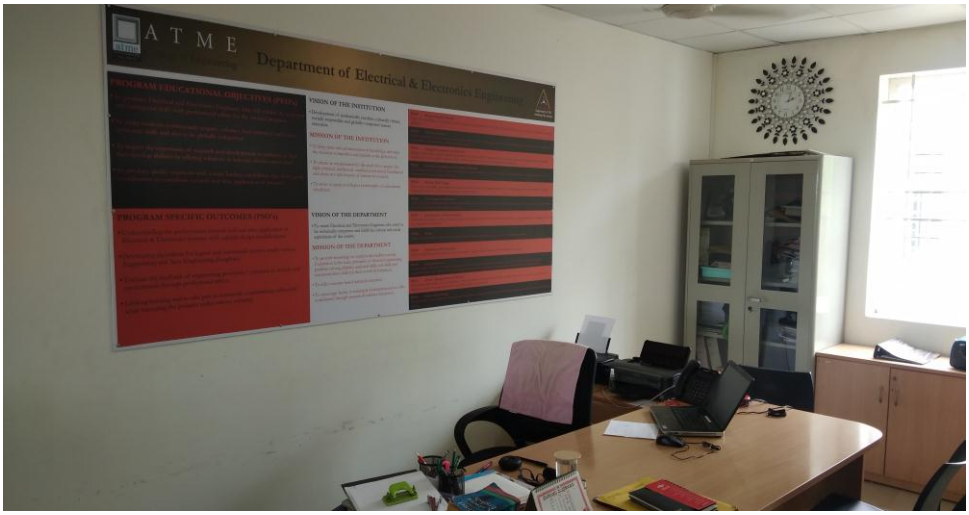

Fig: HoD Office

Fig: Department Office

Department of Electrical and Electronics Engineering

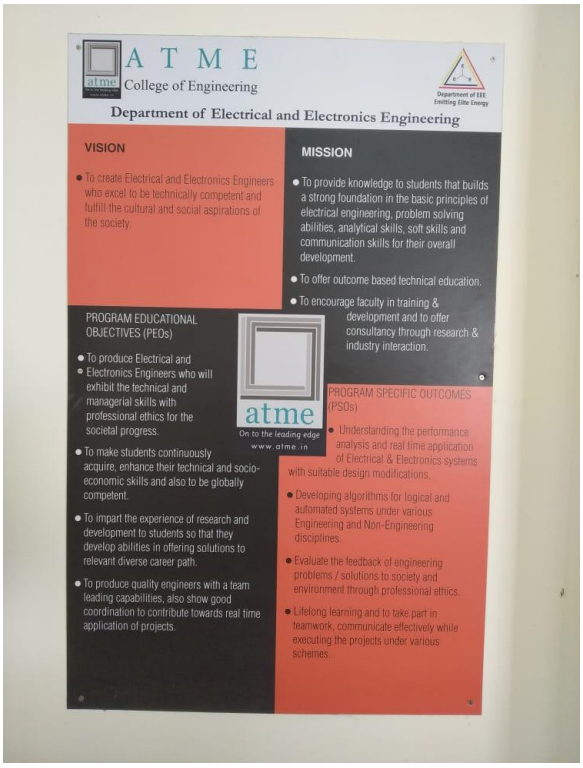

Fig: Department Office

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Professor and HOD
Dept. of Electrical & Electronics Engineering
ATME College of Engineering, Mysuru

Department of Electrical and Electronics Engineering

H. Magazine

Quantum Department Magazine

Chief Editor
Parthasarathy L
Professor & Head
Department of EEE
ATMECE, Mysuru

Co-editor
Mr. Sathish K R
Assistant Professor, Department of EEE
ATMECE, Mysuru

Student Representative
Mr. Navneet Pralhad Tavagal, 7th Semester
Mr. Ranjith Kumar G 7th Semester
Mr. Rahul C M 5th Semester
Ms. Kausar Afreen 5th Semester

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Dr. PARTHASARATHY L.
Professor and HOD
Dept. of Electrical & Electronics Engineering
ATME College of Engineering, Mysuru

Department of Electrical and Electronics Engineering

I. Handbook

ATME College of Engineering

Department of Electrical & Electronics Engineering

Staff Handbook

ATME College of Engineering, Mysuru

Program Outcomes (PO's)

PO1: Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.

PO2: Problem Analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3: Design / Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex Problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern Tool Usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The Engineer and Society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and Sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and Team Work: Function effectively as an individual and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10: Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project Management and Finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and
in multidisciplinary environments.

PO12: Life-Long Learning: Recognize the need for and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change.

ATME College of Engineering

Emitting Elite Energy

STUDENT HANDBOOK

Student Name:

USN:

Semester: VII

AY: 2018-19

Department of Electrical & Electronics Engineering

CONTENTS

Department of Electrical and Electronics Engineering

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ATME College of Engineering

Department of Electrical & Electronics Engineering

COURSE MODULE OF THE SUBJECT TAUGHT FOR THE SESSION AUG-NOV 2018-19(ODD SEM)

Course Syllabi with CO's

Faculty Name : Dr.Parthasarathy L				**Academic Year**: 2018-2019 (Odd Semester)			
Department: Electrical & Electronics Engineering							
Course Code	**Course Title**	**Core/Elective**	**Prerequisite**	**Contact Hours**			**Total Hrs/ Sessions**
				L	T	P	
15EE71	POWER SYSTEM ANALYSIS-2	Core	POWER SYSTEM ANALYSIS -1	4	-	-	50
Objectives	This course will enable students to: 1. To explain formulation of network models and bus admittance matrix for solving load flow problems 2. To discuss solution of nonlinear static load flow equations by different numerical techniques and methods to control voltage profile 3. To discuss optimal operation of generators on a bus bar, optimal unit commitment, reliability considerations and optimum generation scheduling 4. To discuss optimal power flow solution, scheduling of hydro-thermal system, power system security and reliability 5. To explain formulation of bus impedance matrix for the use in short circuit studies on power systems. 6. To explain numerical solution of swing equation for multi-machine stability.						
Topics as per Syllabus							
PART – A							
UNIT - 1 **Load Flow Studies:** Introduction, Network Model Formulation, Formation of Ybus by Singular Transformation, Load Flow Problem, Gauss-Seidel Method. **10 Hours**							
UNIT - 2 **Load Flow Studies (continued):** Newton-Raphson Method, Decoupled Load Flow Methods, Comparison of Load Flow Methods, Control of Voltage Profile. **10 Hours**							
UNIT - 3 **Optimal System Operation:** Introduction, Optimal Operation of Generators on a Bus Bar, Optimal Unit Commitment, Reliability Considerations, Optimum Generation Scheduling. **10 Hours**							
UNIT -4 **Optimal System Operation (continued):** Optimal Load Flow Solution, Optimal Scheduling of Hydrothermal System, Power System Security, Maintenance Scheduling, Power System Reliability. **10 Hours**							

UNIT-5 **Symmetrical Fault Analysis:** Algorithm for Short Circuit Studies, Zbus Formulation. **Power System Stability:** Numerical Solution of Swing Equation, Multi-machine Stability. **10 Hours**	
List of Text Books	
1. **Modern Power System Analysis,** Nagrath, I. J., and Kothari, D. P, TMH, 4th Edition, 2011.	
List of Reference Books:	
1. **Computer Methods in Power System Analysis,** Stagg, G. W., and El- Abiad, A. H.- McGraw Hill International Student Edition. 1968 2. **Computer Techniques in Power System Analysis**, Pai, M. A- TMH, 2nd edition, 2006. 3. **Power System Analysis,** Hiadi Sadat, TMH, 2nd Edition, 12th reprint, 2007	
List of URLs, Text Books, Notes, Multimedia Content, etc	
1.http://vtu.alloylabus.com/EEE/sem_7/Computer_Technics_in_Power_system_Analysis/COMPUTER_TECHNIQUES_IN_POWER_SYSTEM_ANALYSIS_NOTES.pdf	
Course Outcomes	After the completion the course, the students will be able to: CO1. Form the Y_{BUS} and analyse Power system fault using Zbus. CO2. Find power flow solution by Gauss Siedel, Newton Raphson, FDLF Method and Control voltage profile. CO3. Find optimal unit commitment and optimal generation scheduling. CO4. Find optimal scheduling of hydro-thermal systems, basics of Power system security and reliability. CO5. Find the solution to swing equation and basics of multi machine stability.
Internal Assessment test: 15marks (3 Session Tests are conducted during the semester and marks allotted based on average of two top performances). **Assignment/quiz/seminar:** 5 marks	

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Professor and HOD
Dept. of Electrical & Electronics Engineering
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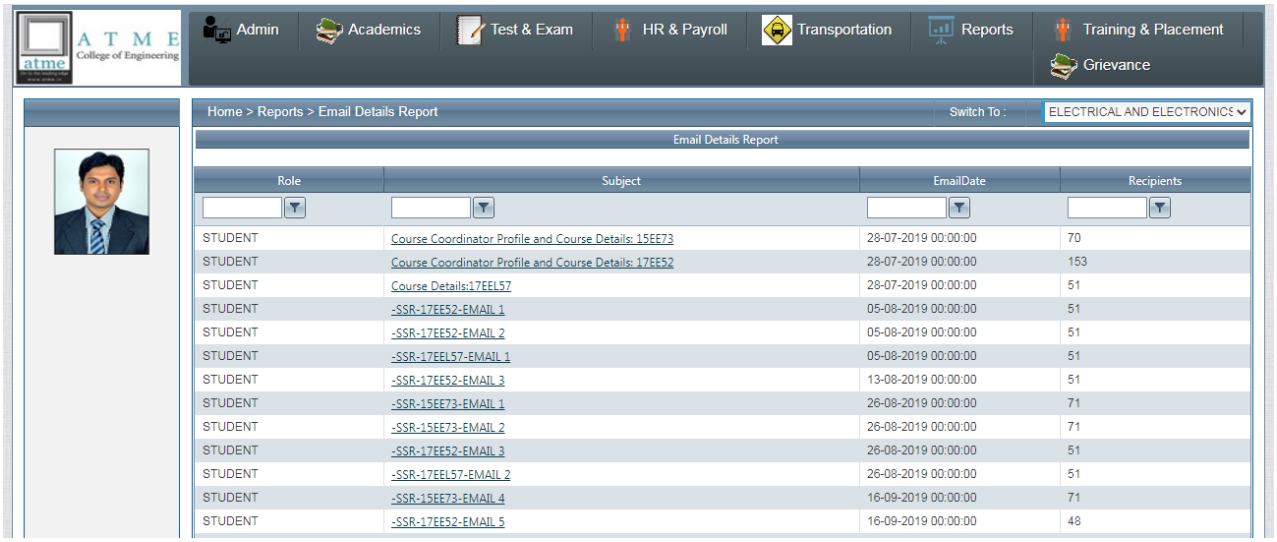
J. Flipped Classroom through Mail (CERP/ MS Teams)



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STUDENT	Course Coordinator Profile and Course Details: 17EE52	28-07-2019 00:00:00	153
STUDENT	Course Details:17EEL57	28-07-2019 00:00:00	51
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STUDENT	-SSR-17EE52-EMAIL 2	05-08-2019 00:00:00	51
STUDENT	-SSR-17EEL57-EMAIL 1	05-08-2019 00:00:00	51
STUDENT	-SSR-17EE52-EMAIL 3	13-08-2019 00:00:00	51
STUDENT	-SSR-15EE73-EMAIL 1	26-08-2019 00:00:00	71
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Mail:

-SSR-15EE73-EMAIL 2

Week No	Class No	DATE	HOUR	Topics Covered
5	6	5/08/2019	FIFTH HOUR	Breakdown in Non-Uniform Fields and Corona Discharges
	7	06/08/2019	FIRST HOUR	Conduction and Breakdown in Liquid Dielectrics: Liquids as Insulators, Pure Liquids and Commercial Liquids
	8	06/08/2019	SECOND HOUR	Breakdown in Solid Dielectrics: Introduction, Intrinsic Breakdown, Electromechanical Breakdown, Thermal Breakdown
6	9	09/09/2019	SECOND HOUR	Summary of Module 1
6	10	12/09/2019	FIFTH HOUR	SRS Evaluation

c. Course Outcomes achievable at the end of Module 1

CO-1: Interpret the conduction and breakdown phenomenon in dielectrics. [L2, **Module 1]**

d. Resource Link and Books:

1. High Voltage Engineering, M.S. Naidu, V. Kamaraju, McGraw Hill, 5th Edition, 2013
2. http://nptel.ac.in/courses/108104048/

Fundamentals of High Voltage Engineering By S.K.Singh, Dhanpat Rai& Co.

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Professor and HOD
Dept. of Electrical & Electronics Engineering
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CO STATEMENTS

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Department of Electrical & Electronics Engineering

CO Statements, CO-PO and CO-PSO Matrix for AY 2019-2020

Course Name: Transform Calculus, Numerical Methods & Fourier Series (18MAT31)																
C201	C201.1	Use Laplace transform and inverse Laplace transform in solving differential/ integral equation arising in network analysis, control systems and other fields of engineering.														
	C201.2	Demonstrate Fourier series to study the behaviour of periodic functions and their applications in system communications, digital signal processing and field theory.														
	C201.3	Make use of Fourier transform and Z-transform to illustrate discrete/continuous function arising in wave and heat propagation, signals and systems.														
	C201.4	Solve first and second order ordinary differential equations arising in engineering problems using single step and multistep numerical methods.														
	C201.5	Determine the externals of functionals using calculus of variations and solve problems arising in dynamics of rigid bodies and vibrational analysis.														
		PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**		
	C201.1	3	3	0	0	0	0	0	0	0	0	0	1				
	C201.2	2	2	0	0	0	0	0	0	0	0	0	1				
	C201.3	2	2	0	0	0	0	0	0	0	0	0	2				
	C201.4	1	1	0	0	0	0	0	0	0	0	0	1				
	C201.5	1	1	0	0	0	0	0	0	0	0	0	1				
Course Name: Electric Circuit Analysis (18EE32)																
C202	C202.1	Analyse the source transformation, source shifting, super mesh, super node and network reduction techniques on DC and AC Circuits.														
	C202.2	Examine the complex electric circuits using network theorems.														
	C202.3	Examine the resonant frequency, quality factor and selectivity in series and parallel resonance circuits.														
	C202.4	Analyse the switching behaviour of RL & RC circuits.														
	C202.5	Dissect typical waveforms using Laplace transformation.														
	C202.6	Analyse unbalanced three phase systems and also the performance of two port networks.														
		PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**		
	C202.1	3	3	0	0	0	0	0	0	0	0	0	3	0	3		
	C202.2	3	3	0	0	0	0	0	0	0	0	0	3	0	3		
	C202.3	3	3	0	0	0	0	0	0	0	0	0	3	0	2		
	C202.4	2	2	0	0	0	0	0	0	0	0	0	3	0	2		
	C202.5	3	2	0	0	0	0	0	0	0	0	0	3	0	2		
	C202.6	3	3	0	0	0	0	0	0	0	0	0	3	0	3		
Course Name: Transformers & Generators (18EE33)																
C203	C203.1	Analyze the voltage regulation, commercial and all day efficiency of single phase transformer. Explain the operation of 3-Phase transformers, on-load tap-changers and Autotransformer														
	C203.2	Analyze the performance of transformers by Sumpner's Test, phase conversion, 3-phase connections and parallel operation														
	C203.3	Analyze the effect of excitation of non-salient pole synchronous generator and determine the ATD, ATC in DC Generators														
	C203.4	Analyze the regulation of Synchronous Generator by Slip test, EMF, MMF, and ZPF Methods														
	C203.5	Analyze the performance of the salient pole Synchronous Generators on infinite bus and parallel operation														
		PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**		
	C203.1	3	3	0	0	0	0	0	0	0	0	0	2	0	2		
	C203.2	3	3	0	0	0	0	0	0	0	0	0	2	0	2		
	C203.3	3	3	0	0	0	0	0	0	0	0	0	2	0	2		
	C203.4	3	3	0	0	0	0	0	0	0	0	0	0	0	2		
	C203.5	3	3	0	0	0	0	0	0	0	0	0	2	0	2		
Course Name: Analog Electronics Circuit (18EE34)																
C204	C204.1	CO1: Analyse the output response of clipper and clamper circuits and produce the preliminary design of the transistor biasing circuits and switching circuits.														
	C204.2	CO2: Develop the model of transistor amplifiers for their h-parameters at low frequencies.														
	C204.3	CO3: Analyse and produce the preliminary design of the multistage and feedback amplifiers.														
	C204.4	CO4: Analyse and produce the preliminary design of the power amplifier circuits and oscillators for different frequencies.														
	C204.5	CO5: Analyse and produce the preliminary design of the FET and MOSFET amplifiers.														
		PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**		
	C204.1	3	3	0	0	0	0	0	0	0	0	0	3	2	1		
	C204.2	3	3	0	0	0	0	0	0	0	0	0	3	2	1		
	C204.3	3	3	0	0	0	0	0	0	0	0	0	3	2	1		
	C204.4	3	3	0	0	0	0	0	0	0	0	0	3	2	1		
	C204.5	3	3	0	0	0	0	0	0	0	0	0	3	2	1		
Course Name: Digital System Design (18EE35)																
C205	C205.1	CO1. Develop simplified switching equation using Karnaugh Maps and Quine McClusky techniques.[L4]														
	C205.2	CO2:Apply the design procedures for Multiplexer, Encoder, Decoder, Adder, Subtractors and Comparator as digital combinational control circuits.[L3]														
	C205.3	CO3: Illustrate the design of flip flops and development of its characteristic equation.[L3]														
	C205.4	CO4:Apply the design procedures for counters and shift registers as sequential control circuits.[L3]														
	C205.5	CO5: Develop Mealy/Moore Models and state diagrams for the given clocked sequential circuits and Interpret the functioning of different programmable memory[L4]														
		PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**		
	C205.1	3	2	2	0	0	0	0	0	0	0	0	0	0	3		
	C205.2	3	3	2	0	0	0	0	0	0	0	0	0	0	3		
	C205.3	2	2	2	0	0	0	0	0	0	0	0	0	0	3		
	C205.4	3	2	2	0	0	0	0	0	0	0	0	0	0	3		
	C205.5	3	3	2	0	0	0	0	0	0	0	0	0	0	3		
Course Name: Electrical & Electronics Measurements (18EE36)																

HoD

Dr. PARTHASARATHY L.
Professor and HOD
Dept. of Electrical & Electronics Engineering
ATME College of Engineering, Mysuru

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Department of Electrical & Electronics Engineering

CO Statements, CO-PO and CO-PSO Matrix for AY 2019-2020

C206	C206.1	CO1:Apply relevant bridges to find the resistance, inductance and capacitance and also find earth resistance
	C206.2	CO2:Apply relevant meters to find power and energy and explain the operation of power factor meter, frequency meter and energy meter.
	C206.3	CO3:Apply methods of extending the range of ammeters and voltmeters & operation of instrument transformers and magnetic permeameters.
	C206.4	CO4:Illustrate the operation of Electronic multimeters. Electronic and digital voltmeters, Q meter and electronic energy meter.
	C206.5	CO5:Illustrate the operation of various display and recording devices (electronic & digital).

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2		
	C206.1	3	0	0	0	0	0	0	0	0	0	0	0	0	3		
	C206.2	2	2	0	0	0	0	0	0	0	0	0	0	0	3		
	C206.3	3	2	0	0	0	2	0	0	0	0	0	0	0	3		
	C206.4	3	2	0	0	0	2	0	0	0	0	0	0	0	3		
	C206.5	2	0	0	0	0	2	0	0	0	0	0	0	0	3		

Course Name: Electrical Machines lab-1 (18EEL37)

C207	C207.1	CO1: Assess the equivalent circuit, voltage regulation and efficiency of transformers.
	C207.2	CO2: Evaluate the performance of two single phase transformers of different KVA rating connected in parallel.
	C207.3	CO3: Analyze the performance of 3 single phase transformers connected in star-delta, delta – delta and V – V (open delta) for three phase operation and phase conversion.
	C207.4	CO4: Assess the voltage regulation and efficiency of salient pole and non-salient pole synchronous generator by direct & indirect methods.
	C207.5	CO5: Practically demonstrate the synchronization of synchronous generator to infinite bus.

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2		
	C207.1	3	3	0	0	0	0	0	0	3	3	0	3	0	3		
	C207.2	3	3	0	0	0	0	0	0	3	3	0	3	0	3		
	C207.3	3	3	0	0	0	0	0	0	3	3	0	3	0	3		
	C207.4	3	3	0	0	0	0	0	0	3	3	0	3	0	3		
	C207.5	3	3	0	0	0	0	0	0	3	3	0	3	0	3		

Course Name: Electronics Lab (18EEL38)

C208	C208.1	Design and test rectifier circuits with and without capacitor filters.
	C208.2	Determine h-parameter models of transistor for all modes.
	C208.3	Design and test BJT and FET amplifier.[
	C208.4	Design and test RC phase shift oscillator circuit
	C208.5	Realize Boolean expressions, adders, subtractors and code conversion using gates and ICs.
	C208.6	Design and test Ring counter/Johnson counter, Sequence generator and 3 bit counters.

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2		
	C208.1	3	3	0	0	0	0	0	0	3	3	0	2	2	1		

HoD

Dr. PARTHASARATHY L.
Professor and HOD
Dept. of Electrical & Electronics Engineering
ATME College of Engineering, Mysuru

Department of Electrical and Electronics Engineering

ATME College of Engineering
Department of EEE Emitting Elite Energy

Department of Electrical & Electronics Engineering

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	C208.2	3	3	0	0	0	0	0	0	3	3	0	2	2	1		
	C208.3	3	3	0	0	0	0	0	0	3	3	0	2	2	1		
	C208.4	3	3	0	0	0	0	0	0	3	3	0	2	2	1		
	C208.5	3	3	0	0	0	0	0	0	3	3	0	2	2	1		
	C208.6	3	3	0	0	0	0	0	0	3	3	0	2	2	1		
Course Name: Mathematics-IV (18MAT41)																	
	C209.1	CO1 Use the concepts of analytic function and complex potentials to solve the problems arising in electromagnetic field theory															
	C209.2	CO2 Utilize conformal transformation and complex integral arising in aerofoil theory, fluid flow visualization and image processing.															
	C209.3	CO3 Apply discrete and continuous probability distributions in analyzing the probability models arising in engineering field.															
	C209.4	CO4 • Make use of the correlation and regression analysis to fit a suitable mathematical model for the statistical data.															
	C209.5	CO5 Construct joint probability distributions and demonstrate the validity of testing the hypothesis.															
C209		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**		
	C209.1	2	2	0	0	0	0	0	0	0	0	0	1				
	C209.2	2	2	0	0	0	0	0	0	0	0	0	1				
	C209.3	2	2	0	0	0	0	0	0	0	0	0	1				
	C209.4	1	1	0	0	0	0	0	0	0	0	0	0				
	C209.5	2	2	0	0	0	0	0	0	0	0	0	1				
Course Name: Power Generation, Economics (18EE42)																	
	C210.1	CO1: Explain the working of hydroelectric power plant and state functions of major equipment of the power plants [L2]															
	C210.2	CO2: Explain the working of steam, Diesel and Gas power plants and state functions of major equipment of the power plants [L2]															
	C210.3	CO3: Explain the working of nuclear power plants and state functions of major equipment of the power plants [L2]															
	C210.4	CO4: Classify various substations and explain the importance of grounding [L2]															
	C210.5	CO5: Apply the economic aspects of power system operation and its effects and explain the importance of power factor improvement [L3]															
C210		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**		
	C210.1	2	0	0	0	0	0	0	0	0	0	0	0	3	0		
	C210.2	2	0	0	0	0	2	0	0	0	0	0	0	3	0		
	C210.3	2	0	0	0	0	2	0	0	0	0	0	0	3	0		
	C210.4	2	2	0	0	0	0	0	0	0	0	0	2	3	0		
	C210.5	2	2	0	0	0	0	0	0	0	0	0	2	3	0		
Course Name: Transmission & Distribution (18EE43)																	
	C211.1	Explain transmission and distribution scheme, identify the importance of different transmission systems and types of insulators															
	C211.2	Analyze and compute the parameters of the transmission line for different configurations															
	C211.3	Assess the performance of overhead lines															
	C211.4	Interpret corona and explain the use of underground cables															
	C211.5	Classify different types of distribution systems; examine its quality & reliability															
C211		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**		
	C211.1	3	2	0	0	0	2	2	0	0	0	0	2	2	0		
	C211.2	3	2	0	0	0	0	0	0	0	0	0	2	2	0		
	C211.3	3	2	0	0	0	0	0	0	0	0	0	0	2	0		
	C211.4	3	2	0	0	0	2	0	0	0	0	0	2	2	0		
	C211.5	3	2	0	0	0	2	0	0	0	0	0	2	2	0		
Course Name: Electric Motors (18EE44)																	
	C212.1	CO-1 :Explain the constructional features of Motors and select a suitable drive for specific application.[L2]															
	C212.2	CO-2. Analyze and assess the performance characteristics of DC motors by conducting suitable tests and control the speed by suitable method.[L4]															
	C212.3	CO-3:Explain the constructional features of Three Phase and Single phase induction Motors and assess their performance.[L4]															
	C212.4	CO-4:Control the speed of induction motor by a suitable method and Explain the operation of Synchronous motor and special motors.[L4]															
C212		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**		
	C212.1	3	0	0	0	0	0	0	0	0	0	0	2	0	2		
	C212.2	3	3	0	0	0	0	0	0	0	0	0	2	0	2		
	C212.3	3	3	0	0	0	0	0	0	0	0	0	2	0	2		
	C212.4	3	3	0	0	0	0	0	0	0	0	0	2	0	2		
Course Name: Electromagentic Field Theory (18EE45)																	
	C213.1	CO1: Apply different coordinate systems , Coulomb's Law and Gauss Law for the evaluation of electric fields produced by different charge configurations.[L3]															
	C213.2	CO2: Calculate the energy and potential due to a system of charges & Explain the behavior of electric field across a boundary conditions.[L4]															
	C213.3	CO3: Explain the Poisson's, Laplace equations and behavior of steady magnetic fields.[L2]															
	C213.4	CO4: Explain the behavior of magnetic fields and magnetic materials.[L2]															
	C213.5	CO5: Analyze time varying fields and propagation of waves in different media.[L4]															
C213		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**		
	C213.1	3	0	0	0	0	0	0	0	0	0	0	0	2	0		
	C213.2	3	2	0	0	0	0	0	0	0	0	0	0	2	0		
	C213.3	3	0	0	0	0	0	0	0	0	0	0	0	2	0		
	C213.4	3	0	0	0	0	0	0	0	0	0	0	0	2	0		
	C213.5	3	2	0	0	0	0	0	0	0	0	0	0	2	0		
Course Name: Operational amps & Linears Ics (18EE46)																	
	C214.1	Interpret the characteristics of ideal and practical op-amp.[L2]															

HoD

Dr. PARTHASARATHY L.
Professor and HOD
Dept. of Electrical & Electronics Engineering
ATME College of Engineering, Mysuru

Department of Electrical and Electronics Engineering

ATME College of Engineering

Department of Electrical & Electronics Engineering

CO Statements, CO-PO and CO-PSO Matrix for AY 2019-2020

	C214.2	Analyse filters, signal generators and voltage regulators using linear ICs.[L4]														
	C214.3	Analyse the application of Linear ICs as comparators and converters.[L4]														
	C214.4	Analyse rectifiers, A/D & D/A converters using op-amp[L4]														
C214	C214.5	Interpret the basics of PLL and timers [L2]														
		PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**		
	C214.1	3	2	0	0	0	0	0	0	0	0	0	2	2	1		
	C214.2	3	2	0	0	0	0	0	0	0	0	0	2	2	1		
	C214.3	3	2	0	0	0	0	0	0	0	0	0	2	2	1		
	C214.4	3	2	0	0	0	0	0	0	0	0	0	2	2	1		
	C214.5	3	2	0	0	0	0	0	0	0	0	0	2	2	1		
Course Name: Electrical Machines Lab-II (18EEL47)																	
	C215.1	CO-1-Test dc machines to determine their characteristics and control the speed of DC motors.															
	C215.2	CO-2-Pre-determine the performance characteristics of dc machines by conducting suitable tests.															
	C215.3	CO-3-Perform load test on single phase and three phase induction motor to assess its performance.															
	C215.4	CO-4-Conduct test on induction motor to pre-determine the performance characteristics															
	C215.5	CO-5-Conduct test on synchronous motor to draw the performance curves															
C215		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**		
	C215.1	3	3	0	2	0	0	0	0	3	3	0	0	0	2		
	C215.2	3	3	0	2	0	0	0	0	3	3	0	0	0	2		
	C215.3	3	3	0	2	0	0	0	0	3	3	0	0	0	2		
	C215.4	3	3	0	2	0	0	0	0	3	3	0	0	0	2		
	C215.5	3	3	0	2	0	0	0	0	3	3	0	0	0	2		
Course Name: Operational amps & Linears ICs Lab (18EEL48)																	
	C216.1	Analyze the characteristic parameters of OP-Amp [L4]															
	C216.2	Design and analyse the OP-Amp as Amplifier, adder, subtractor, differentiator and integrator.															
	C216.3	Evaluate the OP-Amp as oscillators and filters. [L5]															
	C216.4	Analyse the Linear IC's as regulators and waveform generators. [L4]															
C216	C216.5	Design and analyse the Linear IC's as timer and Schmitt trigger circuit [L4]															
		PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**		
	C216.1	3	2	0	0	0	0	0	0	2	2	0	2	2	1		
	C216.2	3	2	0	0	0	0	0	0	2	2	0	2	2	1		
	C216.3	3	2	0	0	0	0	0	0	2	2	0	2	2	1		
	C216.4	3	2	0	0	0	0	0	0	2	2	0	2	2	1		
	C216.5	3	2	0	0	0	0	0	0	2	2	0	2	2	1		
Course Name: Management and Entrepreneurship (17EE51)																	
	C301.1	CO.1. Apply the principles and concepts of management, planning for decision making. [M1][L2]															
	C301.2	CO.2. Interpret the concepts of organizing, staffing, directing and controlling. [M2][L2]															
	C301.3	CO.3. Interpret the concepts and characteristics of entrepreneur and business for capacity building and corporate Governance. [M3][L3]															
	C301.4	CO.4. Extend the concepts of small-scale industries and receive institutional supports for industries. [M4] [L3]															
	C301.5	CO.5: Apply the ideas in the development and execution of the project by considering Technical, Economical, Administrative and relevant aspects. [M5] [L4]															
C301		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**		
	C301.1	2	0	0	0	0	2	0	0	0	0	0	0	0	1		
	C301.2	2	0	0	0	0	2	0	0	0	0	0	0	0	1		
	C301.3	2	0	0	0	0	2	0	0	0	0	0	0	0	2		
	C301.4	2	0	0	0	0	2	0	0	0	0	0	0	0	1		
	C301.5	2	0	0	0	0	2	0	0	0	0	3	0	0	2		
Course Name: Microcntroller (17EE52)																	
	C302.1	CO.1. Interpret the architectural features of 8051 microcontroller and its peripherals, Memory Organization, memory interfacing and looping instructions.[L4]															
	C302.2	CO.2. Develop 8051 programs in assembly language to solve arithmetic and logical programs.[L4]															
	C302.3	CO.3. Analyse different I/O devices (Serial), interrupts and develop programs to configure 8051 Microcontroller.[L4]															
	C302.4	CO.4. Analyse Interfacing of 8051 Microcontroller for different I/O devices and 8255 Microcontroller.[L4]															
C302	C302.5	CO5 Evaluate software delays, timer delays and timer programming using both Assembly and C language.[L5]															
		PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**		
	C302.1	0	3	0	0	2	0	0	0	0	0	0	3	0	3		
	C302.2	0	3	0	0	2	0	0	0	0	0	0	3	0	3		
	C302.3	0	3	0	0	2	0	0	0	0	0	0	3	0	3		
	C302.4	0	3	0	0	2	0	0	0	0	0	0	3	0	3		
	C302.5	0	3	0	0	2	0	0	0	0	0	0	3	0	3		
Course Name: Power Electronics (17EE53)																	
	C303.1	CO.1. Analyse and design single phase diode rectifier circuits with the characteristics of power diodes.[L4]															
	C303.2	CO.2. Analyse the steady state, switching characteristics and gate control requirements of power transistors.[L3]															
	C303.3	CO.3. Analyse the gate characteristics and gate control requirements of power thyristors.[L3]															
	C303.4	CO.4. Analyse and design of controlled rectifiers and AC voltage controllers.[L4]															
	C303.5	CO.5 Analyse and design of DC-DC converters and DC-AC Converters.[L4]															
C303		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**		

HoD

Dr. PARTHASARATHY L.
Professor and HOD
Dept. of Electrical & Electronics Engineering
ATME College of Engineering, Mysuru

Department of Electrical and Electronics Engineering

ATME College of Engineering

Department of Electrical & Electronics Engineering

CO Statements, CO-PO and CO-PSO Matrix for AY 2019-2020

	C303.1	3	3	0	0	0	0	0	0	0	0	0	3	2	1		
	C303.2	3	3	0	0	0	0	0	0	0	0	0	3	2	1		
	C303.3	3	3	0	0	0	0	0	0	0	0	0	3	2	1		
	C303.4	3	3	0	0	0	0	0	0	0	0	0	3	3	2		
	C303.5	3	3	0	0	0	0	0	0	0	0	0	3	3	2		
Course Name: Signal & Systems (17EE54)																	
	C304.1	CO.1. Analyse the classification of the signals, and illustrate its operations and properties.[L4]															
	C304.2	CO.2. Apply convolution in both continuous and discrete domain for the impulse response of an LTI system.[L3]															
	C304.3	CO.3. Apply continuous time Fourier transform representation and to analyze its properties and applications (frequency response and solutions of differential equations) for LTI systems.[L3]															
	C304.4	CO.4. Apply discrete time Fourier transform representation and to analyze its properties and applications (frequency response and solutions of difference equations) for LTI systems.[L3]															
	C304.5	CO.5. Apply Z-transform and properties of ROC for the analysis of discrete time systems.[L4]															
C304		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**		
	C304.1	2	2	0	0	0	0	0	0	0	0	0	1	0	3		
	C304.2	2	2	0	0	0	0	0	0	0	0	0	2	0	3		
	C304.3	2	2	0	0	0	0	0	0	0	0	0	2	0	3		
	C304.4	2	2	0	0	0	0	0	0	0	0	0	2	0	3		
	C304.5	1	2	0	0	0	0	0	0	0	0	0	2	0	3		
Course Name: Electrical Engineering Materials (17EE552)																	
	C305.1	CO.1. Interpret the importance and operational requirement of electrical and electronics materials.[L2] M1															
	C305.2	CO.2. Interpret the properties and applications of conducting materials and dielectric materials.[L2] M2															
	C305.3	CO.3. Interpret the properties and applications of insulating materials and magnetic materials.[L2] M3															
	C305.4	CO.4. Interpret the properties and applications of super conducting materials.[L2] M4															
	C305.5	CO5:Interpret the properties and applications of plastic & materials of Opto electronic devices. [L2][M5]															
C305		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**		
	C305.1	3	0	0	0	0	0	0	0	0	0	0	0	1	0		
	C305.2	3	0	0	0	0	0	0	0	0	0	0	0	1	0		
	C305.3	3	0	0	0	0	0	0	0	0	0	0	0	1	0		
	C305.4	3	0	0	0	0	0	0	0	0	0	0	0	1	0		
	C305.5	3	0	0	0	0	0	0	0	0	0	0	0	1	0		
Course Name: Renewable Energy Sources (17EE563)																	
	C306.1	Discuss causes of energy scarcity and its solution, availability of renewable energy and also discuss on energy from sun reaching the Earth's surface and solar thermal energy applications.															
	C306.2	Explain the types of solar collectors, their configurations, solar cell system, its characteristics and their applications.															
	C306.3	Interpret on generation of energy from hydrogen, wind, geothermal system, solid waste and agriculture refuse.															
	C306.4	Discuss on generation of energy from solid waste, agriculture refuse, biomass and biogas.															
	C306.5	Discuss on tidal enegy, wave energy and ocean thermal energy resources.															
C306		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**		
	C306.1	3	2	0	0	0	2	2	1	0	0	0	2	2	0		
	C306.2	3	2	0	0	0	2	2	1	0	0	0	2	2	0		
	C306.3	3	0	0	0	0	2	2	1	0	0	0	2	2	0		
	C306.4	3	0	0	0	0	2	2	1	0	0	0	2	2	0		
	C306.5	3	0	0	0	0	2	2	1	0	0	0	2	2	0		
Course Name: Microcontrollers Laboratory(17EEL57)																	
	C307.1	CO.1. Evaluate the output for data transfer, aritlmetic, Boolean, logical instructions using Assembly Language Programming.[L5]															
	C307.2	CO.2. Evaluate the output for code conversions using Assembly Language Programming.[L5]															
	C307.3	CO.3. Evaluate the output for subroutines for generation of delays, counters, configuration of SFRs, serial communication and timers using Assembly Language Programming.[L5]															
	C307.4	CO.4. Evaluate the interfacing of PMDC motors using C programming.[L5]															
	C307.5	CO.5. Evaluate the interfacing of DAC, Elevator (Board Simulator) and LCD using C Programming.[L5]															
C307		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**		
	C307.1	0	0	0	0	3	0	0	0	0	0	0	3	0	3		
	C307.2	0	0	0	0	3	0	0	0	0	0	0	3	0	3		
	C307.3	0	0	0	0	3	0	0	0	0	0	0	3	0	3		
	C307.4	0	0	0	0	3	0	0	0	0	0	0	3	0	3		
	C307.5	0	0	0	0	3	0	0	0	0	0	0	3	0	3		
Course Name: Power Electronics Lab (17EEL58)																	
	C308.1	CO.1. Analyse the static characteristics of SCR, MOSFET, IGBT and TRIAC and compare their performances.[L3]															
	C308.2	CO.2. Demonstrate UJT relaxation oscillator and digital firing circuit to turn-on SCR.[L3]															
	C308.3	CO.3. Analyse the performance of single phase controlled full wave rectifier and AC voltage controller with R and RL loads.[L3]															
	C308.4	CO.4. Control the speed of a DC motor, universal motor and stepper motor by using SCR, MOSFET and TRIAC.[L3]															
	C308.5	CO.5 Analyse and design of snubber circuit.[L4]															
C308		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**		
	C308.1	3	0	0	0	0	0	0	0	2	2	0	2	2	1		
	C308.2	3	2	0	0	0	0	0	0	2	2	0	2	2	1		
	C308.3	3	0	0	0	0	0	0	0	2	2	0	2	3	1		
	C308.4	3	0	0	0	0	0	0	0	2	2	0	2	3	1		
	C308.5	3	2	0	0	0	0	0	0	2	2	0	2	2	1		

HoD

Dr. PARTHASARATHY L.
Professor and HOD
Dept. of Electrical & Electronics Engineering
ATME College of Engineering, Mysuru

Department of Electrical and Electronics Engineering

ATME College of Engineering

Department of Electrical & Electronics Engineering

CO Statements, CO-PO and CO-PSO Matrix for AY 2019-2020

Course Name: Control System (17EE61)																
	C309.1	Analyse the modelling of mechanical and electrical systems and develop the transfer functions of the control systems. [L4]														
	C309.2	Analyse and develop the transfer function of the system by using block diagram reduction technique and signal flow graph. [L4]														
	C309.3	Analyse the time response of first order and second order system and determine the stability of system using RH criteria. [L4]														
	C309.4	Analyse the stability of the system using Root Locus and Bode plot. [L4]														
	C309.5	Analyse the stability of the system using nyquist plot and design the controllers and compensators.[L4]														
C309		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**		
	C309.1	3	3	0	0	0	0	0	0	0	0	0	3	2	2		
	C309.2	3	3	0	0	0	0	0	0	0	0	0	3	2	2		
	C309.3	3	3	2	0	3	0	0	0	0	0	0	3	2	1		
	C309.4	3	3	2	0	3	0	0	0	0	0	0	3	2	1		
	C309.5	3	3	2	0	3	0	0	0	0	0	0	3	2	2		
Course Name: Power System Analysis and Stability (17EE62)																
	C310.1	CO1.Apply the per unit system for one line diagram of power systems. [L3] M-1														
	C310.2	CO2. Analyze the selection of circuit breaker through short circuit analysis for synchronous machines. [L4] M2														
	C310.3	CO3. Develop un-balanced power system network using symmetrical components.[L3] M3														
	C310.4	CO4. Analyze unsymmetrical fault currents using symmetrical components. [L4] M4														
	C310.5	CO5. Analyze the dynamics of synchronous machine and transient stability [L4] M5														
C310		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**		
	C310.1	3	2	0	0	0	0	0	0	0	0	0	0	3	0		
	C310.2	3	2	0	0	0	0	0	0	0	0	0	0	3	0		
	C310.3	3	2	0	0	0	0	0	0	0	0	0	0	3	0		
	C310.4	3	2	0	0	0	0	0	0	0	0	0	0	3	0		
	C310.5	3	2	0	0	0	0	0	0	0	0	0	0	3	0		
Course Name: Digital Signal Processing (17EE63)																
	C311.1	CO1: Apply Discrete Fourier transform of various signals and circular convolution using various methods. [L3]														
	C311.2	CO2: Apply Fast Fourier Transforms Algorithm for computing DFT and inverse DFT of a given sequence [L3]														
	C311.3	CO3: Analyse and Design IIR Filters using various techniques (impulse invariant transformation, bilinear transformation and Frequency transformations). [L4]														
	C311.4	CO4: Analyse and Design FIR Filters using various techniques(Window functions and frequency sampling techniques) [L4]														
	C311.5	CO5: Realize and develop digital IIR and FIR system by various methods.[L3]														
C311		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**		
	C311.1	2	3	0	0	2	0	0	0	0	0	0	2	0	3		
	C311.2	2	3	0	0	2	0	0	0	0	0	0	2	0	3		
	C311.3	2	3	2	0	2	0	0	0	0	0	0	2	0	3		
	C311.4	2	3	2	0	2	0	0	0	0	0	0	2	0	3		
	C311.5	0	2	0	0	0	0	0	0	0	0	0	0	0	3		
Course Name: Electrical Machine Design (17EE64)																
	C312.1	CO1: Apply the knowledge of engineering materials for the design of electrical machines.														
	C312.2	CO2: Apply design procedures for preliminary design of Transformers.														
	C312.3	CO3: Apply design procedures for preliminary design preliminary design of DC machines.														
	C312.4	CO4: Apply design procedures for preliminary design preliminary design of the stator of Induction Motors and Synchronous machines.														
	C312.5	CO5: Apply design procedures for preliminary design preliminary design of the rotor of Induction Motors.														
	C312.6	CO6: Apply design procedures for preliminary design preliminary design of the rotor of Synchronous machines.														
C312		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**		
	C312.1	3	0	0	0	0	3	2	2	0	0	0	3	0	2		
	C312.2	3	3	3	0	0	3	2	2	0	0	0	3	0	0		
	C312.3	3	3	3	0	0	3	2	2	0	0	0	3	2	2		
	C312.4	3	3	3	0	0	3	2	2	0	0	0	3	0	0		
	C312.5	3	3	3	0	0	3	2	2	0	0	0	3	0	0		
	C312.6	3	3	3	0	0	3	2	2	0	0	0	3	0	0		
Course Name: CAED (17EE651)																
	C313.1	CO1- Develop armature winding diagram for DC and AC machines and explain their terminologies[L3]														
	C313.2	CO2- Develop a layout for substation using the standard symbols for substation equipment [L3]														
	C313.3	CO3- Analyse and draw the sectional views of core and shell types transformers using the design data [L4]														
	C313.4	CO4- Analyse and draw sectional views of assembled DC machine or its parts using the design data or the sketches[L4]														
	C313.5	CO5- Analyse and draw sectional views of assembled alternator or its parts using the design data or the sketches.[L4]														
C313		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**		
	C313.1	3	0	0	0	3	0	0	0	0	0	0	0	0	2		
	C313.2	3	0	0	0	3	3	0	0	0	0	0	0	0	2		
	C313.3	3	3	0	0	3	0	0	0	0	0	0	0	0	2		
	C313.4	3	3	0	0	3	0	0	0	0	0	0	0	0	2		
	C313.5	3	3	0	0	3	0	0	0	0	0	0	0	0	2		
Course Name: Sensors & Transducer (17EE662)																
	C314.1	CO1:Analyze the construction and working of different types of sensors and transducers and know their classification, advantages, disadvantages, and applications														
	C314.2	CO2:Analyze signal conditioning methods and know the equipment's used for the same.														

HoD

Dr. PARTHASARATHY L.
Professor and HOD
Dept. of Electrical & Electronics Engineering
ATME College of Engineering, Mysuru

Department of Electrical and Electronics Engineering

ATME College of Engineering
Department of EEE Emitting Elite Energy

Department of Electrical & Electronics Engineering

CO Statements, CO-PO and CO-PSO Matrix for AY 2019-2020

	C314.3	CO3:Discuss configuration of Data Acquisition System and data conversion.														
	C314.4	CO4:Discuss about data transmission and telemetry.														
	C314.5	CO5:Explain measurement of non-electrical quantities like temperature, flow, speed, force, torque, power, and viscosity.														
C314		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**		
	C314.1	3	3	0	0	0	0	0	0	0	0	0	0	0	3		
	C314.2	3	3	0	0	0	0	0	0	0	0	0	0	0	3		
	C314.3	3	3	0	0	0	0	0	0	0	0	0	0	0	2		
	C314.4	3	3	0	0	0	0	0	0	0	0	0	0	0	2		
	C314.5	3	0	0	0	0	0	0	0	0	0	0	0	0	3		
Course Name: Control Systems Laboratory (17EEL67)																	
	C315.1	Analyse the performance characteristics of AC servomotor, DC servomotors and syclhro-transmitter receiver pair. [L4]														
	C315.2	Determine the time response and frequency response of a second order system using software package and discrete components.[L5]														
	C315.3	Design and Analyse the Lead, Lag and Lag-Lead compensators for the given specifications.[L4]														
	C315.4	Analyse the effect of P, PI, PD, PID and DC position controllers on the step response of the second order system.[L4]														
	C315.5	Evaluate the stability of the system using root locus, bode plot and nyquist plot.[L5]														
C315		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**		
	C315.1	3	1	0	0	0	0	0	0	2	2	2	2	2	1		
	C315.2	3	2	0	0	3	0	0	0	2	2	2	2	2	2		
	C315.3	3	2	0	0	0	0	0	0	2	2	2	2	2	1		
	C315.4	3	2	0	0	3	0	0	0	2	0	2	2	2	1		
	C315.5	3	2	0	0	3	0	0	0	2	0	2	2	2	1		
Course Name: Digital Signal processing Lab (17EEL68)																	
	C316.1	CO1: Explain the physical interpretation of sampling theorem in time and frequency domain.[L2]														
	C316.2	CO2: Evaluate the impulse response of systems.[L3]														
	C316.3	CO3: Perform Convolution of given sequences to evaluate the response of systems.[L3]														
	C316.4	CO4: Construct DFT and IDFT of a given sequences using basic definition.[L3]														
	C316.5	CO5: Construct a solution for a given difference equation and implement IIR & FIR filters [L3]														
C316		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**		
	C316.1	3	0	0	0	3	0	0	0	3	3	0	0	0	1		
	C316.2	3	0	0	0	3	0	0	0	3	3	0	0	0	1		
	C316.3	3	0	0	0	3	0	0	0	3	3	0	0	0	1		
	C316.4	3	0	0	0	3	0	0	0	3	3	0	0	0	1		
	C316.5	3	3	0	0	3	0	0	0	3	3	0	0	0	1		
Course Name: Power Systems Analysis -II (15EE71)																	
	C401.1	CO1: Develop the Ybus of power system using rule of inspection and graph theory(M-1)[L3]														
	C401.2	CO2: Perform load flow analysis of power system networks using Gauss-Seidel, Newton-Raphson and Fast decoupled iterative methods.(M-1,M-2)[L4]														
	C401.3	CO3: Solve the Unit Commitment problem with various constraints using optimization techniques.(M-3)[L4]														
	C401.4	CO4. Analyze optimal scheduling of hydro-thermal systems, Power system security and reliability.(M-4)[L4]														
	C401.5	CO5: Analyze short circuit faults in power system networks using ZBus(M-5)[L4]														
	C401.6	CO6: Interpret power system stability through solution of swing equation (M-5)[L4]														
C401		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**		
	C401.1	3	0	0	0	3	0	0	0	0	0	0	2	2	0		
	C401.2	3	3	0	0	3	0	0	0	0	0	0	3	2	0		
	C401.3	3	3	1	0	3	0	0	0	0	0	0	2	2	0		
	C401.4	3	3	1	0	1	0	0	0	0	0	0	2	2	0		
	C401.5	3	0	0	0	3	0	0	0	0	0	0	2	2	0		
	C401.6	3	3	0	0	1	0	0	0	0	0	0	2	2	0		
Course Name: Power System Protection (15EE72)																	
	C402.1	CO1:Interpret performance of protective relays, components of protection scheme and relay terminology.[L4] [M-1]														
	C402.2	CO2:Interpret over current protection, working and characteristics of distance relays and the effects of arc resistance, power swings, line length and source impedance on performance of distance relays.[L4][M-2]														
	C402.3	CO3:Interpret pilot protection, wire pilot relaying and carrier pilot relaying, interpret construction, operating principles and performance of differential relays for differential protection & interpret protection of generators, motors, Transformer and Bus Zone Protection[L5][M-3]														
	C402.4	CO4:Interpret the principle of circuit interruption in different types of circuit breakers. [L4][M 4].														
	C402.5	CO5:Interpret the construction and operating principle of different types of fuses and to give the definitions of different terminologies related to a fuse and Discuss protection against Overvoltages and Gas Insulated Substation[L4][M5]														
C402		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**		
	C402.1	3	0	1	0	0	0	0	1	0	0	0	2	2	1		
	C402.2	3	2	1	0	0	0	0	1	0	0	0	2	2	1		
	C402.3	3	2	1	0	0	0	0	1	0	0	0	2	2	1		
	C402.4	3	2	1	0	0	0	0	1	0	0	0	2	2	1		
	C402.5	3	1	1	0	0	0	0	1	0	0	0	2	2	1		
Course Name: HV Engineering (15EE73)																	
	C403.1	CO-1: Interpret the conduction and breakdown phenomenon in dielectrics. [L2, Module 1]														
	C403.2	CO-2: Apply the principles of generation of high voltage, currents and Impulse voltages. [L2, Module 2]														
	C403.3	CO-3: Apply measurement techniques for High Voltage, current and Impulse voltages. [L3, Module 3]														
	C403.4	CO-4: Interpret overvoltage phenomenon and insulation coordination in electric power systems.[L2, Module 4]														
	C403.5	CO-5: Solve the dielectric properties and interpret the testing methods of surge arrestors and switchgear.														

HoD

Dr. PARTHASARATHY L.
Professor and HOD
Dept. of Electrical & Electronics Engineering
ATME College of Engineering, Mysuru

Department of Electrical and Electronics Engineering

ATME College of Engineering

Department of Electrical & Electronics Engineering

CO Statements, CO-PO and CO-PSO Matrix for AY 2019-2020

C403		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2		
	C403.1	3	2	0	0	0	2	0	0	0	0	0	0	3	0		
	C403.2	3	2	0	0	0	2	0	0	0	0	0	0	3	0		
	C403.3	3	2	0	0	0	2	0	0	0	0	0	0	3	0		
	C403.4	3	2	0	0	0	2	0	0	0	0	0	0	3	0		
	C403.5	3	2	0	0	0	2	0	0	0	0	0	0	3	0		
Course Name: Utilisation Of Electrical Power (15EE742)																	
	C404.1	1. Apply electric heating, welding techniques and electrolysis techniques. [L3]															
	C404.2	2. Analyse the illumination levels for factory lighting- flood lighting-street lighting through design interior and exterior lighting systems. [L4]															
	C404.3	3. Analyse systems of electric traction and their control, speed time curves and mechanics of train movement. [L4]															
	C404.4	4. Explain the braking of electric motors, traction systems and their power supplies. [L2]															
	C404.5	5. Explain the working of electric and hybrid electric vehicles [L2]															
C404		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2		
	C404.1	3	0	0	0	0	2	0	0	0	0	0	0	3	0		
	C404.2	3	0	0	0	0	2	0	0	0	0	0	0	3	0		
	C404.3	3	3	0	0	0	3	0	0	0	0	0	0	3	0		
	C404.4	2	0	0	0	0	2	0	0	0	0	0	0	3	0		
	C404.5	2	0	0	0	0	3	0	0	0	0	0	0	3	0		
Course Name: Testing & Commission of Electrical Apparatus (15EE752)																	
	C405.1	CO-1 Describe the process to plan, testing, operation, control and implement commissioning of Transformers and Practice standard electrical safety regulations and rules during maintenance.															
	C405.2	CO-2: Demonstrate the performance specifications, testing, operation and commissioning of synchronous machines.															
	C405.3	CO-3: Explain the performance specifications, testing, operation and commissioning of Induction motor.															
	C405.4	CO-4: Describe the process of operation, handling, testing and commissioning of Underground Cables.															
	C405.5	CO-5: Explain the performance specifications, testing, operation and commissioning of Switchgear Devices and Domestic Installation.															
C405		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2		
	C405.1	3	0	0	0	0	0	0	2	0	0	0	3	2	0		
	C405.2	3	0	0	0	0	0	0	2	0	0	0	0	0	1		
	C405.3	3	0	0	0	0	0	0	2	0	0	0	0	0	1		
	C405.4	3	0	0	0	0	0	0	2	0	0	0	2	2	0		
	C405.5	3	0	0	0	0	0	0	2	0	0	0	0	2	0		
Course Name: Power System Simulation Laboratory (15EEL76)																	
	C406.1	CO1: Develop a program in power system toolbox to assess the performance of medium and long transmission lines and to solve bus admittance and bus impedance matrices of interconnected power systems.															
	C406.2	CO2: Develop a program to obtain the power angle characteristics of salient and non-salient pole alternator and to assess the transient stability under three phase fault at different locations in a of radial power systems.															
	C406.3	CO3: Solve power flow problem for simple power systems using Mi-power Tool.															
	C406.4	CO4:Interpret the unsymmetrical faults in radial power systems at different locations.															
	C406.5	CO5:Analyse optimal generation scheduling problems for thermal power plants using Mi-power tool.															
C406		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2		
	C406.1	3	0	0	0	3	0	0	0	3	3	0	2	2	0		
	C406.2	3	0	0	0	3	0	0	0	3	3	0	2	2	0		
	C406.3	3	3	0	0	3	0	0	0	3	3	0	3	2	0		
	C406.4	3	3	0	0	3	0	0	0	3	3	0	2	2	0		
	C406.5	3	3	0	0	3	0	0	0	3	3	0	2	2	0		
Course Name: Relay & High Voltage Lab (15EEL77)																	
	C407.1	CO1: Ability to set Plug Setting Multiplier, Time Setting Multiplier for Electromagnetic over Current Relay, Over Voltage Relay for a given actuating quantity and verify the characteristics of negative sequence relays. [L5]															
	C407.2	CO2. Ability to set Plug Setting Multiplier, Time Setting Multiplier for a given actuating quantity for numerical relay[L5]															
	C407.3	CO3:Ability to estimate asymmetric fault current for protection of generator and Motor [L4]															
	C407.4	CO4: Analyze the spark over characteristics for air for uniform and non-uniform configurations using High AC and DC voltages and measure high AC and DC voltages and breakdown strength of transformer oil.[L5]															
	C407.5	CO5. Estimate electric field and measure the capacitance of different electrode configuration models[L5]															
C407		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2		
	C407.1	2	0	0	0	0	0	0	0	2	0	0	0	2	0		
	C407.2	2	0	0	0	0	0	0	0	2	0	0	0	2	0		
	C407.3	2	0	0	0	0	0	0	0	2	1	0	0	2	0		
	C407.4	2	0	0	0	0	0	0	0	2	0	0	0	2	0		
	C407.5	1	0	0	0	0	0	0	0	2	0	0	0	0	0		
Course Name: PROJECT PHASE – I AND SEMINAR (15EEP78)																	
	C408.1	CO1. Demonstrate a sound technical knowledge of their selected project topic. [L4]															
	C408.2	CO2. Undertake problem identification, formulation and solution. [L4]															
	C408.3	CO3. Design engineering solutions to complex problems utilizing a systems approach. [L5]															
	C408.4	CO4. Demonstrate the knowledge, skills and attitudes of a professional engineer and Communicate with engineers, community at large in written and oral forms and. [L5]															
	C408.5	CO5. Demonstrate the engineering principles in a team to manage projects in multidisciplinary field. [L6]															
C408		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2		
	C408.1	0	0	3	3	2	0	0	0	3	3	3	3	3	3		
	C408.2	0	0	3	3	2	0	0	0	3	3	3	3	3	3		
	C408.3	0	0	3	3	2	0	0	0	3	3	3	3	3	3		
	C408.4	0	0	2	2	2	0	0	0	3	3	3	3	3	3		

HoD

Dr. PARTHASARATHY L.
Professor and HOD
Dept. of Electrical & Electronics Engineering
ATME College of Engineering, Mysuru

Department of Electrical and Electronics Engineering

ATME College of Engineering

Department of Electrical & Electronics Engineering

CO Statements, CO-PO and CO-PSO Matrix for AY 2019-2020

	C408.5	0	0	2	2	2	0	0	0	3	3	3	3	3	3		
Course Name: Power System Operation & Control (15EE81)																	
	C409.1	CO1: Analyze various levels of controls in Power systems, SCADA and Solve unit commitment problems															
	C409.2	CO2: Apply the issues concerning hydrothermal scheduling and its solutions to hydro thermal problems															
	C409.3	CO3: Analyze the basic generator control loops, mathematical models of ALFC and functions of Automatic generation control															
	C409.4	CO4: Analyze automatic generation control in an interconnected power system and the methods of voltage and reactive power control															
	C409.5	CO5: Analyze reliability, security, contingency analysis and state estimation of power systems.															
C409		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2		
	C409.1	3	3	0	0	0	0	0	0	0	0	0	2	3	0		
	C409.2	3	3	0	0	0	0	0	0	0	0	0	2	3	0		
	C409.3	3	3	0	0	0	0	0	0	0	0	0	2	3	0		
	C409.4	3	3	0	0	0	0	0	0	0	0	0	2	3	0		
	C409.5	3	3	0	0	0	0	0	0	0	0	0	2	3	0		
Course Name: Industrial Drives And Applications (15EE82)																	
	C410.1	CO1-Explain the advantages of Electric drives and its dynamics and different modes of operation [L4] M1															
	C410.2	CO2-Illustrate a motor for a drive and control of dc motor using controlled rectifiers. [L4] M2															
	C410.3	CO3-Analyze the performance of induction motor drives under different conditions. [L4], M3															
	C410.4	CO4-Control induction motor, synchronous motor and stepper motor drives. [L4] M4&M5															
	C410.5	CO5- Illustrate a suitable electrical drive for specific application in the industry. [L4] M5															
C410		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2		
	C410.1	3	0	0	0	0	0	0	0	0	0	0	0	0	0		
	C410.2	3	1	1	0	0	0	0	0	0	0	0	0	3	0		
	C410.3	2	1	0	0	0	0	0	0	0	0	0	0	1	0		
	C410.4	2	1	1	0	0	0	0	0	0	0	0	0	3	0		
	C410.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Course Name: INTEGRATION OF DISTRIBUTED GENERATION (15EE833)																	
	C411.1	Explain energy generation by wind power and solar power and discuss the variation in production capacity at different timescales, the size of individual units, and the flexibility in choosing locations with respect to wind and solar systems															
	C411.2	Explain the performance of the system when distributed generation is integrated to the system.															
	C411.3	Discuss effects of the integration of DG: Due to the increased risk of overload & increased losses.															
	C411.4	Discuss effects of the integration of DG: Increased risk of overvoltage's, increased levels of power quality disturbances															
C411		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2		
	C411.1	2	0	0	0	0	0	2	0	0	0	0	3	2	0		
	C411.2	2	0	2	0	0	0	0	0	0	0	0	0	2	0		
	C411.3	2	0	2	0	0	0	0	0	0	0	0	0	2	0		
	C411.4	2	0	2	0	0	0	0	0	0	0	0	0	2	0		
Course Name: Intership/Professional Practice (15EE84)																	
	C412.1	Gain Practical experience and acquire knowledge within industry in which the internship is done.															
	C412.2	Develop a greater understanding about career options while more clearly defining personal career goals and experience the activities and functions of professionals.															
	C412.3	Develop and refine oral and written communication skills and identify areas for future knowledge and skill development.															
	C412.4	Acquire the knowledge of administration, marketing, finance and economics and expand intellectual capacity, credibility, judgement intution.															
C412		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2		
	C412.1	0	0	3	3	2	0	0	0	3	3	3	3	3	3		
	C412.2	0	0	3	3	2	0	0	0	3	3	3	3	3	3		
	C412.3	0	0	3	3	2	0	0	0	3	3	3	3	3	3		
	C412.4	0	0	3	3	2	0	0	0	3	3	3	3	3	3		
Course Name: Project Work - Phase-II(15EEP85)																	
	C413.1	Apply Present the project and be able to defend it.															
	C413.2	Make links across different areas of knowledge and to generate, develop and evaluate ideas and information so as to apply these skills to the project task															
	C413.3	Habituated to critical thinking and use problem solving skills															
	C413.4	Communicate effectively and to present ideas clearly and coherently in both the written and oral forms.															
	C413.5	Learn on their own, reflect on their learning and take appropriate actions to improve it and Work in a team to achieve common goal															
C413		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2		
	C413.1	0	0	3	3	2	0	0	0	3	3	3	3	3	3		
	C413.2	0	0	3	3	2	0	0	0	3	3	3	3	3	3		
	C413.3	0	0	3	3	2	0	0	0	3	3	3	3	3	3		
	C413.4	0	0	2	2	2	0	0	0	3	3	3	3	3	3		
	C413.5	0	0	2	2	2	0	0	0	3	3	3	3	3	3		
Course Name: Seminar (15EES86)																	
	C414.1	Attain use and develop knowledge in the field of electrical and electronics engineering and other disciplines through independent learning															
	C414.2	Identify, understand and discuss current, real time issues															
	C414.3	Improve oral and written communication skills															
	C414.4	Explore an appreciation of the self in relation to its large diverse social and academic contexts and apply priciples of ethics and respect in interaction with others.															
C414		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2		
	C414.1	0	0	3	3	0	0	1	0	3	3	0	0	2	3		
	C414.2	0	0	3	3	2	0	1	0	3	3	0	0	2	3		

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Professor and HOD
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Department of Electrical & Electronics Engineering

CO Statements, CO-PO and CO-PSO Matrix for AY 2019-2020

	C414.3	0	0	3	3	0	0	1	0	3	3	0	0	2	3	
	C414.4	0	0	3	3	0	0	1	3	3	3	0	0	2	3	

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Dr. PARTHASARATHY L.
Professor and HOD
Dept. of Electrical & Electronics Engineering
ATME College of Engineering, Mysuru

OBE, Curricular Gap & Activities

Department of Electrical and Electronics Engineering

The institution follows **Outcome Based education**. Outcome-Based Education (OBE) is a student-centric teaching and learning methodology in which the course delivery, assessment are planned to achieve stated objectives and outcomes.

It focuses on measuring student performance i.e. outcomes at different levels.

Some important aspects of the Outcome Based Education

1. Course is defined as a theory, practical or theory cum practical subject studied in a semester.

2. Course Outcome (CO) Course outcomes are statements that describe significant and essential learning that learners have achieved, and can reliably demonstrate at the end of a course. Generally, three or more course outcomes may be specified for each course based on its weightage.

3. Programme is defined as the specialization or discipline of a Degree. It is the interconnected arrangement of courses, co-curricular and extracurricular activities to accomplish predetermined objectives leading to the awarding of a degree.

4. Programme Outcomes (POs) Program outcomes are narrower statements that describe what students are expected to be able to do by the time of graduation. POs are expected to be aligned closely with Graduate Attributes.

5. Program Educational Objectives (PEOs) The Programme Educational Objectives of a program are the statements that describe the expected achievements of graduates in their career, and also in particular, what the graduates are expected to perform and achieve during the first few years after graduation.

6. Programme Specific Outcomes (PSO) Programme Specific Outcomes are what the students should be able to do at the time of graduation with reference to a specific discipline. Usually there are two to four PSOs for a programme.

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Professor and HOD
Dept. of Electrical & Electronics Engineering
ATME College of Engineering, Mysuru

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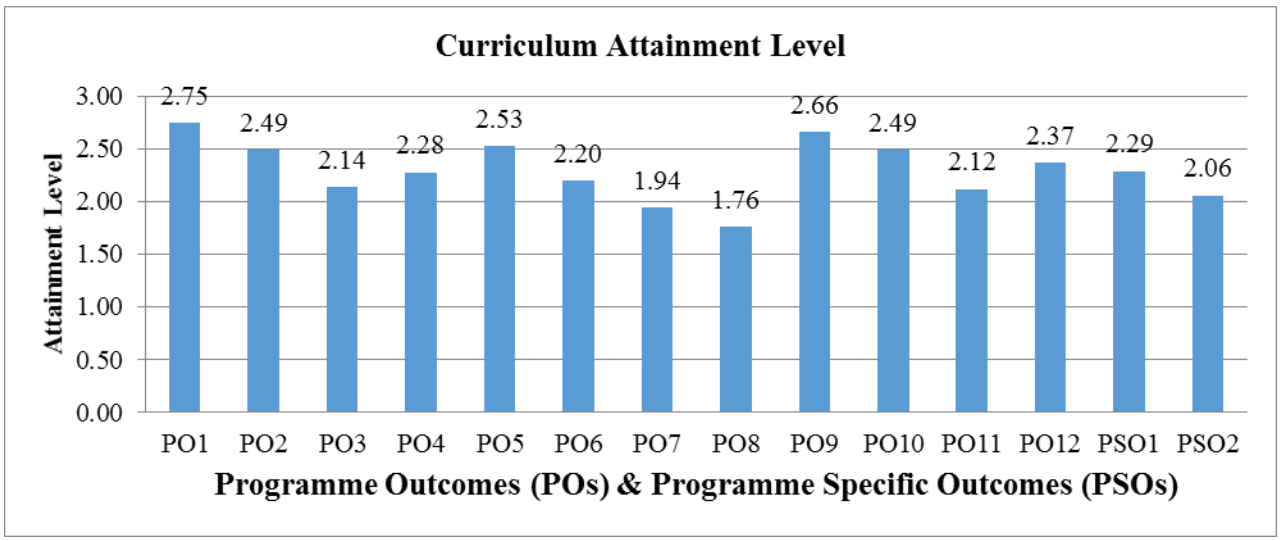
Curricular Gap for the attainment of PO and PSO

AY:2019-2020

2019-20	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
Curriculum Attainment Level	**2.75**	**2.49**	**2.14**	**2.28**	**2.53**	**2.20**	**1.94**	**1.76**	**2.66**	**2.49**	**2.12**	**2.37**	**2.29**	**2.06**

PAM	**2.68**	**2.35**	**1.92**	**2.10**	**2.41**	**2.00**	**1.67**	**1.45**	**2.57**	**2.36**	**1.89**	**2.21**	**2.35**	**2.06**
Feedback from Stakeholders	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PS01	PS02
Final Value	**2.75**	**2.49**	**2.14**	**2.28**	**2.53**	**2.20**	**1.94**	**1.76**	**2.66**	**2.49**	**2.12**	**2.37**	**2.29**	**2.06**



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List of activities observed to reduce the curriculum gap during the Academic Year-2019-2020

SL. No.	Activity	Action taken	Date	Resource Person with Designation	% of the Students	Relevance to POs	Relevance to PSOs
1	Programming concepts	Technical Training on C	Semester throughout	Mr. Kiran B	85%	PO3,PO4, PO10, PO12	PSO1,PSO2,
2	Technical Talk	Technical talk on Smart Grid Initiatives in India	4th September 2019	Er. HumeeraHaneef & Er. Manju K	90%	PO6,PO10, PO12	PSO2
3	Industry Visit	Understanding of Power Transformer, Switching and protective devices in a substation.	29th February 2020	Mr. Mahesh, Junior Engineer	95%	PO1,PO4,PO6,PO7,PO9, PO10, PO12	PSO1,PSO2
4	Industry Visit	Understanding of working condition of distribution transformers & PLC automation	29th February 2020	Mr. Ravi Kumar Manager, TPC	90%	PO1,PO4,PO6,PO7,PO9, PO10, PO12	PSO1,PSO2
5	Activity	State Level Technical Fest "Avagamah" Hackathon	14th November 2019	--	90%	PO1,PO4,PO6,PO7, PO8,PO9, PO10, PO12 PO8	PSO1,PSO2
6	Technical talk	Career Opportunities and Skillset for Engineering Graduates- Industry Expert Perspective	3rd August 2020	Ms. Kavyashree Ramesh	90%	PO1,PO4,PO6,PO7,PO8, PO9, PO10, PO12	PSO1,PSO2
7	Technical Training	PLC & SCADA-Level-1	Semester throughout	Mrs. Kiran Pathnak	100%	PO1,PO4,PO6,PO7,PO9, PO10, PO12	PSO1,PSO2

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Sample Activity

State Level Technical Fest "Avagamah"

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Department of EEE
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Department of Electrical and Electronics Engineering

Circular **08.11.2019**

Subject: Technical Fest

The Department of Electrical & Electronics Engineering is organising State Level Technical Fest "AVAGAMAH" under department association "Quantum" on 14th November 2019. Students are Informed to participate and make use of the opportunity to enhance and exhibit your skills.

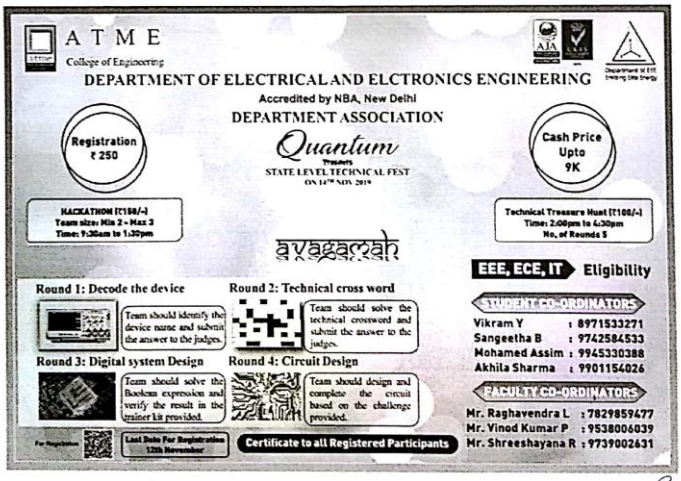
Events:

1. Hackathon
2. Technical Treasure Hunt

Objectives:

1. To enhance the Analytical and Technical Skills in students.
2. To enhance organising skills, analysing skills, technical skills in students.

For Further details contact the coordinators:



8.11.19
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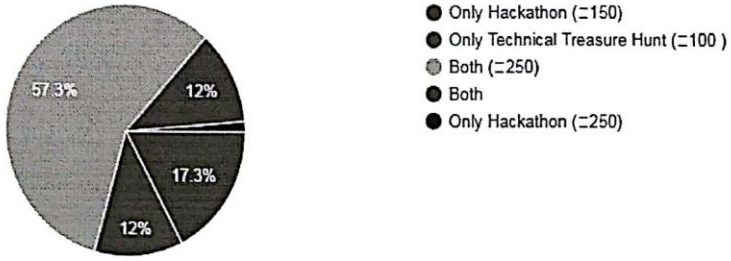
Google Response Form:

Event Registration

75 responses

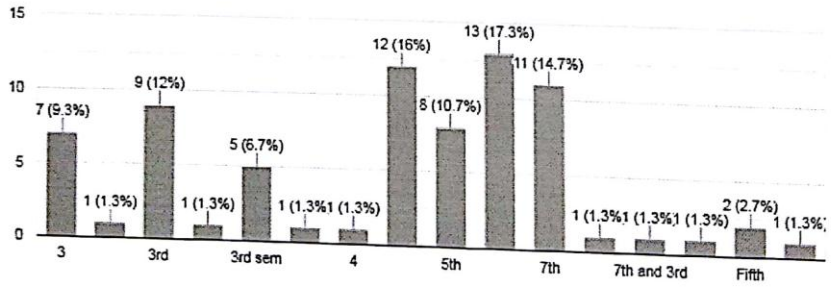


Registration Date

75 responses

Semester

75 responses



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Outcome

Students were able to:

1. Exhibit Analytical and Technical Skills through Hackathon event
2. Analyse and Infer result for the assigned task through technical Treasure hunt activity.

SL.No	No of Teams	Event Type
1	75	State Level

Event Coordinators Signature

1.Mr. Raghavendra L

2.Mr.Vinod Kumar P

3.Mr. Shreeshayana R

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Professor and HOD
Dept. of Electrical & Electronics Engineering
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Feedback Form

1. **Student Name:** ARPITHA R
2. **USN:** 4ADITEE002
3. **Activity:** Technical Fest (Hackathon, Technical treasure Hunt)
4. **Venue:** Dept of EEE ATMECE [Room No. 004]
5. **Date:** 14/11/19

Tick the appropriate Feedback response:

SL.No.	Parameters	Excellent	Very Good	Good	Satisfactory
1	Objectives & Outcomes of the event met your expectation		✓		
2	Effectiveness of discussion, Knowledge gained from the Activity	✓			
3	Overall, how do you rate the activity in terms of skill enhancement		✓		

Suggestions: It let us to gain knowledge in a better way, it will be very helpful for Students in participating.

Signature with Date: 15/11/19

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Department of Electrical and Electronics Engineering

Feedback Form

1. **Student Name:** JOSHUA . H. RAYAPUR
2. **USN:** 4AD17EE015
3. **Activity:** Hackathon, Technical Treasure Hunt in [Technical Fest]
4. **Venue:** Department of EEE [Room no. 04]
5. **Date:** 14/11/19

Tick the appropriate Feedback response:

SL.No.	Parameters	Excellent	Very Good	Good	Satisfactory
1	Objectives & Outcomes of the event met your expectation		✓		
2	Effectiveness of discussion, Knowledge gained from the Activity		✓		
3	Overall, how do you rate the activity in terms of skill enhancement	✓			

Suggestions: It would be helpful if you conduct similar activities to improve our skills.

Signature with Date: 15/11/19

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Professor and HOD
Dept. of Electrical & Electronics Engineering
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Curricular Gap for the attainment of PO and PSO, Previous Years

Table 1: POs and PSOs attainment for the University Curriculum in the Academic Year: 2018-19

Method	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
PAM and Feedbacks from Stakeholders	2.70	2.34	1.73	1.68	2.18	1.87	1.80	1.92	1.98	1.94	1.99	1.96	2.46	1.87	1.74	2.01

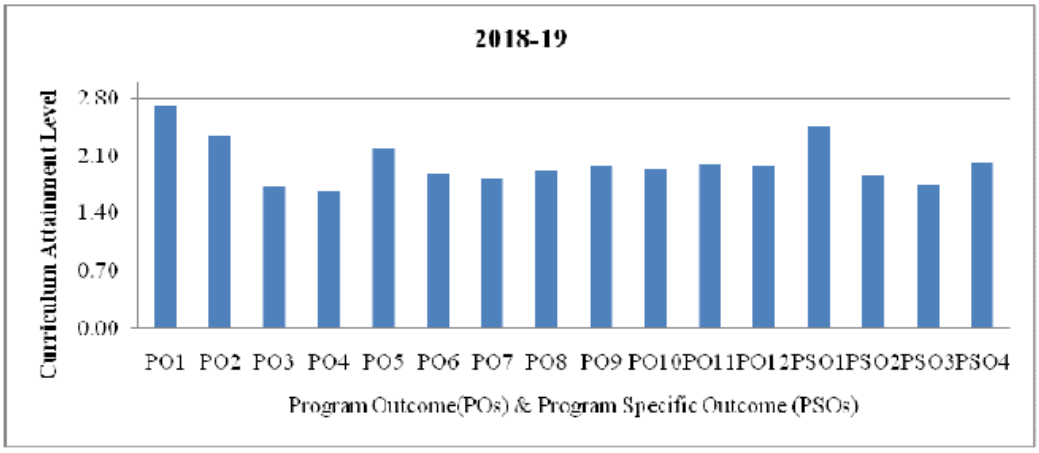

Table II: POs and PSOs attainment for the University Curriculum in the Academic Year: 2017-18

Method	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
PAM and Feedbacks from Stakeholders	2.45	2.45	1.87	1.95	1.95	1.79	1.86	1.86	2.04	1.70	1.70	2.01	1.76	1.76	1.69	1.92

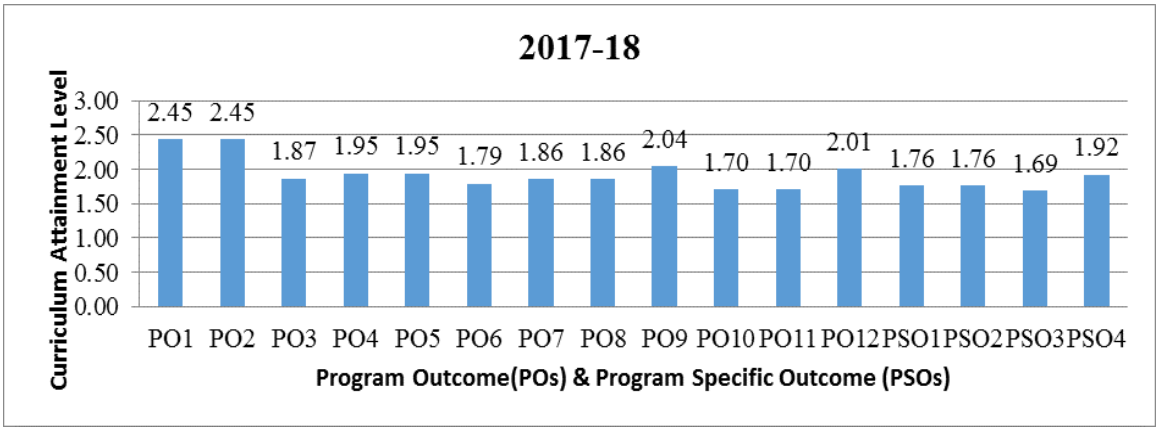

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Table III: POs and PSOs attainment for the University Curriculum in the Academic Year:2016-17

Method	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
PAM and Feedbacks from Stakeholders	2.30	2.30	1.83	1.92	1.92	1.58	1.72	1.72	1.75	1.52	1.52	1.95	1.49	1.49	1.39	1.73

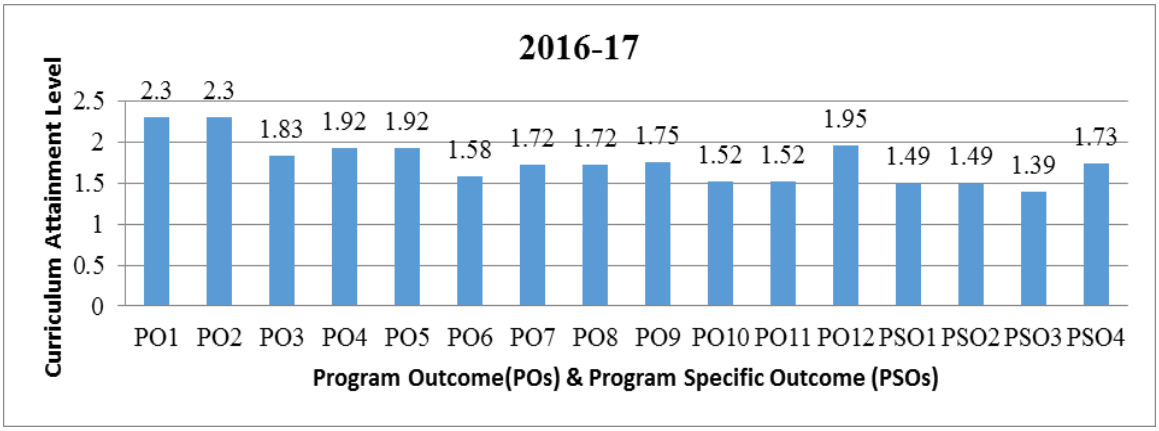
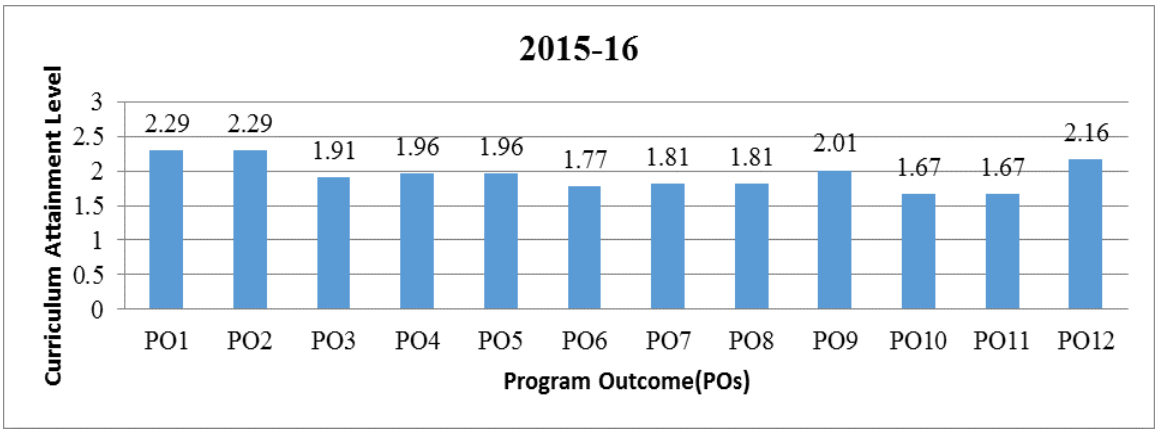


Table IV: POs attainment for the University Curriculum in the Academic Year: 2015-16

Method	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
PAM and Feedbacks from Stakeholders	2.29	2.29	1.91	1.96	1.96	1.77	1.81	1.81	2.01	1.67	1.67	2.16



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Professor and HOD
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Faculty and students are aware of the stated Programme and course outcomes of the Programmes

To create awareness about **Programme and course outcomes** of the department, it has been published and disseminated among the stake holders.

The extent of student awareness about the POs and COs and their actual performance reflecting these would be the real indicators of success or outcome of the programme. In this regard our Institution has taken certain measures to educate and to create the awareness about the program outcomes and course outcomes among the faculty members and students.

Stakeholder	**Purpose**
Faculty	Implementer (Contributor) of Policies. Key contributor in developing/implementing growth Plan. Responsible for producing competent graduates/product of the Institution.
Student	Product of the Institution, responsible for creating Image of the institution while serving the society

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Dept. of Electronics & Communication
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Mysuru - 570 028

Programme Outcomes and Course Outcomes Dissemination

Sl. No	Particulars	Programme Outcomes	Course Outcomes
1	College Website	✓	✓
2	Corridors	✓	✓
3	Notes & Lab Manual	✓	✓
4	Course Module, Lesson Plan	--	✓
5	IA Question Paper	--	✓
6	Classroom, Seminar Hall, Laboratory	✓	--
7	Faculty Office, Dept. Office	✓	--
8	Magazine	✓	--
9	College Enterprise Resource Planning(CERP) Portal	✓	--
10	Student Handbook	✓	✓
11	Faculty Handbook	✓	✓
12	Flipped Classroom(Mail) through CERP/MS Teams	--	✓

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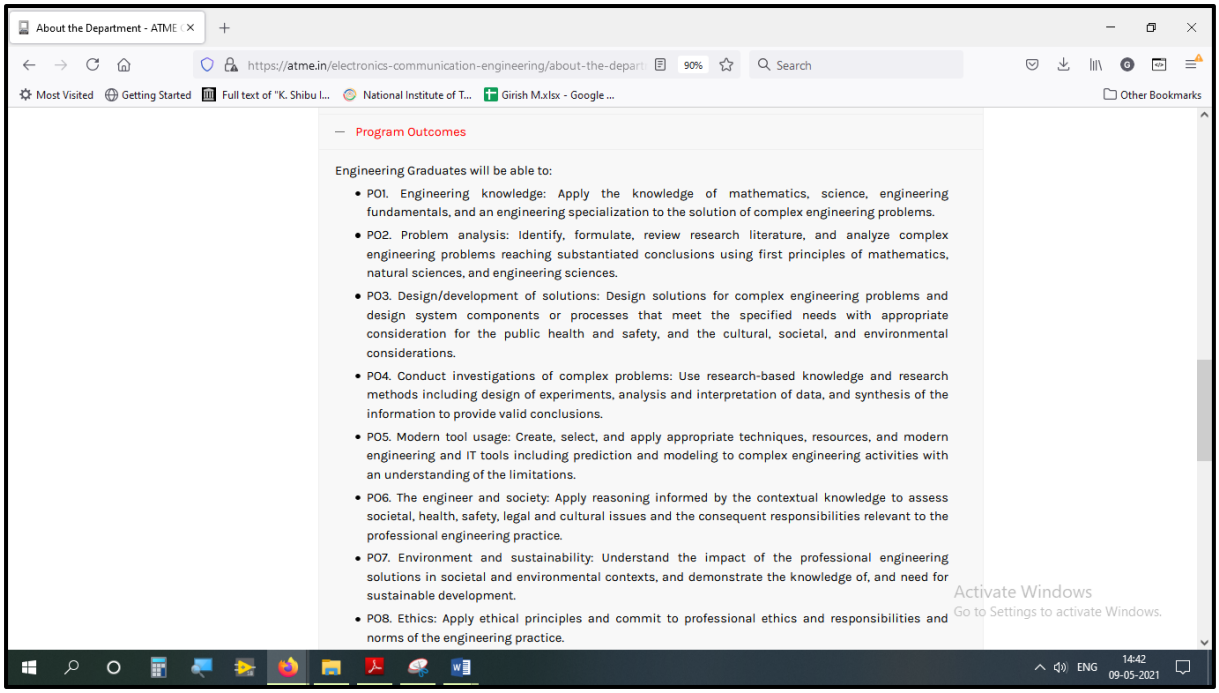
1. College Website

URL:https://atme.in/electronics-communication-engineering/about-the-department/#1512155409961-e1adfb92-dff2



2. Department Corridors

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3. Notes & Lab Manual

A T M E College of Engineering

Department of Electronics & Communication Engineering

Subject: Digital System Design
Subject Code:18EC34

Girish M.
Asst. Professor
Department of ECE
ATMECE, Mysuru

PROGRAMME OUTCOMES:

Engineering Graduates will be able to:

PO1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of EXPERIMENTs, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6. The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

A T M E College of Engineering

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

ACADEMIC YEAR 2018-19

LABORATORY MANUAL

SUBJECT: DIGITAL SYSTEM DESIGN LAB

SUB CODE: 18ECL38

SEMESTER: III

PO7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes (PSOs)

At the end of graduation the student will be able,

- To comprehend the fundamental ideas in Electronics and Communication Engineering and apply them to identify, formulate and effectively solve complex engineering problems using latest tools and techniques.
- To work successfully as an individual pioneer, team member and as a leader in assorted groups, having the capacity to grasp any requirement and compose viable solutions.
- To be articulate, write cogent reports and make proficient presentations while yearning for continuous self improvement.
- To exhibit honesty, integrity and conduct oneself responsibly, ethically and legally; holding the safety and welfare of the society paramount.

Program Educational Objectives (PEOs)

- Graduates will have a successful professional career and will be able to pursue higher education and research globally in the field of Electronics and Communication Engineering thereby engaging in lifelong learning.
- Graduates will be able to analyse, design and create innovative products by adapting to the current and emerging technologies while developing a conscience for environmental/ societal impact.
- Graduates with strong character backed with professional attitude and ethical values will have the ability to work as a member and as a leader in a team.
- Graduates with effective communication skills and multidisciplinary approach will be able to redefine problems beyond boundaries and develop solutions to complex problems of today's society.

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ATME College of Engineering

VISION AND MISSION OF THE INSTITUTE

VISION

Development of academically excellent, culturally vibrant, socially responsible and globally competent human resources.

MISSION

- To keep pace with advancements in knowledge and make the students competitive and capable at the global level.
- To create an environment for the students to acquire the right physical, intellectual, emotional and moral foundations and shine as torch bearers of tomorrow's society.
- To strive to attain ever-higher benchmarks of educational excellence.

ATME COLLEGE OF ENGINEERING
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Vision

To develop highly skilled and globally competent professionals in the field of Electronics and Communication Engineering to meet industrial and social requirements with ethical responsibility.

Mission

- To provide State-of-art technical education in Electronics and Communication at undergraduate and post-graduate levels, to meet the needs of the profession and society and achieve excellence in teaching-learning and research.
- To develop talented and committed human resource, by providing an opportunity for innovation, creativity and entrepreneurial leadership with high standards of professional ethics, transparency and accountability.
- To function collaboratively with technical Institutes/Universities/Industries, offer opportunities for interaction among faculty-students and promote networking with alumni, industries and other stake-holders.

Program outcomes (POs)

Engineering Graduates will be able to:

PO1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

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PO3. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

PO6. The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

4. Course Module, Lesson Plan

COURSE MODULES OF THE SUBJECT TAUGHT FOR THE SESSION AUG-NOV 2019

ourse Syllabi with CO's

Academic Year: 2019-20 (Odd Semester)

Department: Electronics and Communication Engineering

Course Code	Course Title	Core/Elective	Prerequisite	Contact Hours L	T	P	Total Hrs/ Sessions
18EC34	**Digital System Design**	Core	Basic Electronics, Number System, Boolean Algebra,	3		-	40

Course Learning Objectives:

This course will enable students to:

- Illustrate simplification of Algebraic equations using Karnaugh Maps and Quine-Mc Clusky Techniques.
- Design Decoders, Encoders, Digital Multiplexer, Adders, Subtractors and Binary Comparators.
- Describe Latches and Flip-flops, Registers and Counters.
- Analyze Mealy and Moore Models.
- Develop state diagrams Synchronous Sequential Circuits.
- Appreciate the applications of digital circuits.

Topics Covered as per Syllabus

Module-1

Principles of combinational logic: Definition of combinational logic, canonical forms, Generation of switching equations from truth tables, Karnaugh maps-3,4,5 variables, Incompletely specified functions (Don't care terms) Simplifying Max term equations, Quine-McClusky techniques – 3 & 4 variables.
(Text 1 - Chapter 3) **[RBT Levels: L1, L2, L3]**

Module-2

Analysis and design of combinational logic: Decoders, Encoders, Digital multiplexers, Adders and subtractors, look ahead carry, Binary comparators. (Text 1 - Chapter 4). Programmable Logic Devices, Complex PLD, FPGA. (Text 3 - Chapter 9, 9.6 to 9.8) **[RBT Levels: L1, L2, L3]**

Module-3

Flip-Flops and its Applications: Basic Bi-stable elements, Latches, The master-slave flipflops (pulse-triggered flip-flops): SR flip-flops, JK flip-flops, Characteristic equations, Registers, binary ripple counters, and synchronous binary counters. (Text 2 - Chapter 6) **[RBT Levels: L1, L2, L3]**

Module-4

Sequential Circuit Design: Design of a synchronous counter, Design of a synchronous mod-n counter using clocked JK, D, T and SR flip-flops. (Text 2 - Chapter 6) Mealy and Moore models, State machine notation, Construction of state diagrams. (Text 1 -Chapter 6) **[RBT Levels: L1, L2, L3]**

Module-5

Applications of Digital Circuits: Design of a Sequence Detector, Guidelines for construction of state graphs, Design Example – Code Converter, Design of Iterative Circuits (Comparator), Design of Sequential Circuits using ROMs and PLAs, CPLDs and FPGAs, Serial Adder with Accumulator, Design of Binary Multiplier, Design of Binary Divider. (Text 3 – 14.1, 14.3, 16.2, 16.3, 16.4, 18.1, 18.2, 18.3) **[RBT Levels: L1, L2, L3]**

List of Text Books

1. John M Yarbrough, -Digital Logic Applications and Design, Thomson Learning,2001.
2. Donald D. Givone, —Digital Principles and Design|, McGraw Hill, 2002.
3. Charles H Roth Jr., Larry L. Kinney —Fundamentals of Logic Design, Cengage Learning, 7th Edition.

List of Reference Books

1. D. P. Kothari and J. S Dhillon, —Digital Circuits and Design|, Pearson, 2016.
2. Morris Mano, —Digital Design|, Prentice Hall of India, Third Edition.
3. K. A. Navas, —Electronics Lab Manual|, Volume I, PHI, 5th Edition, 2015.

List of URLs, Text Books, Notes, Multimedia Content, etc

1. Logic Design, Sudhakar Samuel, Pearson/Saguine, 2007.
2. https://onlinecourses.nptel.ac.in/noc19_ee51

Course Outcomes

After studying this course, students will be able to:

1. Explain the concept of combinational and sequential logic circuits.
2. Design the combinational logic circuits.
3. Design the sequential circuits using SR, JK, D, T flip-flops and Mealy & Moore machines
4. Design applications of Combinational & Sequential Circuits.

Internal Assessment Marks: 40 marks (3 Session tests are conducted for 30 marks during the semester + 10 marks for the assignment and marks are allotted based on average of three test performances).

The Correlation of Course Outcomes (CO's) and Program Outcomes (PO's)

Subject Code:	18EC34	TITLE: Digital System Design										
List of Course Outcomes	Program Outcomes											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO-1	2	2	1	-	-	-	-	-	-	-	-	1
CO-2	2	2	2	-	1	-	-	-	-	-	-	2
CO-3	2	2	1	1	1	-	-	-	-	-	-	2
CO-4	3	2	2	1	1	-	-	-	-	-	-	2

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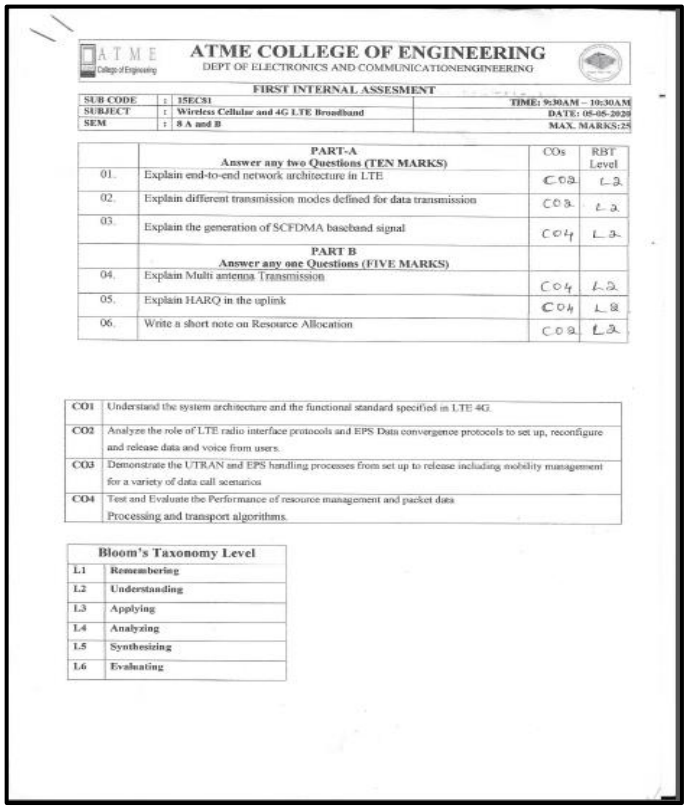
5. IA Question Paper & Scheme



ATME COLLEGE OF ENGINEERING
DEPT OF ELECTRONICS AND COMMUNICATIONENGINEERING

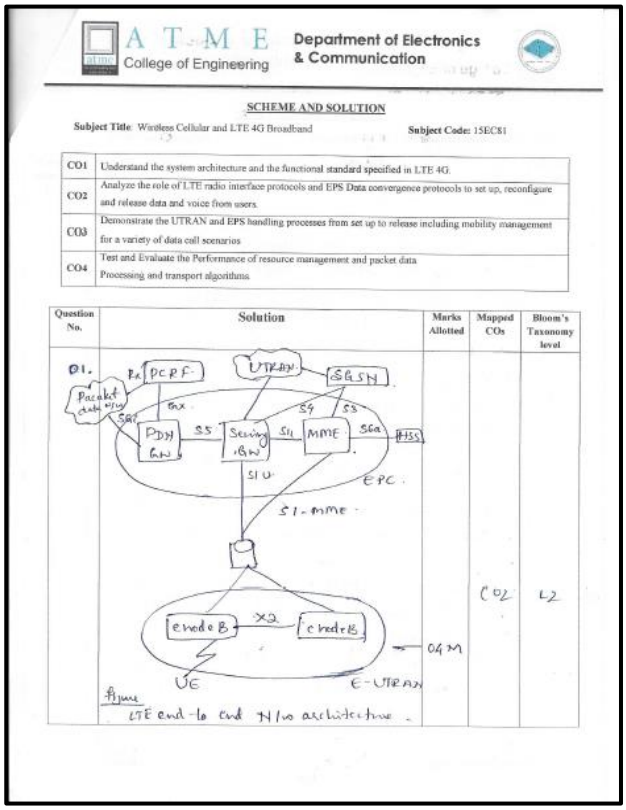
FIRST INTERNAL ASSESMENT

SUB CODE	:	15EC81	TIME: 9:30AM – 10:30AM
SUBJECT	:	Wireless Cellular and 4G LTE Broadband	DATE: 05-05-2020
SEM	:	8 A and B	MAX. MARKS:25

		COs	RBT Level
	PART-A Answer any two Questions (TEN MARKS)		
01.	Explain end-to-end network architecture in LTE	CO2	L2
02.	Explain different transmission modes defined for data transmission	CO3	L2
03.	Explain the generation of SCFDMA baseband signal	CO4	L2
	PART B Answer any one Questions (FIVE MARKS)		
04.	Explain Multi antenna Transmission	CO4	L2
05.	Explain HARQ in the uplink	CO4	L2
06.	Write a short note on Resource Allocation	CO2	L2

CO1	Understand the system architecture and the functional standard specified in LTE 4G.
CO2	Analyze the role of LTE radio interface protocols and EPS Data convergence protocols to set up, reconfigure and release data and voice from users.
CO3	Demonstrate the UTRAN and EPS handling processes from set up to release including mobility management for a variety of data call scenarios
CO4	Test and Evaluate the Performance of resource management and packet data Processing and transport algorithms.

Bloom's Taxonomy Level	
L1	Remembering
L2	Understanding
L3	Applying
L4	Analyzing
L5	Synthesizing
L6	Evaluating



A T M E College of Engineering
Department of Electronics & Communication

SCHEME AND SOLUTION

Subject Title: Wireless Cellular and LTE 4G Broadband Subject Code: 15EC81

CO1	Understand the system architecture and the functional standard specified in LTE 4G.
CO2	Analyze the role of LTE radio interface protocols and EPS Data convergence protocols to set up, reconfigure and release data and voice from users.
CO3	Demonstrate the UTRAN and EPS handling processes from set up to release including mobility management for a variety of data call scenarios
CO4	Test and Evaluate the Performance of resource management and packet data Processing and transport algorithms.

Question No.	Solution	Marks Allotted	Mapped COs	Bloom's Taxonomy level
01.	Figure LTE end-to end N/w architecture.	04 M	CO2	L2

6. Faculty Office, Dept. Office

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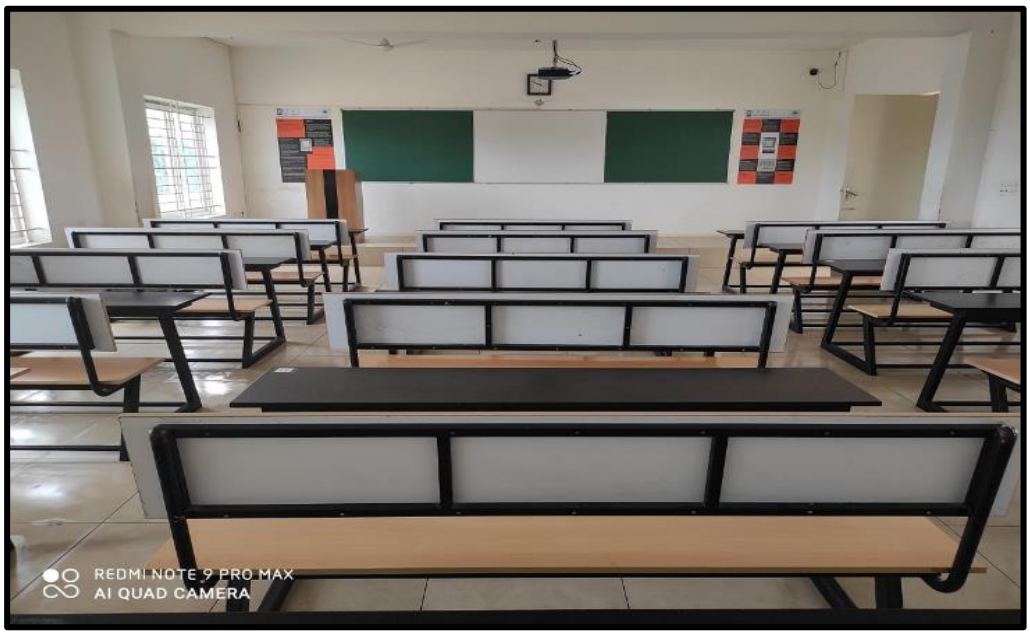
7. Classroom, Seminar Hall, Laboratory



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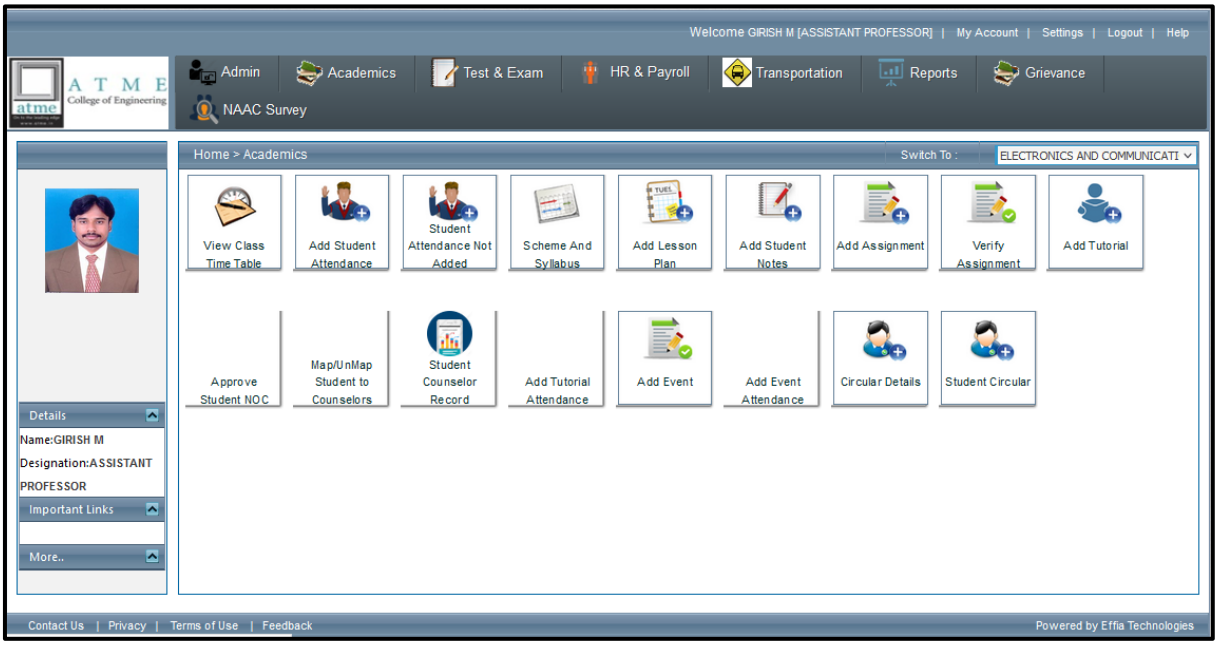
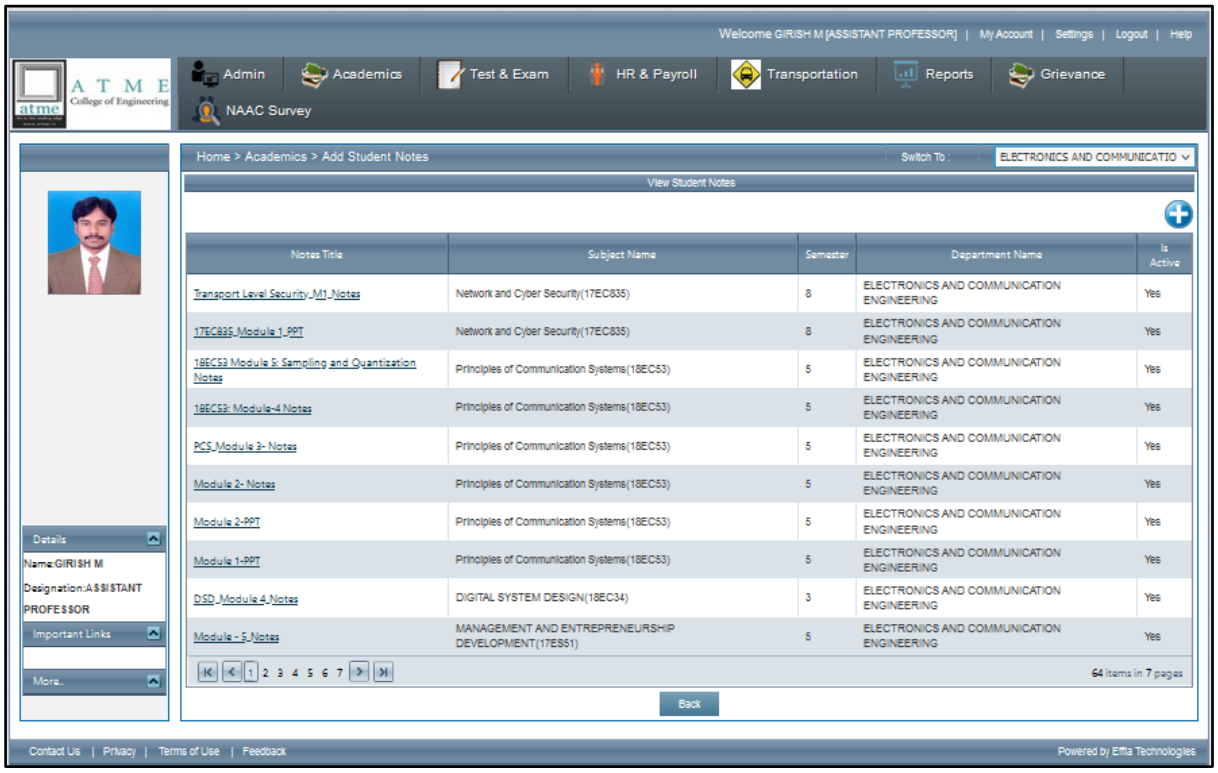
8. College Enterprise Resource Planning(CERP) Portal

Link: https://eerp.effia.co.in/WebForms/Academics/AcademicsHome.aspx





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9. Student Handbook

PO9. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

THE ADVANTAGES OF ACCREDITATION FROM NBA:

- Students get quality education and better employment opportunity.
- Employer in industry/ academia/ public services get well grounded practice engineers with requisite technical and behavioural skills / graduate attributes.
- Continuous improvement towards excellence.
- Graduation from an accredited program is Educational Passport for engineers' mobility across good number of advanced nations and emerging economies.
- The graduates may get leadership positions and challenging technology development opportunities.
- Industry hire graduates from accredited institutions for innovation-intensive projects for higher profits.

NATIONAL BOARD OF ACCREDITATION

Accreditation of UG Engineering Programmes

Student Handout

Vision and Mission of the institute

Vision

Development of academically excellent, culturally vibrant, socially responsible and globally competent human resources.

Mission

- To keep pace with advancements in knowledge and make the students competitive and capable at the global level.
- To create an environment for the students to acquire the right physical, intellectual, emotional and moral foundations and shine as torch bearers of tomorrow's society.
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Vision and Mission of the Dept of Electronics and Communication Engineering

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Program Educational Objectives (PEOs)

- Graduates will have a successful professional career and will be able to pursue higher education and research globally in the field of Electronics and Communication Engineering thereby engaging in lifelong learning.
- Graduates will be able to analyse, design and create innovative products by adapting to the current and emerging technologies while developing a conscience for environmental/ societal impact.
- Graduates with strong character backed with professional attitude and ethical values will have the ability to work as a member and as a leader in a team.
- Graduates with effective communication skills and multidisciplinary approach will be able to redefine problems beyond boundaries and develop solutions to complex problems of today's society.

Program Specific Outcomes (PSOs)

At the end of graduation the student will be able,

- To comprehend the fundamental ideas in Electronics and Communication Engineering and apply them to identify, formulate and effectively solve complex engineering problems using latest tools and techniques.
- To work successfully as an individual pioneer, team member and as a leader in assorted groups, having the capacity to grasp any requirement and compose viable solutions.
- To be articulate, write cogent reports and make proficient presentations while yearning for continuous self improvement.
- To exhibit honesty, integrity and conduct oneself responsibly, ethically and legally; holding the safety and welfare of the society paramount.

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PO7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

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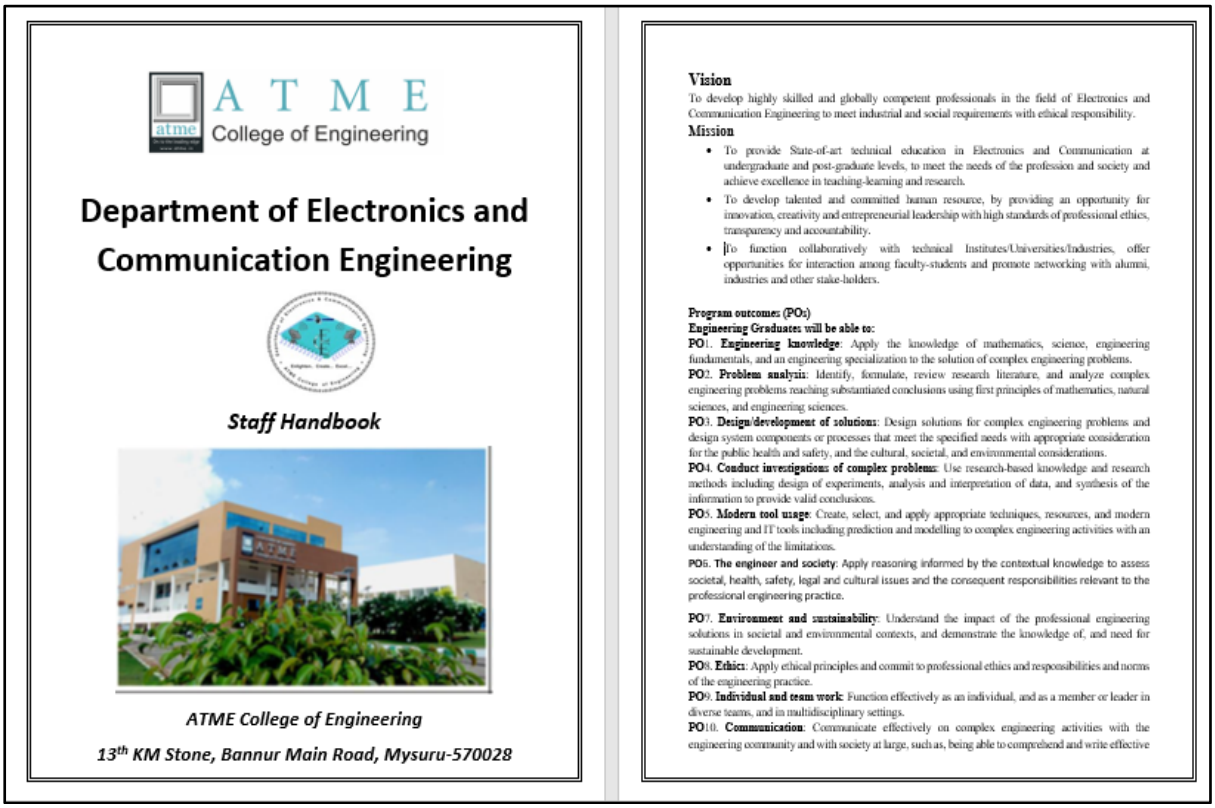
10. Faculty Handbook



A T M E College of Engineering

Department of Electronics and Communication Engineering

Staff Handbook

ATME College of Engineering

13th KM Stone, Bannur Main Road, Mysuru-570028

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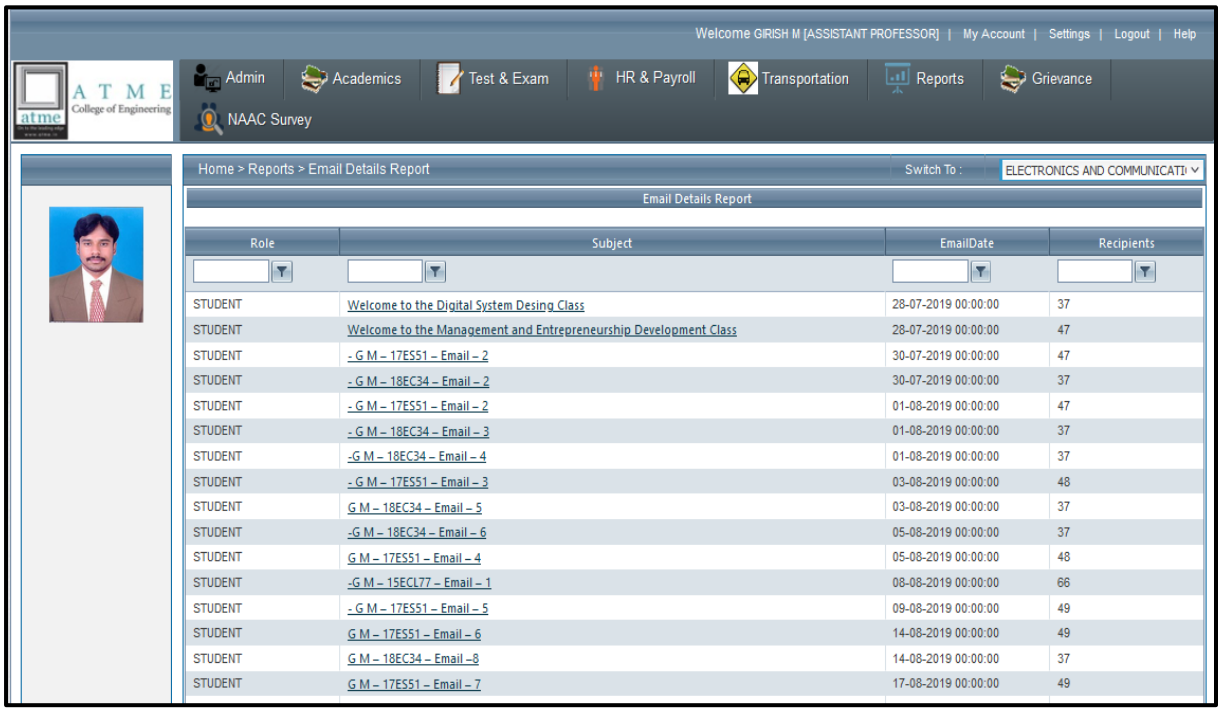
11. Flipped Classroom(Mail) through CERP/MS Teams



Role	Subject	EmailDate	Recipients
STUDENT	Welcome to the Digital System Desing Class	28-07-2019 00:00:00	37
STUDENT	Welcome to the Management and Entrepreneurship Development Class	28-07-2019 00:00:00	47
STUDENT	- G M – 17ES51 – Email – 2	30-07-2019 00:00:00	47
STUDENT	- G M – 18EC34 – Email – 2	30-07-2019 00:00:00	37
STUDENT	- G M – 17ES51 – Email – 2	01-08-2019 00:00:00	47
STUDENT	- G M – 18EC34 – Email – 3	01-08-2019 00:00:00	37
STUDENT	-G M – 18EC34 – Email – 4	01-08-2019 00:00:00	37
STUDENT	- G M – 17ES51 – Email – 3	03-08-2019 00:00:00	48
STUDENT	G M – 18EC34 – Email – 5	03-08-2019 00:00:00	37
STUDENT	-G M – 18EC34 – Email – 6	05-08-2019 00:00:00	37
STUDENT	G M – 17ES51 – Email – 4	05-08-2019 00:00:00	48
STUDENT	-G M – 15ECL77 – Email – 1	08-08-2019 00:00:00	66
STUDENT	- G M – 17ES51 – Email – 5	09-08-2019 00:00:00	49
STUDENT	G M – 17ES51 – Email – 6	14-08-2019 00:00:00	49
STUDENT	G M – 18EC34 – Email –8	14-08-2019 00:00:00	37
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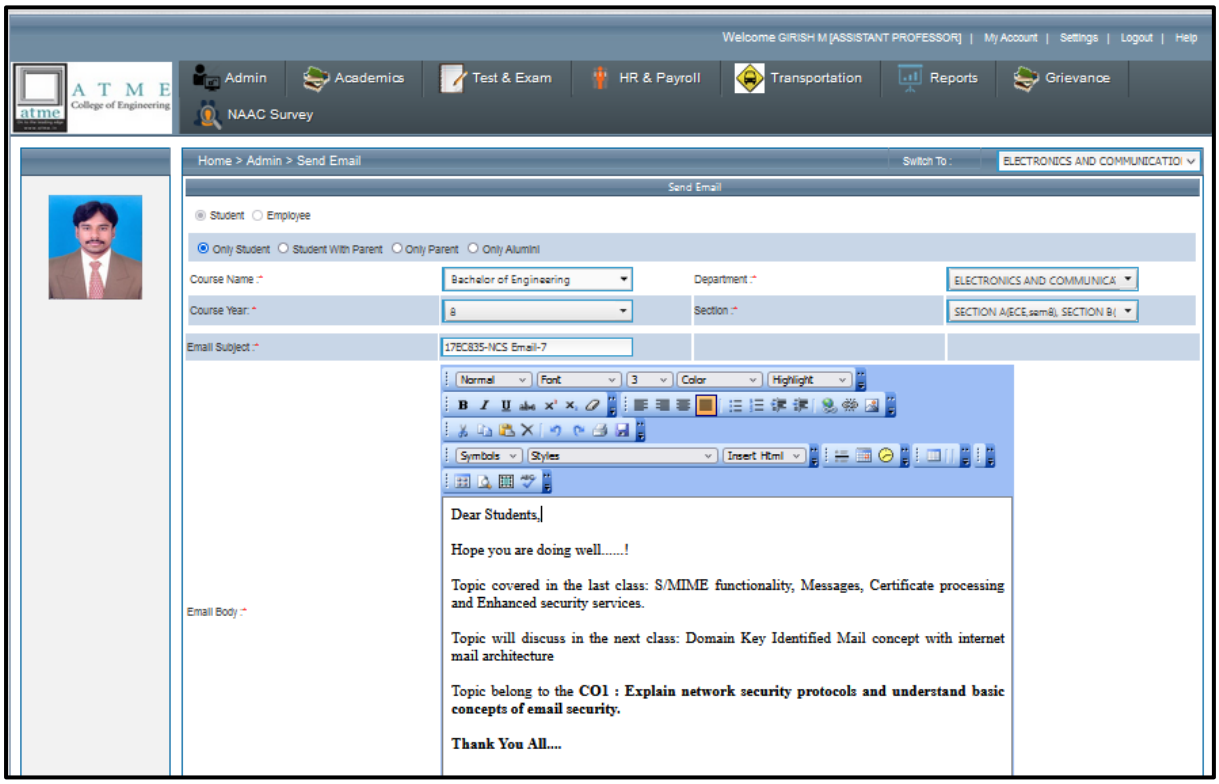

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Department of Electronics & Communication Engineering

(Accredited by NBA, New Delhi. Validity 01.07.2019 to 30.06.2022)

Course Outcomes and Mapping:AY 2019-20

Course Name: Transform Calculus, Fourier Series and Numerical Techniques (18MAT31)															
C2O1	**C2O1.1**	Use Laplace transform and inverse Laplace transform in solving differential/ integral equation arising in network analysis, control systems and other fields of engineering.													
	C2O1.2	Demonstrate Fourier series to study the behaviour of periodic functions and their applications in system communications, digital signal processing and field theory													
	C2O1.3	Make use of Fourier transform and Z-transform to illustrate discrete/continuous function arising in wave and heat propagation, signals and systems.													
	C2O1.4	Solve first and second order ordinary differential equations arising in engineering problems using single step and multistep numerical methods.													
	C2O1.5	Determine the extremals of functionals using calculus of variations and solve problems arising in dynamics of rigid bodies and vibrational analysis.													
		PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C2O1.1	3	2	2	-	-	-	-	-	-	-	-	1	1	-
	C2O1.2	2	2	-	-	-	-	-	-	-	-	-	1	1	-
	C2O1.3	3	2	-	-	-	-	-	-	-	-	-	3	1	-
	C2O1.4	2	2	-	-	-	-	-	-	-	-	-	1	1	-
	C2O1.5	1	1	-	-	-	-	-	-	-	-	-	1	1	-
Course Name: Network Theory (18EC32)															
C2O2	**C2O2.1**	Determine currents and voltages using source transformation/ source shifting/ mesh/ nodal analysis and reduce given network using star-delta transformation/source transformation/ source shifting.													
	C2O2.2	Solve network problems by applying Superposition/ Reciprocity/ Thevenin's/ Norton's/ Maximum Power Transfer/Millman's Network Theorems and electrical laws to reduce circuit complexities and to arrive at feasible solutions.													
	C2O2.3	Calculate current and voltages for the given circuit under transient conditions and apply Laplace transform to solve the given network.													
	C2O2.4	Solve the given network using specified two port network parameter like Z or Y or T or h and Understand the concept of resonance													
		PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C2O2.1	3	3	-	-	-	-	-	1	-	-	1	2	2	1
	C2O2.2	3	3	-	-	-	-	-	1	-	-	1	2	2	1
	C2O2.3	3	2	-	-	-	-	-	1	-	-	1	1	2	1
	C2O2.4	2	2	-	-	-	-	-	1	-	-	1	1	2	1
Course Name: Electronic Devices (18EC33)															
C2O3	**C2O3.1**	Understand the principles of semiconductor Physics													
	C2O3.2	Understand the principles and characteristics of different types of semiconductor devices													
	C2O3.3	Understand the fabrication process of semiconductor devices													
	C2O3.4	Utilize the mathematical models of semiconductor junctions and MOS transistors for circuits and systems.													
		PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C2O3.1	2	1	1	-	1	-	-	-	-	-	-	1	2	-
	C2O3.2	2	2	1	-	1	-	-	-	-	-	-	1	2	-
	C2O3.3	2	2	1	-	1	-	-	-	-	-	-	1	2	-
	C2O3.4	3	2	1	-	1	-	-	-	-	-	-	1	2	-

Course Name: Digital System Design (18EC34)															
	C2O4.1	Explain the concept of combinational and sequential logic circuits.													
	C2O4.2	Design the combinational logic circuits.													
	C2O4.3	Design the sequential circuits using SR, JK, D, T flip-flops and Mealy & Moore machines													
	C2O4.4	Design applications of Combinational & Sequential Circuits.													
C2O4		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C2O4.1	1	1	1	-	1	-	-	-	-	-	-	1	2	1
	C2O4.2	2	2	2	-	1	-	-	-	-	-	-	1	2	1
	C2O4.3	2	2	2	-	1	-	-	-	-	-	-	1	2	1
	C2O4.4	3	3	2	-	1	-	-	-	-	-	-	1	2	1
Course Name: Computer Organization & Architecture (18EC35)															
	C2O5.1	Explain the basic organization of a computer system.													
	C2O5.2	Explain different ways of accessing an input / output device including interrupts.													
	C2O5.3	Illustrate the organization of different types of semiconductor and other secondary storage memories.													
	C2O5.4	Illustrate simple processor organization based on hardwired control and micro programmed control.													
C2O5		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C2O5.1	2	-	-	-	-	1	1	-	-	-	-	3	2	3
	C2O5.2	3	1	-	-	-	1	1	-	-	-	-	2	1	2
	C2O5.3	2	1	-	-	-	1	1	-	-	2	-	3	1	3
	C2O5.4	3	1	1	-	1	1	1	-	-	2	-	1	1	1
Course Name: Power Electronics & Instrumentation (18EC36)															
	C2O6.1	Build and test circuits using power electronic devices.													
	C2O6.2	Analyze and design controlled rectifier, DC to DC converters, DC to AC inverters and SMPS.													
	C2O6.3	Define instrument errors and develop circuits for multirange Ammeters, Voltmeters and Bridges to measure passive component values and frequency													
	C2O6.4	Describe the principle of operation of Digital instruments and PLCs.													
	C2O6.5	Use Instrumentation amplifier for measuring physical parameters..													
C2O6		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C2O6.1	2	2	1	-	1	-	-	-	-	-	-	1	2	-
	C2O6.2	2	2	-	-	1	-	-	-	-	-	1	1	3	-
	C2O6.3	1	1	-	-	1	-	-	-	-	-	-	1	1	-
	C2O6.4	1	-	-	-	1	-	-	-	-	-	-	1	2	-
	C2O6.5	1	-	-	-	-	-	-	-	-	-	-	1	2	1
Course Name: Electronic Devices & Instrumentation Laboratory (18ECL37)															
	C2O7.1	Understand the characteristics of various electronic devices and measurement of parameters.													
	C2O7.2	Design and test simple electronic circuits.													
	C2O7.3	Use of circuit simulation software for the implementation and characterization of electronic circuits and devices.													
C2O7		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C2O7.1	3	2	-	-	2	-	-	1	2	1	-	1	1	-
	C2O7.2	3	2	-	-	2	-	-	1	2	1	-	1	1	-
	C2O7.3	3	2	-	-	3	-	-	1	2	1	-	1	1	-
Course Name: Digital System Design Laboratory (18ECL38)															

	C2O8.1	Demonstrate the truth table of various expressions and combinational circuits using logic gate													
	C2O8.2	Design various combinational circuits such as adders, subtractors, comparators, multiplexers and demultiplexers.													
	C2O8.3	Construct flips-flops, counters and shift registers.													
	C2O8.4	Simulate Serial adder and Binary Multiplier.													
C2O8		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C2O8.1	1	2	2	1	1	-	-	-	-	-	-	1	2	-
	C2O8.2	1	2	2	1	1	-	-	-	-	-	-	1	2	-
	C2O8.3	1	2	2	1	1	-	-	-	-	-	-	1	2	-
	C2O8.4	1	2	2	1	1	-	-	-	-	-	-	1	2	-
Course Name: Complex Analysis, Probability and Statistical Methods (18MAT41)															
	C2O9.1	Use the concepts of analytic function and complex potentials to solve the problems arising in electromagnetic field theory													
	C2O9.2	Utilize conformal transformation and complex integral arising in aerofoil theory, fluid flow visualization and image processing.													
	C2O9.3	Apply discrete and continuous probability distributions in analyzing the probability models arising in engineering field.													
	C2O9.4	Make use of the correlation and regression analysis to fit a suitable mathematical model for the statistical data													
	C2O9.5	Construct joint probability distributions and demonstrate the validity of testing the hypothesis.													
C2O9		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C2O9.1	2	1	-	-	-	-	-	-	-	-	-	1	1	-
	C2O9.2	2	1	-	-	-	-	-	-	-	-	-	1	1	-
	C2O9.3	1	-	-	-	-	-	-	-	-	-	-	1	1	-
	C2O9.4	2	2	-	-	-	-	-	-	-	-	-	2	1	-
	C2O9.5	2	1	-	-	-	-	-	-	-	-	-	2	1	-
Course Name: Analog Circuits (18EC42)															
	C210.1	Understand the characteristics of BJTs and FETs.													
	C210.2	Design and analyse BJT and FET amplifier circuits.													
	C210.3	Design sinusoidal and non-sinusoidal oscillators.													
	C210.4	Understand the functioning of linear ICs.													
	C210.5	Design of Linear IC based circuits.													
C210		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C210.1	2	2	1	1	1	0	0	1	0	0	0	1	2	1
	C210.2	2	2	2	2	2	0	0	1	0	0	0	1	2	1
	C210.3	2	2	2	2	1	0	0	1	0	0	0	1	2	1
	C210.4	1	2	1	1	1	0	0	1	0	0	0	1	2	1
	C210.5	2	3	2	2	2	0	0	1	0	0	0	1	2	1

Course Name: Control Systems (18EC43)

	C211.1	Develop the mathematical model of mechanical and electrical systems.
	C211.2	Develop transfer function for a given control system using block diagram reduction techniques and signal flow graph method.
	C211.3	Determine the time domain specification s for first an d second order systems.
	C211.4	Deter mine the stability of a system in the time domain using Routh-Hurwitz criterion and Root-locus technique.
	C211.5	Determine the s stability of a system in the frequency domain u sing Nyquist and bode plots

C211		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C211.1	3	3	-	-	-	-	-	1	-	-	2	1	2	1
	C211.2	2	1	1	-	-	-	-	1	-	-	1	1	2	1
	C211.3	2	1	-	-	-	-	-	1	-	-	-	1	2	1
	C211.4	2	1	-	-	2	-	-	1	-	-	1	1	2	1
	C211.5	2	1	-	-	2	-	-	1	-	-	2	1	2	1

Course Name: Engineering Statistics & Linear Algebra (18EC44)

	C212.1	Identify and associate Random Variables and Random Processes in Communication events.
	C212.2	Analyze and model the Random events in typical communication events to extract quantitative statistical parameters.
	C212.3	Analyze and model typical signal sets in terms of a basis function set of Amplitude, phase and frequency.
	C212.4	Demonstrate by way of simulation or emulation the ease of analysis employing basis functions, statistical representation and Eigen values.

C212		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C212.1	2	2	1	-	-	-	-	-	1	2	-	2	1	-
	C212.2	2	1	1	-	-	-	-	-	1	2	-	2	1	-
	C212.3	2	1	1	-	-	-	-	-	1	1	-	2	1	-
	C212.4	2	2	1	-	-	-	-	-	1	1	-	2	1	-

Course Name: Signals & Systems (18EC45)

	C213.1	Analyze the different types of signals and systems.
	C213.2	Determine the linearity, causality, time-invariance and stability properties of continuous and discrete time systems.
	C213.3	Represent continuous and discrete systems in time and frequency domain using different transforms Test whether the system is stable.

C213		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C213.1	3	2	2	1	-	-	-	-	-	-	-	2	1	-
	C213.2	3	2	2	1	-	-	-	-	-	-	-	2	1	-
	C213.3	3	2	2	1	-	-	-	-	-	-	-	2	1	-

Course Name: Microcontroller (18EC46)

	C214.1	Explain the difference between Microprocessors & Microcontrollers, Architecture of 8051 Microcontroller, and Interfacing of 8051 to external memory and Instruction set of 8051
	C214.2	Write 8051 Assembly level programs using 8051 instruction set.
	C214.3	Explain the Interrupt system, operation of Timers/Counters and Serial port of 8051.
	C214.4	Write 8051 Assembly language program to generate timings and waveforms using 8051 timers, to send & receive serial data using 8051 serial port and to generate an external interrupt using a switch
	C214.5	Write 8051 Assembly language programs to generate square wave on 8051 I/O port pin using interrupt and C Programme to send & receive serial data using 8051 serial port
	C214.6	Interface simple switches, simple LEDs, ADC 0804, LCD and Stepper Motor to 8051 using 8051 I/O ports.

C214		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C214.1	2	1	2	-	-	-	-	-	-	-	-	2	1	2
	C214.2	2	1	1	-	-	-	-	-	-	-	-	2	1	1
	C214.3	2	1	1	-	-	-	-	-	-	-	-	2	1	1

	C214.4	2	1	1	-	-	-	-	-	-	-	-	2	1	1
	C214.5	2	1	1	-	-	-	-	-	-	-	-	2	1	1
	C214.6	2	1	1	-	-	-	-	-	-	-	-	2	1	1
Course Name: Microcontroller Laboratory (18ECL47)															
	C215.1	Write Assembly language programs in 8051 for solving simple problems that manipulate input data using different instructions of 8051.													
	C215.2	Interface different input and output devices to 8051 and control them using Assembly language programs.													
	C215.3	Interface the serial devices to 8051 and do the serial transfer using C programming.													
C215		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C215.1	1	-	2	-	-	-	-	-	-	-	-	1	1	-
	C215.2	1	-	1	-	-	-	-	-	-	-	-	1	1	-
	C215.3	1	-	2	-	-	-	-	-	-	-	-	1	1	-
Course Name: Analog Circuits Laboratory (18ECL48)															
	C216.1	Design analog circuits using BJT/FETs and evaluate their performance characteristics.													
	C216.2	Design analog circuits using OPAMPs for different applications													
	C216.3	Simulate and analyze analog circuits that usesICs for different electronic applications.													
C216		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C216.1	2	2	2	-	-	-	-	-	1	1	-	1	1	-
	C216.2	2	2	2	-	-	-	-	-	1	1	-	2	1	-
	C216.3	1	1	1	-	2	-	-	-	1	1	-	2	1	-
Course Name: Management and Entrepreneurship Development (17ES51)															
	C301.1	Explain the fundamental concepts of management and Entrepreneurship													
	C301.2	Describe a best entrpreneurship model for the required domain of extablishment													
	C301.3	Describe the functions of Managers, entrpreneurs and their social responsibilities and compare various types of entrepreneurs													
	C301.4	Analyse the institutional support by various state and central government agencies													
C301		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C301.1	-	-	-	-	-	2	1	2	3	3	2	3	2	1
	C301.2	-	-	-	-	-	3	1	2	3	3	2	3	2	1
	C301.3	-	-	-	-	-	2	1	2	2	2	3	2	2	2
	C301.4	-	-	-	-	-	1	1	3	2	2	3	1	2	1
Course Name: Digital Signal Processing (15EC52)															
	C302.1	Determine response of LTI systems using time domain and DFT techniques.													
	C302.2	Compute DFT of real and complex discrete time signals.													
	C302.3	Computation of DFT using FFT algorithms and linear filtering approach.													
	C302.4	Solve problems on digital filter design and realize using digital computations.													
C302		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C302.1	2	1	1	-	-	-	-	-	-	-	-	-	1	-
	C302.2	3	2	2	2	-	1	-	-	-	-	-	-	1	-
	C302.3	3	3	3	2	-	1	-	-	-	-	-	-	1	-
	C302.4	2	2	2	2	-	1	-	-	-	-	-	-	1	-

Course Name: Verilog HDL (17EC53)															
	C303.1	Write Verilog programs in gate, dataflow (RTL), behavioral and switch modeling levels of Abstraction.													
	C303.2	Write simple programs in VHDL in different styles.													
	C303.3	Design and verify the functionality of digital circuit/system using test benches and Identify the suitable Abstraction level for a particular digital design.													
	C303.4	Write the programs more effectively using Verilog tasks and directives and Perform timing and delay Simulation.													
C303		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C303.1	2	1	1	-	-	-	-	-	-	-	-	-	2	1
	C303.2	3	2	2	2	-	1	-	-	-	-	-	-	2	1
	C303.3	3	3	3	2	-	1	-	-	-	-	-	-	2	1
	C303.4	2	2	2	2	-	1	-	-	-	-	-	-	2	1
Course Name: Information Theory & Coding (17EC54)															
	C304.1	Explain concept of Dependent & Independent Source, measure of information, Entropy, Rate of Information and Order of a source													
	C304.2	Represent the information using Shannon Encoding, Shannon Fano, Prefix and Huffman Encoding Algorithm													
	C304.3	Model the continuous and discrete communication channels using input, output and joint probabilities													
	C304.4	Determine a codeword comprising of the check bits computed using Linear Block codes, cyclic codes & convolutional codes													
	C304.5	Design the encoding and decoding circuits for Linear Block codes, cyclic codes, convolutional codes, BCH and Golay codes													
C304		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C304.1	3	2	1	1	-	-	-	2	-	-	-	2	2	2
	C304.2	3	3	1	1	-	-	-	2	-	-	-	2	3	2
	C304.3	3	2	2	1	-	-	-	1	-	-	-	2	2	2
	C304.4	3	3	2	2	-	-	-	1	-	-	-	2	3	2
	C304.5	3	2	3	2	-	-	-	1	-	-	-	2	2	2
Course Name: Operating System (17EC553)															
	C305.1	Explain the goals, structure, operation and types of operating system													
	C305.2	Apply scheduling techniques to find performance factors.													
	C305.3	Explain organization of file systems and IOCS													
	C305.4	Apply suitable techniques for contiguous and non-contiguous memory allocation.													
	C305.5	Describe message passing, deadlock detection and prevention methods.													
C305		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C305.1	2	-	-	-	2	-	1	-	2	1	2	1	2	1
	C305.2	2	2	2	1	-	-	-	-	1	1	2	2	2	1
	C305.3	1	-	-	-	1	-	-	-	1	-	1	1	2	-
	C305.4	2	1	1	1	-	-	-	-	1	1	1	1	2	-
	C305.5	1	1	1	-	-	-	-	-	1	1	1	1	1	-

Course Name: Automotive Electronics (17EC561)															
	C306.1	Summarize an overview of automotive components, subsystems, and basics of Electronic Engine Control in today's automotive industry.													
	C306.2	Describe available automotive sensors and actuators while interfacing with microcontrollers / microprocessors during automotive system design.													
	C306.3	Associate the networking of various modules in automotive systems, communication protocols and diagnostics of the sub systems.													
	C306.4	Discuss the ideas that attribute the reliability, safety, and smartness to the automobiles, providing add-on comforts and get fair idea on future Automotive Electronic Systems.													
C306		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	C306.1	3	2	1	1	-	2	2	-	1	-	-	2	2	1
	C306.2	3	2	1	1	-	-	-	-	1	-	-	2	2	1
	C306.3	3	3	2	2	-	-	-	-	1	-	-	2	2	1
	C306.4	3	3	2	1	-	2	2	-	1	-	-	3	2	1
Course Name: DSP Lab (17ECL57)															
	C307.1	Understand the concepts of analog to digital conversion of signals and frequency domain sampling of signals.													
	C307.2	Modelling of discrete time signals and systems and verification of its properties and results.													
	C307.3	Implementation of discrete computations using DSP processor and verify the results.													
	C307.4	Realize the digital filters using a simulation tool and a DSP processor and verify the frequency and phase response.													
C307		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	C307.1	2	2	1	-	2	-	-	-	1	-	-	2	1	-
	C307.2	2	2	2	1	2	-	-	-	1	-	-	2	2	1
	C307.3	3	3	2	1	3	-	-	-	1	-	-	2	2	1
	C307.4	3	3	3	1	3	2	-	-	1	-	-	2	3	1
Course Name: HDL Lab (15ECL58)															
	C308.1	Write the Verilog/VHDL programs to simulate Combinational circuits in Dataflow, Behavioral and Gate level Abstractions.													
	C308.2	Describe sequential circuits like flip flops and counters in Behavioral description and obtain simulation waveforms.													
	C308.3	Synthesize Combinational and Sequential circuits on programmable ICs and test the hardware.													
	C308.4	Interface the hardware to the programmable chips and obtain the required output													
C308		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	C308.1	2	3	-	-	2	-	-	-	2	2	-	1	-	1
	C308.2	2	3	1	-	2	-	-	-	2	2	-	1	-	1
	C308.3	2	2	2	-	2	-	-	-	2	2	-	1	-	1
	C308.4	2	2	-	-	2	-	-	-	2	2	-	2	-	2
Course Name: Digital Communication (17EC61)															
	C309.1	Determine response of LTI systems using time domain and DFT techniques.													
	C309.2	Compute DFT of real and complex discrete time signals. .													
	C309.3	Computation of DFT using FFT algorithms and linear filtering approach.													
	C309.4	Solve problems on digital filter design and realize using digital computations.													
C309		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	C309.1	3	2		-	-	2	-	-	-	-	-	-	1	-
	C309.2	2	2		-	-	2	-	-	-	-	-	-	1	-
	C309.3	3	2		-	-	2	-	-	-	-	-	-	2	1
	C309.4	3	3		-	-	2	-	-	-	-	-	-	1	1
Course Name: ARM Microcontroller & Embedded Systems (17EC62)															

	C310.1	Describe the architectural features and instructions of 32-bit microcontroller ARM Cortex M3.													
	C310.2	Apply the knowledge gained for Programming ARM Cortex M3 for different applications													
	C310.3	Understand the basic hardware components and their selection method based on the characteristics and attributes of an embedded system.													
	C310.4	Develop the hardware /software co-design and firmware design approaches.													
	C310.5	Explain the need of real time operating system for embedded system applications.													
C310		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C310.1	3	1	1	1	1	-	-	-	1	1	-	2	3	1
	C310.2	3	2	2	2	1	-	-	-	1	2	-	2	3	1
	C310.3	3	2	2	2	1	-	-	-	1	2	-	2	2	2
	C310.4	3	2	2	2	1	-	-	-	1	2	-	2	3	2
	C310.5	3	2	2	2	2	-	-	-	1	2	-	2	2	2
Course Name: VLSI Design (17EC63)															
	C311.1	Demonstrate understanding of MOS transistor theory, CMOS fabrication flow and technology scaling													
	C311.2	Draw the basic gates using the stick and layout diagrams with the knowledge of physical design aspects.													
	C311.3	Interpret Memory elements along with timing considerations													
	C311.4	Demonstrate knowledge of FPGA based system design													
	C311.5	Interpret testing and testability issues in VLSI Design													
	C311.6	Analyze CMOS subsystems and architectural issues with the design constraints.													
C311		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C311.1	2	1	1	1	-	-	-	-	2	3	-	-	3	1
	C311.2	2	2	1	-	1	-	1	-	2	3	-	-	2	1
	C311.3	2	1	1	1	-	-	-	-	2	3	-	-	3	-
	C311.4	2	1	1	1	-	-	-	-	2	3	-	-	3	-
	C311.5	2	1	1	1	-	-	-	-	2	3	-	-	3	-
	C311.6	2	2	1	1	-	-	-	-	2	3	-	-	2	1
Course Name: Computer Communication Networks (17EC64)															
	C312.1	Identify the protocols and services of Data link layer.													
	C312.2	Identify the protocols and functions associated with the transport layer services.													
	C312.3	Describe the layering architecture of computer networks and distinguish between the OSI reference model and TCP/IP protocol suite.													
	C312.4	Distinguish the basic network configurations and standards associated with each network.													
	C312.5	Construct a network model and determine the routing of packets using different routing algorithms.													
C312		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C312.1	3	-	-	-	2	-	-	-	1	-	1	2	2	-
	C312.2	3	-	-	-	2	-	-	-	1	-	1	2	2	-
	C312.3	3	-	-	-	2	-	-	-	1	-	1	2	2	-
	C312.4	3	-	-	-	2	-	-	-	1	-	1	2	2	-
	C312.5	3	-	-	-	2	-	-	-	1	-	1	2	2	-

Course Name: Digital Switching Systems (17EC654)															
	C313.1	Describe the electromechanical switching systems and its comparison with the digital switching.													
	C313.2	Determine the telecommunication traffic and its measurements.													
	C313.3	Define the technologies associated with the data switching operations.													
	C313.4	Describe the software aspects of switching systems and its maintenance.													
C313		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	C313.1	2	1	1	-	-	-	-	-	-	-	-	2	2	-
	C313.2	2	2	2	-	-	-	-	-	-	-	-	1	2	-
	C313.3	2	1	-	-	-	-	-	-	-	-	-	1	2	-
	C313.4	2	2	2	-	-	-	-	-	-	-	-	2	2	-
Course Name: Digital System Design using Verilog (17EC663)															
	C314.1	Construct the combinational circuits, using discrete gates and programmable logic devices.													
	C314.2	Describe Verilog model for sequential circuits and test pattern generation.													
	C314.3	Design a semiconductor memory for specific chip design.													
	C314.4	Design embedded systems using small microcontrollers, larger CPUs/DSPs, or hard or soft processor cores.													
	C314.5	Synthesize different types of processor and I/O controllers that are used in embedded system.													
C314		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	C314.1	3	-	-	-	2	-	-	-	1	-	1	2	2	-
	C314.2	3	-	-	-	2	-	-	-	1	-	1	2	2	-
	C314.3	3	-	-	-	2	-	-	-	1	-	1	2	2	-
	C314.4	3	-	-	-	2	-	-	-	1	-	1	2	2	-
	C314.5	3	-	-	-	2	-	-	-	1	-	1	2	2	-
Course Name: Embedded Controller Lab (17ECL67)															
	C315.1	Understand the instruction set of 32 bit microcontroller ARM Cortex M3, and the software tool required for programming in Assembly and C language.													
	C315.2	Develop assembly language programs using ARM Cortex M3 for different applications.													
	C315.3	Interface external devices and I/O with ARM Cortex M3.													
	C315.4	Develop C language programs and library functions for embedded system applications.													
C315		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	C315.1	3	1	1	1	1	-	-	-	1	1	-	2	3	1
	C315.2	3	2	2	2	1	-	-	-	1	2	-	2	3	1
	C315.3	3	2	2	2	1	-	-	-	1	2	-	2	2	2
	C315.4	3	2	2	2	1	-	-	-	1	2	-	2	3	2
Course Name: Computer Networks Lab (17ECL68)															
	C316.1	Use the network simulator for learning and practice of networking algorithms.													
	C316.2	Illustrate the operations of network protocols and algorithms using C programming.													
	C316.3	Simulate the network with different configurations to measure the performance parameters.													
	C316.4	Implement the data link and routing protocols using C programming.													
C316		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	C316.1	2	1	1	1	1	-	-	-	-	-	-	2	-	1
	C316.2	2	1	1	1	1	-	-	-	-	-	-	2	-	1
	C316.3	2	1	1	1	1	-	-	-	-	-	-	2	-	1

	C316.4	2	1	1	1	1	-	-	-	-	-	-	2	-	1
Course Name: Microwave and Antennas (15EC71)															
	C401.1	Describe the use and advantages of microwave transmission and analyze various parameters related to microwave transmission lines and waveguides.													
	C401.2	Identify microwave devices and understand strip lines for several applications.													
	C401.3	Analyze various antenna parameters and necessary point source and array configurations for building an RF system.													
	C401.4	Recommend various antenna configurations according to the applications.													
C401		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C401.1	2	2	1	-	-	-	-	-	-	-	-	1	2	1
	C401.2	2	2	1	-	-	-	-	-	-	-	--	1	2	1
	C401.3	2	2	2	-	1	-	-	2	-	2	-	1	2	1
	C401.4	2	2	2	-	1	-	-	2	-	2	-	1	2	1
Course Name: Digital Image Processing (15EC72)															
	C402.1	Describe image formation and the role human visual system plays in perception of gray and color image data													
	C402.2	Apply image processing techniques in both the spatial and frequency (Fourier) domains.													
	C402.3	Design image analysis techniques in the form of image segmentation and to evaluate the Methodologies for segmentation.													
	C402.4	Conduct independent study and analysis of Image Enhancement techniques.													
C402		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C402.1	2	1	1	-	-	-	-	-	-	-	-	-	1	-
	C402.2	3	2	2	2	-	1	-	-	-	-	-	-	2	1
	C402.3	3	3	3	2	-	1	-	-	-	-	-	-	2	1
	C402.4	2	2	2	2	-	1	-	-	-	-	-	-	1	-
Course Name: Power Electronics (15EC73)															
	C403.1	Describe the characteristics of different power devices and identify the various applications associated with it.													
	C403.2	Illustrate the working of power circuit as DC-DC converter													
C403	**C403.3**	Illustrate the operation of inverter circuit and static switches.													
	C403.4	Determine the output response of a thyristor circuit with various triggering options.													
	C403.5	Determine the response of controlled rectifier with resistive and inductive loads.													
		PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C403.1	2	1	-	-	1	-	-	-	2	2	-	1	2	1
	C403.2	2	2	2	-	1	-	-	-	-	-	-	1	2	-
C403	**C403.3**	2	2	2	-	1	-	-	-	-	-	-	1	2	-
	C403.4	2	2	2	-	1	-	-	-	-	-	-	1	2	-
	C403.5	2	2	2	-	1	-	-	-	-	-	-	1	2	-

Course Name: Multimedia Communication (15EC741)															
	C404.1	Explain the basics of different multimedia networks, applications and analyze the different media types to represent them in digital form.													
	C404.2	Identify the different types of text and image compression techniques with DMA. L1, L2													
	C404.3	Apply the different types of compression techniques to compress audio and video with DMS													
	C404.4	Describe the multimedia communication across the network.													
C404		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C404.1	3	1	-	-	-	-	-	-	-	1	1	2	1	2
	C404.2	3	2	-	-	-	-	-	-	-	1	1	2	2	2
	C404.3	3	1	-	-	-	-	-	-	-	1	1	2	1	2
	C404.4	3	1	-	-	-	-	-	-	-	2	1	2	1	2
Course Name: Satellite Communication (15EC755)															
	C405.1	Describe the satellite orbits and its trajectories with the definitions of parameters associated with it.													
	C405.2	Describe the electronic hardware systems associated with the satellite subsystem and earth station.													
	C405.3	Describe the various applications of satellite with the focus on national satellite system.													
	C405.4	Compute the satellite link parameters under various propagation conditions with the illustration of multiple access techniques.													
C405		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C405.1	3	2	-	-	-	-	-	-	-	-	1	1	2	-
	C405.2	3	1	1	-	-	-	-	-	-	-	1	1	1	-
	C405.3	3	-	-	-	-	-	-	-	-	-	1	1	1	-
	C405.4	3	1	1	-	-	-	-	-	-	-	1	1	1	-
Course Name: Advanced Communication Lab (15ECL76)															
	C406.1	Determine the characteristics and response of microwave devices and optical waveguide.													
C406	C406.2	Determine the characteristics of microstrip antennas and devices and compute the parameters associated with it.													
	C406.3	Simulate the digital modulation schemes with the display of waveforms and computation of performance parameters.													
	C406.4	Design and test the digital modulation circuits/systems and display the waveforms.													
		PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C406.1	2	1	1	1	1	-	-	-	1	1	-	2	3	2
C406	**C406.2**	2	2	2	2	1	-	-	-	1	1	1	2	3	1
	C406.3	2	2	2	2	1	-	-	-	1	1	-	2	3	1
	C406.4	2	2	2	1	1	-	-	-	1	1	-	2	3	2
Course Name: VLSI Lab (15ECL77)															
	C407.1	Write test bench to simulate various digital circuits.													
	C407.2	Design and simulate basic CMOS circuits like inverter, common source amplifier and differential amplifiers and interpret concepts of DC Analysis, AC Analysis and Transient Analysis in analog circuits													
	C407.3	Use basic amplifiers and further design higher level circuits like operational amplifier and analog/digital converters to meet desired parameters.													
	C407.4	Use transistors to design gates and further using gates realize shift registers and adders to meet desired parameters.													
C407		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C407.1	3	3	3	2	3	1	-	-	-	2	1	2	3	2
	C407.2	3	1	2	1	3	1	-	-	-	2	1	3	1	3
	C407.3	3	3	3	2	3	1	-	-	-	2	1	2	3	2
	C407.4	3	1	2	1	3	1	-	-	-	2	1	3	1	3

Course Name: Project Work Phase–I + Project work Seminar (15ECP78)															
C408	C408.1	Enhance and Analyze the selected project making use of the technical and engineering knowledge gained from past courses with technology impact awareness on the society and their ethical responsibilities.													
	C408.2	Design and Implement the work, with the advanced apparatuses required for the execution of the undertaking and getting the outcomes within the stipulated time.													
	C408.3	Form a team and distribute the work among them and also communicate technical and general information by means of oral as well as written presentation skills with professionalism.													
	C408.4	Get critical thinking, framework mix, venture administration and documentation abilities.													
		PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C408.1	2	2	2	2	2	1	1	3	2	2	1	2	1	2
	C408.2	2	2	2	2	2	2	1	1	2	1	1	2	1	2
	C408.3	1	1	1	1	1	2	2	2	3	3	3	2	3	2
	C408.4	1	1	2	2	1	2	2	2	2	3	3	2	3	2
Course Name: Wireless Cellular and LTE 4G Broadband (15EC81)															
C409	C409.1	Understand the system architecture and the functional standard specified in LTE 4G													
	C409.2	Analyze the role of LTE radio interface protocols and EPS Data convergence protocols to set up, reconfigure and release data and voice from users.													
	C409.3	Demonstrate the UTRAN and EPS handling processes from set up to release including mobility management for a variety of data call scenarios.													
	C409.4	Test and Evaluate the Performance of resource management and packet data processing and transport algorithms.													
		PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C409.1	1	1	2	1	-	-	-	-	-	-	-	2	1	-
	C409.2	1	1	2	1	-	-	-	-	-	-	-	2	1	-
	C409.3	1	1	2	1	-	-	-	-	-	-	-	2	1	-
	C409.4	1	1	2	1	-	-	-	-	-	-	-	2	1	-
Course Name: Fiber Optics & Networks (15EC82)															
C410	C410.1	Classification and working of optical fiber with different modes of signal propagation.													
	C410.2	Describe the transmission characteristics and losses in optical fiber communication.													
	C410.3	Describe the construction and working principle of optical connectors, multiplexers and amplifiers.													
	C410.4	Describe the constructional features and the characteristics of optical sources and detectors and networking aspects of optical fiber.													
		PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C410.1	3	1	-	1	-	-	-	0	2	1	1	2	1	2
	C410.2	3	1	-	-	-	-	-	0	2	2	1	2	1	2
	C410.3	3	1	2	1	2	-	-	1	2	2	1	2	1	2
	C410.4	3	2	2	2	2	3	-	1	2	2	1	2	2	2
Course Name: Network and Cyber Security (15EC835)															
C411	C411.1	Explain network security protocols and understand basic concepts of email security.													
	C411.2	Discuss IP security overview and policies.													
	C411.3	Understand the basic concepts of cyber security and discuss the cyber security problems													
	C411.4	Explain Enterprise Security Framework and apply concept of cyber security framework in computer system administration													
		PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C411.1	2	1	1	1	2	-	-	2	2	2	1	2	1	2
	C411.2	2	1	1	1	2	-	-	2	2	2	1	3	1	3
	C411.3	2	1	1	1	2	-	-	2	2	2	1	1	1	1
	C411.4	2	2	2	1	2	-	-	2	2	2	1	1	2	1

Course Name: Internship/Professional Practice (15EC84)															
C412	C412.1	Explore career alternatives prior to graduation.													
	C412.2	Integrate theory and practice.													
	C412.3	Assess interests and abilities in their field of study.													
	C412.4	Learn to appreciate work and its function in the economy.													
		PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C412.1	-	-	-	-	3	3	1	1	2	2	3	3	1	2
	C412.2	1	1	1	1	2	3	2	3	3	3	3	3	3	3
	C412.3	2	1	1	2	2	-	-	2	3	3	3	3	2	3
	C412.4	2	3	1	2	3	3	3	3	3	3	3	3	3	3
Course Name: Project Work (15ECP85)															
C413	C413.1	Determine project goals, constraints, deliverables, performance criteria, control needs, and resource requirements													
	C413.2	Choose Skills to manage project processes effectively and efficiently													
	C413.3	Formulate the series of steps/processes & strategies to achieve end result													
	C413.4	Construct a Project with strong working knowledge of ethics and professional responsibility.													
		PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C413.1	3	3	3	3	3	3	2	2	3	2	2	2	2	2
	C413.2	3	3	3	3	3	3	2	2	3	3	3	2	2	3
	C413.3	3	3	3	3	3	3	2	2	3	3	3	1	2	1
	C413.4	3	3	3	3	3	3	2	2	3	3	3	1	2	1
Course Name: Seminar (15ECS86)															
C414	C414.1	In terms of content, students will be able to show competence in identifying relevant information, defining and explaining topics.													
	C414.2	In terms of organization, students will be able to show competence in working with a methodology, structuring their oral work, and synthesizing information. They will demonstrate clarity, the strength of their thesis statement, and develop their topic with appropriate signposting.													
	C414.3	In terms of delivery, students will use appropriate registers and vocabulary, and will demonstrate command of voice modulation, voice projection, and pacing.													
	C414.4	Apply principles of ethics and respect in interaction with others.													
		PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C414.1	3	2	-	1	-	1	1	1	1	3	-	2	3	2
	C414.2	3	2	-	-	-	-	-	2	2	3	2	2	3	3
	C414.3	2	-	-	-	-	-	-	-	-	3	2	2	2	-
	C414.4	3	-	-	-	-	-	-	3	-	3	2	2	2	-

DEPARTMENT OF CIVIL ENGINEERING

Faculty and students are aware of the stated Programme and course outcomes of the Programmes

To create awareness about Programme and course outcomes of the department, it has been published and disseminated among the stake holders.

The extent of student awareness about the POs and COs and their actual performance reflecting these would be the real indicators of success or outcome of the programme. In this regard our Institution has taken certain measures to educate and to create the awareness about the program outcomes and course outcomes among the faculty members and students.

Stakeholder	Purpose
Faculty	• Implementer (Contributor) of Policies. • Key contributor in developing/implementing growth Plan. • Responsible for producing competent graduates/product of the Institution.
Students	• Product of the Institution, responsible for creating Image of the institution while serving the society

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Programme and Course Outcomes Dissemination

Sl. No	Particulars	Program Outcomes	Course Outcomes
1	College Website	✓	✓
2	Notes & Lab Manual	✓	✓
3	Course Module, Lesson Plan	-	✓
4	IA Question Paper	-	✓
5	Classroom, Seminar Hall, Laboratory	✓	-
6	Faculty Office, Dept. Office	✓	-
7	Magazine	✓	-
8	College Enterprise Resource Planning(CERP) Portal	✓	✓
9	Flipped Classroom(Mail) through CERP/MS Teams	-	✓

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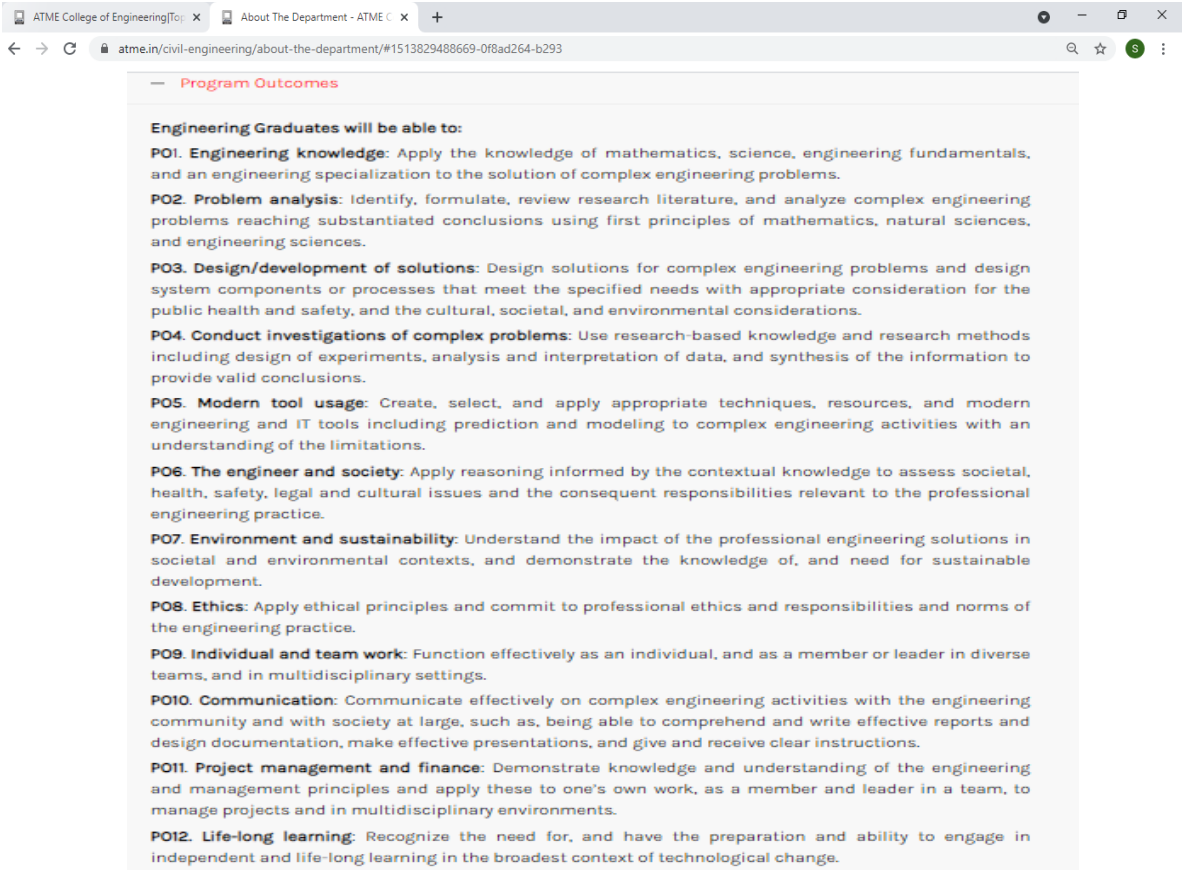
DEPARTMENT OF CIVIL ENGINEERING

A. College Website Dissemination

https://atme.in/civil-engineering/about-the-department/#1513829488669-0f8ad264-b293



https://atme.in/civil-engineering/civil-resources/

Academic Year – 2020-2021

Course Details & Content

3rd Semester

Sl. No.	Subject/Lab Code	Subject/ Lab Name	Course Coordinator	CM	LP	NOTES / HANDOUT / LABMANUAL	PPT	IA Scheme
1	18MAT31	Transform Calculus, Fourier Series and Numerical Techniques	Madhusudhan K V	CLICK	CLICK	CLICK	CLICK	CLICK
2	18CV32	Strength of Materials	P Shashank	CLICK	CLICK	CLICK	CLICK	CLICK
3	18CV33	Fluid Mechanics	Dr Akshaya B J	CLICK	CLICK	CLICK	CLICK	CLICK
4	18CV34	Building Materials and Construction	Srivathsa H U	CLICK	CLICK	CLICK	CLICK	CLICK
5	18CV35	Basic Surveying	Rudresh A N	CLICK	CLICK	CLICK	CLICK	CLICK
6	18CV36	Engineering Geology	-	CLICK	CLICK	CLICK	CLICK	CLICK
7	18CVL37	Computer Aided Building Planning & Drawing	P Shashank	CLICK	CLICK	CLICK	CLICK	CLICK
8	18CVL38	Building Materials Testing Laboratory	Jyothi D N	CLICK	CLICK	CLICK	CLICK	CLICK
10	18MATDIP31	Additional Mathematics - I	Madhusudhan K V	CLICK	CLICK	CLICK	CLICK	CLICK

5th Semester

Sl. No.	Subject/Lab Code	Subject/ Lab Name	Course Coordinator	CM	LP	NOTES / HANDOUT / LABMANUAL	PPT	IA Scheme
11	18CV51	Construction Management & Entrepreneurship	Mandeep G	CLICK	CLICK	CLICK	CLICK	CLICK
12	18CV52	Analysis of Indeterminate Structures	Manu Vijay	CLICK	CLICK	CLICK	CLICK	CLICK
13	18CV53	Design of RC Structural Elements	Shruthi H G	CLICK	CLICK	CLICK	CLICK	CLICK
14	18CV54	Basic Geotechnical Engineering	Puneeth K	CLICK	CLICK	CLICK	CLICK	CLICK
15	18CV55	Municipal Wastewater Engineering	Dr Suneeth Kumar K M	CLICK	CLICK	CLICK	CLICK	CLICK
16	18CV56	Highway Engineering	Bharathi B	CLICK	CLICK	CLICK	CLICK	CLICK
17	18CVL57	Surveying Practice	Rudresh A N	CLICK	CLICK	CLICK	CLICK	CLICK
18	18CVL58	Concrete and Highway Materials Laboratory	Mandeep G	CLICK	CLICK	CLICK	CLICK	CLICK
19	18CIV59	Environmental Studies	-	CLICK	CLICK	CLICK	CLICK	CLICK

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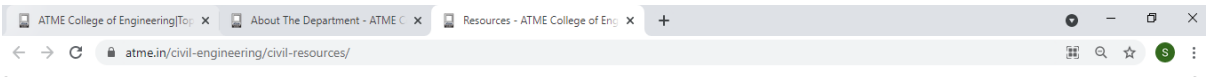

7th Semester								
Sl. No.	Subject/ Lab Name	Subject/Lab Code	Course Coordinator	CM	LP	NOTES / HANDOUT / LABMANUAL	PPT	IA Scheme
20	17CV71	Municipal and Industrial Waste Water Engineering	Jyothi D N	CLICK	CLICK	CLICK	CLICK	CLICK
21	17CV72	Design of RCC and Steel Structures	Srivathsa H U	CLICK	CLICK	CLICK	CLICK	CLICK
22	17CV73	Hydrology and Irrigation Engineering	Rudresh A N	CLICK	CLICK	CLICK	CLICK	CLICK
23	17CV742	Ground Water & Hydraulics	Dr Akshaya B J	CLICK	CLICK	CLICK	CLICK	CLICK
24	17CV753	Rehabilitation and Retrofitting of Structures	Manu Vijay	CLICK	CLICK	CLICK	CLICK	CLICK
25	17CVL76	Environmental Engineering Laboratory	Bharathi B	CLICK	CLICK	CLICK	CLICK	CLICK
26	17CVL77	Computer Aided Detailing of Structures	Srivathsa H U	CLICK	CLICK	CLICK	CLICK	CLICK

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B. Notes, Lab Manual, Course Module, Lesson Plan

NOTES SAMPLE

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13th K M Stone, Bannur Road, Mysore – 570028

ATME College of Engineering

DEPARTMENT OF CIVIL ENGINEERING

(ACADEMIC YEAR 2020-21)

DESIGN OF STEEL STRUCTURAL ELEMENTS

SUB CODE: 18CV61

SEMESTER: VI

Vision of the Institute

Development of academically excellent, culturally vibrant, socially responsible and globally competent human resources

Mission of the Institute

To keep pace with advancements in knowledge and make the students competitive and capable at the global level

To create an environment for the students to acquire the right physical, intellectual, emotional and moral foundations and shine as torchbearers of tomorrow's society

To strive to attain ever-higher benchmarks of educational excellence

Vision of the Department

To develop globally competent civil engineers who excel in academics, research and are ethically responsible for the development of the society.

Mission of the Department

To provide quality education through faculty and state of the art infrastructure.

To identify current problems in the society pertaining to Civil Engineering disciplines and to address them effectively and efficiently

To inculcate the habit of research and entrepreneurship in our graduates to address current infrastructure needs of society

PEO's

Graduates who complete their UG course through our institution will be,

PEO 1- Engaged in professional practices, such as construction, environmental, geotechnical, structural, transportation, or water resources engineering by using technical, communication and management skills.

PEO 2- Engaged in higher studies and research activities in various Civil Engineering fields and a life time commitment to learn ever changing technologies to satisfy increasing demand of sustainable infrastructural facilities

PEO 3- Serve in a leadership position in any professional or community organization, or local/state engineering board

PEO 4- Registered as a professional engineer or developed a strong ability leading to professional licensure being an entrepreneur.

PROGRAM OUTCOMES

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, research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
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 considerations.
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 modelling 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. 44
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 effective reports and design documentation, make effective presentations, and give and receive clear instructions.
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.

PSO's

PSO1: Provide the necessary infrastructure for all situations through competitive plans, maps and designs with the aid of a thorough Engineering Survey and Quantity Estimation.

PSO 2: Assess the impact of anthropogenic activities leading to environmental imbalance on land, in water & in air and provide necessary viable solutions revamping water resources and transportation for a sustainable development.

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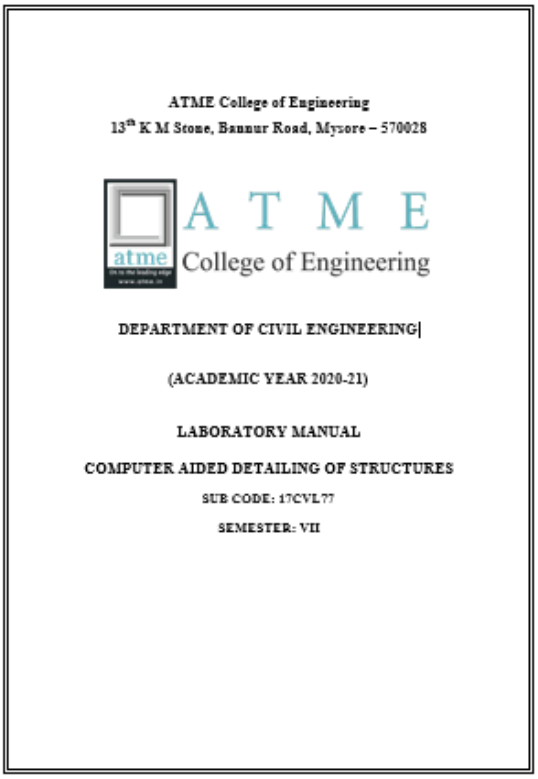
LAB MANUAL SAMPLE



ATME College of Engineering
13th K M Stone, Bannur Road, Mysore – 570028

DEPARTMENT OF CIVIL ENGINEERING

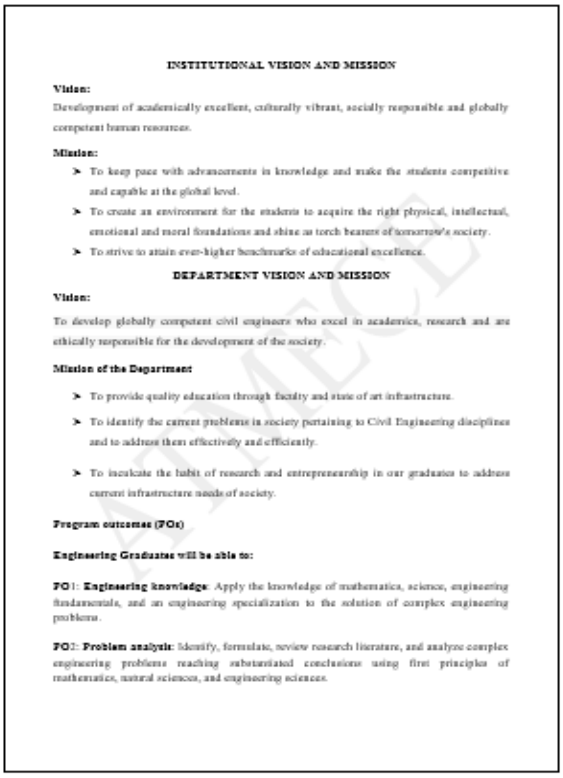
(ACADEMIC YEAR 2020-21)

LABORATORY MANUAL

COMPUTER AIDED DETAILING OF STRUCTURES

SUB CODE: 17CVL77

SEMESTER: VII



INSTITUTIONAL VISION AND MISSION

Vision:

Development of academically excellent, culturally vibrant, socially responsible and globally competent human resources.

Mission:

- To keep pace with advancements in knowledge and make the students competitive and capable at the global level.
- To create an environment for the students to acquire the right physical, intellectual, emotional and moral foundations and shine as torch bearers of tomorrow's society.
- To strive to attain ever-higher benchmarks of educational excellence.

DEPARTMENT VISION AND MISSION

Vision:

To develop globally competent civil engineers who excel in academics, research and are ethically responsible for the development of the society.

Mission of the Department

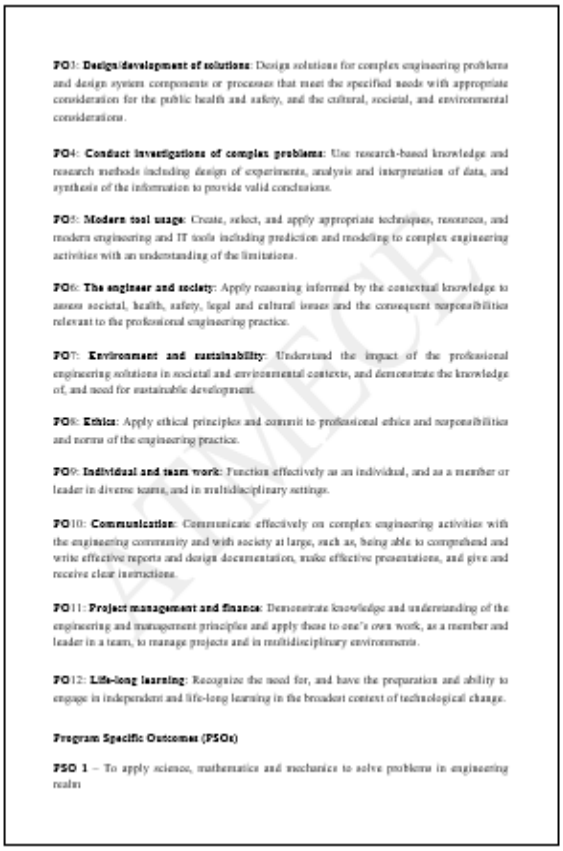
- To provide quality education through faculty and state of art infrastructure.
- To identify the current problems in society pertaining to Civil Engineering disciplines and to address them effectively and efficiently.
- To inculcate the habit of research and entrepreneurship in our graduates to address current infrastructure needs of society.

Program outcomes (POs)

Engineering Graduates will be able to:

PO1: Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2: Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.



PO3: Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

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PO8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10: Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes (PSOs)

PSO 1 – To apply science, mathematics and mechanics to solve problems in engineering realm

PSO 2 – To analyze the techniques, skills and modern engineering tools necessary for engineering practices

PSO 3 – To develop ability to function as a leader and a team player in multidisciplinary teams

PSO 4 – To recognize of the need for and an ability to engage in research and life-long learning for developing sustainable construction practices

PSO 5 – To design and conduct experiments as well as to analyze and interpret data

Program Educational Objectives (PEOs)

PEO 1 - Engaged in professional practices, such as construction, environmental, geotechnical, structural, transportation, water resource engineering by using technical, communication and management skills.

PEO 2 - Engaged in higher studies and research activities in various civil engineering fields and life time commitment to learn ever changing technologies to satisfy increasing demand of sustainable infrastructural facilities.

PEO 3 - Serve in a leadership position in any professional or community organization or local or state engineering board

PEO 4 - Registered as professional engineer or developed a strong ability leading to professional licensure being an entrepreneur.

Course Outcomes (COs)

1. Prepare Civil Engineering structural drawings using AutoCAD software.
2. Apply the tools of AUTOCAD software for structural detailing of RCC structural elements
3. Apply the tools of AUTOCAD software for structural detailing of Steel connections

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COURSE MODULE

ATME College of Engineering DEPARTMENT OF CIVIL ENGINEERING

Course Modules of the Subject Taught for the Session Sep-Dec 2020-21 (Odd Semester)

Course Syllabi with CO's

Faculty Name : SRIVATHSA H U			Academic Year: 2020-2021				
Department: CIVIL ENGINEERING							
Course Code	Course Title	Core/Elective	Prerequisite	Contact Hours			Total Hrs/ Sessions
				L	T	P	
18CV34	**Building Materials & Construction**	**Core**	**Elements of Civil Engineering**	3	-	-	40
Objectives:	1. To recognize good construction materials based on properties. 2. To investigate soil properties and design suitable foundation. 3. To understand the types and properties of masonry materials and supervise masonry construction. 4. To gain knowledge of structural components like lintels, arches, staircase and roofs. 5. To understand the finishes in construction like flooring, plastering, painting.						

Topics Covered as per Syllabus

Module 1

Building Materials:

Stone as building material: Requirement of good building stones, Dressing of stones, Deterioration and Preservation of stone work.

Bricks: Classification, Manufacturing of clay bricks, Requirement of good bricks. Field and laboratory tests on bricks; compressive strength, water absorption, efflorescence, dimension and warpage.

Cement Concrete blocks, Stabilized Mud Blocks, Sizes, requirement of good blocks. Mortar: types and requirements. Timber as construction material

Fine aggregate: Natural and manufactured: Sieve analysis, zoning, specify gravity, bulking, moisture content, deleterious materials.

Coarse aggregate: Natural and manufactured: Importance of size, shape and texture. Grading of aggregates, Sieve analysis, specific gravity, Flakiness and elongation index, crushing, impact and abrasion tests. **10 Hours**

Module 2

Foundation:

Preliminary investigation of soil, safe bearing capacity of soil, Function and requirements of good foundation, types of foundation, introduction to spread, combined, strap, mat and pile foundation

Masonry:

Definition and terms used in masonry. Brick masonry, characteristics and requirements of good brick masonry, Bonds in brick work, Header,

Stretcher, English, Flemish bond, Stone masonry, Requirements of good stone masonry, Classification, characteristics of different stone masonry, Joints in stone masonry. Types of walls; load bearing, partition walls, cavity walls **10 Hours**

Module 3

Lintels and Arches:

Definition, function and classification of lintels, Balconies, chejja and canopy. Arches; Elements and Stability of an Arch.

Floors and roofs:

Floors; Requirement of good floor, Components of ground floor, Selection of flooring material, Laying of Concrete, Mosaic, Marble, Granite, Tile flooring, Cladding of tiles.

Roof: - Requirement of good roof, Types of roof, Elements of a pitched roof, Trussed roof, King post Truss, Queen Post Truss, Steel Truss,

Different roofing materials, R.C.C. Roof. **10 Hours**

Module 4

Doors, Windows and Ventilators:

Location of doors and windows, technical terms, Materials for doors and windows, Panelled door, Flush door, Collapsible door, rolling shutter, PVC Door, Panelled and glazed Window, Bay Window, French window. Ventilators. Sizes as per IS recommendations

Stairs: Definitions, technical terms and types of stairs, Requirements of good stairs. Geometrical design of RCC doglegged and open-well stairs.

Formwork: Introduction to form work, scaffolding, shoring, under pinning **10Hours**

ATME College of Engineering DEPARTMENT OF CIVIL ENGINEERING

Module 5

Plastering and Pointing: purpose, materials and methods of plastering and pointing, defects in Plastering-Stucco plastering, lathe plastering

Damp proofing- causes, effects and methods.

Paints- Purpose, types, ingredients and defects **10 Hours**

List of Text Books

1. Sushil Kumar "Building Materials and construction", 20th edition, reprint 2015, Standard Publishers
2. Dr. B.C. Punmia, Ashok kumar Jain, Arun Kumar Jain, "Building Construction, Laxmi Publications (P) ltd., New Delhi.
3. Rangawala S. C. "Engineering Materials", Charter Publishing House, Anand, India.

List of Reference Books

1. S.K. Duggal, "Building Materials", (Fourth Edition) New Age International (P) Limited, 2016
2. National Building Code(NBC) of India
3. P C Vergese, "Building Materials", PHI Learning Pvt. Ltd
4. Building Materials and Components, CBRI, 1990, India
5. Jagadish. K.S, "Alternative Building Materials Technology", New Age International, 2007.
6. M. S. Shetty, "Concrete Technology", S. Chand & Co. New Delhi.

URLs : 1. http://nptel.ac.in/courses/105102088/

Course Outcomes		
	1. Select suitable materials for buildings and adopt suitable construction techniques.	L3
	2. Decide suitable type of foundation based on soil parameters	L4
	3. Supervise the construction of different building elements based on suitability	L4
	4. Exhibit the knowledge of building finishes and form work requirements	L3

Internal Assessment Marks: 30 + 10 (3 Session Tests are conducted during the semester and marks allotted based on average of 3 test and assignment performances).

The Correlation of Course Outcomes (CO's) and Program Outcomes (PO's)

Subject Code:	18CV34	TITLE: Building Materials & Construction				Faculty Name:		SRIVATHSA H U			
List of Course Outcomes	Program Outcomes										
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO-1	1	1	-	-	-	-	-	-	-	-	-	1
CO-2	1	1	-	-	-	-	-	1	-	1	-	1
CO-3	1	-	-	-	-	-	-	-	-	-	-	1
CO-4	1	-	-	-	-	-	-	-	-	-	-	1

Note: 3 = Strong Contribution 2 = Average Contribution 1 = Weak Contribution - = No Contribution

The Correlation of Course Outcomes (CO's) and Program Specific Outcomes (PSO's)

Subject Code:	18CV34	TITLE: Building Materials & Construction	Faculty Name:	SRIVATHSA H U
List of Course Outcomes	Program Specific Outcomes			
	PSO1		PSO2	
CO-1	-		1	
CO-2	-		1	
CO-3	-		-	
CO-4	-		1	

Note: 3 = Strong Contribution 2 = Average Contribution 1 = Weak Contribution - = No Contribution

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C. IA QP and Scheme

ATME College of Engineering
Department of Civil Engineering

Online IA - 3

Subject Code	:	18CV34	Time	:	2:30 – 4:00 PM
Subject	:	Building Materials & Construction	Date	:	28.12.2020
Semester	:	III	Max. Marks	:	50

	PART-A-Answer any three full Questions	Marks	COs	BTL
01.	a) Answer the following multiple choice questions and each carries 1mark i. The most common type of door is a) Double leaf door b) Louvered door c) Single leaf door d) Battened door ii. A bay window is a multi-panel window, which: a) Is provided at corners b) Runs parallel to the wall c) Embeds inside wall d) Projects outside wall	2 M	3	L1
	b) Explain any 4 types of doors in detail	8 M		L2
02.	a) Answer the following multiple choice questions and each carries 1mark i. The vertical portion between each tread on the stair is called: a) Going b) Nosing c) Winder d) Riser ii. Maximum and Minimum number of steps allowed in a single flight is a) 13, 3 b) 12. 2 c) 12, 3 d) 10, 3	2 M	3	L1
	b) i) Explain Dog legged and Open Newel staircase with a neat sketch ii) Draw plan and sectional elevation of RCC dog-legged staircase for an office building which measures 3m x 5.5m. The vertical distance between the floor is 3.3m (including landing). Provide steps with tread of 300mm and rise of 150mm. Width of stair is 1.5m.	4 M 4 M		L2
03.	a) Answer the following multiple choice questions and each carries 1 mark i. The _____ is used for formwork when it is desired to reuse the formwork several times. a) Stone b) Steel c) Timber d) Bamboo ii. The formwork for _____ consists of stringers, sheets, joist, bearers and vertical post. a) Walls b) Column c) Beams d) Stairs	2 M	4	L1
	b) Define Shoring and explain the types of shores with a neat sketch	8 M		L2
04.	a) Answer the following multiple choice questions and each carries 1 marks i. Sometimes the structures are to be temporarily supported. This is achieved by what is known as the _____ a) Scaffolding b) Shoring c) Underpinning d) Grouting ii. In _____ shore arrangement, the inclined supports are given to the external walls from the ground. a) Raking shore b) Flying shore c) Dead shore d) Patented shore	2M	4	L1
	b) Define Underpinning & Explain the methods of underpinning	8M		L2

	PART-B-Answer any two full Questions	Marks	COs	BTL
01.	a) Answer the following multiple choice questions and each carries 1 marks i. Before plastering, the surface has to be: a) Rough b) Smooth c) Cemented d) Watered ii. Which of the below is not a plaster type based on the material? a) Cement b) Gypsum c) Pozzolana d) Lime	2 M	4	L1
	b) i) Explain any 5 types of surface finishes that are adopted in plastering work ii) Explain any 5 types of defects in plastering	4 M 4 M		L2
02.	a) Answer the following multiple choice questions and each carries 1 marks i. DPM stands for: a) Damp Proof Material b) Damp Proof Mix c) Damp Proof Member d) Damp Proof Membrane ii. A paint normally consists of _____ components. a) 3 b) 4 c) 5 d) 6	2 M	4	L1
	b) Explain the methods of damp proofing	8 M		L2
03.	a) Answer the following multiple choice questions and each carries 1 marks i. The appearance of glossy patches on the painted surface is called: a) Flashing b) Blooming c) Running d) Blistering ii. Which of the below is a pigment imparting brown color? a) Raw sienna b) Soot c) Burnt sienna d) Ultramarine	2 M	4	L1
	b) Explain the defects in painting works	8 M		L2

CO1	Select suitable materials for buildings and adopt suitable construction techniques.
CO2	Decide suitable type of foundation based on soil parameters
CO3	Supervise the construction of different building elements based on suitability
CO4	Exhibit the knowledge of building finishes and form work requirements

Bloom's Taxonomy Level	
L1	Remembering
L2	Understanding
L3	Applying
L4	Analyzing
L5	Synthesizing
L6	Creating

Srivatsa. H.V
Name & Signature of Course Coordinator

HOD Signature

ATME College of Engineering
Department of Civil Engineering

Subject Name: Building Materials & construction Subject Code: 18CV34
Faculty Name: Srivatsa. H.V IA Number: 3

CO1	Select suitable materials for buildings and adopt suitable construction techniques
CO2	Decide suitable type of foundation based on soil parameters
CO3	Supervise the construction of different building elements based on suitability
CO4	Exhibit the knowledge of building finishes & form work requirements
CO5	
CO6	

Revised Bloom's Taxonomy Levels
L1: Remembering L2: Understanding L3: Applying L4: Analyzing L5: Evaluating L6: Creating

No	Solution	Marks	COs	BTL
01.	a) i) Single leaf door ii) Projects outside wall — 1×2 = 2m	2	4	L1
	b) Framed & Panelled door * These type of doors are commonly used in all types of building * This type of door consists of framework of vertical members & horizontal members * Panels may be made of timber, black board or glass. Door may have one, two, three or six panels Glazed or sash doors * These are adopted to admit more light into the room obtained coming from windows. * It may be fully glazed or partly paneled & partly glazed. * In partly glazed & partly paneled, ratio of glazed portion to paneled portion to be maintained in the ratio of 2:1, the bottom ⅓rd height is paneled & ⅔rd is glazed.	8	4	L2

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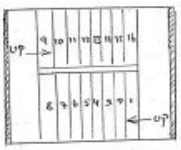
Department of Civil Engineering

No	Solution	Marks	COs	BTL
	Flush door :- * With the large scale production of plywood flush doors are becoming increasingly popular these days. * It is adopted because of its pleasing appearance, simplicity of construction, less cost, better strength & greater durability. * They can be used for both residential as well as public building Swinging doors :- * A swing door is provided with special hinges & then the shutter of the door are held in closed position when door is not in use. * It is desirable to provide a glazed shutter at eye level to avoid the accidents at the time of opening & closing the shutter. → 4×2 = 8marks			
02.	a) i) Riser ii) 12, 3 → 1×2 = 2marks	2	4	L1
	b) Dog-legged stair * In this type, flight runs in opp direction & there is no space between them in plan. * These are adopted when space available for staircase is equal to twice the width of step. * Name is given because of its appearance in s/n elevation  → 2marks	8	4	L2

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No	Solution	Marks	COs	BTL

Open Newel Stairs

* In this type there will be a well @ hole formed in b/w the flights
* These are adopted when space available is greater than twice the width of stair.

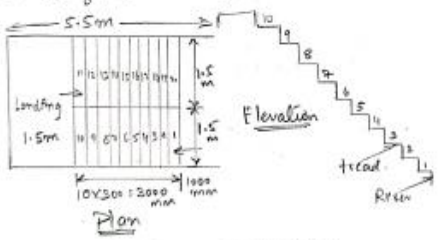
i) No of riser = Total height of floor / Height of Riser = 3.3 / 0.15 = 22 nos

Let us provide 2 flights

∴ No of risers in 1st flight = 22/2 = 11 nos

No of risers in 2nd flight = 11 nos

∴ No of treads in each flight = 11 − 1 = 10 nos



Q3 a) i) Steel ii) Glass → 2 x 1 = 2 marks	provide	2	4	L1
b) Shoring is temporary structure constructed to temporary support for an unsafe structure. → 1 mark.		8	4	L2

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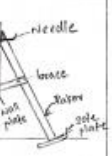
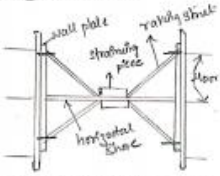
No	Solution	Marks	COs	BTL

Raking shores

* In this method inclined members called rakers are provided to give lateral support to the wall
* Rakers are provided @ each floors
* At the top rakers are provided with needle & at bottom it is provided with Sole plate to avoid the sliding of raker.
* Similar rakers should be placed @ 2 to 4.6 c/c.

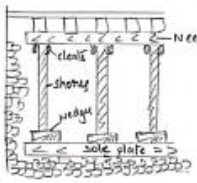


* Horizontal Shores



* In this method, horizontal supports are placed parallel to the wall & none of the struts reaches the ground.
* Raking struts are held against the wall & well secured with needle @ top & at bottom shoring piece is provided to avoid sliding.

Flying Vertical Shores



* This type of shoring consists of vertical members known as dead shores supporting the H/C beams or needles.
* Needle transfer the load of wall of 1st floor to the ground through the vertical shores from sole plate.
* Distances at which holes are cut in walls of 1st floor may varies about 1.2 to 1.5m for inserting needles. → 3x3=9m

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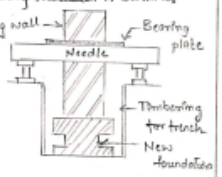
No	Solution	Marks	COs	BTL
Q4. a) i) Shoring ii) Raking shore → 2x1 = 2 marks		2	4	L1

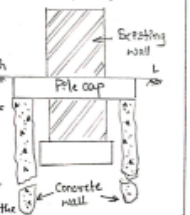
b) Process of placing new foundation below an existing foundation or portion of strengthening the existing foundation is known as Underpinning.

Pot method.



* Existing wall is divided into suitable size & width about 1.2m to 1.5m.
* Holes are made in the existing wall
* Needles with bearing plates are inserted through holes and supported by jacks.
* Pit is excavated & existing foundation is taken upto required level.

Pile method.



* Piles are driven into the ground along the sides of the existing walls & then needles in the form of pile caps are provided through the existing walls.
* Underpinning is provided for light structure, the piles are driven along the piles are driven along the structure & cantilever needle are provided to carry structure.

Cement Grouting

* This method is used to restore slab or pavement which has settled.
* The holes are drilled in the slab and cement grout is forced

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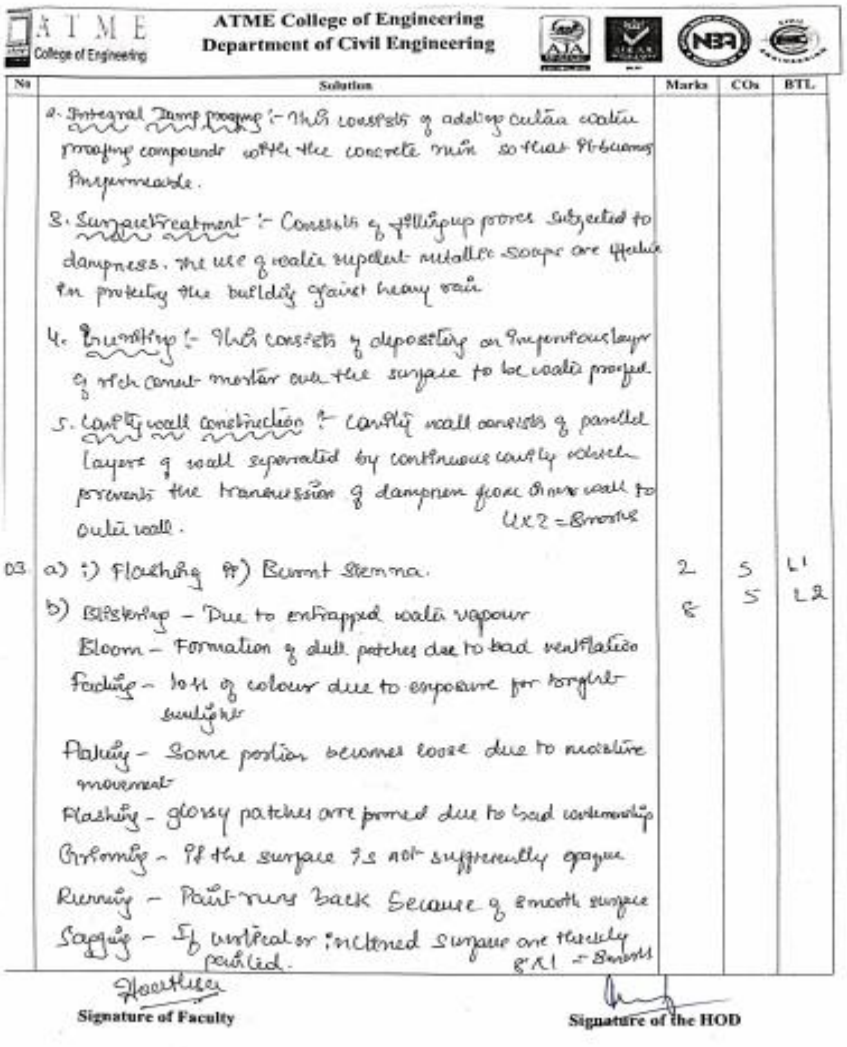
No	Solution	Marks	COs	BTL
	under pressure through these holes. * The pressure is maintained until the cement grout has set.			
	Part-B			
Q1. a) i) Rapid/water ii) Pozzolana → 2x1 = 2 marks		2	5	L1
b) Smooth cast :- It is a finish which provides levelled & smooth surface.		5	5	L2
Rough cast :- It is a finish in which mortar for the final coat contains a proportion of gravel/big size coarse aggregates.				
Pebble cast :- It is a finish in which small pebbles @ crushed stones of suitable size are thrown & left exposed.				
Textured finish :- Ornamental patterns or textured surfaces are produced by working with various tools on freshly applied coat.				
Stippled finish :- It is a finish of pock-dap or rough surface textures to the applied coat. → 5x1 = 5 marks				
Blistering/Dyed :- Formation of small patches of plaster swelling out beyond the plastered surface due to late slaking		5	5	L2
Cracking :- Formation of cracks due to improper preparation				
Efflorescence :- Crystalline whitish precipitate appears on finished plastered surface.				
Flaking :- Formation of very loose mass of plastered surface				
Peeling :- Complete dislocation of some portion of plaster results with formation of patches. → 5x1 = 5 marks				
Q2 a) i) Damp proof membrane ii) 6 → 2x1 = 2 marks		2	5	L1
b) Membrane Damp proofing :- It consists of providing a layer of membrane of water impervious material b/w the source of dampness & the part of the structure adjacent to it.		8	5	L2

Signature of Faculty — Signature of the HOD



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Department of Civil Engineering

No	Solution	Marks	COs	BTL
	2. Integral Damp proofing :- This consists of adding suitable waterproofing compounds with the concrete mix so that it becomes impermeable.			
	3. Surface treatment :- Consists of filling up pores subjected to dampness. The use of water repellent metallic soaps are effective in protecting the building against heavy rain.			
	4. Rendering :- This consists of depositing an impervious layer of rich cement mortar over the surface to be water proofed.			
	5. Cavity wall construction :- Cavity wall consists of parallel layers of wall separated by continuous cavity which prevents the transmission of dampness from one wall to other wall. 1X2 = 2marks			
03	a) i) Flushing ii) Burnt Stemma.	2	5	L1
	b) Blistering – Due to entrapped water vapour Bloom – Formation of dull patches due to bad ventilation Fading – loss of colour due to exposure for longer sunlight Flaking – Some portion becomes loose due to moisture movement Flashing – glossy patches are formed due to bad workmanship Chalking – If the surface is not sufficiently opaque Running – Paint runs back because of smooth surface Sagging – If vertical or inclined surface are heavily painted. 8X1 = 8marks	8	5	L2

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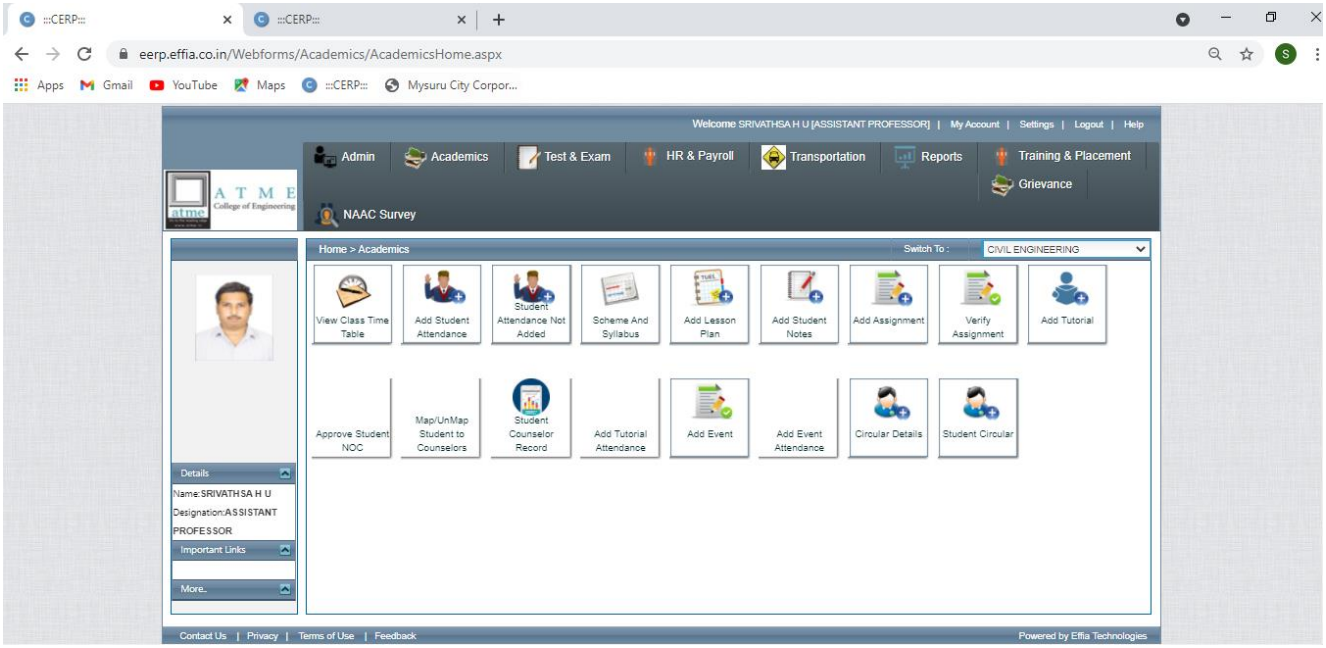
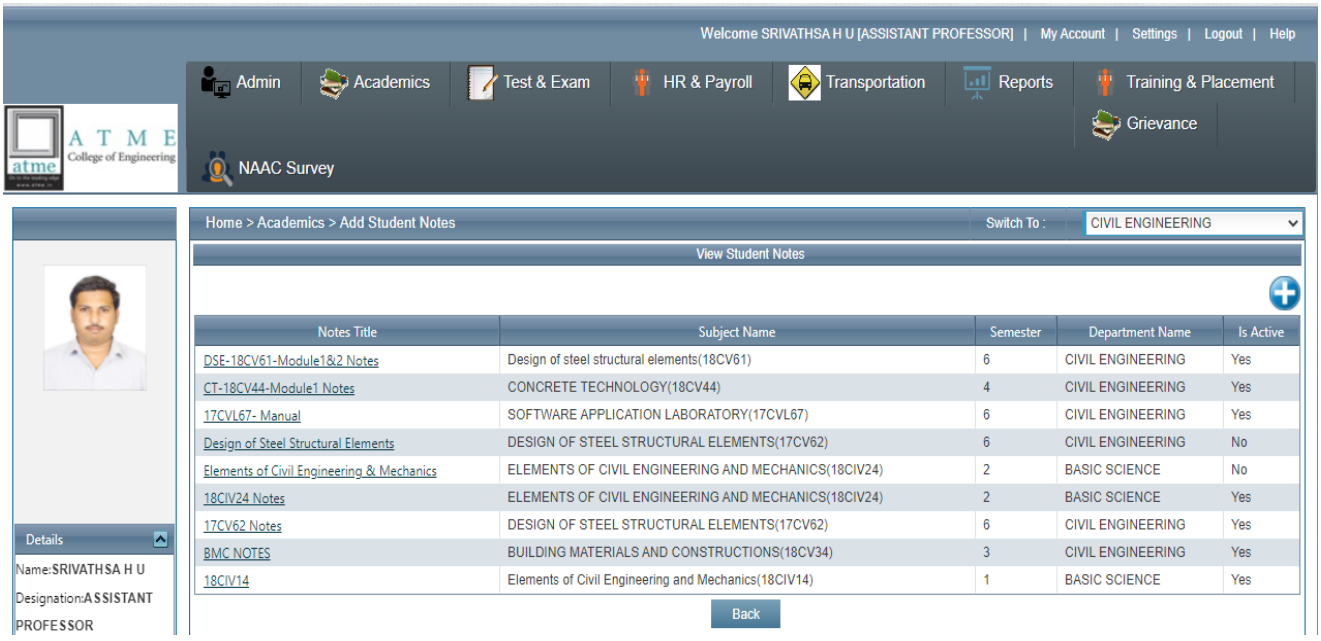
D. CERP Link: https://eerp.effia.co.in/Webforms/frmLogin.aspx

Note: Only authorised access





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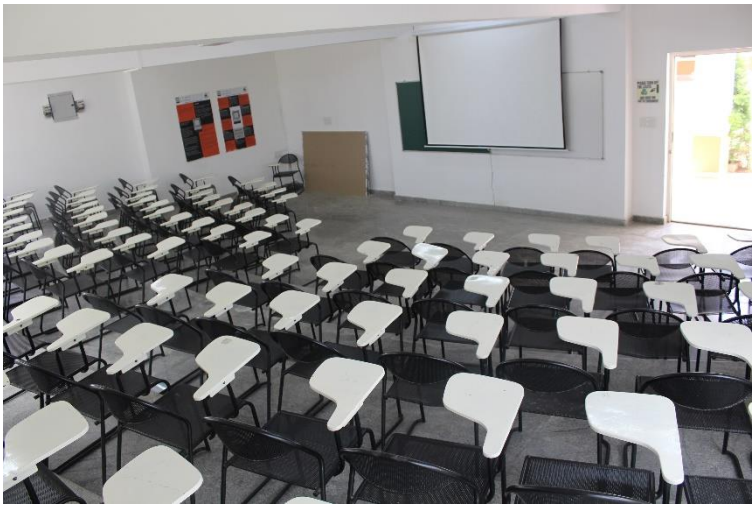
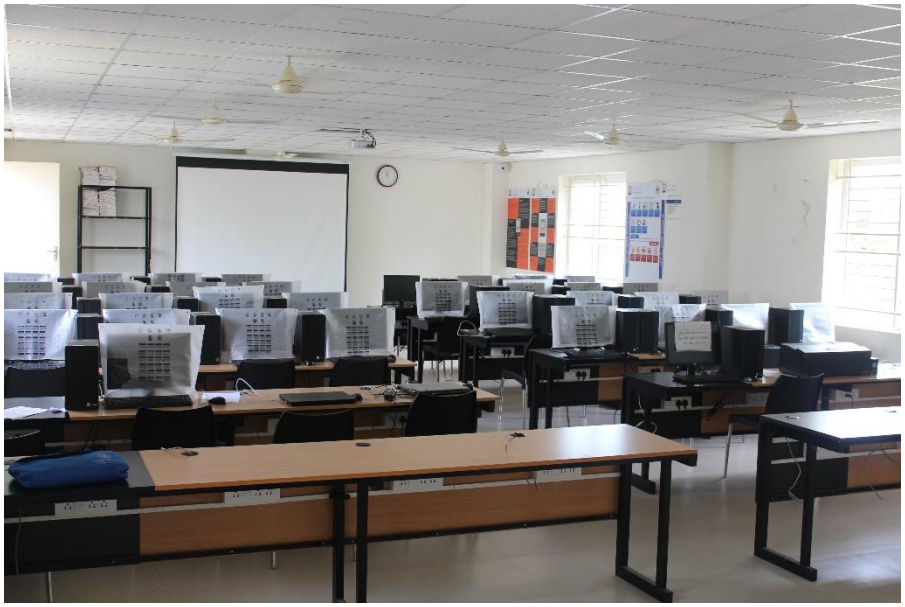
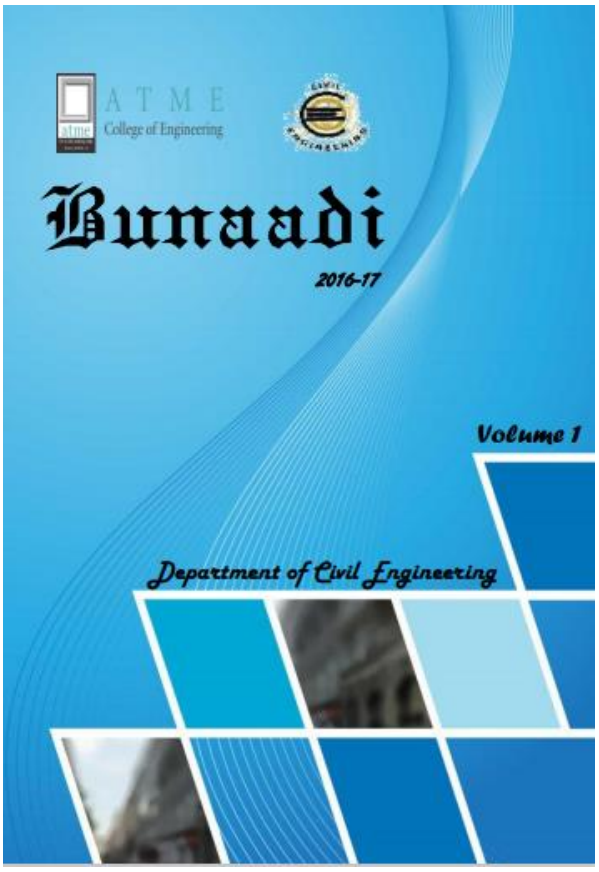
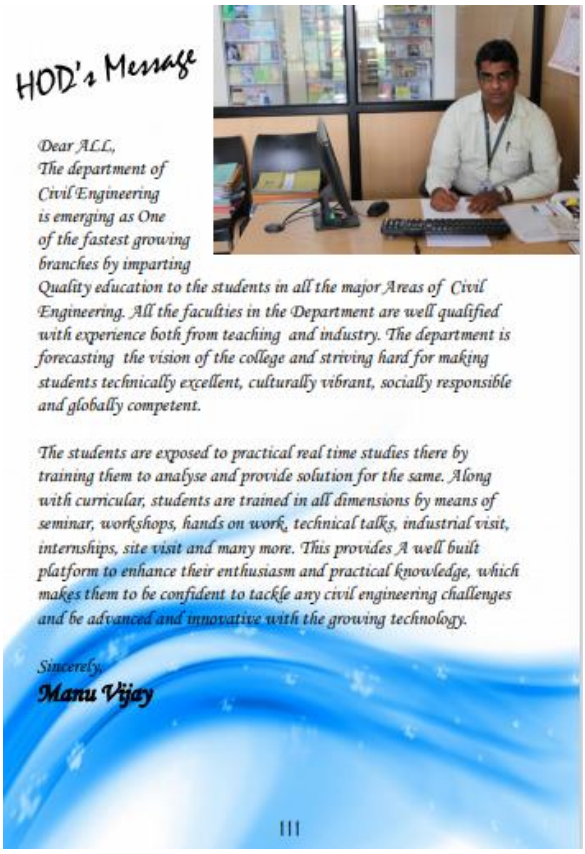
E. CLASSROOM, SEMINAR HALL & LABORATORY





F. Magazine





HOD's Message

Dear ALL,

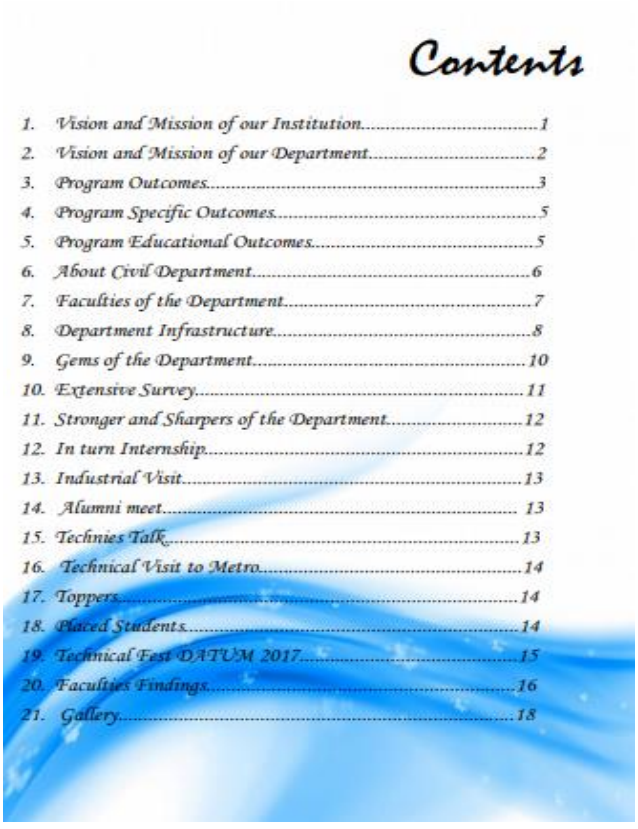
The department of Civil Engineering is emerging as One of the fastest growing branches by imparting Quality education to the students in all the major Areas of Civil Engineering. All the faculties in the Department are well qualified with experience both from teaching and industry. The department is forecasting the vision of the college and striving hard for making students technically excellent, culturally vibrant, socially responsible and globally competent.

The students are exposed to practical real time studies there by training them to analyse and provide solution for the same. Along with curricular, students are trained in all dimensions by means of seminar, workshops, hands on work, technical talks, industrial visit, internships, site visit and many more. This provides A well built platform to enhance their enthusiasm and practical knowledge, which makes them to be confident to tackle any civil engineering challenges and be advanced and innovative with the growing technology.

Sincerely,

Manu Vijay

III



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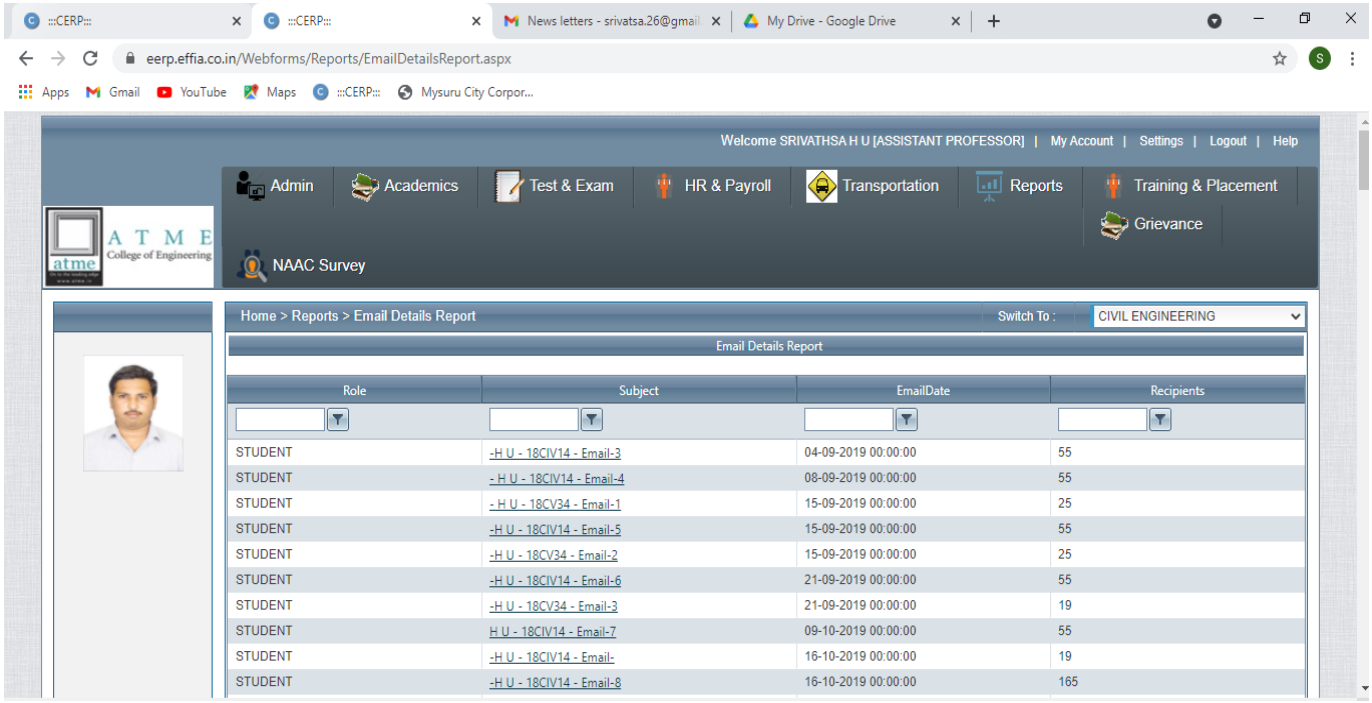
G. Flipped Classroom through Mail (CERP/ MS Teams)



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STUDENT	- H U - 18CIV14 - Email-4	08-09-2019 00:00:00	55
STUDENT	- H U - 18CV34 - Email-1	15-09-2019 00:00:00	25
STUDENT	-H U - 18CIV14 - Email-5	15-09-2019 00:00:00	55
STUDENT	-H U - 18CV34 - Email-2	15-09-2019 00:00:00	25
STUDENT	-H U - 18CIV14 - Email-6	21-09-2019 00:00:00	55
STUDENT	-H U - 18CV34 - Email-3	21-09-2019 00:00:00	19
STUDENT	H U - 18CIV14 - Email-7	09-10-2019 00:00:00	55
STUDENT	-H U - 18CIV14 - Email-	16-10-2019 00:00:00	19
STUDENT	-H U - 18CIV14 - Email-8	16-10-2019 00:00:00	165

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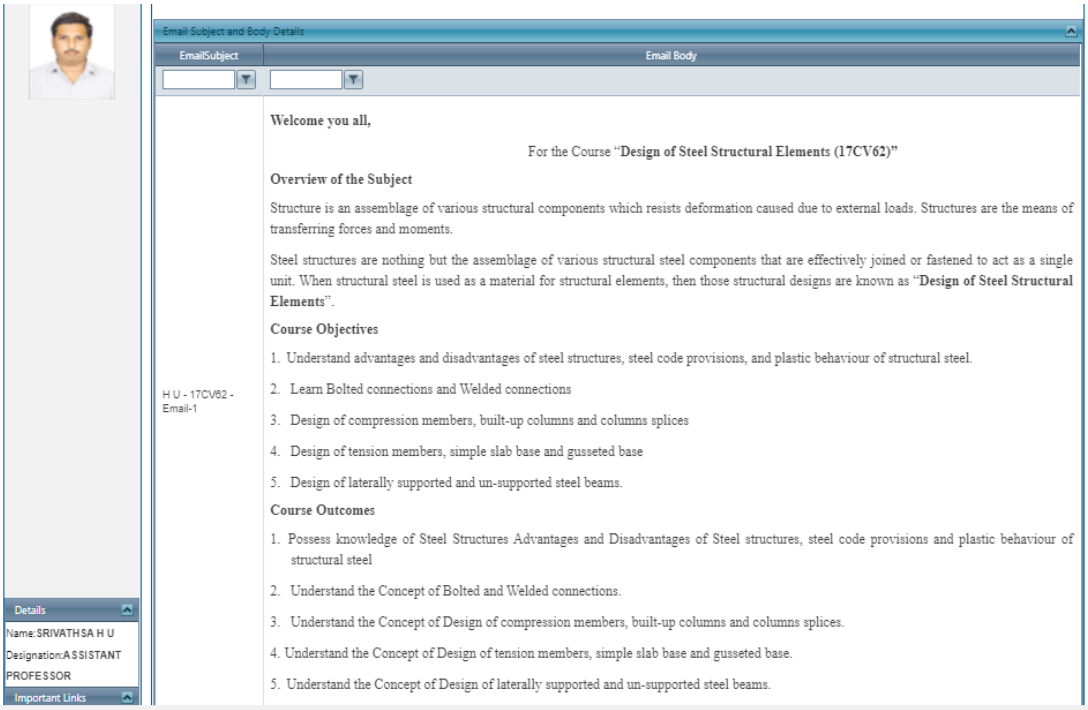

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DEPARTMENT OF CIVIL ENGINEERING

CO STATEMENTS

DEPARTMENT OF CIVIL ENGINEERING

CO Statements, CO-PO & CO-PSO Matrix for the AY 2019-20

DEPARTMENT OF CIVIL ENGINEERING

CO PO MATRIX - THIRD SEMESTER

COURSE NAME: ENGINEERING MATHEMATICS-III (18MAT31)

Course: C201	C201.1	Know the use of periodic signals and Fourier series to analyze circuits and system
	C201.2	Explain the general linear system theory for continuous-time signals and digital signal
	C201.3	Employ appropriate numerical methods to solve algebraic and transcendental equations.
	C201.4	Apply Green's Theorem, Divergence Theorem and Stokes' theorem in various applications in the field of electro-magnetic and gravitational fields and fluid flow problems.
	C201.5	Determine the extremals of functionals and solve the simple problems of the calculus of

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C201.1	1	-	-	-	-	-	-	-	-	-	-	-	-	-
C201.2	1	-	-	-	-	-	-	-	-	-	-	-	-	-
C201.3	3	3	-	3	2	-	-	-	2	-	1	2	2	2
C201.4	2	2	-	2	1	-	-	-	1	2	1	2	1	1
C201.5	1	1	-	-	-	-	-	-	-	-	-	-	2	2

COURSE NAME: STRENGTH OF MATERIALS (18CV32)

Course: C202	C202.1	To evaluate the strength of various structural elements internal forces such as compression, tension, shear, bending and torsion
	C202.2	To suggest suitable material from among the available in the field of construction and manufacturing.
	C202.3	To evaluate the behavior and strength of structural elements under the action of compound stresses and thus understand failure concepts
	C202.4	To understand the basic concept of analysis and design of members subjected to torsion
	C202.5	To understand the basic concept of analysis and design of structural elements such as columns and struts

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C202.1	1	2	1	-	-	-	-	-	-	1	1	1	1	-
C202.2	1	1	-	-	-	-	-	-	1	-	-	1	-	-
C202.3	1	1	2	1	-	-	-	-	-	-	-	1	-	-
C202.4	1	2	1	1	-	-	-	-	-	-	-	1	1	-
C202.5	1	1	1	1	-	-	-	1	-	-	-	1	-	-

COURSE NAME:FLUID MECHANICS(18CV33)

Course: C203	C203.1	Possess a sound knowledge of fundamental properties of fluids and fluid Continuum
	C203.2	Compute and solve problems on hydrostatics, including practical applications
	C203.3	Apply principles of mathematics to represent kinematic concepts related to fluid flow
	C203.4	Apply fundamental laws of fluid mechanics and the Bernoulli's principle for practical applications
	C203.5	Compute the discharge through pipes and over notches and weirs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C203.1	3	2	-	-	-	-	-	-	-	-	-	1	-	-
C203.2	3	2	-	-	-	-	-	-	-	-	-	1	1	-
C203.3	3	2	-	-	-	-	-	-	-	-	-	1	-	-
C203.4	3	1	-	-	-	-	-	-	-	-	-	1	-	-
C203.5	3	1	-	-	-	-	-	-	-	-	-	1	1	-

COURSE NAME: Building Materials and Construction (18CV34)

Course: C204	C204.1	Select suitable materials for buildings and adopt suitable construction techniques.
	C204.2	Decide suitable type of foundation based on soil parameters
	C204.3	Supervise the construction of differetn building elements based on suitability
	C204.4	Exhibit the knowledge of building finishers and form work requirements

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C204.1	1	1	-	-	-	-	-	-	-	-	-	1	1	-
C204.2	1	1	-	-	-	-	-	1	-	1	-	1	1	-
C204.3	1	-	-	-	-	-	-	-	-	-	-	1	1	-
C204.4	1	-	-	-	-	-	-	-	-	-	-	1	1	-

COURSE NAME: Basic Surveying (18CV35)

Course: C205	C205.1	Posses a sound knowledge of fundamental principles Geodetics
	C205.2	Measurement of vertical and horizontal plane, linear and angular dimensions to arrive at solutions to basic surveying problems
	C205.3	Capture geodetic data to process and perform analysis for survey problems
	C205.4	Analyse the obtained spatial data and compute areas and volumes. Represent 3D data on plane figures as contours

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C205.1	2	-	-	-	-	-	-	-	-	-	-	1	1	-
C205.2	2	-	-	-	-	-	-	-	-	-	-	1	1	-
C205.3	1	-	-	-	-	-	-	-	-	-	-	1	1	-
C205.4	2	1	-	-	-	-	-	-	-	-	-	1	1	-

COURSE NAME: ENGINEERING GEOLOGY (18CV36)

Course: C206	C206.1	Students will able to apply the knowledge of geology and its role in Civil Engineering
	C206.2	Students will effectively utilize earth's materials such as mineral, rocks and water in civil engineering practices.
	C206.3	Analyze the natural disasters and their mitigation
	C206.4	Assess various structural features and geological tools in ground water exploration, Natural resource estimation and solving civil engineering problems.
	C206.5	Apply and asses use of building materials in construction and asses their properties

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C206.1	2	2	-	-	-	-	1	-	-	-	-	1	1	-
C206.2	2	2	-	-	-	-	1	-	-	-	-	1	1	-
C206.3	2	1	-	-	-	-	1	-	-	-	-	1	1	-
C206.4	2	1	-	-	1	1	1	-	-	-	-	1	1	-
C206.5	1	1	-	-	-	-	1	-	-	-	-	1	1	-

COURSE NAME:Basic Material Testing Laboratory (18CVL37)

Course: C207	C207.1	Reproduce the basic knowledge of mathematics and engineering in finding the strength in tension, compression, shear and torsion.
	C207.2	Identify, formulate and solve engineering problems of structural elements subjected to flexure
	C207.3	Evaluate the impact of engineering solutions on the society and also will be aware of contemporary issues regarding failure of structures due to unsuitable materials

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C207.1	3	2	1	1	-	-	1	-	2	2	2	-	3	-
C207.2	3	3	1	1	1	-	1	-	2	2	3	-	3	-
C207.3	2	3	2	3	1	-	1	-	2	2	3	1	3	-

COURSE NAME: Computer Aided Building Planning and Drawing(18CV38)

Course: C208	C208.1	Apply the basic principles of engineering surveying and for linear and angular measurements.
	C208.2	Comprehend effectively field procedures required for a professional surveyor
	C208.3	Use techniques, skills and conventional surveying instruments necessary for engineering practice

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C208.1	3	-	-	-	-	-	-	-	1	1	-	-	3	-
C208.2	3	-	-	-	-	-	-	-	2	2	-	-	3	-
C208.3	3	-	-	-	3	-	-	-	2	2	-	-	3	3

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CO PO MATRIX - FOURTH SEMESTER

COURSE NAME: ENGINEERING MATHEMATICS-IV (18MAT41)

Course: C209	C209.1	Solve first and second order ordinary differential equation arising in flow problems using single step and multistep numerical methods.
	C209.2	Illustrate problems of potential theory, quantum mechanics and heat conduction by employing notions and properties of Bessel's functions and Legendre's polynomials.
	C209.3	Explain the concepts of analytic functions, residues, poles of complex potentials and describe conformal and Bilinear transformation arising in field theory and signal
	C209.4	Develop probability distribution of discrete, continuous random variables and joint probability distribution occurring in digital signal processing, information theory and design
	C209.5	Demonstrate testing of hypothesis of sampling distributions and illustrate examples of Markov chains related to discrete parameter stochastic process.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C209.1	2	-	-	-	-	-	-	-	-	-	-	-	1	1
C209.2	1	1	-	-	-	-	-	-	-	-	-	-	1	1
C209.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C209.4	3	2	-	2	1	1	-	-	2	2	1	2	3	2
C209.5	1	1	-	-	-	-	-	-	-	-	-	-	1	1

COURSE NAME: Analysis of Determinate Structures(18CV42)

Course: C210	C210.1	Identify different form of structural system
	C210.2	Construct ILD and anaylyse the beams and trusses subjected to moving loads
	C210.3	Understand the energy principles and energy theorems and its applications to determine the deflections of trusses and bent frames.
	C210.4	Determine the stress resultants in arches and cables

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C210.1	2	2	2	2	-	-	-	-	-	-	-	2	2	-
C210.2	2	2	2	2	-	-	-	-	-	-	-	2	2	-
C210.3	2	2	2	2	-	-	-	-	-	-	-	2	2	-
C210.4	2	2	2	2	-	-	-	-	-	-	-	2	2	-

COURSE NAME:Applied Hydraulics (18CV43)

Course: C211	C211.1	Apply dimensional analysis to develop mathematical modeling and compute the parametric values in prototype by analyzing the corresponding model parameters
	C211.2	Knowledge of stability of submerged and floating bodies.
	C211.3	Design the open channels of various cross sections including economical channel sections.
	C211.4	Apply Energy concepts to flow in open channel sections, Calculate Energy dissipation Compute water surface profiles at different conditions
	C211.5	Design turbines for the given data, and to know their operation characteristics under different operating conditions

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C211.1	3	1	-	-	-	-	-	-	-	-	-	1	-	-
C211.2	3	-	1	-	-	-	-	-	-	-	-	1	1	-
C211.3	2	-	-	-	-	-	-	-	-	-	-	1	-	-
C211.4	3	1	-	-	-	-	-	-	-	-	-	1	-	-
C211.5	3	1	1	-	-	-	-	-	-	-	-	1	1	-

COURSE NAME: Concrete Technology (18CV44)

Course: C212	C212.1	Relate material characteristics and their influence on microstructure of concrete.
	C212.2	Distinguish concrete behaviour based on its fresh and hardened properties.
	C212.3	Illustrate proportioning of different types of concrete mixes for required fresh
	C212.4	Adapt suitable concreting methods to place the concrete based on requirement
	C212.5	Select a suitable type of cncrete based on specific application

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C212.1	1	-	-	-	-	-	-	-	-	-	-	-	1	-
C212.2	2	-	-	-	-	-	-	-	-	-	-	-	1	-
C212.3	2	-	-	-	-	-	-	-	-	-	-	-	1	-
C212.4	1	-	-	-	-	-	-	-	-	-	-	-	1	-
C212.5	1	-	-	-	-	-	-	-	-	-	-	-	1	-

COURSE NAME: Advanced Surveying (18CV45)

Course: C213	C213.1	Apply the knowledge of geometric principles to arrive at surveying problems
	C213.2	Use modern instruments to obtain geo-spatial data and analyse the same to appropriate engineering problems.
	C213.3	Capture geodetic data to process and perform analysis for survey problems with the use of electronic instruments;
	C213.4	Design and implement the different types of curves for deviating type of alignments.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C213.1	2	-	-	-	-	-	-	-	-	-	-	1	1	-
C213.2	3	-	-	-	-	-	-	-	-	-	-	1	1	-
C213.3	2	-	-	-	-	-	-	-	-	-	-	1	1	-
C213.4	2	1	2	-	-	-	-	-	-	-	-	1	1	-

COURSE NAME: Water supply and treatment Engineering(18CV46)

Course: C214	C214.1	Estimate, average and peak water demand for a community
	C214.2	Evaluate available sources of water, quantitatively and qualitatively and make appropriate choice for a community
	C214.3	Evaluate water wuality and environmental significance of various parameters and plan suitable treament system
	C214.4	Design a comprehensive water treatment and distribution system to purify and distribute water to the required quality standeards

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C214.1	2	-	1	-	-	1	-	-	-	-	-	-	-	1
C214.2	2	-	1	-	-	1	-	-	-	-	-	1	-	-
C214.3	2	1	1	-	-	1	-	1	-	-	-	1	-	1
C214.4	3	1	1	-	-	1	1	-	-	-	-	1	-	1

COURSE NAME: Fluid Mechanics and Hydraulic Machines Laboratory (18CVL48)

Course: C216	C215.1	Properties of fluids and the use of various instruments for fluid flow measurement.
	C215.2	Working of hydraulic machines under various conditions of working and their characteristics

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C215.1	3	3	2	2	-	1	-	-	3	-	-	2	-	1
C215.2	3	3	2	2	-	1	1	-	3	-	-	3	-	1

COURSE NAME: Engineering Geology Laboratory (18CVL47)

Course: C215	C216.1	Identifying the minerals and rocks and utilize them effectively in civil engineering practices.
	C216.2	Understanding and interpreting the geological conditions of the area for the implementation o f civil engineering projects.
	C216.3	Interpreting subsurface information such as thickness of soil, weathered zone, depth of hard rock and saturated zone by using geophysical methods.
	C216.4	Learn the technoque in interpretastion of landsat imageries to find out the lineaments and other structural features for the given area
	C216.5	Able to idetify the difference structures in the field

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C216.1	1	-	-	-	-	1	-	-	3	1	-	1	-	-
C216.2	2	1	1	-	-	1	-	-	-	1	-	2	-	-
C216.3	2	1	1	-	-	1	-	-	-	1	-	2	1	-
C216.4	2	1	1	-	-	1	-	-	-	1	-	2	1	-
C216.5	2	1	1	-	-	2	-	-	-	2	-	2	1	-

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DEPARTMENT OF CIVIL ENGINEERING

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CO PO MATRIX - SIXTH SEMESTER

COURSE NAME: Construction Management and Entrepreneurship (17CV61)

Course: C309	C309.1	Understand the construction management process.
	C309.2	Understand and solve variety of issues that are encountered by every professional in discharging professional duties
	C309.3	Undestand the influence of economy on construction projects
	C309.4	Understand the concept of Entrepreneurial evolution and business planning

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
C309.1	2	-	-	-	1	1	-	-	1	1	2	1	1	-	-	1	-
C309.2	1	-	-	-	-	2	1	3	-	-	1	1	1	-	-	1	-
C309.3	1	-	-	-	1	-	1	-	-	-	2	1	1	-	-	1	-
C309.4	-	-	-	-	-	-	-	-	3	1	1	1	1	-	-	1	-

COURSE NAME: Design of Steel Structural Elements (15CV62)

Course: C310	C310.1	Possess a knowledge of Steel Structures Advantages and Disadvantages of Steel structures, steel code provisions and plastic behaviour of structural steel
	C310.2	Understand the Concept of Bolted and Welded connections.
	C310.3	Understand the Concept of Design of compression members, built-up columns and columns splices
	C310.4	Understand the Concept of Design of tension members, simple slab base and gusseted base
	C310.5	Understand the Concept of Design of laterally supported and un-supported steel beams.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
C310.1	1	1	-	-	-	-	-	-	-	-	-	1	1	-	-	1	-
C310.2	2	3	1	-	-	-	-	1	-	1	-	1	1	-	-	1	-
C310.3	2	2	1	-	-	-	-	1	-	1	-	1	1	-	-	1	-
C310.4	3	3	1	-	-	-	-	1	-	1	-	1	1	-	-	1	-
C310.5	2	3	1	-	-	-	-	1	-	-	-	1	1	-	-	1	-

COURSE NAME: Highway Engineering (17CV63)

Course: C311	C311.1	Acquire the capability of proposing a new alignment or re-alignment of existing roads, conduct necessary field investigation for generation of required data.
	C311.2	Evaluate the engineering properties of the materials and suggest the suitability of the same for pavement construction
	C311.3	Design road geometrics, structural components of pavement and drainage.
	C311.4	Evaluate the highway economics by few select methods and also will have a basic knowledge of various highway financing concepts.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
C311.1	3	-	1	-	-	-	-	-	-	-	-	1	2	1	-	1	-
C311.2	1	1	-	1	-	-	-	-	-	-	-	1	2	1	-	1	-
C311.3	2	-	-	-	-	-	-	-	-	-	-	1	3	1	-	1	-
C311.4	2	1	-	-	-	-	-	-	-	-	2	1	2	1	-	1	-

COURSE NAME: Water Supply and Treatment Engineering (17CV64)

Course: C312	C312.1	Estimate average and peak water demand for a community
	C312.2	Evaluate available sources of water, quantitatively and qualitatively and make appropriate choice for a community
	C312.3	Evaluate water quality and environmental significance of various parameters and plan suitable treatment system.
	C312.4	Design a comprehensive water treatment and distribution system to purify and distribute water to the required quality standards

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
C312.1	2	1	1	-	-	-	-	-	-	1	-	2	2	-	-	2	-
C312.2	2	1	-	-	-	1	-	-	-	1	-	1	2	-	-	2	-
C312.3	2	2	2	-	-	1	-	-	-	1	-	2	2	-	-	2	-
C312.4	2	1	-	-	-	1	1	-	-	1	-	1	2	-	-	2	-

COURSE NAME: Solid Waste Management (15CV654)

Course: C313	C313.1	Give solutions to solve various problems associated with soil formations having less strength.
	C313.2	Use effectively the various methods of ground improvement techniques depending upon the requirements.
	C313.3	utilize properly the locally available materials and techniques for ground improvement so that economy in the design of foundations of various civil engineering structures

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
C313.1	2	2	2	2	-	-	-	1	-	-	-	-	1	-	-	1	-
C313.2	2	2	1	2	-	-	-	1	-	-	1	2	1	-	-	1	-
C313.3	2	2	2	2	-	-	-	1	-	-	1	2	1	-	-	1	-

COURSE NAME: Water Resources Management (17CV661)

Course: C314	C314.1	Assess the potential of groundwater and surface water resources
	C314.2	Address the issues related to planning and management of water resources
	C314.3	Know how to implement IWRM in different regions.
	C314.4	Understand the legal issues of water policy.
	C314.5	Select the method for water harvesting based on the area.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
C314.1	2	2	2	-	-	1	-	-	-	1	-	1	2	-	-	2	-
C314.2	2	1	1	-	-	1	-	-	-	-	1	1	2	-	-	2	-
C314.3	2	2	1	-	-	1	-	-	-	-	-	1	2	-	-	2	-
C314.4	1	-	-	-	-	1	-	1	-	1	-	1	2	-	-	2	-
C314.5	1	-	1	-	-	1	-	-	-	1	-	1	2	-	-	2	-

COURSE NAME: Software Application Lab(15CVL67)

Course: C315	C315.1	use software skills in a professional set up to automate the work and thereby reduce cycle time for completion of the work

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
C307.1	3	2	2	-	3	1	-	-	-	1	-	2	2	3	-	2	-

COURSE NAME: Extensive Survey Project /Camp (15CVP68)

Course: C316	C316.1	Apply Surveying knowledge and tools effectively for the projects
	C316.2	Understanding Task environment, Goals, responsibilities, Task focus, working in Teams towards common goals, Organizational performance expectations, technical and
	C316.3	Application of individual effectiveness skills in team and organizational context, goal setting, time management, communication and presentation skills
	C316.4	Professional etiquettes at workplace, meeting and general
	C316.5	Establishing trust based relationships in teams & organizational environment
	C316.6	Orientation towards conflicts in team and organizational environment, Understanding sources of conflicts, Conflict resolution styles and techniques

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
C316.1	2	2	1	1	1	1	-	-	3	1	-	2	2	1	3	2	1
C316.2	2	2	1	1	1	1	-	-	3	-	-	2	2	1	3	2	1
C316.3	2	2	1	1	1	1	-	-	3	1	-	2	2	1	3	2	1
C316.4	2	2	1	1	1	1	-	-	3	1	-	2	2	1	3	2	1
C316.5	2	2	1	1	1	1	-	-	3	1	-	2	2	1	3	2	1
C316.6	2	2	1	1	1	1	-	-	3	-	-	2	2	1	3	2	1

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CO PO MATRIX - SEVENTH SEMESTER

COURSE NAME: Municipal and Industrial Waste Water Engineering (15CV71)																		
	C401.1	Acquires capability to design sewer and Sewerage treatment plant.																
	C401.2	Evaluate degree of treatment and type of treatment for disposal, reuse and recycle																
	C401.3	Identify waste streams and design the industrial waste water treatment plant.																
	C401.4	Manage sewage and industrial effluent issues.																
Course: C401		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
	C401.1	2	2	2	1	-	1	1	-	-	1	1	1	1	1	-	2	-
	C401.2	2	1	1	1	-	1	1	-	-	1	1	1	1	1	-	1	-
	C401.3	2	2	2	1	-	1	1	-	-	1	1	1	1	1	-	2	-
	C401.4	2	1	1	1	-	1	1	-	-	1	1	1	1	1	-	1	-
COURSE NAME: Design of RCC and Steel Structures (15CV72)																		
	C402.1	Students will be able to apply the design concepts to design RCC and Steel Structural elements																
	C402.2	Students will have the ability to follow design procedures as per codal provisions and skills to arrive at structurally safe RC members.																
	C402.3	Students will have the ability to follow design procedures as per codal provisions and skills to arrive at structurally safe Steel members.																
Course: C402		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
	C402.1	2	-	-	-	-	1	-	-	-	-	-	1	1	-	-	1	-
	C402.2	3	2	1	-	-	1	-	1	-	1	-	2	2	-	-	2	-
	C402.3	3	2	1	-	-	1	-	1	-	1	-	2	2	-	-	2	-
COURSE NAME:Hydrology and Irrigation Engineering(15CV73)																		
	C403.1	Understand the importance of hydrology and its components.																
	C403.2	Measure precipitation and analyze the data and analyze the losses in precipitation.																
	C403.3	Estimate runoff and develop unit hydrographs																
	C403.4	Find the benefits and ill-effects of irrigation.																
	C403.5	Find the quantity of irrigation water and frequency of irrigation for various crops																
	C403.6	Find the canal capacity, design the canal and compute the reservoir capacity.																
Course: C403		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
	C403.1	2	-	-	-	-	-	1	-	-	-	-	1	1	-	-	1	-
	C403.2	2	3	-	-	-	-	-	-	-	-	-	1	1	-	-	1	-
	C403.3	2	2	1	1	-	-	-	-	-	-	-	1	1	-	-	1	-
	C403.4	1	-	-	-	-	2	1	-	-	-	-	1	1	-	-	1	-
	C403.5	2	-	-	-	-	1	-	-	-	-	-	1	1	-	-	1	-
	C403.6	3	2	2	2	-	1	1	-	-	-	-	1	1	-	-	1	-
COURSE NAME: Ground water Hydraulics (15CV741)																		
	C404.1	find the characteristics of aquifers.																
	C404.2	estimate the quantity of ground water by various methods.																
	C404.3	locate the zones of ground water resources.																
	C404.4	select particular type of well and augment the ground water storage.																
Course: C404		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
	C404.1	2	-	-	-	-	-	-	-	-	-	-	1	1	1	-	1	-
	C404.2	1	1	-	1	-	-	-	-	-	-	-	1	2	1	-	1	-
	C404.3	1	-	-	-	1	-	-	-	-	-	-	1	1	1	-	1	-
	C404.4	1	-	-	-	-	1	-	-	-	-	-	1	1	1	-	1	-
COURSE NAME: Urban Transportation and Planning (15CV751)																		
	C405.1	Design, conduct and administer surveys to provide the data required for transportation planning																
	C405.2	Supervise the process of data collection about travel behavior and analyze the data for use in transport planning.																
	C405.3	Develop and calibrate modal split, trip generation rates for specific types of land use developments																
	C405.4	Adopt the steps that are necessary to complete a long-term transportation plan.																
Course: C405		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
	C405.1	2	1	-	-	-	-	-	-	-	-	-	1	2	1		1	
	C405.2	2	-	-	-	-	-	-	-	-	-	-	1	1	1		1	
	C405.3	2	1	1	-	-	-	-	-	-	-	-	1	2	1		1	
	C405.4	2	-	-	-	-	-	-	-	-	-	-	1	1	1		1	
COURSE NAME: : Environmental Engineering Laboratory (15CVL76)																		
	C406.1	Acquire capability to conduct experiments and estimate the concentration of different parameters.																
	C406.2	Compare the result with standards and discuss based on the purpose of analysis.																
	C406.3	Determine type of treatment, degree of treatment for water and waste water.																
	C406.4	Identify the parameter to be analyzed for the student project work in environmental stream.																
Course: C406		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
	C406.1	3	2	2	2	-	1	-	-	-	1	-	2	2	-	-	-	2
	C406.2	2	2	2	2	-	2	-	-	-	1	-	2	2	-	-	-	2
	C406.3	2	2	2	2	-	2	-	-	-	1	-	2	2	-	-	-	2
	C406.4	1	1	1	1	-	1	-	-	-	1	-	1	1	-	-	-	1
COURSE NAME: Computer Aided Detailing of Structures (15CVL77)																		
	C407.1	Prepare Civil Engineering structural drawings using AutoCAD software.																
	C407.2	Apply the tools of AUTOCAD software for structural detailing of RCC structural elements																
	C407.3	Apply the tools of AUTOCAD software for structural detailing of Steel connections																
Course: C407		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
	C407.1	**2**	-	-	-	**3**	-	-	-	-	**1**	-	**2**	**2**	**3**	-	**2**	-
	C407.2	**2**	-	-	-	**3**	-	-	-	-	-	-	**2**	-	**3**	-	**2**	-
	C407.3	2	-	-	-	3	-	-	-	-	1	-	2	-	3	-	2	-

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CO PO MATRIX - EIGTH SEMESTER

COURSE NAME: Quantity Surveying and Contracts Management (15CV81)

Course: C408	C408.1	Prepare detailed and abstract estimates for roads and building
	C408.2	Prepare valuation reports of buildings
	C408.3	Interpret Contract document's of domestic and international construction works

Course: C408	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
C408.1	2	-	-	2	-	-	-	1	3	-	2	-	2	-	2	-	-
C408.2	2	-	-	2	-	-	-	1	2	-	2	-	2	-	2	-	-
C408.3	1	-	-	1	-	-	-	1	3	-	1	2	-	-	2	-	-

COURSE NAME: Design of Pre Stressed Concrete Elements (15CV82)

Course: C409	C409.1	Understand the requirement of PSC members for present scenario
	C409.2	Analyse the stresses encountered in PSC element during transfer and at working
	C409.3	Understand the effectiveness of the design of PSC after studying losses
	C409.4	Capable of analyzing the PSC element and finding its efficiency.
	C409.5	Design PSC beam for different requirements.

Course: C409	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
C409.1	3	-	1	-	-	-	-	-	-	-	-	1	2	2	1	2	2
C409.2	2	2	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
C409.3	1	1	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-
C409.4	2	2	-	-	-	-	-	-	-	-	-	1	1	-	-	1	1
C409.5	2	2	-	-	-	-	-	1	-	-	-	1	-	1	-	-	-

COURSE NAME: Pavement Design (15CV833)

Course: C410	C410.1	Systematically generate and compile required data's for design of pavement (Highway & Airfield).
	C410.2	Analyze stress, strain and deflection by boussinesq's, burmister's and westergaard's theory
	C410.3	Design rigid pavement and flexible pavement conforming to IRC58-2002 and IRC37-2001.
	C410.4	Evaluate the performance of the pavement and also develops maintenance statement based on site specific requirements.

Course: C410	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
C410.1	3	-	1	-	-	-	1	-	-	-	-	1	2	1	-	1	-
C410.2	3	1	1	-	-	-	-	-	-	-	-	1	2	1	-	1	-
C410.3	3	1	-	-	-	-	1	-	-	-	-	1	2	1	-	1	2
C410.4	1	1	-	-	-	-	-	-	-	-	-	1	2	1	-	1	-

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Department of Computer Science and Engineering

Faculty and students are aware of the stated Programme and course outcomes of the Programmes

To create awareness about **Programme and course outcomes** of the department, it has been published and disseminated among the stake holders.

The extent of student awareness about the POs and COs and their actual performance reflecting these would be the real indicators of success or outcome of the programme. In this regard our Institution has taken certain measures to educate and to create the awareness about the program outcomes and course outcomes among the faculty members and students.

Stakeholder	Purpose
Faculty	Implementer (Contributor) of Policies. Key contributor in developing/implementing growth Plan. Responsible for producing competent graduates/product of the Institution.
Student	Product of the Institution, responsible for creating Image of the institution while serving the society.

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Department of Computer Science and Engineering

Programme and Course Outcomes Dissemination

SL. No.	Particulars	Programme Outcomes	Course Outcomes
1.	College Website	✓	✓
2.	Corridors	✓	✓
3.	Notes & Lab Manual	✓	✓
4.	Course Module, Lesson Plan	--	✓
5.	IA Question Paper	--	✓
6.	Classroom, Seminar Hall, Laboratory	✓	-
7.	Faculty Office, Dept. Office	✓	-
8.	Magazine	✓	-
9.	College Enterprise Resource Planning(CERP) Portal	✓	-
10.	Student Handbook	✓	✓
11.	Faculty Handbook	✓	✓
12.	Flipped Classroom(Mail) through CERP/MS Teams	--	✓

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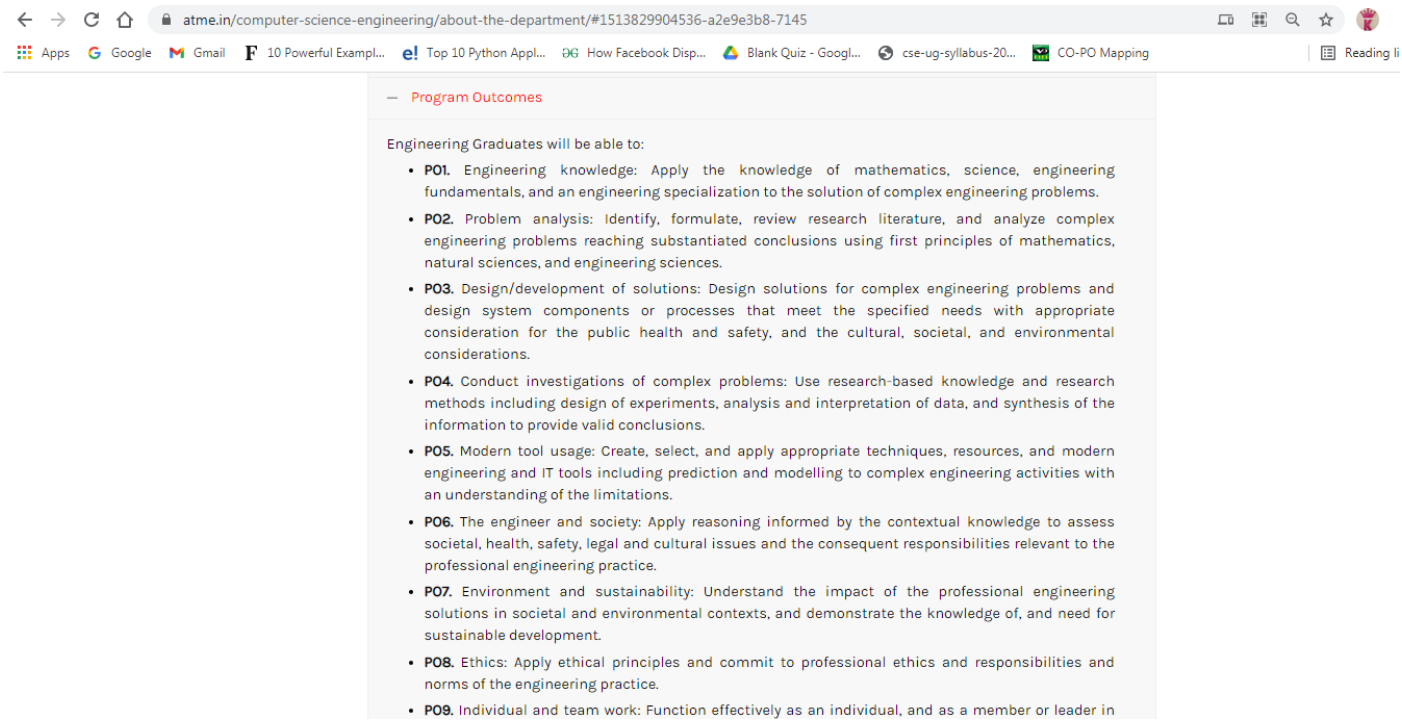
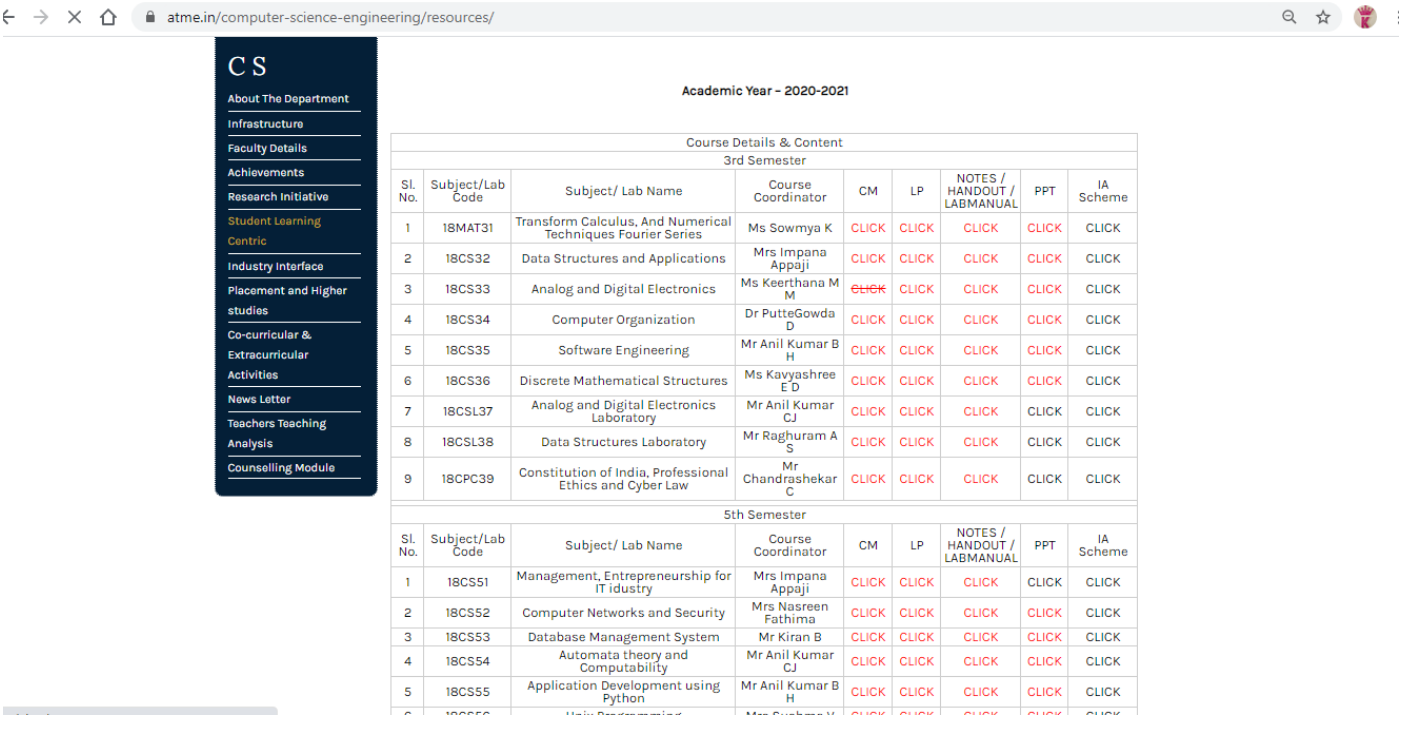
Department of Computer Science and Engineering

A. College Website Dissemination

Link : https://atme.in/computer-science-engineering/about-the-department/#1513829904536-a2e9e3b8-7145



https://atme.in/computer-science-engineering/resources/



Department of Computer Science and Engineering

B. Department Corridor

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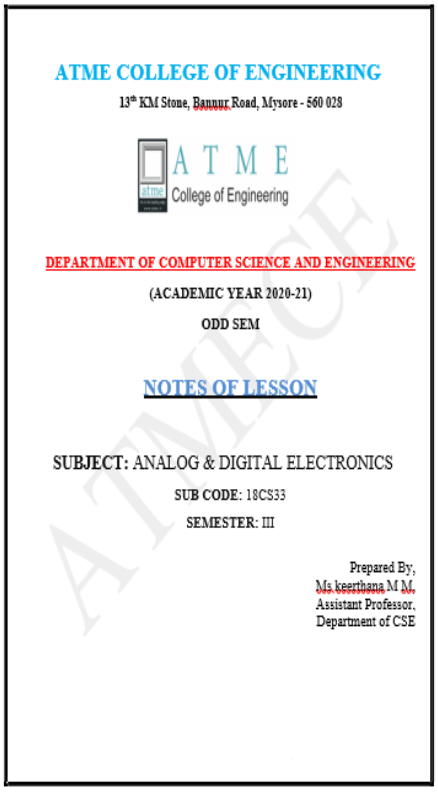
C. Notes, Lab Manual, Course Module, Lesson Plan

NOTES SAMPLE



ATME COLLEGE OF ENGINEERING

13th KM Stone, Bannur Road, Mysore - 560 028

ATME College of Engineering

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

(ACADEMIC YEAR 2020-21)

ODD SEM

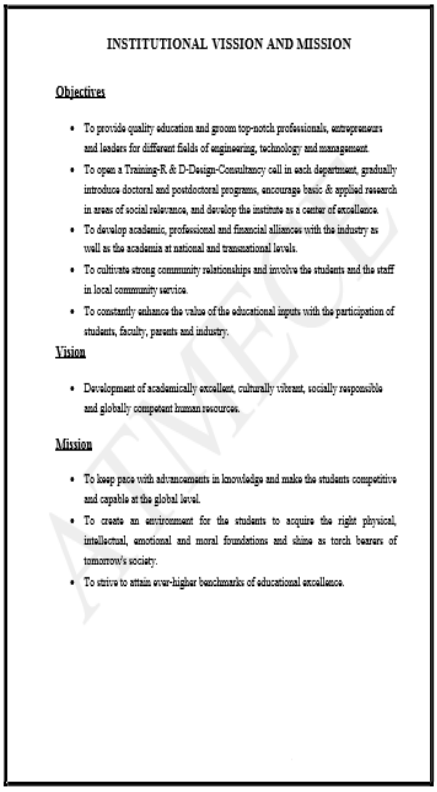
NOTES OF LESSON

SUBJECT: ANALOG & DIGITAL ELECTRONICS

SUB CODE: 18CS33

SEMESTER: III

Prepared By,
Ms keerthana M M,
Assistant Professor,
Department of CSE



INSTITUTIONAL VISSION AND MISSION

Objectives

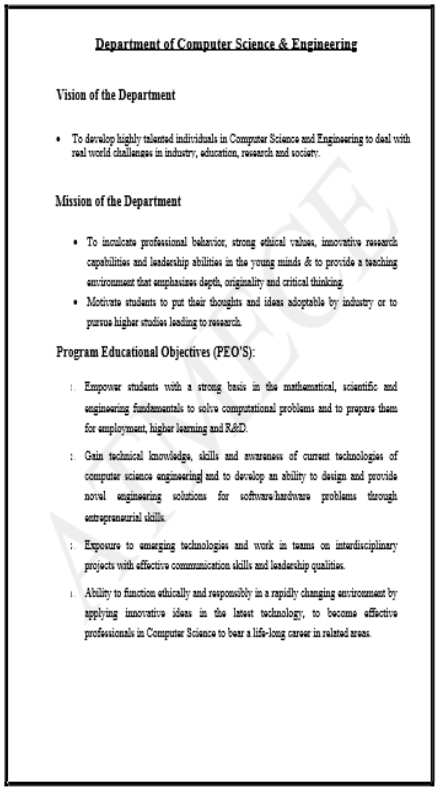
- To provide quality education and groom top-notch professionals, entrepreneurs and leaders for different fields of engineering, technology and management.
- To open a Training-R & D-Design-Consultancy cell in each department, gradually introduce doctoral and postdoctoral programs, encourage basic & applied research in areas of social relevance, and develop the institute as a center of excellence.
- To develop academic, professional and financial alliances with the industry as well as the academia at national and transnational levels.
- To cultivate strong community relationships and involve the students and the staff in local community service.
- To constantly enhance the value of the educational inputs with the participation of students, faculty, parents and industry.

Vision

- Development of academically excellent, culturally vibrant, socially responsible and globally competent human resources.

Mission

- To keep pace with advancements in knowledge and make the students competitive and capable at the global level.
- To create an environment for the students to acquire the right physical, intellectual, emotional and moral foundations and shine as torch bearers of tomorrow's society.
- To strive to attain ever-higher benchmarks of educational excellence.



Department of Computer Science & Engineering

Vision of the Department

- To develop highly talented individuals in Computer Science and Engineering to deal with real world challenges in industry, education, research and society.

Mission of the Department

- To inculcate professional behavior, strong ethical values, innovative research capabilities and leadership abilities in the young minds & to provide a teaching environment that emphasizes depth, originality and critical thinking.
- Motivate students to put their thoughts and ideas adoptable by industry or to pursue higher studies leading to research.

Program Educational Objectives (PEO'S):

1. Empower students with a strong basis in the mathematical, scientific and engineering fundamentals to solve computational problems and to prepare them for employment, higher learning and R&D.
2. Gain technical knowledge, skills and awareness of current technologies of computer science engineering and to develop an ability to design and provide novel engineering solutions for software/hardware problems through entrepreneurial skills.
3. Exposure to emerging technologies and work in teams on interdisciplinary projects with effective communication skills and leadership qualities.
4. Ability to function ethically and responsibly in a rapidly changing environment by applying innovative ideas in the latest technology, to become effective professionals in Computer Science to bear a life-long career in related areas.

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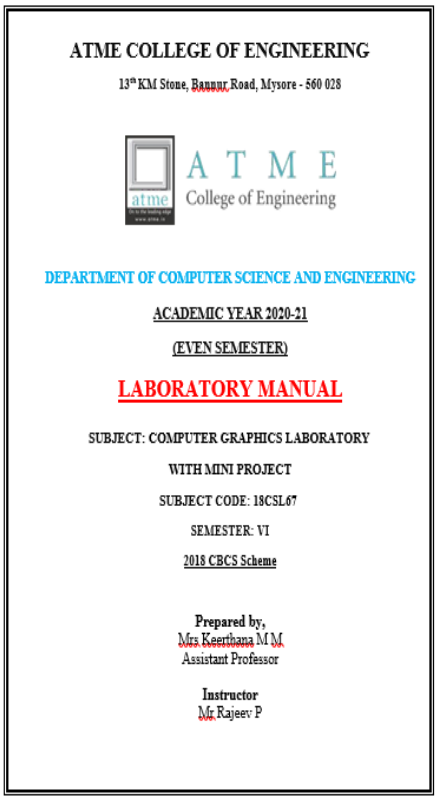
Department of Computer Science and Engineering

LAB MANUAL SAMPLE



ATME COLLEGE OF ENGINEERING

13th KM Stone, Bannur Road, Mysore - 560 028

ATME College of Engineering

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

ACADEMIC YEAR 2020-21

(EVEN SEMESTER)

LABORATORY MANUAL

SUBJECT: COMPUTER GRAPHICS LABORATORY

WITH MINI PROJECT

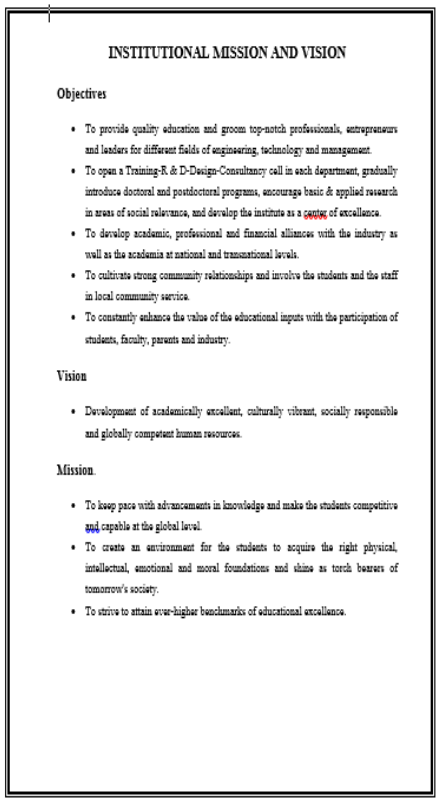
SUBJECT CODE: 18CSL67

SEMESTER: VI

2018 CBCS Scheme

Prepared by,
Mrs Keerthana M M
Assistant Professor

Instructor
Mr Rajeev P



INSTITUTIONAL MISSION AND VISION

Objectives

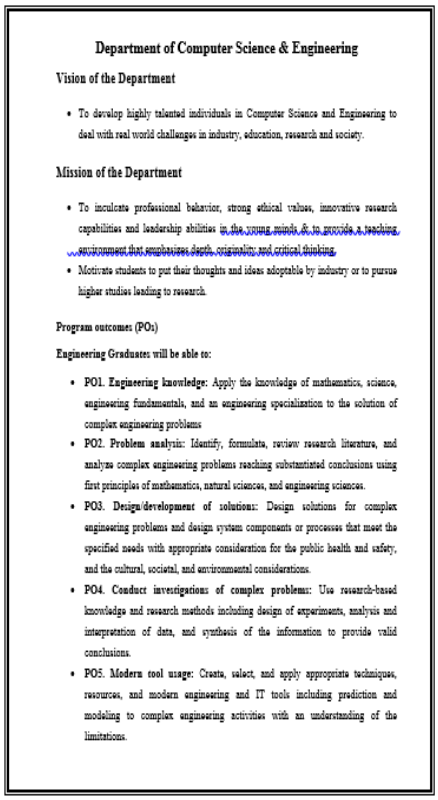
- To provide quality education and groom top-notch professionals, entrepreneurs and leaders for different fields of engineering, technology and management.
- To open a Training-R & D-Design-Consultancy cell in each department, gradually introduce doctoral and postdoctoral programs, encourage basic & applied research in areas of social relevance, and develop the institute as a center of excellence.
- To develop academic, professional and financial alliances with the industry as well as the academia at national and transnational levels.
- To cultivate strong community relationships and involve the students and the staff in local community service.
- To constantly enhance the value of the educational inputs with the participation of students, faculty, parents and industry.

Vision

- Development of academically excellent, culturally vibrant, socially responsible and globally competent human resources.

Mission

- To keep pace with advancements in knowledge and make the students competitive and capable at the global level.
- To create an environment for the students to acquire the right physical, intellectual, emotional and moral foundations and shine as torch bearers of tomorrow's society.
- To strive to attain ever-higher benchmarks of educational excellence.



Department of Computer Science & Engineering

Vision of the Department

- To develop highly talented individuals in Computer Science and Engineering to deal with real world challenges in industry, education, research and society.

Mission of the Department

- To inculcate professional behavior, strong ethical values, innovative research capabilities and leadership abilities in the young minds & to provide a teaching environment that emphasizes depth, originality and critical thinking.
- Motivate students to put their thoughts and ideas adoptable by industry or to pursue higher studies leading to research.

Program outcomes (POs)

Engineering Graduates will be able to:

- PO1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems
- PO2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- PO3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- PO4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- PO5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

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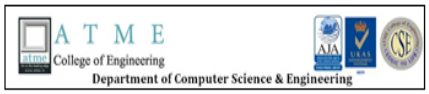
COURSE MODULE



ATME College of Engineering

Department of Computer Science & Engineering

COURSE MODULE FOR THE SESSION 2020-21 (EVEN SEMESTER)

Course Syllabi with CO's

Academic Year: 2020-2021								
Department: Computer Science and Engineering								
Course Code	Course Title	Core/Elective	Prerequisite	Contact Hours			Total Hrs/ Sessions	
				L	T	P		
18CS62	Computer Graphics & Visualization	Core	Good programming skills in C (or C++) Basic Data Structures - Linked lists - Arrays Coordinate Geometry Simple Linear Algebra Basic operations of vectors and matrices.	4	-	-	50	
Objectives	This course will enable students to 1. Explain hardware, software and OpenGL Graphics Primitives. 2. Illustrate interactive computer graphic using the OpenGL. 3. Design and implementation of algorithms for 2D graphics Primitives and attributes. 4. Demonstrate Geometric transformations, viewing on both 2D and 3D objects. 5. Infer the representation of curves, surfaces, Color and Illumination models							
Topics Covered as Per Syllabus								
Module 1:Overview: Computer Graphics and OpenGL: Computer Graphics: Basics of computer graphics, Application of Computer Graphics, Video Display Devices: Random Scan and Raster Scan displays, color CRT monitors, Flat panel displays. Raster-scan systems: video controller, raster scan Display processor, graphics workstations and viewing systems, Input devices, graphics networks, graphics on the internet, graphics software. OpenGL: Introduction to OpenGL ,coordinate reference frames, specifying two-dimensional world coordinate reference frames in OpenGL, OpenGL point functions, OpenGL line functions, point attributes, line attributes, curve attributes, OpenGL point attribute functions, OpenGL line attribute functions, Line drawing algorithms(DDA, Brasenham's), circle generation algorithms (Brasenham's). **Module 2: Fill area Primitives, 2D Geometric Transformations and 2D viewing:** Fill area Primitives: Polygon fill-areas, OpenGL polygon fill area functions, fill area attributes, general scan line polygon fill algorithm, OpenGL fill-area attribute functions. 2DGeometric Transformations: Basic 2D Geometric Transformations, matrix representations and homogeneous coordinates. Inverse transformations, 2DComposite transformations, other 2D transformations, raster methods for geometric transformations, OpenGL raster transformations, OpenGL geometric transformations function, 2D viewing: 2D viewing pipeline, OpenGL 2D viewing functions.							

Module 3: Clipping,3D Geometric Transformations, Color and Illumination Models:
Clipping: clipping window, normalization and viewport transformations, clipping algorithms,2D point clipping, 2D line clipping algorithms: cohen-sutherland line clipping only -polygon fill area clipping: Sutherland-Hodgeman polygon clipping algorithm only.3DGeometric Transformations: 3D translation, rotation, scaling, composite 3D transformations, other 3D transformations, affine transformations, OpenGL geometric transformations functions. Color Models: Properties of light, color models, RGB and CMY color models. Illumination Models: Light sources, basic illumination models-Ambient light, diffuse reflection, specular and phong model, Corresponding openGL functions.

Module 4: 3D Viewing and Visible Surface Detection: 3DViewing:3D viewing concepts, 3D viewing pipeline, 3D viewing coordinate parameters , Transformation from world to viewing coordinates, Projection transformation, orthogonal projections, perspective projections, The viewport transformation and 3D screen coordinates. OpenGL 3D viewing functions. Visible Surface Detection Methods: Classification of visible surface Detection algorithms, back face detection, depth buffer method and OpenGL visibility detection functions.

Module :5Input& interaction, Curves and Computer Animation: Input and Interaction:
Input devices, clients and servers, Display Lists, Display Lists and Modelling, Programming Event Driven Input, Menus Picking, Building Interactive Models, Animating Interactive programs, Design of Interactive programs, Logic operations .Curved surfaces, quadric surfaces, OpenGL Quadric-Surface and Cubic-Surface Functions, Bezier Spline Curves, Bezier surfaces, OpenGL curve functions. Corresponding openGL functions.

List of Text Books
1. Donald Hearn & Pauline Baker: Computer Graphics with OpenGL Version,3rd Edition, Pearson Education,2011 2. Edward Angel: Interactive Computer Graphics- A Top Down approach with OpenGL, 5th edition. Pearson Education, 2008
List of Reference Books
1. James D Foley, Andries Van Dam, Steven K Feiner, John F Hughes Computer graphics with OpenGL: pearson education 2. Xiang, Plastock, Computer Graphics , sham's outline series, 2nd edition, TMG. 3. Kelvin Sung, Peter Shirley, steven Baer : Interactive Computer Graphics, concepts and applications, Cengage Learning 4. M M Raikar, Computer Graphics using OpenGL, Filip learning/Elsevier
List of URLs, Text Books, Notes, Multimedia Content, etc
1. www.opengl.com 2. https://www.opengl.org/discussion_boards/showthread.php/170886-Beginner-Book-Recommendations 3. https://en.wikibooks.org/wiki/OpenGL_Programming

Course Outcomes	1. Design and implement algorithms for 2D graphics primitives and attributes. 2. Illustrate Geometric transformations on both 2D and 3D objects. 3. Apply concepts of clipping and visible surface detection in 2D and 3D viewing, and Illumination Models.

	4. Decide suitable hardware and software for developing graphics packages using OpenGL.
Internal Assessment Marks: 50 (3 Session Tests are conducted for 15 Marks during the semester and marks allotted based on average of best performances, 5 Marks is taken from assignments).	

The Correlation of Course Outcomes (CO's) and Program Outcomes (PO's)

Subject Code:	18CS62	Title: Computer Graphics & Visualization										
List of Course Outcomes	Program Outcomes											Total
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	
CO-1	3	-	1	-	-	-	-	-	-	-	-		
CO-2	-	2	-	--	-	-	-	-	-	-	-		
CO-3	-	-	3	2	-	-	-	-	-	-	-		
CO-4	-	2	1	-	3	-	-	-	-	-	-		
Total													

Note: 3 = Strong Contribution 2 = Average Contribution 1 = Weak Contribution 0 = No Contribution

The Correlation of Course Outcomes (CO's) and Program Outcomes (PSO's)

Subject Code:	18CS62	Title: Computer Graphics & Visualization	
List of Course Outcomes	Program Specific Outcomes		Total
	PSO-1	PSO-2	
CO-1	-	-	
CO-2	-	-	
CO-3	-	-	
CO-4	1	-	
Total			

Note: 3 = Strong Contribution 2 = Average Contribution 1 = Weak Contribution 0 = No Contribution

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D. IA QP and Scheme

SAMPLE IA QP & SCHEME

ATME COLLEGE OF ENGINEERING
DEPT. OF COMPUTER SCIENCE AND ENGINEERING

THIRD INTERNAL ASSESSMENT

SUB CODE	:	17CS651	TIME:01.30PM-2.45PM
SUBJECT	:	Data Mining and Data Warehousing	DATE: 22-07-2020
SEM	:	VI A & B	MAX. MARKS:30

Sl No.	Answer any three Questions (TEN MARKS EACH)	CO's	BLT
01.	Explain how decision tre induction algorithm works. Give example.	3	L2
	OR		
02.	List and explain the different characteristics of decision tree induction		L4
03.	What is cluster analysis? Expalin different types of clusterings.	3	L2
	OR		
04.	Explain briefly agglomerative hierarchical clustering with example.		
05.	Explain DBSCAN algorithm with example.	3	L2
	OR		
06.	Briefly explain BIRCH scalable clustering algorithm.		

CO1	Identify data mining problems and implement the data warehouse
CO2	Write association rules for a given data pattern.
CO3	Choose between classification and clustering solution.

Bloom's Taxonomy Level	
L1	Remembering
L2	Understanding
L3	Applying
L4	Analyzing
L5	Evaluating
L6	Creating

ATME College of Engineering

ATME COLLEGE OF ENGINEERING

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

SCHEME AND SOLUTION

TEST –III

Subject: Data Mining and Data Warehousing **Subject Code:** 17CS651

CO1	Identify data mining problems and implement the data warehouse
CO2	Write association rules for a given data pattern.
CO3	Choose between classification and clustering solution.

Bloom's Taxonomy Levels

L1: Remembering L2: Understanding L3: Applying L4: Analyzing L5: Evaluating L6: Creating

Question No	Solution	Marks	CO's	BLT
1.	**Decision Tree Induction Algorithm** **Hunt's Algorithm** In Hunt's Algorithm, a decision tree is grown in recursive fashion by partitioning the training records into successively purer subsets. Let D_t be the set of training records that are associated with node t and $y = \{y_1, y_2, y_3 \ldots y_c\}$ be the class labels. The following is a recursive definition of Hunt's algorithm **Step 1:** If all the records in D_t belong to the same class y_t, then t is a leaf node labeled as y_t. **Step 2:** If D_t contains records that belong to more than one class, an attribute test condition is selected to partition the records into smaller subsets. A child node is created for each outcome of the test condition and the records in	4m	3	L2

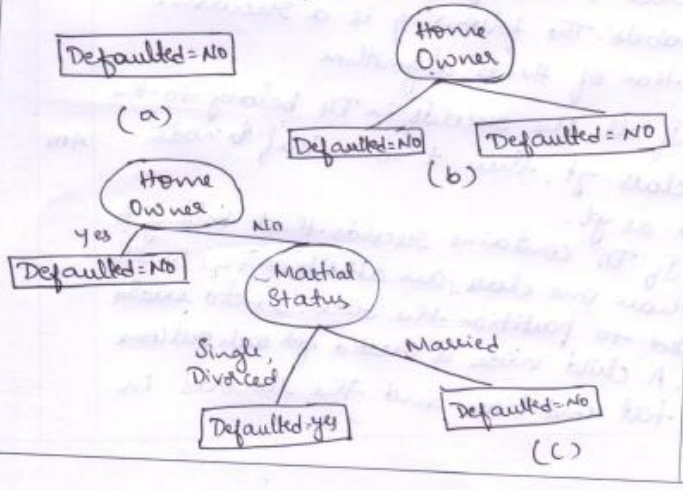
Question No | Solution | Marks | CO's | BLT

Dt are distributed to the children based on the outcomes. The algorithm is then recursively applied to each child node.

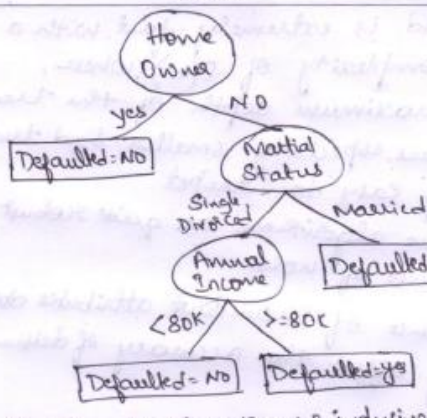
Example:

Tid	Home Owner	Marital Status	Annual Income	Defaulted Borrower
1	yes	Single	125K	NO
2	NO	Married	100K	NO
3	NO	Single	70K	NO
4	yes	Married	120K	NO
5	NO	Divorced	95K	yes
6	NO	Married	60K	NO
7	yes	Divorced	220K	NO
8	NO	Single	85K	yes
9	NO	Married	75K	NO
10	NO	Single	90K	yes

3m



Question No	Solution	Marks	CO's	BLT



3m

10M

Fig: Hunts Algorithm for inducing decision tree.

2 Characteristics of Decision Tree Based Classification:

Advantages

4

(*) Decision tree induction is a nonparametric approach for building classification models. In other words, it does not require any prior assumptions regarding the type of probability distributions satisfied by the class and other attributes.

3

(*) Finding an optimal decision tree is a NP-complete problem

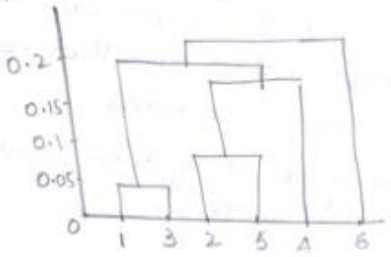
(*) Techniques developed for constructing decision trees are computationally inexpensive, making it possible to quickly construct models even when the training set size is very large. Once a decision tree has been built, classifying

5m

Question No	Solution	Marks	CO's	BLT
	a test record is extremely fast, with a worst-case complexity of O(w), where, w is the maximum depth of the tree. (*) Decision trees, especially smaller-sized trees are relatively easy to interpet. (*) Decision tree algorithms are quite robust to the presence of noise. (*) The presence of redundant attributes does not adversely affect the accuracy of decision trees. Disadvantages (*) Since most decision tree algorithms empby a top-down, recursive partitioning approach, the number of records becomes smaller as we traverse down the tree. At the leaf node, the number of records may be too small to make a statistically significant decision about the class representation of the node (*) A subtree can be replicated multiple times in a decision tree. This makes the decision tree more complex than necessary and perhaps more difficult to interpret. Such a situation can arise from decision tree implementations that rely on a single attribute test condition at each internal node.	5m 10m		

Question No	Solution	Marks	CO's	BLT
3.	**Cluster Analysis**			L2
	Finding groups of objects such that the objects in a group will be similar (or related) to one another and different from (or unrelated to) the objects in other groups. The greater the similarity within a group and the greater the difference between groups, the better or more distinct the clustering. Cluster analysis divides data into groups (clusters) that are meaningful, useful or both. Clusters are potential classes and cluster analysis is the study of techniques for automatically finding classes.	4m	3	
	Types of clustering A cluster is a set of clusters. Important distinction between hierarchical and partitional sets of clusters. Partitional Clustering: A division data objects into non-overlapping subsets (clusters) such that each data object is in exactly one subset. Hierarchical Clustering: A set of nested clusters organized as a hierarchical tree.	6m		

Question No	Solution	Marks	CO's	BLT
	Types of Clusters			
	① Well-Separated clusters			
	② center-based clusters			
	③ contiguous clusters			
	④ Density-based clusters			
	⑤ Property or Conceptual.	10M		
A)	**Agglomerative Hierarchical Clustering**			
	① More popular hierarchical clustering technique			L2
	② Produces a set of nested clusters organized as a hierarchical tree			
	③ Can be visualized as a dendrogram		3	
	④ A tree like diagram that records the sequences of merges or splits.			
	⑤ Do not have to assume any particular number of clusters.			
	⑥ Any desired number of clusters can be obtained by 'cutting' the dendogram at the proper level.	1M		



Question No	Solution	Marks	CO's	BLT

Basic Algorithm

Step1 : Compute the proximity matrix, if necessary

Step 2 : repeat

& Merge the closest two clusters

Update the proximity matrix to reflect the proximity between the new cluster and the original clusters.

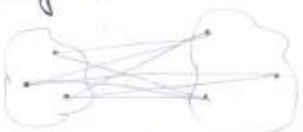
Step 3 : Until only one cluster remains

(8) The inter-cluster similarity or proximity of two clusters can be defined using the functions : Min, Max & group average.

(a) Min (Singlelink)

(b) Max (Completelink)

4m



(c) Group average

Example : Sample data that consists of 6-two dimensional points are used. The x and y coordinates of the points & the Euclidean distances between them are shown.

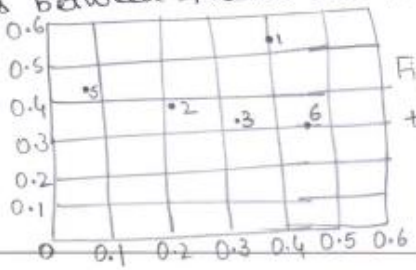


Fig : Set of 6 two-dimensional points

5m

Question No	Solution	Marks	CO's	BLT

Point	x Coordinate	y Coordinate
P1	0.40	0.53
P2	0.22	0.38
P3	0.35	0.32
P4	0.26	0.19
P5	0.08	0.41
P6	0.45	0.30

Fig: xy coordinates of 6 points

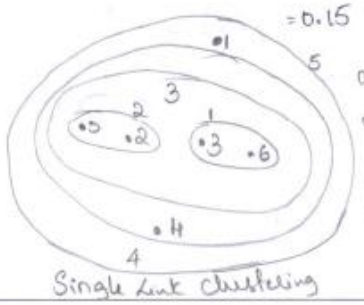
	P1	P2	P3	P4	P5	P6
P1	0.00	0.24	0.22	0.37	0.34	0.23
P2	0.24	0.00	0.15	0.20	0.14	0.25
P3	0.22	0.15	0.00	0.15	0.28	0.11
P4	0.37	0.20	0.15	0.00	0.29	0.22
P5	0.34	0.14	0.29	0.28	0.00	0.39
P6	0.23	0.25	0.11	0.22	0.39	0.00

(a) The distance between clusters {3,6} and {2,5} is given by

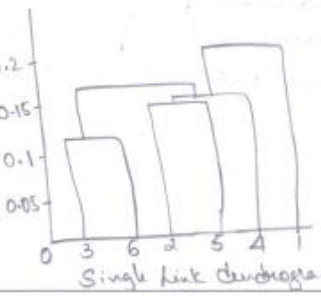
$dist(\{3,6\},\{2,5\}) = \min(dist(3,2), dist(6,2), dist(3,5), dist(6,5))$

$= \min(0.15, 0.25, 0.28, 0.39)$

$= 0.15$



Single Link Clustering



Single Link dendrogram

10M

Question No	Solution	Marks	CO's	BLT
5)	**DBSCAN Algorithm**			L2
	⊛ DBSCAN is a density-based algorithm			
	⊛ Density = number of points within a specified radius (Eps)			
	⊛ A point is a core point if it has more than a specified number of points within Eps.		3	
	⊛ These are points that are at the interior of a cluster			
	⊛ A border point has fewer than MinPts within Eps, but is in the ℵ neighborhood of a core point	2M		
	⊛ A noise point is any point that is not a core point or a border point			
	Algorithm			

	current_cluster_label ← 1
	for all core points do
	if the core point has no cluster label then
	current_cluster_label ← current_cluster_label+1
	Label the current core point with cluster label current_cluster_label
	end if
	for all points in the Eps-neighborhood, except ith the point itself do
	if the point does not have a cluster label then
	Label the point with cluster label current_cluster_label
	end if
	end for
	end for
		4M		

(5)

Question No	Solution	Marks	CO's	BLT

Strengths and weakness of DBSCAN

(*) It is relatively Resistant to noise

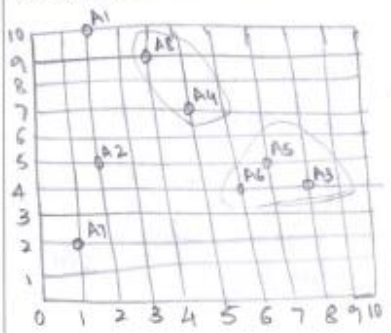
(*) It can handle clusters of different shapes and sizes.

(*) Does not work well when the clusters having varying densities.

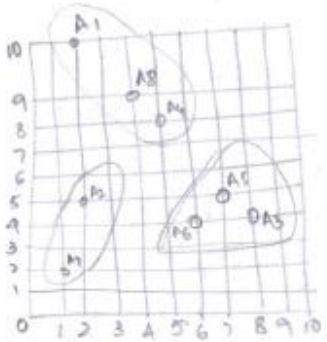
(*) Does not work well with high-dimensional data.

Example: If Epsilon is 2 and minpoint is 2, what are the clusters that DBSCAN would discover with the following 8 examples: A1=(2,10), A2=(2,5) A3=(8,4) A4=(5,8) A5=(7,5), A6=(6,4) A7=(1,2) A8=(4,9).

~~The distance~~ The fig illustrates the discovered clusters using 10 by 10 space ~~and illustrates~~ and Epsilon is increased to $\sqrt{10}$.



Epsilon = 2



Epsilon = $\sqrt{10}$

4M

10M

Question No	Solution	Marks	CO's	BLT
6	**BIRCH Scalable clustering Algorithm**			22
	Balanced Iterative Reducing and Clustering using Hierarchies (BIRCH) is a highly efficient clustering technique for data in Euclidean vector spaces i.e., data for which averages make sense. BIRCH can efficiently cluster such data with one pass and can improve that clustering with additional passes.	3M	3	
	Algorithm:			
	1) Load the data into memory by creating a CF tree that summarizes the data.			
	2) Build a smaller CF tree if it is necessary for Phase3 T is increased, and then the leaf node entries (clusters) are reinserted. Since T has increased, some clusters will be merged.			
	3) Perform global clustering. Different forms of global clustering can be used. Because the clustering features store summary information that is important to certain kinds of clustering, the global clustering algo can be applied.	7M		
	4) Redistribute the data points using the centroids of clusters discovered in step3 and thus discover a new set of clusters. This overcomes certain problems that can occur in the first phase of BIRCH.			
		10M		

Signature of Faculty

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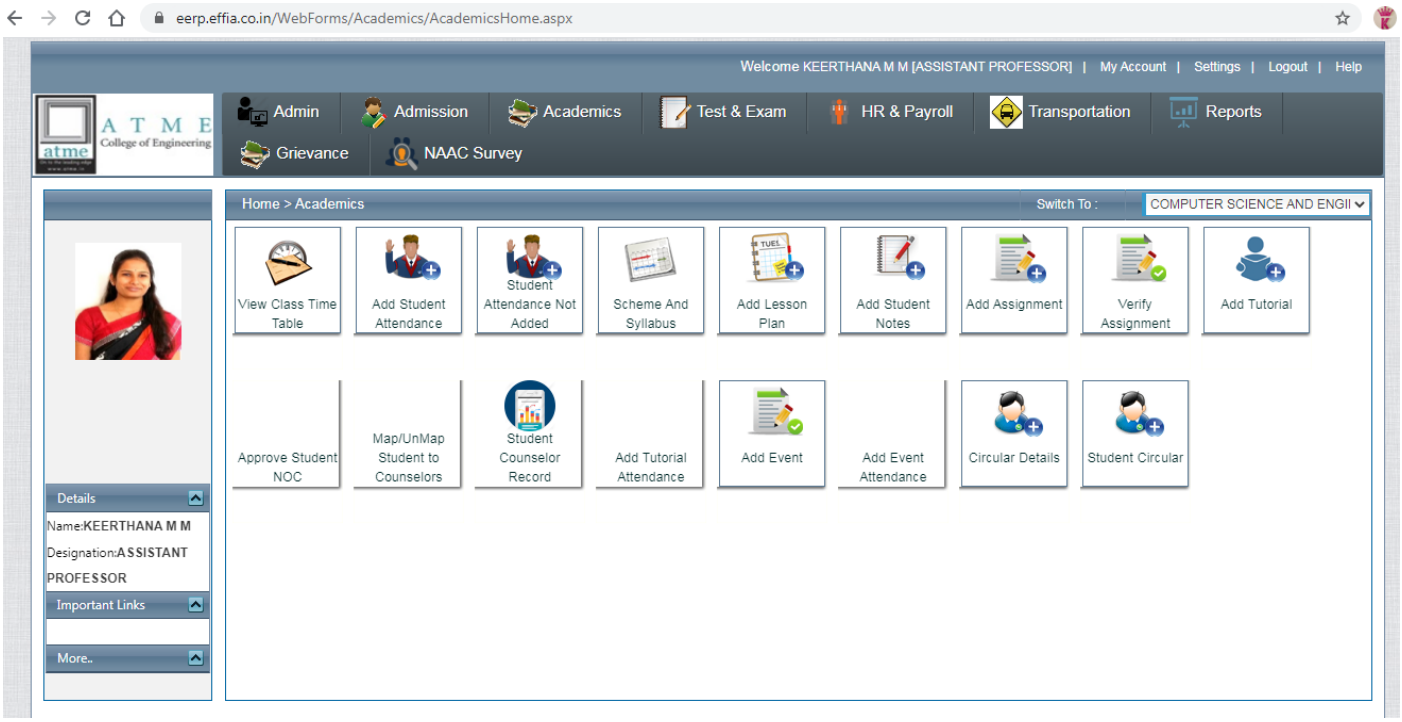
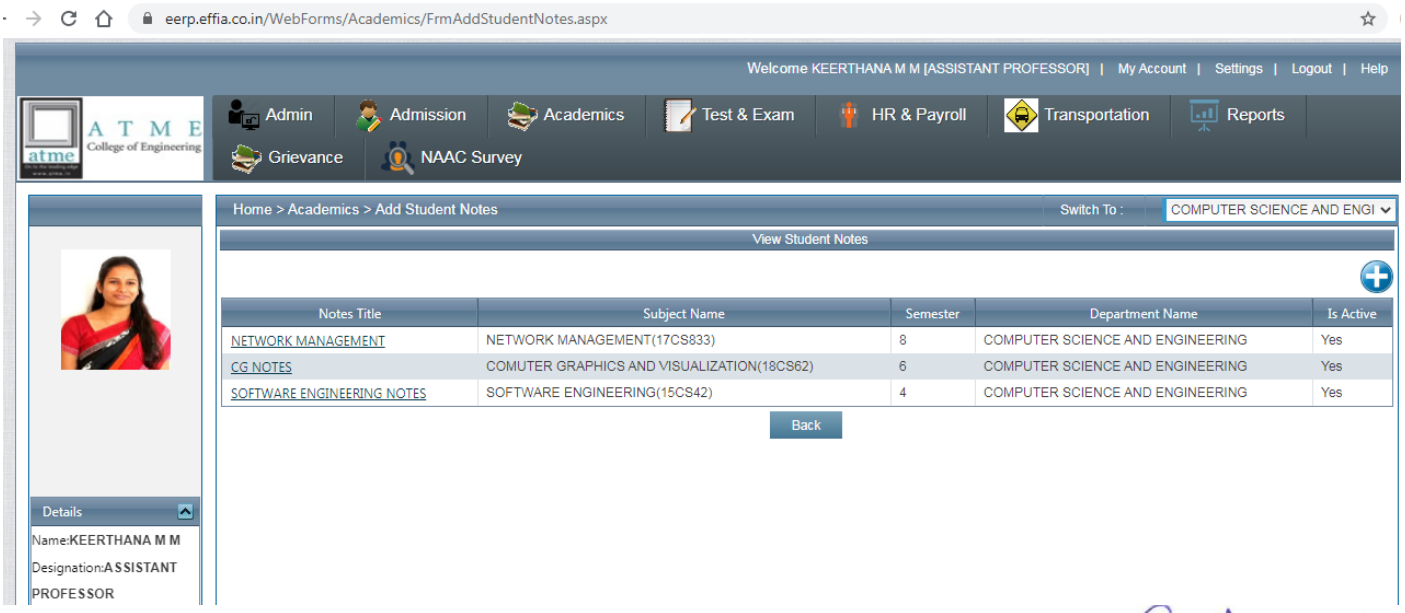
Professor & Head
Dept. of Computer Science & Engg.

E. CERP

Link :https://eerp.effia.co.in/Webforms/frmLogin.aspx

Note: Only authorized access





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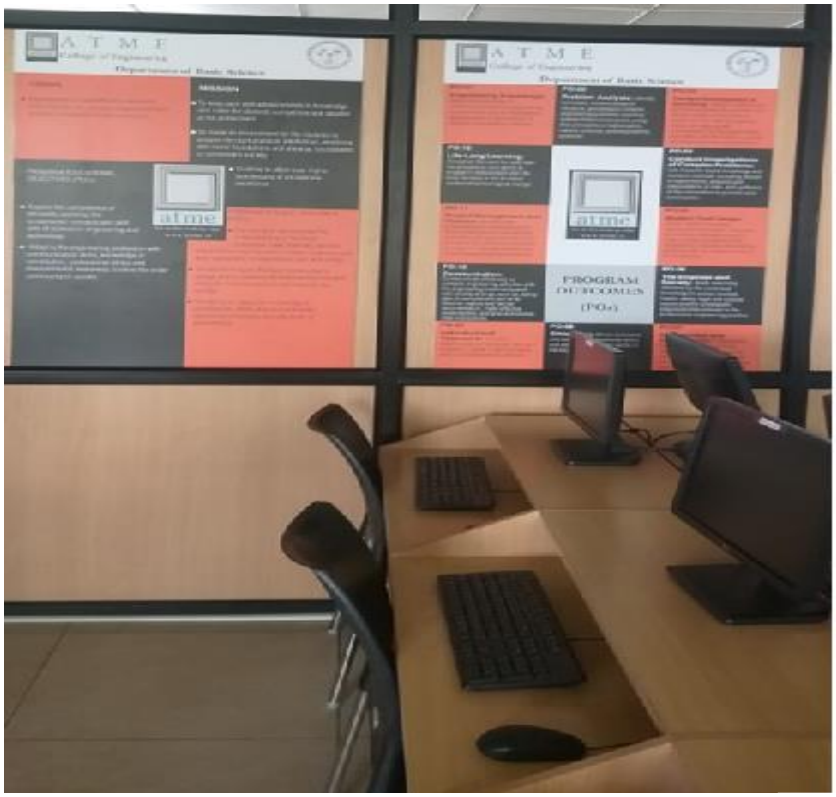
F.Classroom, Seminar Hall,Laboratory



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G. HoD and Department Office

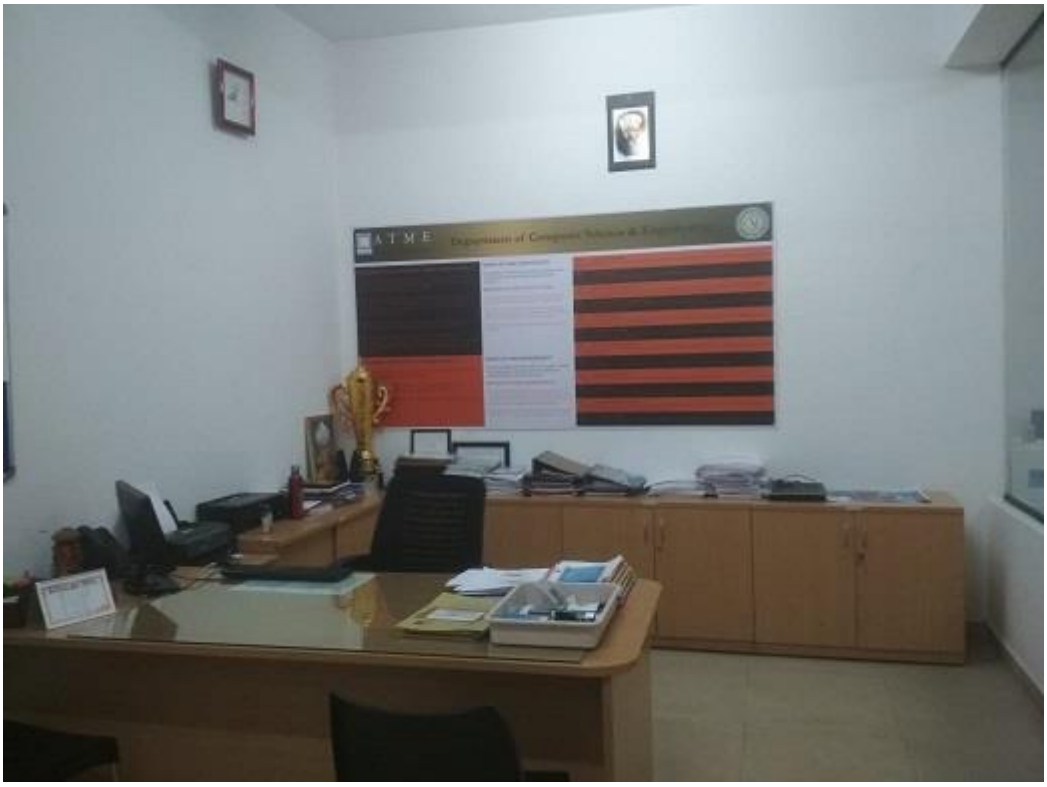

Fig: HoD Office

F

Fig: Department Office

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H. Magazine

ATME College of Engineering

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

CS MAIL

NEWSLETTER VOLUME 8, ISSUE II, AUG 2020

Dear Readers,

It is with great pleasure that we bring you Volume 8, Issue 1 of our department newsletter "CS MAIL". The current newsletter highlights the activities of the department, achievements of faculty and students during the past six months. It also features workshop organized and attended, paper publication details and other social activity undertaken from CS Department. Your valuable comments and suggestions are appreciated.

We wish all the readers an enjoyable reading.

VISION OF THE DEPARTMENT

To develop highly talented individuals in Computer Science and Engineering to deal with real world challenges in industry, education, research and society.

MISSION OF THE DEPARTMENT

- To inculcate professional behavior, Strong ethical values, innovative research capabilities and leadership abilities in the young minds &
- to provide a teaching environment that emphasizes depth, originality and critical thinking.
- Motivate students to put their thoughts and ideas adoptable by industry or to pursue higher studies leading to research.

PROGRAM EDUCATIONAL OBJECTIVES PEO'S

- Empower students with a strong basis in the mathematical, scientific and engineering fundamentals to solve computational problems and to prepare them for employment, higher learning and R&D.
- Gain technical knowledge, skills and awareness of current technologies of computer science engineering and to develop an ability to design and provide novel engineering solutions for software/hardware problems through entrepreneurial skills.
- Exposure to emerging technologies and work in teams on interdisciplinary projects with effective communication skills and leadership qualities.
- Ability to function ethically and responsibly in a rapidly changing environment by applying innovative ideas in the latest technology, to become effective professionals in Computer Science to bear a life-long career in related areas.

Message From Principal

ATMECE has emerged as a prominent institute offering quality education. All round continuous changes in infrastructure and academics standard have helped us to build a brand name. It gives me immense pleasure to introduce the Volume 8, Issue 1 OF THE BIANNUAL NEWSLETTER "CS MAIL" of Computer Science Department. I am pleased to know that the newsletter will showcase the activities and credentials of CS&E department. I hope this will become a platform for students and staff to exhibit their talents in science and technology. On behalf of management, I appreciate the newsletter committee for their efforts in bringing out this edition.

I wish the editorial all success!!!

Regards

Dr I. Ramesmaj

Principal, ATMECE

DON'T WAIT FOR OPPORTUNITY CREATE IT

Message From Chief Editor

Dr Prithviraja D

HoD, CS&E

Department of Computer Science & Engineering commits to work towards developing dedicated professional with a rich blend of competent, technical, managerial and social skills to contribute nation building. I am happy to inform that our department newsletter "CS MAIL" is being released in the month of Aug 2020. The newsletter encourage departments technical activities and also motivate students to bring out their innovative ideas , hidden talents and also provide a common platform to share their knowledge, in turn gain technical knowledge.

I wish all the readers an enjoyable reading!!!

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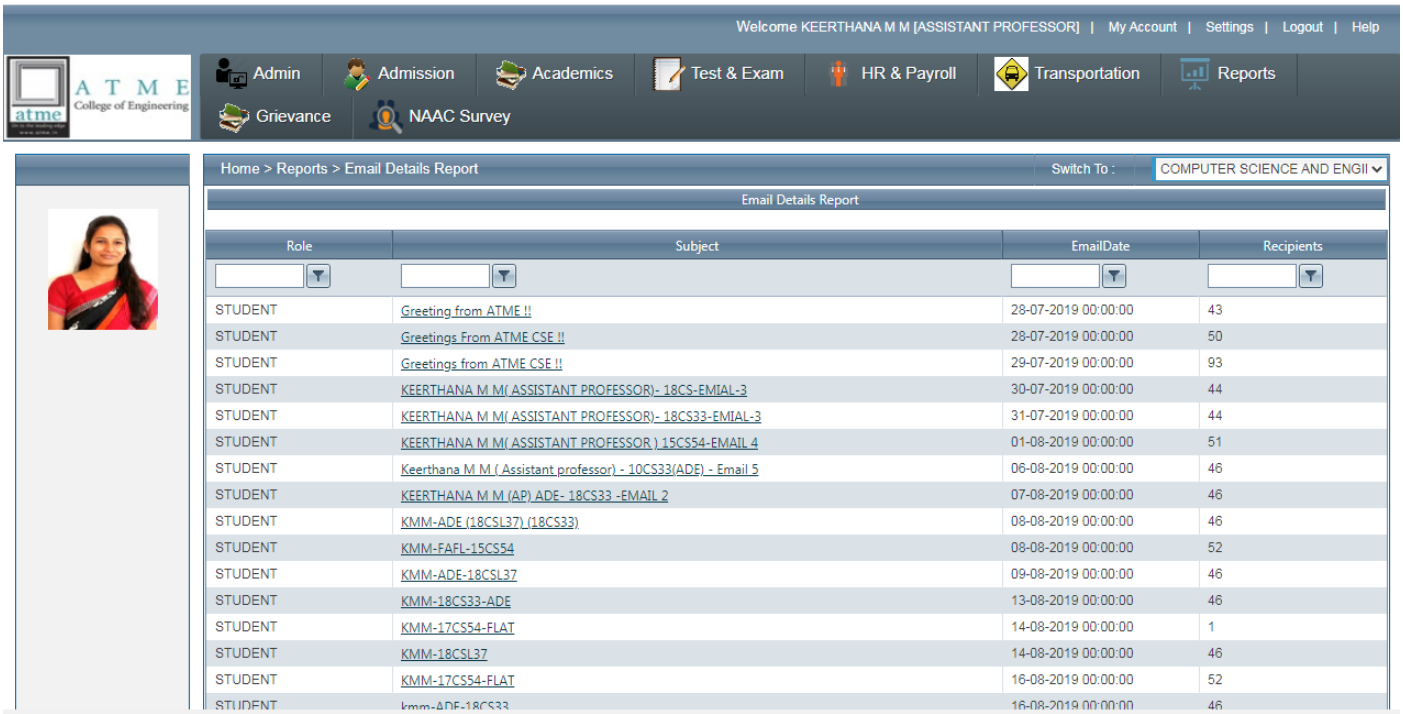
I. Flipped Classroom through Mail (CERP/ MS Teams)



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Week No	Class No	DATE	HOUR	Topics Covered
5	6	5/08/2019	FIFTH HOUR	Breakdown in Non-Uniform Fields and Corona Discharges
	7	06/08/2019	FIRST HOUR	Conduction and Breakdown in Liquid Dielectrics: Liquids as Insulators, Pure Liquids and Commercial Liquids
	8	06/08/2019	SECOND HOUR	Breakdown in Solid Dielectrics: Introduction, Intrinsic Breakdown, Electromechanical Breakdown, Thermal Breakdown
6	9	09/09/2019	SECOND HOUR	Summary of Module 1
6	10	12/09/2019	FIFTH HOUR	SRS Evaluation

c. Course Outcomes achievable at the end of Module 1

CO-1: Interpret the conduction and breakdown phenomenon in dielectrics. [L2, **Module 1]**

d. Resource Link and Books:

1. High Voltage Engineering, M.S. Naidu, V. Kamaraju, McGraw Hill, 5th Edition, 2013
2. http://nptel.ac.in/courses/108104048/

Fundamentals of High Voltage Engineering By S.K.Singh, Dhanpat Rai& Co.

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CO STATEMENTS

ATME College of Engineering

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

CO PO MATRIX- EIGTH SEMESTER

Course Name: Internet Of Things Technology (15CS81)															
C409	C409.1	Interpret the impact and challenges posed by IoT networks leading to new architectural models.													
	C409.2	Outline the role of IoT protocols for efficient network communication and need for Data Analytics and Security in IOT.													
	C409.3	Illustrate different smart objects and sensor technologies for sensing real world entities and identify the applications of IoT in Industry.													
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	C409.1	1	1	2									2	-	1
	C409.2	1	-	-									-	1	-
	C409.3	1	1	1									-	1	-
Course Name: BIG DATA Analytics (15CS82)															
C410	C410.1	Master the concepts of HDFS and MapReduce framework													
	C410.2	Investigate Hadoop related tools for Big Data Analytics and perform basic Hadoop Administration													
	C410.3	Recognize the role of Business Intelligence, Data warehousing and Visualization in decision making													
	C410.4	Infer the importance of core data mining techniques for data analytics													
	C410.5	Compare and contrast different Text Mining Techniques													
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	C402.1	2	1	1	2	2	-	-	-	-	-	1	2	2	
	C402.2	2	2	2	2	2	-	-	-	1	-	1	2	1	
	C402.3	2	1	1	-	1	-	-	-	-	-	1	2	1	
	C402.4	1	-	-	-	2	-	-	-	-	-	-	2	1	
	C402.5	2	-	-	-	2	-	-	-	-	-	-	2	2	
Course Name:Network Mangament(15CS83)															
	C411.1	Analyze the issues and challenges pertaining to management of emerging network technologies such as wired/wireless networks and high- speed internets.													
	C411.2	Apply network management standards to manage practical networks													
	C411.3	Use on SNMP for managing the network													

C411	C411.4	Use RMON for monitoring the behavior of the network													
	C411.5	Identify the various components of network and formulate the scheme for the managing them													
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	C411.1	1	-	-	1	-	-	-	-	-	-	-	-	-	-
	C411.2	1	-	-	-	-	-	-	-	-	-	-	-	-	-
	C411.3	2	1	-	-	-	-	-	-	-	-	-	-	-	-
	C411.4	-	2	-	-	-	-	-	-	-	-	-	-	-	-
	C411.5	-	-	3	-	-	-	-	2	-	-	-	-	-	-
	C411.6	-	-	-	2	-	-	-	-	-	-	-	-	-	-
Course Name:Internship / Professional Practise (15CS84)															
C412	C412.1	Adapt easily to the industry environment													
	C412.2	Take part in team work													
	C412.3	Make use of modern tools to solve complex engineering problems.													
	C412.4	Decide upon project planning and financing.													
	C412.5	5. Adapt ethical values and Motivate for lifelong learning													
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	C412.1	-			-	-	-	2	-	-	-	-	-	2	3
	C412.2	-	-	-	-	-	-	-	-	-	-	-	-	2	-
	C412.3	-	-	-	3	3	-	-	-	-	-	-	-	1	3
	C412.4	-	-	-	-	-	-	-	-	-	-	3	-	2	-
	C412.5	-	-	-	-	-	-	-	3	-	-	-	3	2	3
Course Name: Project (15CSP85)															
C413	C413.1	Identify a issue and derive problem related to society, environment, economics, energy and technology													
	C413.2	complex problems utilising a systems approach using modern tools and techniques													
	C413.3	Develop skills to work in a team to achieve common goals with ethical values.													
	C413.4	Develop skills of project management and finance and Communicate effectively to present ideas clearly and coherently													
	C413.5	Prepare themselves for life-long learning to face the challenges and support the technological changes to meet the societal													
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	C413.1	3	-	-		3	3	3	-	-	-	-	-	3	3
	C413.2	-	3	-	3	-	-	-	-	-	-	-	-	3	3
	C413.3	-	-	-	-	-	-	-	3	3	-		-	3	3
	C413.4	-	-	-	-	-	-	-	-	-	-	3	-	3	3

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	C413.5	-	-	-	-	-	-	-	-	-	-	-	3	3	3

Course Name: Seminar (15CSS86)															
C414	C414.1	Survey the changes in the technologies relevant to the topic selected													
	C414.2	Develop knowledge in the field of Computer Science and Engineering and other disciplines through independent learning and collaborative study													
	C414.3	Discuss the technology and interpret the impact on the society, environment and domain.													
	C414.4	Improve oral and written communication skills													
	C414.5	Compile report of the study and present to the audience, following the ethics.													
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	C414.1		3											3	-
	C414.2												3	3	-
	C414.3							3						3	-
	C414.4										3			3	-
	C414.5								3					3	-

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

CO PO MATRIX- SEVENTH SEMESTER

Course Name: Web Technology and its Applications (15CS71)															
C401	C401.1	Adapt HTML and CSS syntax and semantics to build web pages													
	C401.2	Construct and visually format tables and forms using HTML and CSS													
	C401.3	Develop Client-Side Scripts using JavaScript and Server-Side Scripts using PHP to generate and display the contents dynamically.													
	C401.4	Appraise the principles of object oriented development using PHP													
	C401.3	Inspect JavaScript frameworks like jQuery and Backbone which facilitates developer to focus on core features.													
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	C401.1	2	-	-	-	3	-	-	-	-	-	-	-	2	-
	C401.2	1	-	-	-	3	-	-	-	-	-	-	-	2	-
	C401.3	-	-	-	-	2	-	-	-	-	-	-	-	-	-
	C401.4	-	-	-	-	2	-	-	-	-	-	-	-	-	-
	C401.3	-	-	-	-	2	-	-	-	-	-	-	-	-	-

Course Name: Advanced Computer Architecture (15CS72)															
C402	C402.1	Explain the concepts of parallel computing and hardware technologies													
	C402.2	Compare and contrast the parallel architectures													
	C402.3	Illustrate parallel programming concepts													
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	C402.1	3	3	3	-	-	-	-	-	-	-	-	-	1	-
	C402.2	3	3	3	-	-	-	-	-	-	-	-	-	1	-
	C402.3	2	2	1	-	-	-	-	-	-	-	-	-	1	-

Course Name:Machine Learning(15CS73)		
	C403.1	Identify the problems for machine learning. And select the either supervised,unsupersvised or reinforcement learning.
	C403.2	Explain theory of probability and statistics related to machine learning

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C403	C403.3	Investigate concept learning, ANN, Bayes classifier, k nearest neighbor, Q.													
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	C403.1	3	3	3	-	-	-	-	-	-	-	-	-	1	-
	C403.2	3	2	-	-	-	-	-	-	-	-	-	-	1	-
	C403.3	3	2	3	2	-	-	-	-	-	-	-	1	1	-

Course Name: Information & Network Security [15CS743]															
C404	C404.1	Analyze the Digitals Security Process													
	C404.2	Illustrate the need of key management													
	C404.3	Outline the use of cryptography processes for various applications													
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	C404.1	3	2	-	-	-	-	-	-	-	-	-	-	-	-
	C404.2	1	-	-	-	-	-	-	-	-	-	-	-	-	-
	C404.3	2	-	-	-	-	-	-	-	-	-	-	-	-	-

Course Name:															
C405	C405.1	Identify key challenges in managing information and analyze different storage networking technologies and virtualization													
	C405.2	Explain components and the implementation of NAS													
	C405.3	Describe CAS architecture and types of archives and forms of virtualization													
	C405.4	Illustrate the storage infrastructure and management activities													
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	C405.1	3	3	-	-	-	-	-	-	-	-	-	-		
	C405.2	3	-	-	-	-	-	-	-	-	-	-	-		
	C405.3	3	-			-	-	-	-	-	-	-	-		
	C405.4	3	1	-	-	-	-	-	-	-	-	-	1		

Course Name: Machine Learning Laboratory (15CSL76)															
C406	C406.1	Understand the implementation procedures for the machine learning algorithms.													
	C406.2	Design Java/Python programs for various Learning algorithms													
	C406.3	Applyappropriate data sets to the Machine Learning algorithms.													
	C406.4	Identify and apply Machine Learning algorithms to solve real world problems.													
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	C406.1	1	1	-	2	-	-	-	-	-	-	-	-	1	-
	C406.2	1	2	2	2	2	-	-	-	-	-	-	1	1	-
	C406.3	1	1	1	2	2	-	-	-	-	-	-	-	1	-
	C406.4	1	3	3	2	2	-	-	-	-	-	-	1	2	-

Course Name:Web Technology Laboratory with Mini Project (15CSL77)															
C407	C407.1	Design and develop dynamic web pages with good aesthetic sense of designing and latest technical know-how's.													
	C407.2	Have a good understanding of Web Application Terminologies, Internet Tools other web services.													
	C407.3	Learn how to link and publish web sites													
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	C407.1	2	-	-	-	2	-	-	-	-	-	-	-	2	-
	C407.2	2	-	-	-	3	-	-	-	-	-	-	-	1	-
	C407.3	2	-	-	-	3	-	-	-	-	-	-	-	1	-

Course Name: Project Phase I (15CSP78)															
C408	C408.1	Demonstrate a sound technical knowledge of their selected project topic.													
	C408.2	Undertake problem identification, formulation and solution.													
	C408.3	Design engineering solutions to complex problems utilising a systems approach.													
	C408.4	4. Communicate with engineers and the community at large in written an oral forms.													
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	C408.1	3												1	-
	C408.2		3	3		3								1	-
	C408.3			3	3									1	-
	C408.4						3				3			1	-

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CO PO MATRIX- SIXTH SEMESTER

Course Name: Cryptography Network Security and cyber law (17CS61)															
C309	C309.1	Discuss the cryptography and its need to various applications													
	C309.2	Design and Develop simple cryptography algorithms													
	C309.3	Understand the cyber security and need cyber Law													
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	C309.1	2	2	-	-	-	-	-	-	-	-	-	1	-	-
	C309.2	2	3	-	-	-	-	-	-	-	-	-	1	1	-
	C309.3	1	0	-	-	-	-	-	1	-	-	-	-	-	-
Course Name: Computer Graphics (17CS62)															
C310	C310.1	Design and implement algorithms for 2D graphics primitives and attributes.													
	C310.2	Illustrate Geometric transformations on both 2D and 3D objects.													
	C310.3	Understand the concepts of clipping and visible surface detection in 2D and 3D viewing, and Illumination Models.													
	C310.4	Discussabout suitable hardware and software for developing graphics packages using OpenGL.													
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	C310.1	3	-	1	-	-	-	-	-	--	-	-	-	-	-
	C310.2	-	2	-	--	-	-	-	-	--	-	-	-	-	-
	C310.3	-	-	3	2	-	-	-	-	--	-	-	-	-	-
	C310.4	-	2	1	-	3	-	-	--	-	-	-	-	1	-
Course Name:System Software & Compiler Design (17CS63)															
C311	C311.1	Illustrate system software such as assemblers, loaders, linkers and macroprocessors													
	C311.2	Design and develop lexical analyzers, parsers and code generators													
	C311.3	Discuss about lex and yacc tools for implementing different concepts of system software													
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	C311.1	2	3	3	-	-	-	-	-	-	-	-	-	1	-
	C311.2	3	3	3	-	-	-	-	-	-	-	-	-	1	-
	C311.3	2	3	2	-	-	-	-	-	-	-	-	-	1	-
Course Name: Operating systems (17CS64)															
C312	C312.1	Demonstrate need for OS and different types of OS													
	C312.2	Discuss suitable techniques for management of different resources													
	C312.3	Illustrate processor, memory, storage and file system commands													
	C312.4	Explain the different concepts of OS in platform of usage through case studies													
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	C312.1	3	2	2	-	-	-	-	-	-	-	-	-	-	-
	C312.2	3	2	2	-	-	-	-	-	-	-	-	-	-	-
	C312.3	3	2	2	-	-	-	-	-	-	-	-	-	-	-
	C312.4	3	2	2	-	-	-	-	-	-	-	-	-	-	-
Course Name:Data Mining And Data Warehousing (17CS651)															
C313	C313.1	Identify data mining problems and implement the data warehouse													
	C313.2	Write association rules for a given data pattern.													
	C313.3	Choose between classification and clustering solution.													
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	C313.1	2	3	2	-	-	-	-	-	-	-	-	2	1	1
	C313.2	2	3	2	-	-	-	-	-	-	-	-	-	-	-
	C313.3	3	3	2	-	-	-	-	-	-	-	-	-	1	1
Course Name: Python Application Programming(17CS664)															
C314	C314.1	Examine Python syntax and semantics and be fluent in the use of Python flow control and functions.													
	C314.2	Demonstrate proficiency in handling Strings and File Systems.													
	C314.3	Create, run and manipulate Python Programs using core data structures like Lists, Dictionaries and use Regular Expressions.													
	C314.4	Interpret the concepts of Object-Oriented Programming as used in Python.													
	C314.5	Implement exemplary applications related to Network Programming, Web Services and Databases in Python.													
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	C306.1	1	-	-	-	-	-	-	-	-	-	-	-	-	-

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	C306.2	1	1	1	-	-	-	-	-	-	-	-	-	-	-
	C306.3	1	1	2	-	-	-	-	-	-	-	-	-	-	-
	C306.4	1	1	2	-	-	-	-	-	-	-	-	-	-	-
	C306.5	1	1	2	-	-	-	-	-	-	-	-	2	1	1

Course Name:System Software & Operating System laboratory(17CSL67)															
C315	C315.1	Implement and demonstrate Lexer's and Parser's													
	C315.2	Implement different algorithms required for management, scheduling, allocation and communication used in operating system.													
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	C315.1	2	3	2	-	-	-	-	-	-	-	-	-	-	-
	C315.2	2	3	3	-	-	-	-	-	-	-	-	-	1	-

Course Name: Computer Graphics Lab with Mini Project (17CSL68)															
C316	C316.1	Apply the concepts of computer graphics													
	C316.2	Implement computer graphics applications using OpenGL													
	C316.3	Implement real world problems using OpenGL.													
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	C316.1	1	-	-	-	-	-	-	-	-	-	-	-	-	-
	C316.2	-	-	1	-	1	-	-	-	1	1	-	-	-	-
	C316.3	-	-	-	-	-	-	-	-	-	1	-	-	1	-

ATME College of Engineering

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

CO PO MATRIX- FIFTH SEMESTER

Course Name: Management Entrepreneurship for IT Industry (17CS51)															
C301	C301.1	Define management, organization, entrepreneur, planning, staffing, ERP and outline their importance in entrepreneurship													
	C302.2	Utilize the resources available effectively through ERP													
	C303.3	Make use of IPRs and institutional support in entrepreneurship													
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	C301.1	-	-	-	-	-	-	-	-	3	3	1	-	-	1
	C302.2	-	-	-	-	-	-	-	-	1	-	3	-	-	-
	C303.3	-	-	-	-	-	-	-	-	2	-	-	-	-	1

Course Name: Computer Networks (17CS52)															
C302	C302.1	Explain principles of application layer protocols													
	C302.2	Outline transport layer services and infer UDP and TCP protocols													
	C302.3	Classify routers, IP and Routing Algorithms in network layer													
	C302.4	Explain the Wireless and Mobile Networks covering IEEE 802.11 Standard													
	C302.5	Define Multimedia Networking and Network Management													
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	C302.1	2	-	1	-	-	-	-	-	-	-	-	-	-	1
	C302.2	2	1	1	-	-	-	-	-	-	-	-	-	-	1
	C302.3	2	3	1	2	-	-	-	-	-	-	-	1	2	1
	C302.4	2	1	-	-	-	-	-	-	-	-	-	-	-	1
	C302.5	1	1	-	-	-	-	-	-	-	-	-	-	-	1

Course Name:Database Management System (17CS53)															
C3O3	C303.1	Summarize the concepts of database objects; enforce integrity constraints on a database using RDBMS.													
	C303.2	Use Structured Query Language (SQL) for database manipulation.													
	C303.3	Design simple database systems													
	C303.4	Design code for some application to interact with databases.													
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	C303.1	2	-	2	-	-	-	-	-	-	-	-	-	3	-

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	C303.2	1	2	3	-	-	-	-	-	-	-	-	-	3	-
	C303.3	1	2	3	-	-	-	-	-	-	-	-	-	3	-
	C303.4	1	-	3	-	-	-	-	-	-	-	-	-	3	-

Course Name: Automata Theory And Computability(17CS54)		
C3O4	C304.1	Tell the core concepts in automata theory and Theory of Computation
	C304.2	Explain how to translate between different models of Computation (e.g.,Deterministic and Non-deterministic and Software models)
	C304.3	Interpret Grammars and Automata (recognizers) for different language classes and become knowledgeable about restricted models of Computation (Regular, Context Free) and their relative powers.
	C304.4	Develop skills in formal reasoning and reduction of a problem to a formal model, with an emphasis on semantic precision and conciseness.
	C304.5	Classify a problem with respect to different models of Computation.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C304.1	1	1	-	-	-	-	-	-	-	-	-	-	-	-
C304.2	2	3	3	-	-	-	-	-	-	-	-	-	1	-
C304.3	2	3	3	-	-	-	-	-	-	-	-	-	1	-
C304.4	2	3	3	-	-	-	-	-	-	-	-	-	1	-
	1	3	3	-	-	-	-	-	-	-	-	-	-	-

Course Name:Dot Net Framework for Application Development (17CS564)		
C3O5	C305.1	Build applications on Visual Studio .NET platform by understanding the syntax and semantics of C#.
	C305.2	Demonstrate Object Oriented Programming concepts in C# programming language.
	C305.3	Design custom interfaces for applications and leverage the available built-in interfaces in building complex applications.
	C305.4	Illustrate the use of generics and collections in C#.
	C305.5	Compose queries to query in-memory data and define own operator behaviour.

C3O5	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C305.1	2	2	2	-	1	-	-	-	-	-	-	-	-	-
C305.2	2	1	2	-	-	-	-	-	-	-	-	-	-	-
C305.3	2	2	2	-	1	-	-	-	-	-	-	-	-	-
C305.4	2	1	1	-	-	-	-	-	-	-	-		-	-
C305.5	2	2	1	-	1	-	--	-	-	-	-	-	-	-

Course Name: ADVANCED JAVA AND J2EE (17CS553)		
	C306.1	Incorporate the need of advanced Java concepts like enumerations, auto-boxing and annotations.
C306	C306.2	Demonstrate the use of Collections framework in developing modular and efficient programs.
	C306.3	Use String class and its functions in programming
	C306.4	Describe how servlets are used to build Java-based web application architecture & Use JSP to write efficient server-side programs.
	C306.5	Illustrate database access and details for managing information using the JDBC API.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C306.1	2	-	-	-	-	-	-	-	-	-	-	-	-	-
C306.2	2	2	2	-	-	-	-	-	-	-	-	-	-	-
C306.3	2	3	3	-	-	-	-	-	-	-	-	-	-	-
C306.4	2	2	3	-	-	-	-	-	-	-	-	-	-	-
C306.5	2	2	2	-	--	-	--	-	--	-	--	-	-	--

Course Name: Computer Network Lab (17CSL57)		
C307	C3O7.1	Analyze and Compare various networking protocols.
	C3O7.2	Demonstrate the working of different concepts of networking.
	C3O7.3	Implement and analyze networking protocols in NS2 / NS3

C307	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C3O7.1	2	-	-	1	-	-	-	-	-	-	-	-	1	2
C3O7.2	1	1	-	1	1	-	-	-	-	-	-	-	1	2
C3O7.3	1	1	-	1	2	-	-	-	-	-	-	-	1	2

Course Name: DDBMS Lab with Mini Project (17CSL58)		
C308	C3O8.1	Use Structured Query Language (SQL) for database Creation and manipulation.
	C3O8.2	Demonstrate the working of different concepts of DBMS
	C3O8.3	Implement and test the project developed for an application.

C308	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C3O8.1	1	1	-	-	-	-	-	-	-	-	-	-	2	-
C3O8.2	1	2	-	-	-	-	-	-	-	-	-	-	2	-
C3O8.3	-	1	-	-	-	-	-	-	-	-	1	-	2	-

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Faculty and students are aware of the stated Programme and course outcomes of the Programmes

To create awareness about **Programme and course outcomes** of the department, it has been published and disseminated among the stake holders.

The extent of student awareness about the POs and COs and their actual performance reflecting these would be the real indicators of success or outcome of the programme. In this regard our Institution has taken certain measures to educate and to create the awareness about the program outcomes and course outcomes among the faculty members and students.

Stakeholder	Purpose
Faculty	Implementer (Contributor) of Policies. Key contributor in developing/implementing growth Plan. Responsible for producing competent graduates/product of the Institution.
Student	Product of the Institution, responsible for creating Image of the institution while serving the society.

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Programme and Course Outcomes Dissemination

Sl.No	Particulars	Programme Outcomes	Course Outcomes
1	**College Website**	✓	✓
2	Corridors	✓	✓
3	**Notes & Lab Manual**	✓	✓
4	**Course Module, Lesson Plan**	-	✓
5	**IA Question Paper**	-	✓
6	**Classroom, Seminar Hall, Laboratory**	✓	-
7	**Faculty Office, Dept. Office**	✓	-
8	**Magazine**	✓	-
9	**College Enterprise Resource Planning(CERP) Portal**	✓	-
10	**Student Handbook**	✓	✓
11	**Faculty Handbook**	✓	✓
12	**Flipped Classroom(Mail) through CERP/MS Teams**	-	✓

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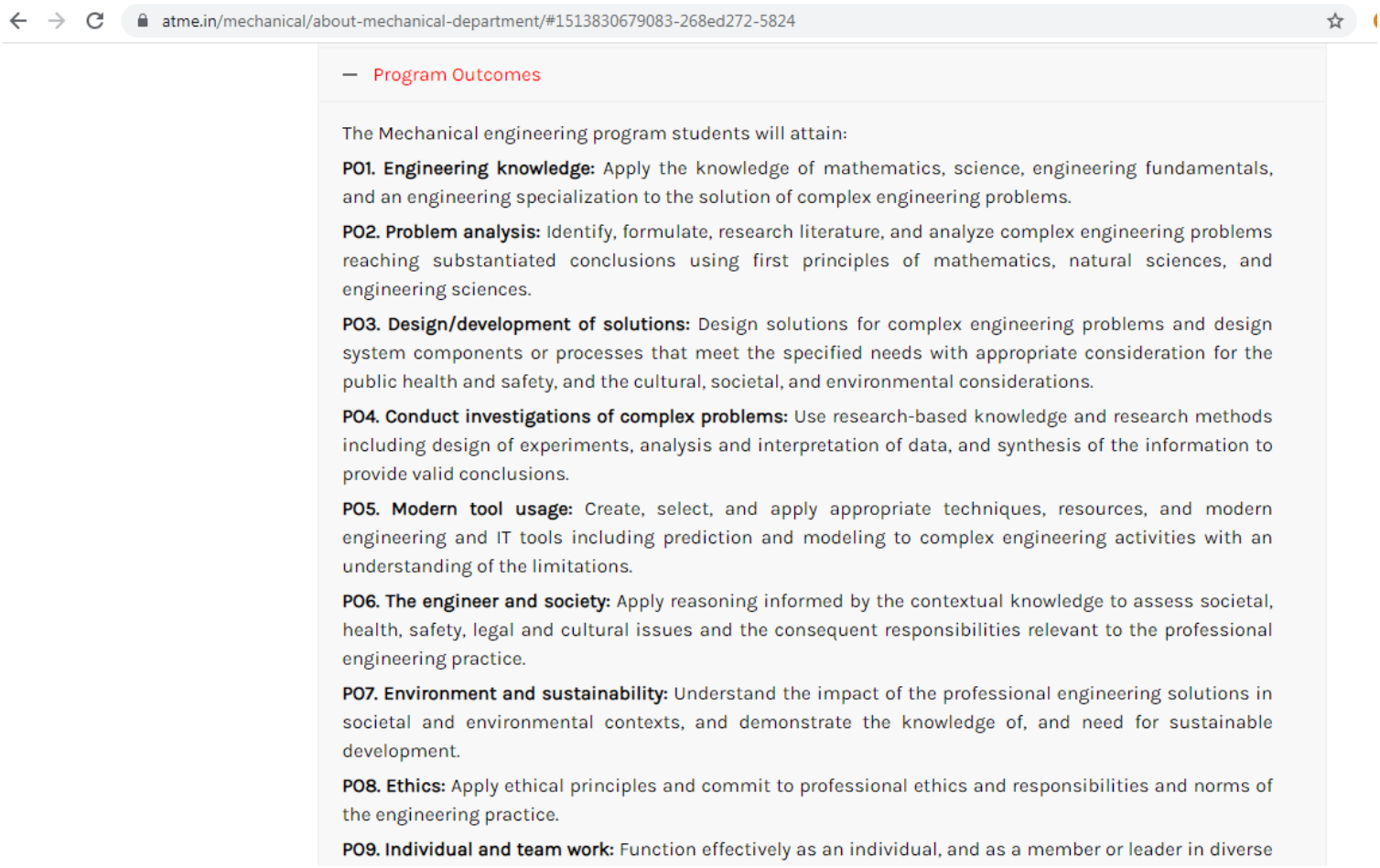
A. College Website Dissemination

Link : https://atme.in/mechanical/resourses-mechanical-department/



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Website Link: http://atme.in/mechanical/resourses-mechanical-department/

Mech

About The Department
Infrastructure
Faculty Details
Student Learning Centric
Achivements
Research Initiative
Industry Interface
Placement
Co curricular & Extra Curricular activities
Teachers Teaching Analysis
Counselling module
E News Letter

Academic Year – 2020-2021

Course Details & Content

3rd Semester

Sl. No.	Subject/Lab Code	Subject/ Lab Name	Course Coordinator	CM	LP	NOTES / HANDOUT / LABMANUAL	PPT	IA Scheme
1	18MAT31	Transform Calculus, Fourier Series and Numerical Techniques	Ms.Banupriya J (A) / Mr.Sudhakar N (B)	CLICK	CLICK	CLICK	CLICK	CLICK
2	18ME32	Mechanics of Materials	Mr. Yashwanth N (A) / Mr. Suresh Kumar S (B)	CLICK	CLICK	CLICK	CLICK	CLICK
3	18ME33	Basic Thermodynamics	Mr. Pavan Kumar K P (A) / Mr. Ravikumar S (B)	CLICK	CLICK	CLICK	CLICK	CLICK
4	18ME34	Material Science	Mr. Devaraj M R (A) / Mr. Deepak MVS (B)	CLICK	CLICK	CLICK	CLICK	CLICK
5	18ME35A	Metal cutting and forming	Mr. Niranjan Kumar V S (A)	CLICK	CLICK	CLICK	CLICK	CLICK
6	18ME35B	Metal Casting and Welding	Dr. Chethan S (B)	CLICK	CLICK	CLICK	CLICK	CLICK
7	18ME36A	Computer Aided Machine Drawing	Mr. Rohith S (A)	CLICK	CLICK	CLICK	CLICK	CLICK
8	18ME36B	Mechanical Measurements and Metrology	Mr. Ramanuja C M (B)	CLICK	CLICK	CLICK	CLICK	CLICK
9	18MEL37A	Meterial Testing Lab	Mr. Yathisha N & Mr. Karthik Kumar M	CLICK	CLICK	CLICK	CLICK	CLICK
10	18MEL37B	Mechanical Measurements and Metrology lab	Dr. Chethan S	CLICK	CLICK	CLICK	CLICK	CLICK
11	18MEL38A	Workshop and Machine Shop Practice (Consists of Fitting, and Machining)	Mr Niranjan Kumar V S & Mr. Thej Kumar J	CLICK	CLICK	CLICK	CLICK	CLICK
12	18MEL38B	Foundry,Forging and Welding lab	Mr. Devaraj MR & Mr. Niranjan Kumar V S	CLICK	CLICK	CLICK	CLICK	CLICK
14	18CPC39	Constitution of India, Professional Ethics and Cyber Law	Mr. Chandrashekar C (A & B)	CLICK	CLICK	CLICK	CLICK	CLICK

5th-SEMESTER COURSES

Sl. No.	Subject/Lab Code	Subject/ Lab Name	Course Coordinator	CM	LP	NOTES / HANDOUT / LABMANUAL	PPT	IA Scheme
1	18ME51	Management and Economics	Mr. Ramanuja C M (A) / Mr. Niranjan Kumar V S (B)	CLICK	CLICK	CLICK	CLICK	CLICK
2	18ME52	Design of Machine Elements I	Dr. Srinivasa K (A) / Mr. Rohith S (B)	CLICK	CLICK	CLICK	CLICK	CLICK
3	18ME53	Dynamics of Machines	Mr. Suresh Kumar S (A) / Mr. Yathisha N (B)	CLICK	CLICK	CLICK	CLICK	CLICK
4	18ME54	Turbo Machines	Dr. M S Govinde Gowda (A) / Mr. Raghu (B)	CLICK	CLICK	CLICK	CLICK	CLICK
5	18ME55	Fluid Power Engineering	Mr. Raghu (A) / Mr. Pavan Kumar K P (B)	CLICK	CLICK	CLICK	CLICK	CLICK
6	18ME56	Operations Management	Dr. Chethan S (A) / Dr. Rathnakar G (B)	CLICK	CLICK	CLICK	CLICK	CLICK
7	18MEL57	Fluid Mechanics/Machines lab	Mr. Ravi Kumar S / Mr. Pavan Kumar K P / Dr Manjunath H S / Mr. Yashwanth N / Mr. Niranjan Kumar V S / Mr. Raghu / Dr. Chethan S	CLICK	CLICK	CLICK	CLICK	CLICK
8	18MEL58	Energy Conversion Lab	Mr. Pavan Kumar K P / Mr. Raghu / Mr. Suresh Kumar S / Mr. Ravi Kumar S / Dr. MD Nadeem M	CLICK	CLICK	CLICK	CLICK	CLICK
9	18CIV59	Environmental Studies		CLICK	CLICK	CLICK	CLICK	CLICK

B. Department Corridor

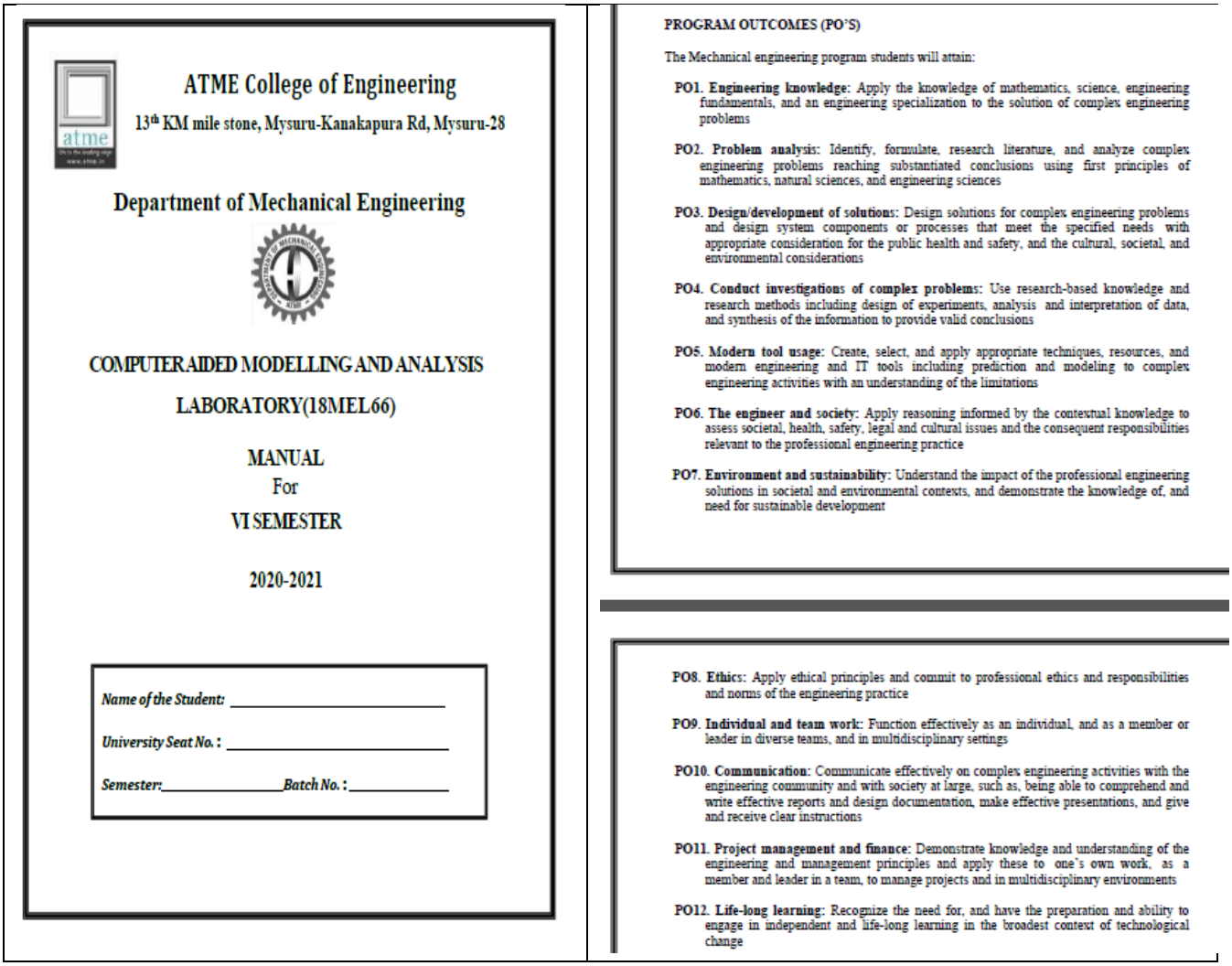
Class Room

Department of Mechanical Engineering

Department Library

HOD

C. Notes, Lab Manual, Course Module, Lesson Plan



ATME College of Engineering
13th KM mile stone, Mysuru-Kanakapura Rd, Mysuru-28

Department of Mechanical Engineering

COMPUTER AIDED MODELLING AND ANALYSIS
LABORATORY(18MEL66)

MANUAL
For
VI SEMESTER

2020-2021

Name of the Student: _____

University Seat No.: _____

*Semester:*_____ *Batch No.:*_____

PROGRAM OUTCOMES (PO'S)

The Mechanical engineering program students will attain:

PO1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems

PO2. Problem analysis: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences

PO3. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations

PO4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions

PO5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations

PO6. The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice

PO7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development

PO8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice

PO9. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings

PO10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions

PO11. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments

PO12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

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DYNAMICS OF MACHINERY

15ME52

PROGRAM OUTCOMES (PO'S)

The Mechanical engineering program students will attain:

PO1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems

PO2. Problem analysis: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences

PO3. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations

PO4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions

PO5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations

PO6. The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice

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COURSE MODULE

ATME College of Engineering

Department of Mechanical Engineering
Accredited by NBA 2019-20 to 2021-22

COURSE MODULE

Faculty Name/s :			Academic Year: 2019-20(Odd Sem)				
Department: Mechanical Engineering							
Course Code	Course Title	Core/Elective	Prerequisite	Contact Hours L	T	P	Total Hrs/ Sessions
17ME52	Dynamics of Machinery	Core	- Engineering Physics& Kinematics of Machinery	4	-	-	50
Objectives	Course objectives: Students will 1. To gain the knowledge static and dynamic equilibrium conditions of mechanisms subjected forces and couple, with and without friction. 2. Analyze the mechanisms for static and dynamic equilibrium. 3. To understand the balancing principles of rotating and reciprocating masses, governors and gyroscopes. 4. Analyze the balancing of rotating and reciprocating masses, governors and gyroscopes. 5. To understand vibrations characteristics of single degree of freedom systems. 6. Characterise the single degree freedom systems subjected to free and forced vibrations with and without damping						
Topics Covered as per Syllabus							

MODULE 1

Static force Analysis: Static equilibrium. Equilibrium of two and three force members. Members with two forces and torque, Free body diagrams, Static force analysis of four bar mechanism and Slider-crank mechanism with and without friction.

Dynamic force Analysis: D'Alembert's principle, Inertia force, Inertia torque. Dynamic force analysis of four-bar mechanism and Slider crank mechanism without friction, numerical problems.

10 Hours

MODULE 2

Balancing of Rotating Masses: Static and dynamic balancing, balancing of single rotating mass by balancing masses in same plane and in different planes. Balancing of several rotating masses by balancing masses in same plane and in different planes.

Balancing of Reciprocating Masses: Inertia effect of crank and connecting rod, Single cylinder engine, balancing in multi cylinder-inline engine (primary and secondary forces), numerical problems.

10 Hours

MODULE 3

Governors: Types of governors, force analysis of Porter and Hartnell governors. Controlling force, Stability, Sensitiveness, Isochronism, Effort and Power.

Gyroscope: Vectorial representation of angular motion, Gyroscopic couple. Effect of gyroscopic couple on plane disc, aeroplane, ship, stability of two wheelers and four wheelers, numerical problems.

10 Hours

MODULE 4

Introduction & Undamped free Vibrations (Single Degree of Freedom) Types of vibrations, Definitions, Simple Harmonic Motion (SHM), Work done by harmonic force, Principle of super position applied to SHM. Methods of analysis – (Newton's, Energy & Rayleigh's methods). Derivations for spring mass systems, Natural frequencies of simple systems, Springs in series and parallel, Torsional and transverse vibrations, Effect of mass of spring and problems.

10 Hours

MODULE – 5

Damped free Vibrations (Single Degree of Freedom)
Types of damping, Analysis with viscous damping - Derivations for over, critical and under damped systems, Logarithmic decrement and numerical problems.

Forced Vibrations (Single Degree of Freedom):
Analysis of forced vibration with constant harmonic excitation, Magnification factor (M.F.), Vibration isolation - Transmissibility ratio, Excitation of support (absolute and relative), Numerical problems.

10 Hours

List of Text Books:

1. Theory of Machines, Sadhu Singh, Pearson Education. 2nd edition. 2007.
2. Theory of Machines, Rattan S.S. Tata McGraw Hill Publishing Company Ltd., New Delhi, 3rd Edition.
3. Mechanism and Machine Theory, A. G. Ambekar PHI, 2007
4. Mechanical Vibrations, G. K.Grover, Nem Chand and Bros.

List of Reference Books

1. Mechanical Vibrations, S. S. Rao, Pearson Education Inc, 4edition, 2003.
2. Mechanical Vibrations, V. P. Singh, Dhanpat Rai and Company

List of URLs, Text Books, Notes, Multimedia Content, etc

NPTEL DOM VIDEO TUTORS
https://www.youtube.com/watch?v=MJeRFas4oRU&list=PLBEA57F7E7560C8E8

Course Outcomes	On completing the course the student will be able to
	1. Determine the forces and Torques for static and dynamic conditions of four bar and slider crank mechanisms to keep the system in equilibrium. RBT-L3
	2. Analyze static and dynamic balancing for Rotating and Reciprocating masses. RBT-L4
	3. Determine Equilibrium speed, sensitiveness, isochronism, effort and power of porter and hartnell governor. Also gyroscopic couple and effects related to aero plane, ship plane disc and 2 & 4 wheeler. RBT-L3
	4. Understand types of vibration, equation of motion and determine frequency and its behavior of Single degree Damped, Undamped and Forced Vibrations. RBT-L3

Internal Assessment Marks: 40(Average of all three tests will be considered for the final I.A)

The Correlation of Course Outcomes (CO's) and Program Outcomes (PO's)

Subject Code:	17ME52	TITLE: Dynamics of Machinery					Faculty Name:					
List of Course Outcomes	Program Outcomes											Total
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	
CO-1	3	3	2	-	-	-	-	-	-	-	-	-	8
CO-2	3	3	2	-	-	-	-	-	-	-	-	-	8
CO-3	3	3	1	-	-	-	-	-	-	-	-	-	7
CO-4	3	3	3	-	-	-	-	-	-	-	-	-	9
Total	12	12	8	-	-	-	-	-	-	-	-	-	32

Note: 3 = Strong Contribution 2 = Average Contribution 1 = Weak Contribution - = No Contribution

The Correlation Of course Outcomes (CO's) and Program Specific Outcomes (PSO's)

Subject Code: 17ME52	TITLE: Dynamics of Machinery	Faculty Name:	
List of Course Outcomes	Program Specific Outcomes		
	PSO1	PSO2	Total
CO-1	3	2	5
CO-2	3	2	5
CO-3	3	2	5
CO-4	3	2	5
Total	12	8	20

Note: 3 = Strong Contribution 2 = Average Contribution 1 = Weak Contribution - = No Contribution

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D. IA QP and Scheme

SAMPLE IA QP & SCHEME

ATME College of Engineering

Department of Mechanical Engineering

SECOND INTERNAL ASSESMENT

SUB CODE	:	17ME52	TIME: 9.30 AM-11.00 AM
SUBJECT	:	Dynamics of Machinery	DATE: 18-10-2019
SEM	:	5th Sem	MAX. MARKS:30

	PART-A Answer any two Questions (12 MARKS EACH)	CO's	Bloom's Taxonomy Level
01.	A four wheel trolley car of total mass 3000Kg. Each axle with its two wheels and gears has total Moment of inertia MI 32Kg-m^2. Each wheel is of 450mm radius. The centre distance between two wheels is 1.4m. Each axle is driven by a motor with speed ratio of 3:1.Each motor along with its gear has a moment of Inertia 16Kg-m^2 and rotaes in the opposite direction to that of axle.The center of mass of the car is 1m above the rails.Determine the limiting speed of the car when it has to travel around a curve of 250m radius with out the wheels leaving the rails.	3	L 5
02.	The rotor of the turbine of a ship has a mass of 2500kg and rotates at a speed of 3200rpm counter clockwise viewed from aft(rear). The rotor has radius of gyration of 0.4mt. Determine the gyroscopic couple and its effect when, i) steers to the left in a curve of 80mt radius at a speed of 15 knots ii) The ship pitches ± 5 degrees up and down with bow descending with time period 40 seconds. (1Knot=1860Mt/hr)	3	L 5
03	Add the SHM analytically and **Analyze** it by Graphically. $X_1 = 2\ Cos\ (wt + 0.5)$ $X_2 = 5\ Sin\ (wt + 1.0)$	4	L 4
	PART B-Answer any one Questions (6 MARKS)		
04	**Explain** the effect of gyroscopic couple on naval ship.	3	L 2
05	**List** and **Explain** Different Types of Vibrations.	4	L 2

CO 1	Determine the forces and couples for static and dynamic conditions of four bar and slider crank mechanisms to keep the system in equilibrium.
CO 2	Analyze static and Dynamic balancing for Rotating and Reciprocating masses.
CO 3	Determine equilibrium speed, sensitiveness, isochronism, effort and power of porter and hartnell governors. Also gyroscopic couple and effects related to 2, 4 wheeler, plane disc, ship and aero planes.
CO 4	Understand types of vibration,equation of motion and determine frequency and its behavior of Single degree Damped, Undamped and Forced Vibrations.

Bloom's Taxonomy Level	
L1	Remembering
L2	Understanding
L3	Applying
L4	Analyzing
L5	Synthesizing
L6	Evaluating

Approved
H.O.D.
Department of Mechanical Engineering
ATME College of Engineering, Mysuru

Scrutinized by
16/10/19

ATME College of Engineering

Department of Mechanical Engineering

II - Internal Assessment Scheme & Solution

Faculty Name: SURESH KUMAR C & SHARVA K T Date of I.A: 18/10/19

Subject with Code: Dynamics of Machinery Class: 5TH - AE - B

Q. No	Scheme & Solution	Marks Allotted	CO/ RBT
01	$\frac{W}{4} = 7357.5\,N$ (2) $C_w = 4 I_w \omega_w \omega_p$ $= 0.5688 V^2$ (2) $C_o = C_w - C_E$ $C_E = 2 I_E \omega_E \omega_p$ $= 0.0948 V^2$ (1) $C = C_w - C_E = 0.474 V^2$ $\frac{P}{2} = \frac{C}{2x} = 0.1692 V^2$ (2) $\frac{Q}{2} = \frac{C_o}{2x} = 4.285 V^2$ (2) $P_I = \frac{W}{4} - \frac{P}{2} - \frac{Q}{2}$ $= 7357.5 - 0.1692 V^2 - 4.285 V^2$ $V = 40.64$ kmph (2)	12	3 L5

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Q. No	Scheme & Solution	Marks Allotted	CO. RBT
02	$V = 15$ knots $= 7.75$ kmph $= \frac{15 \times 1860}{3600}$ kmph (2) $\omega_p = \frac{V}{R} = 0.09$ (1) $\omega_n = \frac{2\pi N}{60} = 335.10$ (1) $G_s = I \omega \omega_p$ $= 12.98 \times 10^3$ N-m (4) Effect: Tends to dip the bow & Raise stern. $G_p = I \omega \omega_{pmax}$ $\omega_{pmax} = \omega_p = \frac{2\pi}{t} \times \theta$ $= 1.837 \times 10^3$ N-m (4) $= 0.137$ Effect: Tends to move the ship toward portside / Left side.	12	3 L5
03	$x_1 = 2\cos(\omega t + 0.5)$ $x_2 = 5\sin(\omega t + 1.0)$ Analytical Solution $x = x_1 + x_2$ $A\sin(\omega t + \theta) = 2\cos(\omega t + 0.5) + \sin(\omega t + 1.0)$ $= 2[\cos\omega t \cos 0.5 - \sin\omega t \sin 0.5] + 5[\sin\omega t \cos 1.0 + \cos\omega t \sin 1.0]$	12	4 L4

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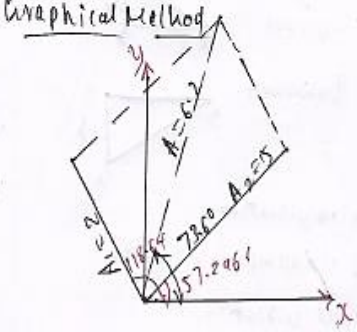
Q. No	Scheme & Solution	Marks Allotted	CO/ RBT
4.	$\sin\omega t\cos\theta + \cos\omega t\sin\theta = 5.9625\cos\omega t + 1.7427\sin\omega t$ $A\cos\theta = 1.7427$ $A\sin\theta = 5.9625$ (E) $A^2\cos^2 + A^2\sin^2\theta = (1.7427)^2 + (5.9625)^2$ $A = 6.212$ $\tan\theta = \frac{5.9625}{1.7427}$ (E) $\theta = 73.708^\circ = 1.2864$ radian. Graphical Method  (C) Steering :- Turning ship towards left or right Pitching :- up & down movement of ship Rolling :- Spin axis & precession axis parallel.	6	3 L2

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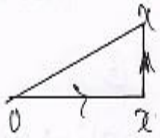
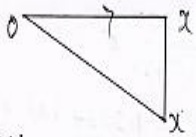
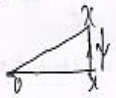
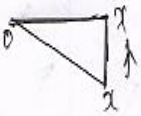
Q. No	Scheme & Solution	Marks Allotted	CO/ RBT
5	Case 1 : propeller Rotating cw direction viewed from stern & taking left turn  Raise the bow & dip the stern. Case-2 : propeller Rotating cw direction viewed from stern & taking Right turn  Dip the bow & Raise the stern. Pitching :- Pitching upward  Pitching Downward  Free & forced vibration Damped & undamped vibration Longitudinal vibration Transverse vibration Torsional vibration Deterministic & Random vibration	6	4 L1

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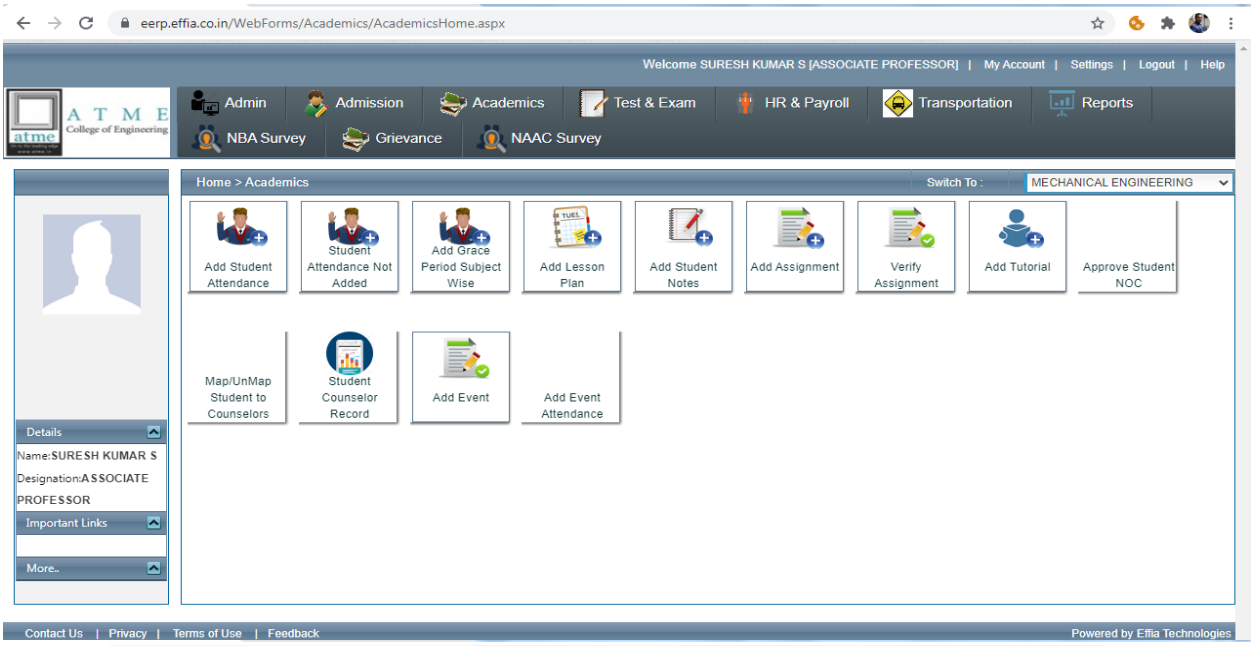
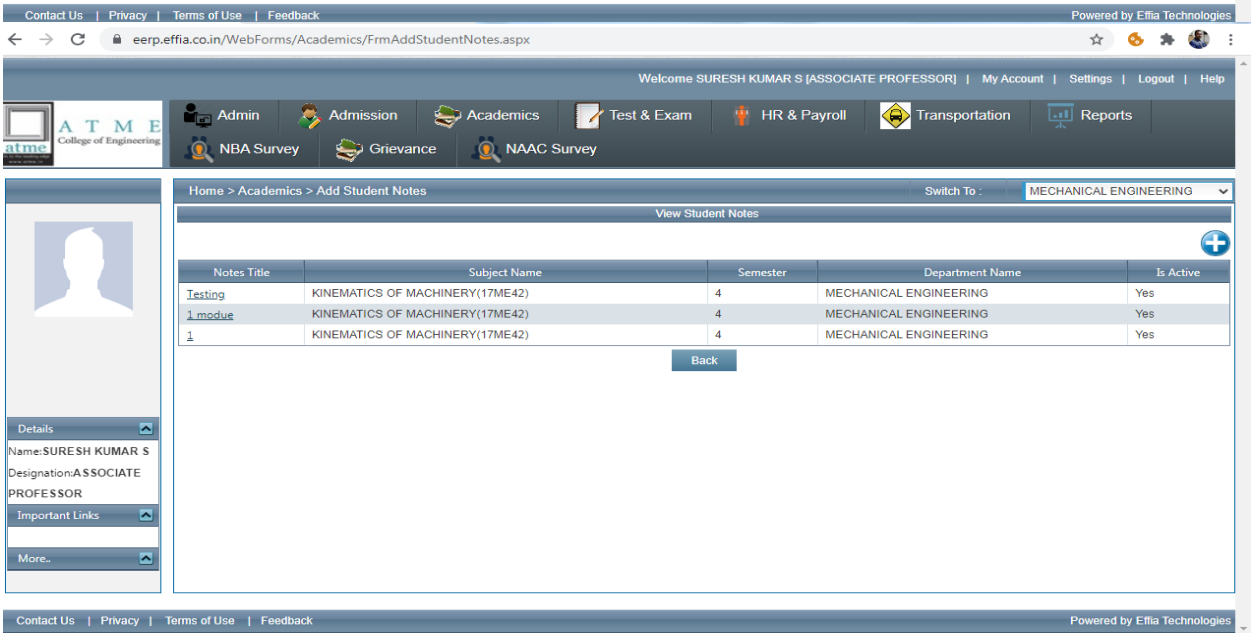
E. CERP Link :

https://eerp.effia.co.in/WebForms/Academics/AcademicsHome.aspx

Note: Only authorised access





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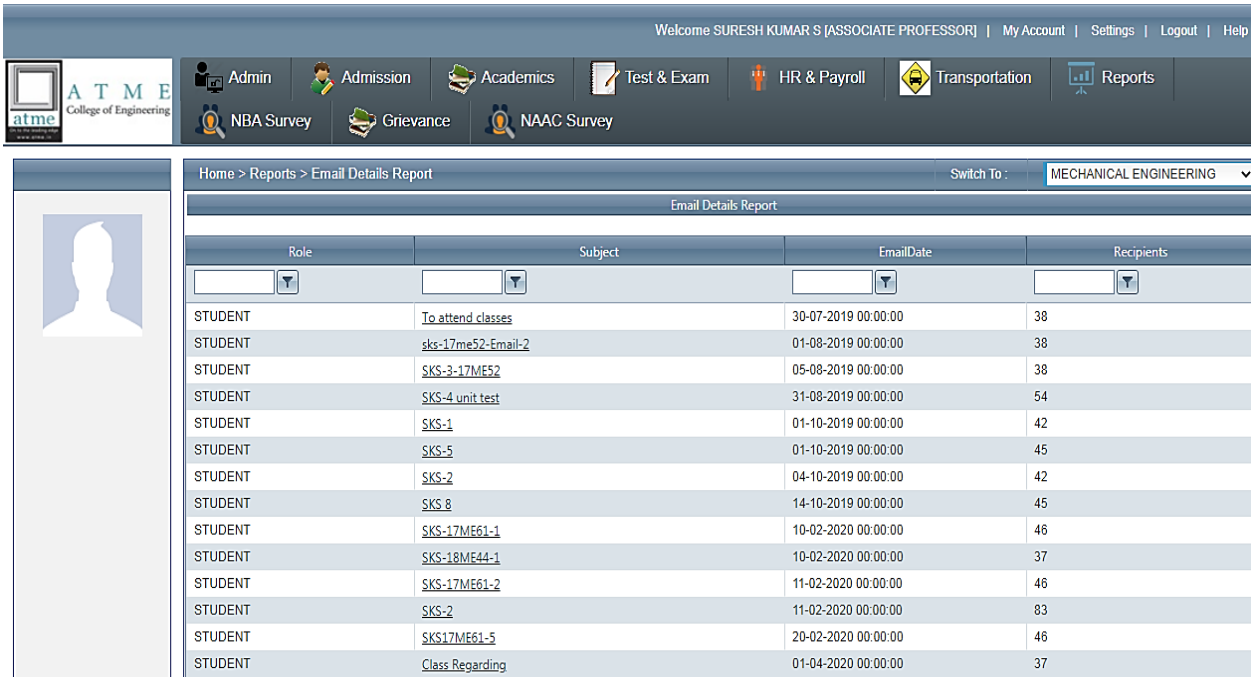
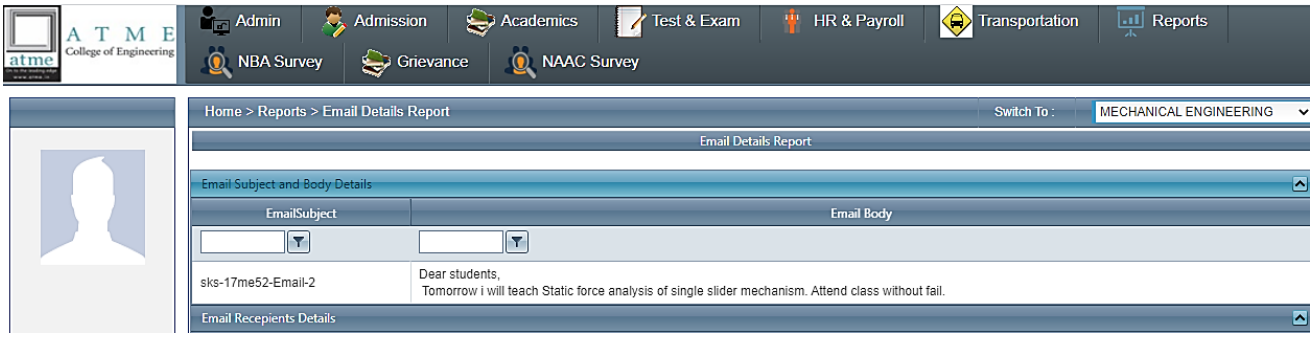
F. Flipped Classroom through Mail (CERP/ MS Teams)



Role	Subject	EmailDate	Recipients
STUDENT	To attend classes	30-07-2019 00:00:00	38
STUDENT	sks-17me52-Email-2	01-08-2019 00:00:00	38
STUDENT	SKS-3-17ME52	05-08-2019 00:00:00	38
STUDENT	SKS-4 unit test	31-08-2019 00:00:00	54
STUDENT	SKS-1	01-10-2019 00:00:00	42
STUDENT	SKS-5	01-10-2019 00:00:00	45
STUDENT	SKS-2	04-10-2019 00:00:00	42
STUDENT	SKS 8	14-10-2019 00:00:00	45
STUDENT	SKS-17ME61-1	10-02-2020 00:00:00	46
STUDENT	SKS-18ME44-1	10-02-2020 00:00:00	37
STUDENT	SKS-17ME61-2	11-02-2020 00:00:00	46
STUDENT	SKS-2	11-02-2020 00:00:00	83
STUDENT	SKS17ME61-5	20-02-2020 00:00:00	46
STUDENT	Class Regarding	01-04-2020 00:00:00	37



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CO STATEMENTS

Course Name: Transform calculus, fourier series and Numerical techniques[18MAT31]															
C201	C201.1	Use Laplace transform and inverse Laplace transform in solving differential/ integral equation arising in network analysis, control systems and other fields of engineering.													
	C201.2	Demonstrate Fourier series to study the behavior of periodic functions and their applications in system communications, digital signal processing and field theory													
	C201.3	Make use of Fourier transform and Z-transform to illustrate discrete/continuous function arising in wave and heat propagation, signals and													
	C201.4	Solve first and second order ordinary differential equations arising in engineering problems using single step and multistep numerical methods.													
	C201.5	Determine the externals of functionals using calculus of variations and solve problems arising in dynamics of rigid bodies and vibrational analysis.													
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	C201.1	3	3	-	-	-	-	-	-	-	-	-	1	-	-
	C201.2	2	2	-	-	-	-	-	-	-	-	-	1	-	-
	C201.3	1	1	-	-	-	-	-	-	-	-	-	1	-	-
	C201.4	2	1	-	-	-	-	-	-	-	-	-	2	-	-
	C201.5	2	1	-	-	-	-	-	-	-	-	-	1	-	-
Course Name: Mechanics of Materials [18ME32]															
C202	C202.1	Understand and Determine different types of stresses and strains, mechanical properties including elastic constants and their relations.													
	C202.2	Explain the idea of analyticity, potential fields residues and poles of complex Potentials in field theory and electromagnetic theory.													
	C202.3	Understand and determine the dimensions of shafts based on torsional strength, rigidity and also to apply Theories of failures for structural members													
	C202.4	Determine strain energy stored in structural members subjected to different loads and also elastic stability of columns using Rankin's and Euler's theory.													
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	C202.1	3	-	-	-	-	-	-	-	-	-	-	-	2	
	C202.2	3	3	1	-	-	-	-	-	-	-	-	-	2	
	C202.3	3	3	1	-	-	-	-	-	-	-	-	-	2	
	C202.4	3	2	1	-	-	-	-	-	-	-	-	-	2	
Course Name: Basic Thermodynamics [18ME33]															
C203	C203.1	Explain fundamentals of thermodynamics and evaluate energy interactions across the boundary of thermodynamic systems													
	C203.2	Analyze structural members and cylinders for stresses, strains and deformations subjected to bending and shear loadsEvaluate the feasibility of cyclic													
	C203.3	Apply the knowledge of entropy, reversibility and irreversibility to solve numerical problems and apply 1st law of thermodynamics to closed and open systems and determine quantity of energy transfers and change in properties.													
	C203.4	Interpret the behavior of pure substances and its application in practical problems.													
	C203.5	Recognize differences between ideal and real gases and evaluate thermodynamic properties of ideal and real gas mixtures using various relations													
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	C203.1	3	-	-	-	-	-	-	-	-	-	-	2	2	
	C203.2	3	2	-	-	-	-	-	-	-	-	-	2	2	
	C203.3	3	2	-	-	-	-	-	-	-	-	-	2	2	
	C203.4	3	2	-	-	-	-	-	-	-	-	-	2	2	
	C203.5	3	2	-	-	-	-	-	-	-	-	-	2	2	
Course Name: Material Science [18ME34]															
C204	C204.1	Understand the mechanical properties of metals and their alloys													
	C204.2	Understand the various modes of failure and understand the microstructures of ferrous and nonferrous materials.													
	C204.3	Describe the processes of heat treatment of various alloys.													
	C204.4	Acquire the Knowledge of composite materials and their production process as well as applications.													
	C204.5	Understand the properties and potentialities of various materials available and material selection													
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	C204.1	3	-	-	-	-	-	-	-	-	-	-	2	2	
	C204.2	3	-	-	-	-	-	-	-	-	-	-	2	2	
	C204.3	3	-	-	-	-	-	-	-	-	-	-	2	2	
	C204.4	3	-	-	-	-	-	-	-	-	-	-	3	2	
	C204.5	3	-	-	-	-	-	-	-	-	-	-	3	2	
Course Name: Metal cutting and forming [18ME35A/45A]															
C205	C205.1	Discuss different cutting tool materials, tool nomenclature and mechanics of orthogonal cutting.													
	C205.2	Explain the construction &operation of various machine tools.													
	C205.3	Analyze tool wear mechanisms and equations to enhance tool life and minimize machining cost and time.													
	C205.4	Describe the concepts of different metal forming processes.													
	C205.5	Apply the concepts of design of sheet metal dies to design different dies for simple sheet metal components.													
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	C205.1	3	-	-	-	-	-	-	-	-	-	-	2	2	
	C205.2	2	-	-	-	-	-	-	-	-	-	-	2	2	
	C205.3	3	2	-	2	2	-	-	-	-	-	-	2	1	
	C205.4	3	-	-	-	-	-	-	-	-	-	-	2	1	
	C205.5	3	2	-	-	-	-	-	-	-	-	-	2	-	
Course Name: Metal Casting and welding [18ME35B/45B]															
C206	C206.1	Infer, Compare and Select appropriate Manufacturing Processes													
	C206.2	Analyse and Interpret the Principles & process of Casting, Forming and Welding to specific applications													
	C206.3	Interpret the Solidification & Metallurgical aspects in both Ferrous & Non-Ferrous alloys.													
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	C206.1	2	2	-				2					2	-	
	C206.2	2	2	1				2					2	2	
	C206.3	-	2	3				2					2	2	
Course Name: Computer Aided Machine Drawing [18ME36A/46A]															
	C207.1	Identify the national and international standards pertaining to machine drawing.													
	C207.2	Understand the importance of the linking functional and visualization aspects in the preparation of the part drawings.													
	C207.3	Apply limits and tolerances to assemblies and choose appropriate fits for given assemblies.													

	C207.4	Interpret the Machining and surface finish symbols on the component drawings													
	C207.5	Preparation of the part or assembly drawings as per the conventions.													
C207		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C207.1	3	-	-	-	-	-	-	3	-	-	-	-	2	2
	C207.2	3	1	2	1	3	-	-	-	-	-	-	2	2	2
	C207.3	3	2	1	-	2	-	-	1	-	-	-	2	2	2
	C207.4	2	-	2	-	1	-	-	1	-	-	-	2	2	2
	C207.5	3	2	2	-	3	-	-	-	-	-	-	2	2	3
Course Name: Mechanical Measurements & Metrology [18ME36B/46B]															
	C208.1	To Understand the objectives of metrology, methods of measurement, standards of measurement & various measurement parameters													
	C208.2	To Understand the tolerance, limits of size, fits, geometric and position tolerances, gauges and their design and also working principle of different ty													
	C208.3	To Understand measurement of major & minor diameter, pitch, angle and effective diameter of screw threads and Gears.													
	C208.4	To Understand measurement systems, transducers, intermediate modifying devices and terminating devices.													
	C208.5	To Understand functioning of force, torque, pressure, strain and temperature measuring devices.													
C208		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C208.1	2	1	-	-	-	-	-	-	-	-	-	-	-	-
	C208.2	2	1	-	-	-	-	-	-	-	-	-	-	-	-
	C208.3	1	1	-	-	-	-	-	-	-	-	-	-	-	-
	C208.4	1	1	-	-	1	-	-	-	-	-	-	-	-	-
	C208.5	2	1	-	-	1	-	-	-	-	-	-	-	-	-
Course Name: Material Testing Lab [18MEL37A/47A]															
	C208.1	Identify the different engineering materials, describe their properties and predict their behavior under different types of loading													
	C208.2	Solve for stresses, strains, moments, & Select materials, sizes and sections for various applications.													
	C208.3	Determine mechanical properties by destructive and non-destructive methods													
C210		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C208.1		3	3	2	-	-	-	-	-	-	-	-	-	-
	C208.2	2	3	1	3	-	-	-	-	-	-	-	-	-	-
	C208.3		3	3	2	2	-	-	-	-	-	-	-	-	-
Course Name: Mechanical Measurements & Metrology Lab [18MEL37B/47B]															
	C211.1	Understand Calibration of pressure gauge, thermocouple, LVDT, load cell, micrometer.													
	C211.2	Apply concepts of Measurement of angle using Sine Centre/ Sine Bar/ Bevel Protractor, alignment using Autocollimator/ Roller set.													
	C211.3	Demonstrate measurements using Optical Projector/Tool maker microscope, Optical flats.													
	C211.4	Understand the concepts of measurement of surface roughness. Analyze tool forces using Lathe/Drill tool dynamometer.													
	C211.5	Analyze Screw thread parameters using 2-Wire or 3-Wire method, gear tooth profile using gear tooth Vernier/Gear tooth micrometer.													
C211		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C211.1	3	-	1	-	-	-	-	-	-	-	-	-	-	-
	C211.2	3	2	1	-	-	-	-	-	-	-	-	-	-	-
	C211.3	3	-	-	-	-	-	-	-	-	-	-	-	-	-
	C211.4	3	-	-	-	-	-	-	-	-	-	-	-	-	-
	C211.5	3	2	-	-	-	-	-	-	-	-	-	-	-	-
Course Name: Workshop and Machine shop practice Lab [18MEL38A/48A]															
	C212.1	Use of precaution and safety norms followed in machine shop and exhibit interpersonal skills towards working in a team.													
	C212.2	Prepare fitting models according to drawings using hand tools- V-block, marking gauge, files, hack saw, drills etc.													
	C212.3	To understand integral parts of lathe, shaping and milling machines and various accessories and attachments used and also to read working drawings, and execute machining operations.													
	C212.4	Perform cylindrical turning operations such as plain turning, taper turning, step turning, thread Cutting, facing, knurling, internal thread cutting, ecce													
	C212.5	Perform machining operations such as plain shaping, inclined shaping, keyway cutting, Indexing and Gear cutting and estimate cutting time.													
C212		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C212.1	2	-	1	-	-	2	-	-	3	2	-	-	-	-
	C212.2	2	2	-	-	-	-	-	-	-	1	-	1	-	-
	C212.3	2									1			-	-
	C212.4	2	2	-	-	-	-	-	-	-	1	-	2	-	-
	C212.5	2	2	-	-	-	-	-	-	-	1	-	2	-	-
Course Name: Foundry, Forging and Welding lab [18MEL38B48B]															
	C213.1	Demonstrate skills in preparation of various green sand moulds using with and without Patterns													
	C213.2	Demonstrate various skills in preparation of moulding sand for conducting tensile, shear and compression tests using Universal sand testing													
	C213.3	Demonstrate skills in determining permeability, clay content and Grain Fineness Number of base- sands.													
	C213.4	Demonstrate skills in preparation of forging models involving upsetting, drawing and bending operations.													
	C213.5	Demonstrate skills in preparation of various welding joints on M.S flats using Arc welding equipment.													
C213		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C213.1	**2**	-	-	-	-	-	-	-	-	-	-	**2**	-	-
	C213.2	**2**	-	-	-	-	-	-	-	-	-	-	**1**	-	-
	C213.3	**2**	-	-	-	-	-	-	-	-	-	-	**1**	-	-
	C213.4	**2**	-	-	-	-	-	-	-	-	-	-	**2**	-	-
	C213.5	**2**	-	-	-	-	-	-	-	-	-	-	**2**	-	-
Course Name: Applied Thermodynamics [18ME42]															
	C217.1	Apply thermodynamic concepts to analyze the performance of gas power cycles and vapour power cycle including propulsion systems.													
	C217.2	Understand combustion of fuels and performance of I C engines.													
	C217.3	Understand the principles and applications of refrigeration systems and Apply Thermodynamic concepts to determine performance parameters of refrigeration and air conditioning systems.													
	C217.4	Understand the working principle of Air compressors and Steam nozzles, applications, relevance of air and identify methods for performance improv													
C217		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C217.1	**3**	**2**	-	-	-	-	-	-	-	-	-	-	2	-
	C217.2	**3**	**2**	-	-	-	-	**2**	-	-	-	-	-	2	-
	C217.3	**3**	**2**	-	-	-	-	-	-	-	-	-	**2**	2	-
	C217.4	**3**	**2**	-	-	-	-	-	-	-	-	-	**2**	2	-
Course Name: Applied Thermodynamics [18ME43]															
	C218.1	Identify and calculate the key fluid properties used in the analysis of fluid behaviour and explain the principles of pressure, buoyancy and floatation.													
	C218.2	Describe and apply the principles of fluid kinematics and dynamics while addressing problems of mechanical engineering.													
	C218.3	Explain the concept of boundary layer in fluid flow and apply dimensional analysis to form dimensionless numbers in terms of input output													
	C218.4	Illustrate and explain the basic concept of compressible flow and CFD.													
C218		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**

	C218.1	**3**	**3**	**2**	**2**	**-**	**-**	**-**	**1**	**-**	**1**	**-**	**1**	**1**	**-**
	C218.2	**3**	**3**	**2**	**1**	**-**	**-**	**-**	**1**	**-**	**-**	**-**	**1**	**1**	**-**
	C218.3	**3**	**3**	**1**	**1**	**-**	**-**	**1**	**1**	**-**	**1**	**-**	**1**	**1**	**-**
	C218.4	**3**	**3**	**1**	**1**	**1**	**-**	**1**	**1**	**-**	**-**	**-**	**1**	**2**	**-**
Course Name: Kinematics of Machines [18ME44]															
	C219.1	Understand mechanisms and inversions with basic understanding of motion.													
	C219.2	Analyse the velocity, acceleration of links and joints of mechanisms.													
	C219.3	Analysis of cam follower motion for the motion specifications.													
	C219.4	Analyse the gear trains speed ratio and torque and Understand the working of the spur gears.													
C219		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C219.1	2	2	2	-	-	-	-	-	-	-	-	2	**3**	-
	C219.2	3	3	3	-	-	-	-	-	-	-	-	2	**3**	-
	C219.3	3	3	3	-	-	-	-	-	-	-	-	2	**3**	-
	C219.4	3	3	3	-	-	-	-	-	-	-	-	2	**3**	-
Course Name: Complex Analysis,Probability and Stastical Methods [18MAT41]															
	C209.1	Use the concepts of analytic function and complex potentials to solve the problems arising in electromagnetic field theory.													
	C209.2	Utilize conformal transformation and complex integral arising in aerofoil theory, fluid flow visualization and image processing.													
	C209.3	Apply discrete and continuous probability distributions in analyzing the probability models arising in engineering field.													
	C209.4	Make use of the correlation and regression analysis to fit a suitable mathematical model for the statistical data.													
	C209.5	Construct joint probability distributions and demonstrate the validity of testing the hypothesis.													
C209		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C209.1	2	2	-	-	-	-	-	-	-	-	-	1		
	C209.2	1	1	-	-	-	-	-	-	-	-	-	0		
	C209.3	1	1	-	-	-	-	-	-	-	-	-	1		
	C209.4	2	1	-	-	-	-	-	-	-	-	-	1		
	C209.5	1	0	-	-	-	-	-	-	-	-	-	1		

HOD

Course Name: Management and Engineering Economics [17ME51]														
C301	C301.1	Understand and practice managerial role and functions through effective decision making in an organization.												
	C301.2	Understand the importance of decision making, problem solving, law of supply demand and select best economic model from various available												
	C301.3	Understand the procedure involved in cost estimation of simple component, product costing and depreciation with its methods.												
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	C301.1	-	-	-	-	-	-	1	1	2	-	-	-	1	
	C301.2	1	2	-	-	-	-	-	-	2	-	3	-	1	
	C301.3	1	2	-	-	-	-	-	-	-	-	1	-	1	
Course Name: Dynamics of Machines [17ME52]														
C302	C302.1	Determine the forces and Torques for static and dynamic conditions of four bar and slider crank mechanisms to keep the system in equilibrium.												
	C302.2	Analyze static and dynamic balancing for Rotating and Reciprocating masses.												
	C302.3	Determine Equilibrium speed, sensitiveness, isochronism, effort and power of porter and hartnell governor. Also gyroscopic couple and effects related to aero plane, ship plane disc and 2 & 4 wheeler.												
	C302.4	Understand types of vibration, equation of motion and determine frequency and its behavior of Single degree Damped, Undamped and Forced Vibrations												
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	C302.1	3	3	2	-	-	-	-	-	-	-	-	-	3	
	C302.2	3	3	2	-	-	-	-	-	-	-	-	-	3	
	C302.3	3	3	1	-	-	-	-	-	-	-	-	-	3	
	C302.4	3	3	3	-	-	-	-	-	-	-	-	-	3	
Course Name: Turbo machines [17ME53]														
C303	C303.1	Apply the Euler's equation for turbomachinery to analyze its energy transfer and performance.												
	C303.2	Understand the principle of operation and preliminary design of turbines.												
	C303.3	Understand the principle of operation and preliminary design of pumps and compressors.												
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	C303.1	3	2	-	-	-	-	-	-	-	-	-	-	2	
	C303.2	3	2	2	-	-	-	-	-	-	-	-	2	2	
	C303.3	3	2	2	-	-	-	-	-	-	-	-	2	2	
Course Name: Design of Machine Elements - I [17ME54]														
C304	C304.1	Describe the design process, choose materials. Apply the codes and standards in design process												
	C304.2	Analyse the behaviour of machine components under static, impact, fatigue loading using failure theories												
	C304.3	Design shafts, joints, couplings												
	C304.4	Design of riveted and welded joints												
	C304.5	Design of threaded fasteners and power screws												
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	C304.1	3	3	1	1	2	1	-	2	1	1	-	3		
	C304.2	3	3	1	2	1	1	-	1	-	1	-	2		
	C304.3	3	3	3	1	1	2	-	1	1	1	-	2		
	C304.4	3	3	3	1	1	1	-	-	1	1	-	1		
	C304.5	3	3	3	2	1	1	-	-	1	1	-	1		
Course Name: Non Traditional Machining [17ME554]														
C305.4	C305.4.1	Understand the compare traditional and non-traditional machining process and recognize the need for Non-traditional machining process.												
	C305.4.2	Understand the constructional features, performance parameters, process characteristics, applications, advantages and limitations of USM, AJM and V												
	C305.4.3	Identify the need of Chemical and electro-chemical machining process along with the constructional features, process parameters, process												
	C305.4.4	Understand the constructional feature of the equipment, process parameters, process characteristics, applications, advantages and limitations EDM												
	C305.4.5	Understand the LBM equipment, LBM parameters, and characteristics. EBM equipment and mechanism of metal removal, applications, advantages												
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	C305.4.1	2	2	-	-	-	-	-	-	-	-	-	-	-	
	C305.4.2	2	2	-	-	-	-	-	-	-	-	-	-	2	
	C305.4.3	2	2	-	-	-	-	-	-	-	-	-	-	2	
	C305.4.4	2	2	-	-	-	-	-	-	-	-	-	-	2	
	C305.4.5	2	2	-	-	-	-	-	-	-	-	-	-	2	
Course Name: Energy and Environment [17ME562]														
C306.2	C306.2.1	Summarize the basic concepts of energy, its distribution and general Scenario.												
	C306.2.2	Explain different energy storage systems, energy management, audit and economic analysis												
	C306.2.3	Summarize the environment eco system and its need for awareness												
	C306.2.4	Identify the various types of environment pollution and their effects												
	C306.2.5	Discuss the social issues of the environment with associated acts												
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	C306.2.1	-	-	-	-	-	-	-	-	-	-	-	-	2	-
	C306.2.2	-	-	-	2	-	-	-	-	-	2	3	3	2	-
	C306.2.3	-	-	-	-	-	-	-	-	-	2	-		2	-
	C306.2.4	-	-	-	-	-	2	2	-	-	-	-	3	2	-
	C306.2.5	-	-	-	-	-	3	2	3	-	3	-	2	2	-
Course Name: Fluid Mechanics and Machinery Lab [17MEL57]														
	C307.1	Perform experiments to determine the coefficient of discharge of flow measuring devices.												
	C307.2	Conduct experiments on hydraulic turbines and pumps to draw characteristics.												

	C307.3	Test basic performance parameters of hydraulic turbines and pumps and execute the knowledge in real life situations.													
	C307.4	Determine the energy flow pattern through the hydraulic turbines and pumps.													
	C307.5	Exhibit his competency towards preventive maintenance of hydraulic machines.													
C307		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C307.1	3	2	-	-	-	-	-	-	-	-	-	-	2	
	C307.2	3	2	-	-	-	-	-	-	-	-	-	-	2	
	C307.3	3	2	-	-	-	-	-	-	-	-	-	2	2	
	C307.4	3	2	-	-	-	-	-	-	-	-	-	-	2	
	C307.5	2	-	-	-	-	-	-	-	-	-	-	2	2	
Course Name: Energy Conversion Lab [17MEL58]															
	C308.1	Perform experiments to determine the properties of fuels and oils													
	C308.2	Conduct performance test on different types of engines and draw inferences on various engine parameters													
	C308.3	Determine the energy flow pattern (heat balance sheet) through the I C Engine and identify exhaust emissions													
C308		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C308.1	3	2	-	-	-	2	-	-	-	-	-	-	3	
	C308.2	3	2	-	-	-	-	-	-	-	-	-	2	3	
	C308.3	3	2	-	-	-	2	2	-	-	-	-	2	3	
Course Name: Finite Element Analysis [17ME61]															
	C309.1	Understand the concepts behind formulation methods in FEM.													
	C309.2	Identify the application and characteristics of FEA elements such as bars, beams, plane and iso-parametric elements													
	C309.3	Develop element characteristic equation and generation of global equation.													
	C309.4	Able to apply suitable boundary conditions to a global equation for bars, trusses, beams, circular shafts, heat transfer, fluid flow, axi symmetric and													
C309		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C309.1	2	2	1	1	1	-	-	-	-	-	-	-	1	1
	C309.2	2	2	1	1	1	-	-	-	-	-	-	1	1	1
	C309.3	2	1	1	1	-	-	-	-	-	-	-	-	1	1
	C309.4	3	3	2	2	2	-	-	-	-	-	-	1	1	1
Course Name: Computer Integrated Manufacturing [17ME62]															
	C310.1	Define Automation, CIM, CAD, and CAM and explain the differences between these concepts. Solve mathematical models and analyze different													
	C310.2	Explain the basics of engineering graphics interface, MRP and CAPP solve problems of transformations.													
	C310.3	Analyze the FMS and automated flow lines to reduce down time and enhance productivity.													
	C310.4	Explain the use of different computer applications in manufacturing, and able to prepare part programs for simple jobs on CNC machine tools and rob													
	C310.5	Visualize and appreciate the modern trends in Manufacturing like additive manufacturing, Industry 4.0 and applications of Internet of Things leading													
C310		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C310.1	2	1	-	-	2	-	-	-	-	1	1	1	-	-
	C310.2	2	1	-	-	2	-	-	-	-	1	-	1	-	-
	C310.3	2	1	-	-	2	-	-	-	-	-	1	1	-	-
	C310.4	1	1	-	-	2	-	-	-	-	1	-	1	-	1
	C310.5	1	-	-	-	2	-	-	-	-	1	1	1	1	-
Course Name: Heat Transfer [17ME63]															
	C311.1	Understand the basic modes of heat transfer.													
	C311.2	Compute temperature distribution in steady-state and unsteady-state heat conduction													
	C311.3	Understand and interpret heat transfer through extended surfaces													
	C311.4	Interpret and compute forced and free convective heat transfer													
	C311.5	Explain the principles of radiation heat transfer and Understand the numerical formula for heat conduction problems.													
	C311.6	Design heat exchangers using LMTD and NTU methods													
C311		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C311.1	3	2	-	-	-	-	-	-	-	-	-	-	2	-
	C311.2	3	2	-	-	-	-	-	-	-	-	-	2	2	-
	C311.3	3	2	-	-	-	-	-	-	-	-	-	2	2	-
	C311.4	3	2	-	-	-	-	-	-	-	-	-	2	2	-
	C311.5	3	2	-	-	-	-	-	-	-	-	-	2	2	-
	C311.6	3	2	2	-	-	-	-	-	-	-	-	2	2	-
Course Name: Design of Machine Elements-II[17ME64]															
	C312.1	Design of Structural and Load carrying machine elements													
	C312.2	Design of Flexible machine elements													
	C312.3	Design of Power transmission elements													
C312		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C312.1	3	3	3	3	-	-	-	1	2	2	1	3		
	C312.2	3	3	3	3	-	-	-	1	2	2	1	3		
	C312.3	3	3	3	3	-	-	-	1	2	2	1	3		
Course Name: Metal Forming [17ME653]															
	C313.3.1	Able to understand the concept of different metal forming process.													
	C313.3.2	Able to approach metal forming processes both analytically and numerically													
	C313.3.3	Able to design metal forming processes													
	C313.3.4	Able to develop approaches and solutions to analyze metal forming processes and the associated problems and flaws.													
C313.3		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C313.3.1	3	-	-	-	-	-	-	-	-	-	-	2		
	C313.3.2	3	2	-	-	-	-	-	-	-	-	-	2		
	C313.3.3	3	-	-	-	-	-	-	-	-	-	-	2		
	C313.3.4	3	2	2	-	-	-	-	-	-	-	-	2		
Course Name: Automobile Engineering [17ME655]															
	C314.5.1	Identify the different parts of an automobile and it's working													
	C314.5.2	Understand the working of transmission and braking systems.													

	C314.5.3	Comprehend the working of steering and suspension systems													
	C314.5.4	Learn various types of fuels and injection systems													
	C314.5.5	Know the cause of automobile emissions, its effects on environment and methods													
C314.5		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C314.5.1	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
	C314.5.2	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
	C314.5.3	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
	C314.5.4	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
	C314.5.5	**3**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
Course Name: Total Quality Management[17ME664]															
	C315.4.1	Describe the various approaches of TQM													
	C315.4.2	Infer the customer perception of quality													
	C315.4.3	Analyse customer needs and perceptions to design feedback systems.													
	C315.4.4	Apply statistical tools for continuous improvement of systems.													
	C315.4.5	Apply the tools and technique for effective implementation of TQM													
C315.4		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C315.4.1	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
	C315.4.2	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
	C315.4.3	**1**	**-**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**1**	**-**
	C315.4.4	**2**	**2**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**2**	**2**
	C315.4.5	**2**	**-**	**-**	**2**	**1**	**-**	**-**	**-**	**-**	**1**	**-**	**-**	**2**	**-**
Course Name: Heat and Mass Transfer Lab [17MEL67]															
	C316.1	Perform experiments to determine the thermal conductivity of a metal rod													
	C316.2	Conduct experiments to determine convective heat transfer coefficient for free and forced convection and correlate with theoretical values.													
	C316.3	Estimate the effective thermal resistance in composite slabs and efficiency in pin-fin													
	C316.4	Determine surface emissivity of a test plate													
	C316.5	Estimate performance of a refrigerator and Air-conditioning system													
	C316.6	Calculate temperature distribution of study and transient heat conduction through plane wall, cylinder and fin using numerical approach.													
C316		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C316.1	3	2	-	2	-	-	-	-	-	-	-	2	2	-
	C316.2	3	2	-	2	-	-	-	-	-	-	-	2	2	-
	C316.3	3	2	-	2	-	-	-	-	-	-	-	2	2	-
	C316.4	3	2	-	2	-	-	-	-	-	-	-	2	2	-
	C316.5	3	2	-	2	-	-	-	-	-	-	-	2	2	-
	C316.6	3	2	-	2	-	-	-	-	-	-	-	2	2	-
Course Name: Modeling and Analysis Lab [17MEL68]															
	C317.1	Demonstrate the basic features of an analysis package. Use the modern tools to formulate the problem, and able to create geometry, discretize, apply													
	C317.2	Demonstrate the deflection of beams subjected to point, uniformly distributed and varying loads further to use the available results to draw shear													
	C317.3	Analyze the given problem by applying basic principle to solve and demonstrate 1D and 2D heat transfer with conduction and convection boundary													
	C317.4	Carry out dynamic analysis and finding natural frequencies for various boundary conditions and also analyze with forcing function.													
C317		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C317.1	-	-	-	-	2	-	-	--	-	1	-	1	-	2
	C317.2	2	1	1	1	2	-	-	-	-	1	-	1	-	2
	C317.3	2	1	1	1	2	-	-	-	-	1	-	1	-	2
	C317.4	2	1	1	1	2	-	-	-	-	1	-	1	-	2

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Course Name: Energy Engineering [15ME71]															
	C401.1	Describe the working and components of Steam power plant													
	C401.2	Study the working and applications of diesel engine and hydroelectric power plants													
	C401.3	Acquire the basic concepts of solar radiation, Photovoltaic and solar thermal systems.													
	C401.4	Understand the principles of energy conversion from alternate sources like wind, tidal, geothermal, ocean, biomass and biogas.													
	C401.5	Discuss the concepts and applications of energy storage methods.													
C401		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	C401.1	3	-	2	-	-	-	2	-	-	-	-	-	2	
	C401.2	3	2	2	-	-	-	2	-	-	-	-	-	2	
	C401.3	3	2	2	-	-	-	-	-	-	-	-	2	2	
	C401.4	3	-	-	-	-	-	-	-	-	-	-	-	2	
	C401.5	2	-	-	-	-	-	-	-	-	-	-	-	2	
Course Name: Fluid Power Systems [15ME72]															
	C402.1	Identify and analyze the functional requirements of a fluid power transmission system for a given application.													
	C402.2	Visualize how a hydraulic/pneumatic circuit will work to accomplish the function.													
	C402.3	Design an appropriate hydraulic or pneumatic circuit or combination circuit like electro-hydraulics, electro-pneumatics for a given application.													
	C402.4	Select and size the different components of the circuit.													
	C402.5	Develop a comprehensive circuit diagram by integrating the components selected for the given application.													
C402		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	C402.1	2	1	1	-	-	1	1	-	-	1	1	1	1	-
	C402.2	2	1	-	-	-	1	1	1	-	1	1	1	2	-
	C402.3	2	1	3	1	-	1	1	1	-	1	1	1	2	-
	C402.4	3	1	2	-	-	1	1	1	-	1	1	2	1	-
	C402.5	3	1	2	1	1	-	1	-	-	1	-	2	2	-
Course Name: Control Engineering [15ME73]															
	C403.1	Recognize control system and its types, control actions and to develop governing equations for physical models (Electrical, Thermal, Mechanical, Electro													
	C403.2	Calculate the gain of the system using block diagram and signal flow graph and to illustrate the response of systems.													
	C403.3	Determine the stability of control system in complex domain and frequency domain utilizing different plots for time variant and time invariant system.													
C403		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	C403.1	3	3	1	-	-	-	-	-	-	-	-	1	1	-
	C403.2	3	3	2	1	-	-	-	-	-	-	-	-	-	-
	C403.3	3	3	3	3	-	-	-	-	-	-	-	-	-	-
Course Name: Design Lab [15MEL76]															
	C406.1	To understand the working principles of machine elements such as Governors, Gyroscopes etc.,													
	C406.2	To identify forces and couples in rotating mechanical system components.													
	C406.3	To identify vibrations in machine elements and design appropriate damping methods and to determine the critical speed of a rotating shaft.													
	C406.4	To measure strain in various machine elements using strain gauges.													
	C406.5	To determine the minimum film thickness, load carrying capacity, frictional torque and pressure distribution of journal bearing.													
	C406.6	To determine strain induced in a structural member using the principle of photo-elasticity.													
C406		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	C406.1	3	3	-	-	-	-	-	-	-	-	-	2	2	-
	C406.2	3	3	-	-	-	-	-	-	-	-	-	2	2	-
	C406.3	3	3	-	-	-	-	-	-	-	-	-	2	2	-
	C406.4	3	3	-	-	-	-	-	-	-	-	-	2	2	-
	C406.5	2	3	-	-	-	-	-	-	-	-	-	-	2	-
	C406.6	3	3	-	-	-	-	-	-	-	-	-	2	2	-
Course Name: Computer Integrated Manufacturing Lab [15MEL77]															
	C407.1	Generate CNC Lathe part program for Turning, Facing, Chamfering, Grooving, Step turning, Taper turning, Circular interpolation etc.													
	C407.2	Generate CNC Mill Part programming for Point to point motions, Line motions, Circular interpolation, Contour motion, Pocket milling- circular, rectangular,													
	C407.3	Use Canned Cycles for Drilling, Peck drilling, Boring, Tapping, Turning, Facing, Taper turning Thread cutting etc.													
	C407.4	Simulate Tool Path for different Machining operations of small components using CNC Lathe & CNC Milling Machine.													
	C407.5	Use high end CAM packages for machining complex parts; use state of art cutting tools and related cutting parameters; optimize cycle time.													
	C407.6	Understand & write programs for Robot control; understand the operating principles of hydraulics, pneumatics and electro pneumatic systems. Apply this													
C407		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	C407.1	2	-	-	-	2	-	-	-	-	1	-	2	2	2
	C407.2	2	-	-	-	2	-	-	-	-	1	-	2	2	2
	C407.3	2	-	-	-	2	-	-	-	-	1	-	2	2	2
	C407.4	2	-	-	-	2	-	-	-	-	1	-	2	2	2
	C407.5	2	-	-	-	3	-	-	-	-	1	-	2	2	2
	C407.6	3	-	-	-	3	-	-	-	-	1	-	2	2	2
Course Name: Project Work Phase 1 [15MEP78]															
	C408.1	Analyze complex Mechanical Engineering problems and apply appropriate Engineering techniques and design processes.													
	C408.2	Develop creative solutions to problems and conceive innovative approaches in developing and designing of mechanical systems and machines.													
	C408.3	Prepare engineering documents and present a clear and coherent presentation of these to a range of technical and nontechnical audiences.													
	C408.4	Acquire and evaluate research regarding new knowledge development within the mechanical engineering discipline and its social, cultural, environmental and leg													
C408		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	C408.1	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	C408.2	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	C408.3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	C408.4	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Course Name: Operations Research [15ME81]															
	C409.1	Understand the meaning, definitions, scope, need, phases and techniques of operations research.													
	C409.2	Formulate as LPP and derive optimal solutions to linear programming problems by graphical method, Simplex method, Big-M method and Dual Simplex													
	C409.3	Formulate as Transportation and Assignment problems and derive optimum solutions for transportation, Assignment and travelling salesman problems.													
	C409.4	Students will analyses and illustrates Network models and problem-solving techniques to solve queuing models.													
	C409.5	Students acquainted to obtain the optimal solution to decision making problems (Game theory) and also sequencing models in order to increase production and													
C409		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	C409.1	2	-	-	-	-	-	-	1	2	1	1	1	-	-
	C409.2	-	-	-	-	-	-	-	1	2	1	1	1	-	-

	C409.3	-	-	2	-	-	-	-	-	2	1	1	1	1	-
	C409.4	-	3	1	-	-	-	-	1	2	1	1	1	1	-
	C409.5	-	3	-	-	-	-	-	-	2	1	1	1	1	-
Course Name: Additive Manufacturing [15ME82]															
	C410.1	Understand the different process of Additive Manufacturing using Polymer, Powder and Nano materials manufacturing.													
	C410.2	Analyze the different characterization techniques.													
	C410.3	Describe the various NC, CNC machine programing and Automation techniques.													
C410		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C410.1	3	-	-	3	3	2	-	-	-	-	-	2	1	-
	C410.2	3	-	-	3	3	1	-	-	-	-	-	2	2	2
	C410.3	3	-	-	2	3	1	-	-	-	-	-	2	2	2
Course Name: Internship [15ME84]															
	C412.1	Apply gained technical knowledge and skills in engineering practice.													
	C412.2	Work individually, in team and communicate effectively through reports and presentations.													
	C412.3	Demonstrate workplace attitude, professional engineering norms and ethics.													
C412		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C412.1	2	1	1	2	3	-	-	-	-	1	-	1	2	1
	C412.2	-	-	-	2	1	1	1	-	3	3	1	1	2	1
	C412.3	-	-	-	-	-	3	2	2	1	-	2	2	2	1
Course Name: Project Work Phase 2 [15MEP85]															
	C413.1	Analyze complex Mechanical Engineering problems and apply appropriate Engineering techniques and design processes.													
	C413.2	Develop creative solutions to problems and conceive innovative approaches in developing and designing of mechanical systems and machines.													
	C413.3	Prepare engineering documents and present a clear and coherent presentation of these to a range of technical and nontechnical audiences.													
	C413.4	Acquire and evaluate research regarding new knowledge development within the mechanical engineering discipline and its social, cultural, environmental and leg													
C413		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C413.1	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	C413.2	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	C413.3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	C413.4	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Course Name: Seminar [15MES86]															
	C414.1	Learn beyond academics by reviewing literature available at many other sources.													
	C414.2	Review research papers periodicals, magazines and review publications on the internet and in other electronic resources.													
	C414.3	Present views comprehensibly to produce a presentation briefly with the surveyed information under the direction of the guide.													
C414		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C414.1	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	C414.2	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	C414.3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Course Name: Tribology [15ME742]															
	C404.2.1	Understand the fundamentals of tribology and associated parameters.													
	C404.2.2	Apply concepts of tribology for the performance analysis and design of components experiencing relative motion.													
	C404.2.3	Analyze the requirements and design hydrodynamic journal and plane slider bearings for a given application.													
	C404.2.4	Select proper bearing materials and lubricants for a given tribological application.													
	C404.2.5	Apply the principles of surface engineering for different applications of tribology.													
C404.2		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C404.2.1	3	2	2	2	2	1	1	2	1	2	2	1		
	C404.2.2	3	2	2	2	2	2	1	1	2	1	1	1		
	C404.2.3	3	3	3	3	2	2	1	1	1	2	1	1		
	C404.2.4	3	2	2	2	2	1	1	1	1	1	1	1		
	C404.2.5	2	2	3	3	3	2	2	1	1	1	1	1		
Course Name: Mechatronics (15ME753)															
	C405.3.1	Illustrate various components of Mechatronics systems.													
	C405.3.2	Assess various control systems used in automation.													
	C405.3.3	Develop mechanical, hydraulic, pneumatic and electrical control systems.													
C405.3		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C405.3.1	3	3	2	2	3	1	3	1	2	3	1	2		
	C405.3.2	3	3	3	1	3	2	1	2	3	2	0	3		
	C405.3.3	3	3	2	2	2	1	2	1	3	1	0	2		
Course Name: Experimental Stress Analysis (15ME832)															
	C411.2.1	Explain characterize the elastic behavior of solid bodies.													
	C411.2.2	Describe stress strain analysis of mechanical systems using electrical resistance strain gauges.													
	C411.2.3	Discuss skills for experimental investigations an accompanying laboratory course is desirable													
	C411.2.4	Discuss experimental investigations by predictions by other methods.													
	C411.2.5	Describe various coating techniques.													
C411.2		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
	C411.2.1	3	3	3	2	2	-	-	1	-	2	-	2		
	C411.2.2	3	3	3	3	3	2	2	1	-	1	-	3		
	C411.2.3	3	3	3	3	3	2	1	1	-	1	-	2		
	C411.2.4	3	3	3	3	3	2	1	1	-	2	-	2		
	C411.2.5	3	3	3	3	3	2	1	1	-	1	-	2		

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