



(An Autonomous Institution - AFFILIATED TO ANNA UNIVERSITY, CHENNAI)

S.P.G.Chidambara Nadar - C.Nagammal Campus

S.P.G.C. Nagar, K.Vellakulam – 625 701 (Near VIRUDHUNAGAR).

**B.E. CIVIL ENGINEERING
REGULATION – 2020
AUTONOMOUS SYLLABUS
CHOICE BASED CREDIT SYSTEM
VII TO VIII SEMESTER CURRICULUM AND SYLLABI**

VISION:

To make the Department of Civil Engineering of this Institution the unique of its kind in the field of Research and Development activities in this part of world.

MISSION:

To impart highly innovative and technical knowledge in the field of Civil Engineering to the urban and unreachable rural student folks through Total Quality Education.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

- PEO 1:** Graduates of the program will be creative, able to apply scientific knowledge and computer aided design tools for technical problems in the field of Civil Engineering.
- PEO 2:** Graduates of the program will be a professional Civil Engineer and/or will pursue higher education in various domains of Civil Engineering by taking competitive examinations.
- PEO 3:** Graduates of the program will passionately perform as a competent team member, team leader and/or entrepreneur in the development of a sustainable environment.

PROGRAM OUTCOMES:

After going through the four years of study, the Civil Engineering graduates will have the ability to

POs	Graduate Attribute	Programme Outcome
1	Engineering knowledge	Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2	Problem analysis	Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, 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 modeling to complex engineering activities with an understanding of the limitations
6	The engineer and society	Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice

7	Environment and sustainability	Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8	Ethics	Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9	Individual and team work	Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10	Communication	Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write 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.

SEMESTER VII

S.NO.	COURSE CODE	COURSE TITLE	CATE GORY	CONTACT PERIODS	L	T	P	C
THEORY								
1	CE1701	Estimation, Costing and Valuation Engineering	PC	3	3	0	0	3
2	GE1771	Principles of Management	ES	3	3	0	0	3
3		Professional Elective III	PE	3	3	0	0	3
4		Professional Elective IV	PE	3	3	0	0	3
5		Open Elective*	OE	3	3	0	0	3
6		Online Course**	OL	NPTEL/SWAYAM				3
PRACTICALS								
7	CE1711	Irrigation and Environmental Engineering Drawing	PC	4	0	0	4	2
8	CE1721	Creative and Innovative Project	EEC	4	0	0	4	2
9	CE1722	Field Practices Training	EEC	0	0	0	0	2
TOTAL				23	15	0	8	24

SEMESTER VIII

S.NO.	COURSE CODE	COURSE TITLE	CATE GORY	CONTACT PERIODS	L	T	P	C
PRACTICALS								
1	CE1821	Project Work	EEC	16	0	0	16	8
TOTAL				16	0	0	16	8

*Course from the Curriculum of other UG programmes.

** Students can take online courses in any of the three semesters (5th, 6th, and 7th) for a total of 6 credits, and grades will be awarded in the consolidated mark statement accordingly.

PROFESSIONAL ELECTIVES (PEs)

PROFESSIONAL ELECTIVE III (SEMESTER VII)

S.NO.	COURSE CODE	COURSE TITLE	CATE GORY	CONTACT PERIODS	L	T	P	C
1	CE1731	Design of Prestressed Concrete Structures	PE	3	3	0	0	3
2	CE1732	Industrial Structures	PE	3	3	0	0	3
3	CE1733	Prefabricated Structures	PE	3	3	0	0	3
4	CE1734	Structural Dynamics and Earthquake Engineering	PE	3	3	0	0	3
5	CE1735	Advanced Concrete Technology	PE	3	3	0	0	3

CE1721

CREATIVE AND INNOVATIVE PROJECT

L	T	P	C
0	0	4	2

OBJECTIVES:

- To use the knowledge acquired in Civil Engineering to do a mini project, which allows the students to come up with designs, fabrication or algorithms and programs expressing their ideas in a novel way.

STRATEGY

To identify a topic of interest in consultation with Faculty/Supervisor. Review the literature and gather information pertaining to the chosen topic. State the objectives and develop a methodology to achieve the objectives. Carryout the design / fabrication or develop computer code. Demonstrate the novelty of the project through the results and outputs.

TOTAL: 60 PERIODS

OUTCOMES:

- CO1:** Summarize the state of art in the chosen area of study by conducting an exhaustive review of literature and making field visits
- CO2:** Choose a problem statement with scope for practical problem solving
- CO3:** Apply the analysis and design skills to develop a solution for the identified problem statement
- CO4:** Make use of modern computer tools and packages for problem solving
- CO5:** Develop documentation skills for reporting the design outcomes.

CE1722

FIELD PRACTICES TRAINING

L	T	P	C
0	0	0	2

OBJECTIVES:

- To train the students in field work so as to have a firsthand knowledge of practical problems in carrying out engineering tasks. To develop skills in facing and solving the field problems.

STRATEGY

The students individually undertake training in reputed civil engineering companies for the specified duration. At the end of the training, a report on the work done will be prepared and presented. The students will be evaluated through a viva-voce examination by a team of internal staff.

OUTCOMES:

CO1: Understand the broad principles of industrial projects

CO2: Make use of the advanced tools and techniques encountered during industrial training

CO3: Interact with industrial personel to clarify about the field practices

CO4: Build internpersonal and team skills

CO5: Prepare professional work reports and presentation

CE1821

PROJECT WORK

L	T	P	C
0	0	16	8

OBJECTIVES:

- Develop the ability to solve a specific problem right from its identification and literature review till the successful solution of the same.
- Train the students in preparing project reports and to face reviews and viva voce examination

The students in a group of 3 to 4 works on a topic approved by the Head of the Department under the guidance of a faculty member and prepares a comprehensive project report after completing the work to the satisfaction of the supervisor. The progress of the project is evaluated based on a minimum of three reviews. The review committee may be constituted by the Head of the Department. A project report is required at the end of the semester. The project work is evaluated based on the oral presentation and the project report jointly by external and internal examiners constituted by the Head of the Department.

TOTAL: 240 PERIODS

OUTCOMES:

- CO1:** Choose any challenging practical problems and understand the background
- CO2:** Make literature review to classify project characteristics
- CO3:** Develop solution by formulating proper methodology
- CO4:** Analyze and apply relevant tools for evolving the solution
- CO5:** Function as a team in multidisciplinary approach.

REGULATIONS - 2021
CHOICE BASED CREDIT SYSTEM
B.E. CIVIL ENGINEERING
CURRICULUM AND SYLLABI FOR SEMESTER V TO VI
SEMESTER – V

S.No.	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
THEORY								
1.	CE2301	Design of Reinforced Concrete Structural Elements	PC	3	3	0	0	3
2.	CE2302	Geotechnical Engineering – II	PC	3	3	0	0	3
3.	CE2303	Structural Analysis	PC	3	3	0	0	3
4.		Professional Elective I	PE	3	3	0	0	3
5.		Professional Elective II	PE	3	3	0	0	3
6.		Professional Elective III	PE	3	3	0	0	3
PRACTICAL								
7.	CE2304	Environmental Engineering Laboratory	PC	3	0	0	3	1
8.	CE2305	Hydraulic Engineering Laboratory	PC	3	0	0	3	1
9.	EM2301	Internship	EM	-	0	0	0	1
TOTAL				24	18	0	6	21

SEMESTER VI

S.No.	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
THEORY								
1.	CE2351	Design of Steel Structural Elements	PC	3	3	0	0	3
2.	CE2352	Highway and Railway Engineering	PC	3	3	0	0	3
3.		Professional Elective IV	PE	3	3	0	0	3
4.		Professional Elective V	PE	3	3	0	0	3
5.		Professional Elective VI	PE	3	3	0	0	3
6.		Open elective – I	OE	3	3	0	0	3
PRACTICAL								
8.	CE2353	Concrete and Highway Engineering Laboratory	PC	3	0	0	3	1
9.	CE2354	Mini Project	EM	4	0	0	4	2
TOTAL				25	18	0	7	21

Course Code	Course Name	L	T	P	C
EM2301	INTERNSHIP	0	0	0	1

Category: Employability Enhancement courses

a. Preamble

- To train the students in field work so as to have a firsthand knowledge of practical problems in carrying out engineering tasks. To develop skills in facing and solving the field problems.

b. Course Outcome

After successful completion of the course, the students will be able to

CO. No.	Course Outcome	Knowledge Level
CO1	Understand the broad principles of industrial projects.	K2
CO2	Make use of the advanced tools and techniques encountered during industrial training.	K2
CO3	Interact with industrial personnel to clarify about the field practices.	K2
CO4	Build interpersonal and team skills.	K3
CO5	Develop professional work reports and presentation.	K3

Total : 80 Hours

c. STRATEGY

(2 Weeks)

The students individually undergo training in reputed industry/research institutes/laboratories for the specified duration. After completion of the training, a detailed report should be submitted within ten days from the commencement of next semester. The evaluation will be done as per the Regulations. Credits shall be awarded to the students who satisfy the clauses for industrial training/ internship of the Regulation concerned.

d. Activities

Students shall be exposed to the latest technologies in reputed organization.

Course Code	Course Name	L	T	P	C
CE2354	MINI PROJECT	0	0	4	2

Category: Employability Enhancement courses

a. Preamble

- Developing the ability to solve a specific problem by identifying it through literature review and proceeding to successful solution by formulating proper methodology.
- Working together in a team to solve any problem statement involving theoretical and experimental studies related to civil engineering.

b. Course Outcome

After successful completion of the course, the students will be able to

CO. No.	Course Outcome	Knowledge Level
CO1	Identify the practical problem by conducting literature survey/patent search.	K3
CO2	Develop the proper methodology as per standards available.	K3
CO3	Solve the problem using suitable experimental/analytical studies	K3
CO4	Make use of tools and packages for problem solving	K3
CO5	Develop documentation skills for reporting the outcomes.	K3

c. Course Syllabus

Total : 60 Periods

1. The students shall form a team with not more than 3 members.
2. The students shall select a technical problem and do a detailed study of it.
3. The students shall then conduct a detailed literature review related to the selected problem.
4. Based on the literature survey, the students shall formulate the study objectives and methodology.
5. The students shall conduct the required experiments/analyses to arrive at the solution.
6. The final report shall be submitted by the students for review and assessment.

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SEMESTER III

S.NO.	COURSE CODE	COURSE TITLE	CATE GORY	CONTACT PERIODS	L	T	P	C
THEORY								
1	MA2202	Transforms and Numerical Solution of Equations	BS	4	3	1	0	4
2	CE2201	Construction Materials	PC	3	3	0	0	3
3	CE2202	Fluid Mechanics	PC	3	3	0	0	3
4	CE2203	Mechanics of Solids	PC	3	3	0	0	3
5	CE2204	Surveying	PC	3	3	0	0	3
6	GE2201	Design Thinking	EM	3	3	0	0	3
7		Audit Course	AU	3	3	0	0	0
PRACTICALS								
8	CE2205	Computer Aided Building Drawing Laboratory	PC	4	0	0	4	2
9	CE2206	Surveying Laboratory	PC	4	0	0	4	2
10	EM2202	Interpersonal Skills - Listening and Speaking	EM	2	0	0	2	1
TOTAL				32	21	1	10	24

SEMESTER IV

S.NO.	COURSE CODE	COURSE TITLE	CATE GORY	CONTACT PERIODS	L	T	P	C
THEORY								
1	MA2254	Probability, Statistics and Numerical Methods	BS	4	3	1	0	4
2	CE2251	Applied Hydraulic Engineering	PC	3	3	0	0	3
3	CE2252	Concrete Technology	PC	3	3	0	0	3
4	CE2253	Environmental Engineering	PC	3	3	0	0	3
5	CE2254	Geotechnical Engineering – I	PC	3	3	0	0	3
6	CE2255	Strength of Materials	PC	4	3	1	0	4
7	GE2251	Quantitative Aptitude	EM	1	1	0	0	1
8	AUD110	Tamils and Technology	AU	1	1	0	0	0
PRACTICALS								
9	CE2256	Geotechnical Laboratory	PC	3	0	0	3	1
10	CE2257	Strength of Materials Laboratory	PC	3	0	0	3	1
11	EM2252	An Introduction to Advanced Reading and Writing	EM	2	0	0	2	1
TOTAL				30	20	2	8	24

Course Code	Course Name	L	T	P	C
GE2201	DESIGN THINKING	3	0	0	3

Category: Employability Enhancement Course

a. Preamble

This course introduces the various principles of design thinking to achieve an effective design and to examine the implementation of the model or process for its successful operation.

b. Course Outcome

After successful completion of the course, the students will be able to

CO. No.	Course Outcome	Knowledge Level
CO1	Describe the basic principles of design and various stages of design thinking for better conceiving of idea and refinement	K2
CO2	Elucidate the concepts of idea generation and refinement	K3
CO3	Apply various prototype models for solving complex problems	K3
CO4	Analyze real-time problems for effective design, implementation and operation	K3
CO5	Device idea/solution towards development of a prototype for a chosen problem of interest	K4

c. Course Syllabus

Total : 45 Periods

INTRODUCTION TO DESIGN THINKING

9

Introduction - Product life cycle – Design Ethics – Design Process – Stages in design thinking: Immersion, Analysis and synthesis, Ideation, Prototyping.

IDEA GENERATION AND REFINEMENT

9

Basic design - directions - Themes of thinking - Inspiration and references - Brainstorming - Value - Inclusion – Sketching - Presenting ideas - Thinking in images - Thinking in signs - Appropriation - Personification - Visual metaphors - Modification - Thinking in words – Words and language - Thinking in shapes - Thinking in proportions - Thinking in color - Outside the Box.

PROTOTYPING

9

Developing designs - Types of prototype - Prototyping for Designing Complex Systems – The Efficacy of Prototyping under Time Constraints.

IMPLEMENTATION

9

Format - Materials - Finishing - Media - Scale - Series/Continuity - Emerging Landscapes of Design - Real-Time Design Interaction Capture and Analysis - Enabling Efficient Collaboration in Digital Design - Spaces Across Time and Distance - Software used in Developing in Virtual Environments.

DESIGN THINKING IN VARIOUS SECTORS

9

. Design & Development of Prototypes for Wall Plastering, Rubber shredding, Separation of Corn seeds, Electric vehicles, Smart gates, Burglar alarm, Tyre pressure monitor, Development of Online Voting System, Online Proctoring System, Online Health Monitoring System, IoT based Home Automation and any other problem of interest in your domain.

d. Activities

Following activities shall be implemented to enhance the knowledge of design thinking in various streams of Engineering

- Brainstorming
- Themes of Thinking
- Seminar
- Prototype Making

e. Learning Resources

Text Books

1. Binder, T., De Michelis, G., Ehn, P., Jacucci, G., Linde, P., and Wagner, I., 2011. *Design things*, MIT press
2. Ambrose, G., and Harris, P., 2009. *Basics Design: Design thinking*, Bloomsbury Publishing

Reference Books

1. Meinel, C., and Leifer, L. (Eds.), 2011. *Understanding Innovation*, Springer.
2. Plattner, H., Meinel, C., and Leifer, L. (Eds.), 2010. *Design thinking: understand–improve–apply*, Springer Science & Business Media
3. Moran, T. P., and Carroll, J. M., 1996. *Design Rationale: Concepts, Techniques, and Use*, L. Erlbaum Associates Inc.
4. Cross, N., 1984. *Developments in Design Methodology*, Chichester: Wiley.

WEB RESOURCES:

1. <https://www.designsociety.org/download/publication/39626/Design+prototyping+of+systems>
2. <https://www.interaction-design.org/literature/article/5-stages-in-the-design-thinking-process>

VIDEO LECTURES :(NPTEL OR ANY OTHER VIDEO LECTURES)

1. <https://nptel.ac.in/courses/110/106/110106124/#>

Course Code	Course Name	L	T	P	C
EM2202	INTERPERSONAL SKILLS - LISTENING AND SPEAKING	0	0	2	1

Category: Employment Enhancement

a. Preamble

The Course will enable learners to:

- Equip students with the English language skills required for the successful undertaking of academic studies with primary emphasis on academic speaking and listening skills.
- Provide guidance and practice in basic general and classroom conversation and to engage in specific academic speaking activities.
- Improve general and academic listening skills
- Make effective presentations.

b. Course Outcome

After successful completion of the course, the students will be able to

CO. No.	Course Outcome	Knowledge Level
CO1	Develop their communicative competence in English with specific reference to listening	
CO2	Prepare conversation with reasonable accuracy	
CO3	Apply lexical Chunking for accuracy in speaking	
CO4	Demonstrate their ability to communicate effectively in GDs	
CO5	Explain directions and instructions in academic and business contexts	

c. Course Syllabus

Total : 30 Periods

LISTENING AS A KEY SKILL

6

Listening as a key skill- its importance- speaking – give personal information – ask for personal information – express ability – enquire about ability – ask for clarification - Improving pronunciation– pronunciation basics — stressing syllables and speaking clearly – intonation patterns – conversation starters: small talk

LISTEN TO A PROCESS INFORMATION

6

Listen to a process information- give information, as part of a simple explanation — taking lecture notes – preparing to listen to a lecture – articulate a complete idea as opposed to producing fragmented utterances - compare and contrast information and ideas from multiple sources- converse with reasonable accuracy over a wide range of everyday topics.

LEXICAL CHUNKING

6

Lexical chunking for accuracy and fluency- factors influence fluency, deliver a five-minute informal talk – greet – respond to greetings – describe health and symptoms – invite and offer – accept – decline – take leave – listen for and follow the gist- listen for detail

GROUP DISCUSSION

6

Being an active listener: giving verbal and non-verbal feedback – participating in a group discussion – summarizing academic readings and lectures conversational speech listening to and participating in conversations – persuade- negotiate disagreement in group work.

GROUP & PAIR PRESENTATIONS

6

Formal and informal talk – listen to follow and respond to explanations, directions and instructions in academic and business contexts – strategies for presentations and interactive communication – group/pair presentations

d. Activities

Students shall be taken to the Language lab for enhancing their listening and speaking skills.

e. Learning Resources

Text Books

1. Brooks, Margret, 2011, *Skills for Success. Listening and Speaking. Level 4*, Oxford University Press, Oxford.
2. Richards, C, Jack and David Bholke, 2010, *Speak Now Level 3*, Oxford University Press, Oxford.

Reference Books

1. Bhatnagar, Nitin and Mamta Bhatnagar, 2010, *Communicative English for Engineers and Professionals*, Pearson, New Delhi.
2. Hughes, Glyn and Josephine Moate, 2014, *Practical English Classroom*, Oxford University Press, Oxford.

3. Vargo, Mari, 2013, *Speak Now Level 4*, Oxford University Press, Oxford.
4. Richards, C, Jack, 2006, *Person to Person (Starter)*, Oxford University Press, Oxford.
5. Ladousse, Gillian Porter, 2014, *Role Play*. Oxford University Press, Oxford.

Web resources:

1. <https://www.cambridge.org/elt/blog/wp-content/uploads/2019/10/Learning-Language-in-Chunks.pdf>
2. <https://english.eagetutor.com/english/628-how-to-greet-your-boss-people-in-office.html>
3. <https://www.groupdiscussionideas.com/group-discussion-topics-with-answers/>
4. <https://www.bbc.co.uk/worldservice/learningenglish/business/talkingbusiness/unit3presentations/1opening.shtml>

Course Code	Course Name	L	T	P	C
GE2251	QUANTITATIVE APTITUDE	1	0	0	1

Category: Employability Enhancement Course

a. Preamble

To develop the thinking ability and problem solving skills of students to compete themselves in placement and competitive examinations.

b. Course Outcome

After successful completion of the course, the students will be able to

CO. No.	Course Outcome	Knowledge Level
CO1	Apply the concept of profit in real life problems	K3
CO2	Solve the problems by using proportion	K3
CO3	Compute accurate speed, time and distance	K3
CO4	Apply the concept of Time & Speed	K3
CO5	Calculate the work done based on various methods	K3

c. Course Syllabus

Total : 15 Periods

PROFIT AND LOSS

3

Profit and Loss - Cost Price, Selling Price, Profit and Loss %, Marked Price, Discount.

RATIO AND PROPORTION

3

Ratio and Proportion - Ratio, Proportion, Comparison of Ratios, Duplicate, TriPLICATE Ratio.

TIME, SPEED AND DISTANCE

3

Time, Speed and Distance - Concept of time, speed and distance, Conversion of units and proportionality, Average speed concept.

APPLICATIONS ON TIME, SPEED AND DISTANCE

3

Problems on trains - Relative speed concept and application. Boats and Streams - Upstream speed, Downstream speed, Speed of stream, Speed of boat.

TIME AND WORK

3

Time & work - Problems based on time and work, Formulae, Computation of work together, Wages based work problems. Pipes & Cisterns - Inlet-outlet, Part of tank filled, Time based problems.

d. Learning Resources

Text Book

1. Dinesh Khattar, *Quantitative Aptitude for Competitive Examinations*, Pearson India Education services Pvt Ltd, Fourth Edition, Uttar Pradesh, 2019.

Reference Books

1. TCY online, *Reasoning ability and Quantitative Aptitude*, Wiley India Pvt. Ltd, First Edition, New Delhi, 2016.
2. Agarwal.R.S, *Quantitative Aptitude for Competitive Examinations*, S.Chand Limited, 2011.
3. Abhijit Guha, *Quantitative Aptitude for Competitive Examinations*, Tata McGraw Hill, 3rd Edition, 2011

Course Code	Course Name	L	T	P	C
EM2252	AN INTRODUCTION TO ADVANCED READING AND WRITING	0	0	2	1

Category: Employment Enhancement

a. Preamble

- To strengthen the reading skills of students of engineering.
- To enhance their writing skills with specific reference to technical writing
- To develop their critical thinking skills.
- To provide more opportunities to develop their project and proposal writing skills

b. Course Outcome

After successful completion of the course, the students will be able to

CO. No.	Course Outcome	Knowledge Level
CO1	Understand how the text positions the reader	K3
CO2	Develop critical thinking while reading a text	K3
CO3	Develop a descriptive paragraph	K3
CO4	Make use of sentence structures effectively when creating an essay.	K3
CO5	Demonstrate proper usage of grammar in writing E-Mails, Job application and project proposals	K3

c. Course Syllabus

Total : 45 Periods

EFFECTIVE READING

6

Reading - Strategies for effective reading-Use glosses and footnotes to aid reading comprehension - Read and recognize different text types - Predicting content using photos and title. Reading - Read for details - Use of graphic organizers to review and aid comprehension.

CRITICAL READING

6

Reading - Understanding pronoun reference and use of connectors in a passage- speed reading techniques. Reading - Genre and Organization of Ideas- Reading - Critical reading and thinking- understanding how the text positions the reader.

PARAGRAPH WRITING

6

Writing-Plan before writing - Develop a paragraph: topic sentence, supporting sentences, concluding sentence.-Write a descriptive paragraph Writing-State reasons and examples to support ideas in writing - Write a paragraph with reasons and examples - Write an opinion paragraph

ESSAY WRITING

6

Writing - Elements of a good essay - Types of essays - descriptive-narrative- issue-based-argumentative-analytical.

EFFECTIVE WRITING

6

Writing - Email writing- visumes - Job application- Report Writing - Project writing-Writing convincing proposals

d.Activities

Students shall be exposed to various passages for reading and trained to write in different forms.

f. Learning Resources

Text Books

1. Gramer, F, Margot & Colin, S, Ward, 2011, *Reading and Writing (Level 3)* ,Oxford University Press, Oxford.
2. Debra Daise, CharlNorloff, and Paul Carne, 2011, *Reading and Writing (Level 4)* Oxford University Press: Oxford.

Reference Books

1. Davis, Jason & Rhonda LIss. 2006 *Effective Academic Writing (Level 3)* Oxford University Press: Oxford.
2. E. Suresh Kumar and et al. 2012, *Enriching Speaking and Writing Skills*, Second Edition, Orient Black swan: Hyderabad.
3. Withrow, Jeans and et al. 2004 *Inspired to Write. Readings and Tasks to develop writing skills*, Cambridge University Press: Cambridge.
4. Goatly, Andrew, 2000 *Critical Reading and Writing*, Routledge: United States of America.
5. Petelin, Roslyn & Marsh Durham, 2004 *The Professional Writing Guide: Knowing Well and Knowing Why*, Business & Professional Publishing: Australia.



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**B.E. COMPUTER SCIENCE AND ENGINEERING
REGULATION – 2020
AUTONOMOUS SYLLABUS
CHOICE BASED CREDIT SYSTEM
VII TO VIII SEMESTER CURRICULUM AND SYLLABI**

VISION:

To make the Department of Computer Science and Engineering the unique of its kind in the field of Research and Development activities in this part of world.

MISSION:

To impart highly innovative and technical knowledge to the urban and unreachable rural student folks in Computer Science and Engineering through "Total Quality Education".

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

- PEO 1:** Apply the necessary mathematical tools and fundamental knowledge of computer science & engineering to solve variety of engineering problems.
- PEO 2:** Develop software based solutions for real life problems and be leaders in their profession with social and ethical responsibilities.
- PEO 3:** Pursue life-long learning and research in selected fields of computer science & engineering and contribute to the growth of those fields and society at large.

PROGRAM OUTCOMES:

After going through the four years of study, the Computer Science and Engineering graduates will have the ability to

POs	Graduate Attribute	Programme Outcome
1	Engineering knowledge	Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2	Problem analysis	Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, 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 modeling to complex engineering activities with an understanding of the limitations
6	The engineer and society	Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice

7	Environment and sustainability	Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8	Ethics	Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9	Individual and team work	Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10	Communication	Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write 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.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO1 : Professional Skills: The ability to understand, analyze and develop computer programs in the areas related to algorithms, system software, multimedia, web design, big data analytics, and networking for efficient design of computer-based systems of varying complexity.

PSO2 : Problem - Solving Skills: The ability to apply standard practices and strategies in software project development using open-ended programming environments to deliver a quality product for business success.

SEMESTER VII

S. NO.	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
THEORY								
1	CS1771	Cloud Computing	PC	3	3	0	0	3
2	IT1671	Cryptography and Network Security	PC	3	3	0	0	3
3	GE1671	Total Quality Management	HS	3	3	0	0	3
4	PE5	Professional Elective V	PE	3	3	0	0	3
5	PE6	Professional Elective VI	PE	3	3	0	0	3
6	OE2	Open Elective – II*	OE	3	3	0	0	3
		Online Course**						
PRACTICALS								
7	IT1681	Cryptography and Network Security Laboratory	PC	4	0	0	4	2
8	CS1781	Cloud Computing laboratory	PC	4	0	0	4	2
9	CS1721	Capstone Project	EEC	4	0	0	4	2
TOTAL				30	18	0	12	24

SEMESTER VIII

S.NO.	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
THEORY								
1	OL2	Online Course – II**	OL	0	0	0	0	3
PRACTICALS								
2	CS1821	Project work	EEC	16	0	0	16	8
TOTAL				16	0	0	16	11

* Course from the Curriculum of other UG programmes.

** Students shall complete online course in this semester. Credits earned will be added in consolidated mark statement.

L	T	P	C
0	0	16	8

OBJECTIVES:

To enable the students to

- Develop the ability to solve a specific problem right from its identification and literature review till the successful solution of the same
- Train the students in preparing project reports and to face reviews and viva voce examination

The students in a group of 3 to 4 works on a topic approved by the Head of the Department under the guidance of a faculty member and prepares a comprehensive project report after completing the work to the satisfaction of the supervisor. The progress of the project is evaluated based on a minimum of three reviews. The review committee may be constituted by the Head of the Department. A project report is required at the end of the semester. The project work is evaluated based on oral presentation and the project report jointly by external and internal examiners constituted by the Head of the Department.

TOTAL: 240 PERIODS

OUTCOMES

- CO1:** Identify challenging engineering problems/Societal needs to propose project-based solutions
- CO2:** Build critical-thinking and analytical decision-making capabilities to find solution by formulating proper methodology
- CO3:** Analyze various algorithmic strategies using technological tools to provide software solutions
- CO4:** Develop solutions to identified problems
- CO5:** Complete an independent project, resulting in at least a publication in reputed journals or conference proceedings



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B.E. COMPUTER SCIENCE AND ENGINEERING

REGULATION – 2021

AUTONOMOUS SYLLABUS

CHOICE BASED CREDIT SYSTEM

V TO VI SEMESTER CURRICULUM AND SYLLABI

VISION:

To make the Department of Computer Science and Engineering the unique of its kind in the field of Research and Development activities in this part of world.

MISSION:

To impart highly innovative and technical knowledge to the urban and unreachable rural student folks in Computer Science and Engineering through "Total Quality Education".

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

- PEO 1:** Apply the necessary mathematical tools and fundamental knowledge of computer science & engineering to solve variety of engineering problems.
- PEO 2:** Develop software based solutions for real life problems and be leaders in their profession with social and ethical responsibilities.
- PEO 3:** Pursue life-long learning and research in selected fields of computer science & engineering and contribute to the growth of those fields and society at large.

PROGRAM OUTCOMES:

After going through the four years of study, the Computer Science and Engineering graduates will have the ability to

POs	Graduate Attribute	Programme Outcome
1	Engineering knowledge	Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2	Problem analysis	Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, 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 modeling to complex engineering activities with an understanding of the limitations
6	The engineer and society	Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice

7	Environment and sustainability	Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8	Ethics	Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9	Individual and team work	Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10	Communication	Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write 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.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO1 : Professional Skills: The ability to understand, analyze and develop computer programs in the areas related to algorithms, system software, multimedia, web design, big data analytics, and networking for efficient design of computer-based systems of varying complexity.

PSO2 : Problem - Solving Skills: The ability to apply standard practices and strategies in software project development using open-ended programming environments to deliver a quality product for business success.

REGULATION - 2021

CHOICE BASED CREDIT SYSTEM

B.E. COMPUTER SCIENCE AND ENGINEERING

CURRICULUM AND SYLLABI FOR SEMESTER V TO VI

SEMESTER V

S.NO.	COURSE CODE	COURSE TITLE	CATE GORY	CONTACT PERIODS	L	T	P	C
THEORY								
1	CS2301	Internet Programming	PC	3	3	0	0	3
2	CS2302	Introduction to Internet of Things	PC	3	3	0	0	3
3	CS2303	Machine Learning Techniques [#]	PC	4	2	0	2	3
4	CS2304	Networking Essentials	PC	3	3	0	0	3
5		Professional Elective I	PE	-	-	-	-	3
6		Professional Elective II	PE	-	-	-	-	3
PRACTICALS								
7	CS2305	Computer Networks Laboratory	PC	4	0	0	4	2
8	CS2306	Internet of Things Laboratory	PC	4	0	0	4	2
9	CS2307	Internet Programming Laboratory	PC	4	0	0	4	2
10	EM2301	Internship**	EM	0	0	0	0	1
TOTAL				-	-	-	-	25

Theory cum Laboratory Course

**** Credits earned by the students through Internship will be given in the final consolidated mark statement.**

SEMESTER VI

S.NO.	COURSE CODE	COURSE TITLE	CATE GORY	CONTACT PERIODS	L	T	P	C
THEORY								
1	CS2351	Theory of Computation and Compiler Design	PC	3	3	0	0	3
2		Professional Elective III	PE	-	-	-	-	3
3		Professional Elective IV	PE	-	-	-	-	3
4		Professional Elective V	PE	-	-	-	-	3
5		Professional Elective VI	PE	-	-	-	-	3
6		Open Elective – I*	OE	3	3	0	0	3
PRACTICALS								
7	CS2352	Mini project	EEC	3	0	0	3	1
8	EM2351	Professional Communication	EM	2	0	0	2	1
TOTAL				-	-	-	-	20

*** Open Elective Shall be chosen from the list of open electives offered by other Programmes**

Course Code	Course Name	L	T	P	C
CS2352	MINI PROJECT	0	0	3	1

Category: Employability Enhancement Course

a. Preamble

This course develops the ability to solve a specific problem right from its identification and literature review till the successful solution of the same. It is used to train the students in preparing project reports and to face reviews and viva voce examination.

b. Course Outcome

After successful completion of the course, the students will be able to

CO. No.	Course Outcome	Knowledge Level
CO1	Identify challenging engineering problems/Societal needs to propose project-based solutions	K3
CO2	Build critical-thinking and analytical decision-making capabilities to find solution by formulating proper methodology	K3
CO3	Analyze various algorithmic strategies using technological tools to provide software solutions	K4
CO4	Develop solutions to identified problems	K3
CO5	Build an independent project, resulting in at least a publication in reputed journals or conference proceedings	K3

TOTAL: 45 PERIODS

The students will be working in single or group of 3 to 4 on a scientific problem approved by the Head of the Department under the guidance of the faculty member and prepare a comprehensive report after completing the work to the satisfaction of the supervisor. The progress of the project is evaluated based on a minimum of three reviews. The review committee may be constituted by the Head of the Department. A project report is required at the end of the semester. The project work is evaluated based on project evaluation process as recommended in the respective regulation.

The student can also be permitted to work on the project in Industry/Research organization with the due permission from Head of the Department. The Engineer/Scientist from Industry/Research Organization can jointly act as supervisor in addition to the Project Supervisor. The student should undergo project evaluation process as recommended in the respective regulation.

Course Code	Course Name	L	T	P	C
EM2351	PROFESSIONAL COMMUNICATION	0	0	2	1

Category: Employability Enhancement Courses

a. Preamble

The course aims to:

- Enhance the Employability and Career Skills of students.
- Orient the students towards grooming as a professional.
- Make them Employable Graduates.
- Develop their confidence and help them attend interviews successfully.

b. Course Outcome

After successful completion of the course, the students will be able to

CO. No.	Course Outcome	Knowledge Level
CO1	Apply hard and soft skills to enhance their employability	K3
CO2	Utilize adequate presentation skills to present a PPT	K3
CO3	Demonstrate the proper usage of grammar in GD	K3
CO4	Make use of the acquired skills while attending interviews	K3
CO5	Develop adequate Soft Skills required for the workplace	K3

c. Course Syllabus

Total : 30 Periods

SOFT SKILLS

6

Introduction to Soft Skills– Hard skills & soft skills – employability and career Skills— Grooming as a professional with values—Time Management—General awareness of Current Affairs.

EFFECTIVE PRESENTATIONS

6

Self-Introduction-organizing the material – Introducing oneself to the audience – introducing the topic – answering questions – individual presentation practice— presenting the visuals effectively – 5 minute presentations.

GROUP DISCUSSION **6**

Introduction to Group Discussion— Participating in group discussions – understanding group dynamics – brainstorming the topic – questioning and clarifying –GD strategies-activities to improve GD skills.

INTERVIEW ETIQUETTE **6**

Interview etiquette – dress code – body language – attending job interviews– telephone/skype interview -one to one interview &panel interview – FAQs related to job interviews.

CAREER PLAN **6**

Recognizing differences between groups and teams- managing time-managing stress-networking professionally- respecting social protocols-understanding career management-developing a long-term career plan-making career changes.

d. Activities

Students shall be trained in Individual Presentation, Group Discussion and Mock Interview.

e. Learning Resources

Reference Books

1. Butterfield and Jeff, *Soft Skills for Everyone*, Cengage Learning: New Delhi, 2015.
2. Suresh Kumar E, *Communication for Professional Success*, Orient Blackswan: Hyderabad, 2015.
3. *Interact English Lab Manual for Undergraduate Students*, Orient BlackSwan: Hyderabad, 2016.
4. Raman, Meenakshi and Sangeeta Sharma, *Professional Communication*, Oxford University Press: Oxford, 2014.
5. Hariharan S, *Soft Skills*, MJP Publishers: Chennai, 2010.



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**B.E. ELECTRICAL AND ELECTRONICS ENGINEERING
REGULATION – 2020
AUTONOMOUS SYLLABUS
CHOICE BASED CREDIT SYSTEM
VII TO VIII SEMESTER CURRICULUM AND SYLLABI**

VISION:

To make the Department of Electrical and Electronics Engineering of this Institution the unique of its kind in the field of Research and Development activities in this part of the world.

MISSION:

Department of Electrical and Electronics Engineering is committed to impart highly innovative and technical knowledge in the field of Electrical and Electronics Engineering to the urban and unreachable rural student folks through Total Quality Education

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

PEO 1: Technical Knowledge: To provide basic knowledge in Physics, Chemistry, Mathematics and necessary foundation in various concepts of Electrical and Electronics Engineering

PEO 2: Problem Solving: To impart training to enable the students to envisage the real time problems related to the field of Electrical and Electronics Engineering and allied areas faced by the Industries so as to model, analyze and provide appropriate solutions.

PEO 3: Personality Development: To provide an academic environment for the students to develop team spirit, leadership qualities, communication skills and soft skills.

PEO 4: Life Long Learning: To motivate students to prepare for competitive examinations enabling them to pursue higher studies, thereby, promoting Research and Development activities.

PROGRAM OUTCOMES:

After going through the four years of study, the Electrical and Electronics Engineering graduates will have the ability to

POs	Graduate Attribute	Programme Outcome
1	Engineering knowledge	Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2	Problem analysis	Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, 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 modeling to complex engineering activities with an understanding of the limitations
6	The engineer and society	Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
7	Environment and sustainability	Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8	Ethics	Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9	Individual and team work	Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10	Communication	Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write 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.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO1 : Ability to design and solve engineering problems by applying the fundamental knowledge of Engineering Mathematics, Basic Sciences, Electrical and Electronics Engineering.

PSO2 : Ability to understand the recent technological developments in Electrical & Electronics Engineering and develop products / software to cater the Societal & Industrial needs.

SEMESTER VII

S.NO.	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
THEORY								
1	EE1701	Power Systems Operation and Control	PC	3	3	0	0	3
2	GE1471	Professional Ethics and Human Values	HS	3	3	0	0	3
3	GE1771	Principles of Management	HS	3	3	0	0	3
4		Professional Elective III	PE	3	3	0	0	3
5		Professional Elective IV	PE	3	3	0	0	3
6		Open Elective II*	OE	3	3	0	0	3
7		Online Course II**	OL	3	3	0	0	3
PRACTICALS								
8	EE1711	Power System Simulation Laboratory	PC	4	0	0	4	2
9	EE1721	Mini Project	EEC	4	0	0	4	2
TOTAL				26	18	0	8	22

SEMESTER VIII

S.NO.	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
THEORY								
1		Online Course II**	OL					
PRACTICALS								
2	EE1821	Project Work	EEC	16	0	0	16	8
TOTAL				19	3	0	16	11

* Course from the Curriculum of other UG programmes.

**The students shall complete the online course from 5th semester and credits would be added in consolidated mark sheet.

EE1721

MINI PROJECT

L	T	P	C
0	0	4	2

OBJECTIVES:

- To develop their own innovative prototype of ideas.
- To train the students in preparing mini project reports and examination.

The students in a group of 3 to 4 works on a topic approved by the head of the department and prepares a comprehensive mini project report after completing the work to the satisfaction. The progress of the project is evaluated based on a minimum of two reviews. The review committee may be constituted by the Head of the Department. A mini project report is required at the end of the semester. The mini project work is evaluated based on oral presentation and the mini project report jointly by external and internal examiners constituted by the Head of the Department.

TOTAL: 60 PERIODS

OUTCOMES:

CO1: Identify a potential problem based on literature survey and real time needs.

CO2: Categorize various solution methodologies to solve problem taken for study.

CO3: Design and develop solution for the proposed problem.

CO4: Infer the experimental results based on hardware & software implementation.

CO5: Analyse the results with the existing solutions.

EE1821

PROJECT WORK

L	T	P	C
0	0	16	8

OBJECTIVES:

- To develop the ability to solve a specific problem right from its identification and literature review till the successful solution of the same. To train the students in preparing project reports and to face reviews and viva voce examination

The students in a group of 3 to 4 works on a topic approved by the head of the department under the guidance of a faculty member and prepares a comprehensive project report after completing the work to the satisfaction of the supervisor. The progress of the project is evaluated based on a minimum of three reviews. The review committee may be constituted by the Head of the Department. A project report is required at the end of the semester. The project work is evaluated based on oral presentation and the project report jointly by external and internal examiners constituted by the Head of the Department.

TOTAL: 240 PERIODS

OUTCOMES:

- CO1:** Identifying a potential problem based on literature survey impending industrial/real time needs.
- CO2:** Categorizing various solution methodologies to solve problem taken for study.
- CO3:** Design engineering solutions to complex problems utilising a systematic approach.
- CO4:** Analyze design/experimental results based on hardware & software implementation.
- CO5:** Draw conclusion based on analysis and prepare a detailed technical report



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REGULATIONS - 2021
CHOICE BASED CREDIT SYSTEM
B.E. ELECTRICAL AND ELECTRONICS ENGINEERING
CURRICULUM AND SYLLABI FOR SEMESTER III TO IV
SEMESTER III

S.NO.	COURSE CODE	COURSE TITLE	CATE GORY	CONTACT PERIODS	L	T	P	C
THEORY								
1	MA2202	Transforms and Numerical solution of equations	BS	4	3	1	0	4
2	EE2202	Circuit Theory	PC	4	3	1	0	4
3	EE2203	Electronic Devices and Circuits	ES	3	3	0	0	3
4	EE2204	Measurements and Instrumentation	PC	3	3	0	0	3
5	EE2205	Transmission and Distribution	PC	3	3	0	0	3
6	GE2201	Design Thinking	ES	3	3	0	0	3
7		Audit Course	AU	3	3	0	0	0
PRACTICALS								
8	EE2206	Electric Circuits Laboratory	PC	4	0	0	4	2
9	EE2207	Electronic Devices and Circuits Laboratory	ES	4	0	0	4	2
10	EM2201	Practical Course on Electronic Product Development	EM	2	0	0	2	1
TOTAL				33	21	2	10	25

Course Code	Course Name	L	T	P	C
EM2201	PRACTICAL COURSE ON ELECTRONIC PRODUCT DEVELOPMENT	0	0	2	1

Category: Employability Enhancement Course

a. Preamble

All the electrical and electronics engineers should have knowledge in PCB Design, Layout and printing. This course will give practical exposure to the students in the operation of PCB Machine, Arduino Controller & Various Sensors.

b. Course Outcome

After successful completion of the course, the students will be able to

CO. No.	Course Outcome	Knowledge Level
CO1	Understand and develop the basic PCB design	K3
CO2	Develop basic PCB design in the PCB Board by using manual and using PCB machine.	K3
CO3	Model and analyze Arduino Controller and their application to Real time	K3
CO4	Implement the simple applications using Sensors.	K3
CO5	Implement simple applications for controlling PWM pulses	K3

c. Course Syllabus

Total: 30 Periods

Design and Development of:

1. PCB Board for 5V DC Power Supply - using Manual method
2. PCB Board for 5V DC Power Supply - using PCB Machine
3. Product for water level indication
4. Product for protect the motor/electrical equipment
5. 12V DC – 12V AC Square Wave Inverter
6. 12V DC Step Down DC Chopper

d. Activities

Students will develop electronic products.

e. Learning Resources

i. REFERENCE BOOKS

1. Archambeault, B.R. and Drewniak, J., 2013. *PCB design for real-world EMI control* (Vol. 696). Springer Science & Business Media.
2. Norris, D., 2015. *The Internet of things: do-it-yourself projects with Arduino, Raspberry Pi, and BeagleBone Black*. McGraw-Hill Education TAB.
3. Fraden, J. and Fraden, J., 2004. *Handbook of modern sensors: physics, designs, and applications* (Vol. 3). New York, NY, USA: springer.

SEMESTER VI

S.NO.	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
THEORY								
1.	EE2351	Power Electronics	PC	3	3	0	0	3
2.	EE2352	Power System Operation and Control	PC	3	3	0	0	3
3.		Professional Elective IV	PE	3	3	0	0	3
4.		Professional Elective V	PE	3	3	0	0	3
5.		Professional Elective VI	PE	3	3	0	0	3
6.		Open Elective I	OE	4	2	0	2	3
PRACTICAL								
7.	EE2353	Mini Project	EM	3	0	0	3	1
8.	EE2354	Power Electronics Laboratory	PC	4	0	0	4	2
9.	EE2355	Power System Simulation Laboratory	PC	4	0	0	4	2
TOTAL				30	17	0	13	23

Course Code	Course Name	L	T	P	C
EE2353	MINI PROJECT	0	0	3	1
Category: Employability Enhancement Course					
a. Preamble					
The main objective is to give an opportunity to the student to gain valuable insights, foster creativity, acquire technical skills and share knowledge by effective collaboration. This endeavor serves as a platform for as to explore, create and learn.					
b. Course Outcome					
After successful completion of the course, the students will be able to					
CO. No.	Course Outcome	Knowledge Level			
CO1	Identify a potential problem based on literature survey and real time needs.	K3			
CO2	Categorize various solution methodologies to solve problem taken for study.	K3			
CO3	Design and develop solution for the proposed problem.	K3			
CO4	Infer the experimental results based on hardware & software implementation.	K3			
CO5	Analyze the results with the existing solutions.	K3			
c. Guideline for Review and Evaluation					Total: 45 Periods
The students will be working in single or group of 3 to 4 on a scientific problem approved by the Head of the Department under the guidance of the faculty member and prepare a comprehensive report after completing the work to the satisfaction of the supervisor. The progress of the project is evaluated based on a minimum of three reviews. The review committee may be constituted by the Head of the Department. A project report is required at the end of the semester. The project work is evaluated based on project evaluation process as recommended in the respective regulation.					



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**B.E. ELECTRONICS AND COMMUNICATION ENGINEERING
REGULATION – 2020
AUTONOMOUS SYLLABUS
CHOICE BASED CREDIT SYSTEM
VII TO VIII SEMESTER CURRICULUM AND SYLLABI**

VISION:

To make the Department of Electronics and Communication Engineering of this Institution the unique of its kind in the field of Research and Development activities in this part of world.

MISSION:

To impart highly innovative and technical knowledge in the field of Electronics and Communication Engineering to the urban and unreachable rural student folks through Total Quality Education.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

- PEO 1:** To establish a strong foundation in Electronics and Communication Engineering necessary to formulate, model, analyze and solve real time problems.
- PEO 2:** To inculcate professional skills and life skills for placement or to pursue higher studies in the relevant fields.
- PEO 3:** To promote research and development activities and solve industrial problems with creative ideas.

PROGRAM OUTCOMES:

After going through the four years of study, the Electronics and Communication Engineering graduates will have the ability to

POs	Graduate Attribute	Programme Outcome
1	Engineering knowledge	Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2	Problem analysis	Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, 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 modeling to complex engineering activities with an understanding of the limitations
6	The engineer and society	Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice

7	Environment and sustainability	Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8	Ethics	Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9	Individual and team work	Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10	Communication	Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write 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.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1 : Ability to make use of attained technical knowledge in the field of Electronics and Communication Engineering for successful career and qualifying in competitive examinations at the national level.

PSO 2 : Ability to develop workable solutions for real time challenges in Electronics and Communication Engineering.

SEMESTER VII

S.NO.	COURSE CODE	COURSE TITLE	CATE GORY	CONTACT PERIODS	L	T	P	C
THEORY								
1	EC1701	Embedded and Real Time Systems [#]	PC	5	3	0	2	4
2	EC1702	Optical Communication	PC	3	3	0	0	3
3	GE1771	Principles of Management	HS	3	3	0	0	3
4		Professional Elective – III	PE	3	3	0	0	3
5		Professional Elective – IV	PE	3	3	0	0	3
6		Open Elective – II*	OE	3	3	0	0	3
PRACTICALS								
7	EC1711	Advanced Communication Laboratory	PC	4	0	0	4	2
TOTAL				24	18	0	6	21

*Course from the Curriculum of other UG programmes.

[#]Theory cum Laboratory Course

SEMESTER VIII

S.NO.	COURSE CODE	COURSE TITLE	CATE GORY	CONTACT PERIODS	L	T	P	C
THEORY								
1		Online Course – II	OL	3	3	0	0	3
PRACTICALS								
2	EC1821	Project Work	EEC	16	0	0	16	8
TOTAL				19	3	0	16	11

L	T	P	C
0	0	16	8

OBJECTIVES:

- To impart required knowledge related to the project.
- To analyze the realtime problem with an indepth study from available literature in the selected domain.
- To understand the methodology used to solve the problem.
- To apply the engineering knowledge in the project domain.
- To discuss results with experimental outputs of hardware/ software implementation.

The Students in a group of 3 or 4 works on a topic approved by the Head of the Department under the guidance of a faculty member and prepares a comprehensive project report after completing the work to the satisfaction of the supervisor. The review progress of the project is evaluated based on a minimum of three reviews. The review committee may be constituted by the Head of the Department. A project report is required at the end of the semester. The project work is evaluated based on oral presentation and the project report jointly by external and internal examiners constituted by the Head of the Department.

TOTAL: 240 PERIODS

OUTCOMES

- CO1:** Identify a potential problem based on literature Survey/impending industrial/real time needs.
- CO2:** Categorize various solution methodologies to solve Problem taken for study.
- CO3:** Design and develop proposed solution relevant to the Problem.
- CO4:** Analyze design/experimental results based on hardware & software implementation.
- CO5:** Analyze and recommend solution to potential engineering problems based on results and conclusion.



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S.P.G.Chidambara Nadar - C.Nagammal Campus

S.P.G.C. Nagar, K.Vellakulam – 625 701 (Near VIRUDHUNAGAR).

B.E. ELECTRONICS AND INSTRUMENTATION ENGINEERING

Regulation - 2020

AUTONOMOUS SYLLABUS

CHOICE BASED CREDIT SYSTEM (CBCS)

VII TO VIII SEMESTER CURRICULUM AND SYLLABI

VISION:

To develop competent Electronics and Instrumentation Engineers with Societal, Environmental and Human Values through Quality Education, Training and Research.

MISSION:

Department of Electronics and Instrumentation Engineering is committed to

1. Impart technical knowledge and skills to meet the industry needs.
2. Build self-learning capability among the students to update the recent technology.
3. Tie up with the industries and research institution.
4. Create passion for serving the society with moral and ethical values.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

Graduates of the programme will be able to

PEO 1: Work in the Design, Automation, Testing and Software Industries.

PEO 2: Pursue higher studies and research in the field of Process Control, Biomedical, Robotics & Automation and Renewable Energy Resources.

PEO 3: Be an Entrepreneur by building leadership quality and teamwork

PROGRAM OUTCOMES:

After going through the four years of study, the Electronics and Instrumentation Engineering graduates will have the ability to

POs	Graduate Attribute	Programme Outcome
1	Engineering knowledge	Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems
2	Problem analysis	Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, 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 modeling to complex engineering activities with an understanding of the limitations

6	The engineer and society	Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
7	Environment and sustainability	Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8	Ethics	Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9	Individual and team work	Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings
10	Communication	Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write 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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO1 : Design and develop mathematical model for transducer, process control system.

PSO2 : Select and use appropriate hardware circuit and software tools to control industrial and automation process.

SEMESTER VII

S.NO.	COURSE CODE	COURSE TITLE	CATE GORY	CONTACT PERIODS	L	T	P	C
THEORY								
1	GE1771	Principles of Management	FC	3	3	0	0	3
2	GE1471	Professional Ethics and Human Values	FC	3	3	0	0	3
3	EI1701	Logic and Distributed Control System	PC	3	3	0	0	3
4		Professional Elective –V	PE	3	3	0	0	3
5		Professional Elective -VI	PE	3	3	0	0	3
6		Open Elective –II*	OE	3	3	0	0	3
7		Online Course	OL	3				3
PRACTICALS								
7	EI1711	Industrial Automation Laboratory	PC	4	0	0	4	2
8	EI1721	Mini Project	EEC	4	0	0	4	2
TOTAL				26	18	0	08	25

SEMESTER VIII

S.NO.	COURSE CODE	COURSE TITLE	CATE GORY	CONTACT PERIODS	L	T	P	C
PRACTICALS								
1	EI1821	Project Work	EEC	16	0	0	16	8
TOTAL				16	0	0	16	8

* Course from the Curriculum of other UG Programmes.

LIST OF EQUIPMENT FOR A BATCH OF 30 STUDENTS:

Hardware :

- 1) PLC Panel board with power supply. – 6 No's
 - a. Siemens (SIMANTIC S7 200) PLC
 - b. Allen Bradley (Micro Logix 1200) PLC
 - c. Delta (DVP – SS Series) PLC
- 2) Process Control Station
- 3) ½ HP AC motor
- 4) VFD to control ½ HP AC motor
- 5) Traffic Light Controller – 2 NO's
- 6) DC Motor – 2 No's
- 7) Personal Computer – 10No's
- 8) Smart Transmitter – 1 No.

Software :

- 1) Siemens/ Allen Bradley/ Delta PLC Software
- 2) Open Source SCADA software such as Free SCADA, Open SCADA, Idigo SCADA CodeSys open source for PLC Programming and interfacing with real time PLC.

EI1721

MINI PROJECT

L	T	P	C
0	0	4	2

OBJECTIVES:

- To develop their own innovative prototype of ideas.
- To train the students in preparing mini project reports and examination.

The student in a group of 5 to 6 works on a topic approved by the head of the department and prepares a comprehensive mini project report after completing the work to the satisfaction. The progress of the project is evaluated based on a minimum of two reviews. The review committee may be constituted by the Head of the Department. A mini project report is required at the end of the semester. The mini

project work is evaluated based on oral presentation and the mini project report jointly by external and internal examiners constituted by the Head of the Department.

TOTAL: 60 PERIODS

OUTCOMES:

- CO1:** A position to take up their final year project work and find solution by formulating proper methodology.
- CO2:** To use the knowledge acquired in various subjects of Electronics and Instrumentation Engineering and carry out Mini Project. This will motivate students to come up with new designs, Fabrication, Developing algorithms and software programs expressing their ideas in a novel way.
- CO3:** Learn methodology to select a good project and able to work in a team leading to development of hardware/software product.
- CO4:** Prepare a good technical report.
- CO5:** Gain Motivation to present the ideas behind the project with clarity.

EI1821

PROJECT WORK

L	T	P	C
0	0	16	8

OBJECTIVES:

- To develop the ability to solve a specific problem right from its identification and literature review till the successful solution of the same.
- To train the students in preparing project reports and to face reviews and viva voce examination

The student in a group of 3 to 4 works on a topic approved by the head of the department under the guidance of a faculty member and prepares a comprehensive project report after completing the work to the satisfaction of the supervisor. The progress of the project is evaluated based on a minimum of three reviews. The review committee may be constituted by the Head of the Department. A project report is required at the end of the semester. The project work is evaluated based on oral

presentation and the project report jointly by external and internal examiners constituted by the Head of the Department.

TOTAL: 240 PERIODS

OUTCOMES:

- CO1:** Define, formulate and analyze a problem.
- CO2:** select a good project and able to work in a team leading to development of hardware/software product
- CO3:** Manage a project from start to finish
- CO4:** prepare a good technical report and able to present the ideas with clarity
- CO5:** Gain knowledge of the Innovation & Product Development process

EI1731

IMAGE PROCESSING

L	T	P	C
3	0	0	3

OBJECTIVES:

- To study the formation of an image and its acquisition.
- To introduce the application of transforms in image processing.
- To study techniques for improving quality of information in images.
- To get familiarized with image and video processing techniques.
- To apply image and video processing in industrial applications.

UNIT I DIGITAL IMAGE FUNDAMENTALS 9

Elements of digital image processing systems – Digital Image Representation - Elements of visual perception – Image acquisition - Image sampling and Quantization – Image geometry – Discrete Image Transforms- Properties- Color image fundamentals:- RGB, HSI models.

UNIT II IMAGE PREPROCESSING AND ENHANCEMENT 9

Point processing methods: Contrast stretching – Gray level slicing- Histograms, Histogram equalization and specification techniques, Spatial filtering, Directional Smoothing, Median, Geometric mean, and Harmonic mean filters - Color image enhancement.



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**B.E. MECHANICAL ENGINEERING
REGULATION – 2020
AUTONOMOUS SYLLABUS
CHOICE BASED CREDIT SYSTEM
VII TO VIII SEMESTER CURRICULUM AND SYLLABI**

VISION:

To make the Department of Mechanical Engineering the unique of its kind in the field of Research and Development activities in the prominent field of Mechanical Engineering in this part of the world.

MISSION:

To impart highly innovative and technical knowledge in the field of Mechanical Engineering to the urban and unreachable rural student folks through “Total Quality Education”.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

- PEO 1:** Graduates of the Programme will excel in Technical knowledge and apply Innovative skills in the field of Mechanical Engineering.
- PEO 2:** Graduates will contribute to the Technological Development and Research Activities through “Total Quality Education”.
- PEO 3:** Graduates of the Programme will accomplish the Leadership Qualities and Social Responsibilities through “Life Long Learning”.

PROGRAM OUTCOMES:

After going through the four years of study, the Mechanical Engineering graduates will have the ability to

POs	Graduate Attribute	Programme Outcome
1	Engineering knowledge	Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2	Problem analysis	Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, 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 modeling to complex engineering activities with an understanding of the limitations.
6	The engineer and society	Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7	Environment and sustainability	Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8	Ethics	Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9	Individual and team work	Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10	Communication	Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write 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.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO1 : Graduates will be able to create and analyze the Research and Development activities related to Design and Manufacturing.

PSO2 : Graduates will be able to Design, Develop need based products in Mechanical Engineering and Allied Industries.

SEMESTER VII

S.NO.	COURSE CODE	COURSE TITLE	CATE GORY	CONTA CT PERIODS	L	T	P	C
THEORY								
1	ME1701	Principles of Industrial Engineering	PC	3	3	0	0	3
2	ME1702	Robotics	PC	3	3	0	0	3
3		Open Elective – II*	OE	3	3	0	0	3
4		Professional Elective – III	PE	3	3	0	0	3
5		Professional Elective – IV	PE	3	3	0	0	3
6		Professional Elective – V	PE	3	3	0	0	3
7		Online Course – 2**	OL	0	0	0	0	3
PRACTICALS								
8	ME1711	Automation & IOT Laboratory	PC	4	0	0	4	2
9	ME1721	Technical Seminar	EEC	2	0	0	2	1
TOTAL				24	18	0	6	24

SEMESTER VIII

S.NO.	COURSE CODE	COURSE TITLE	CATE GORY	CONTACT PERIODS	L	T	P	C
PRACTICALS								
1	ME1821	Project Work	EEC	20	0	0	20	10
2		Online Course – 2**						
TOTAL				20	0	0	20	10

* Course from the Curriculum of other UG Programme.

**The students shall complete the online course in this semester and credits would be added in consolidated mark sheet.

PROFESSIONAL ELECTIVES (PEs)

PROFESSIONAL ELECTIVE III (SEMESTER VII)

S.NO.	COURSE CODE	COURSE TITLE	CATE GORY	CONTACT PERIODS	L	T	P	C
1	ME1731	Concepts of Engineering Design	PE	3	3	0	0	3
2	ME1732	Mechatronics and IoT	PE	3	3	0	0	3
3	ME1733	Product Design using Value Engineering	PE	3	3	0	0	3
4	ME1734	Solar Energy Technology	PE	3	3	0	0	3
5	ME1735	Waste management and energy recovery	PE	3	3	0	0	3

ME1721

TECHNICAL SEMINAR

L	T	P	C
0	0	2	1

To enrich the communication skills of the student and presentations of technical topics of interest, this course is introduced. In this course, a student has to present three Technical papers or recent advances in engineering/technology that will be evaluated by a Committee constituted by the Head of the Department.

TOTAL: 30 PERIODS

OUTCOMES

- CO 1 :** Demonstrate the technical contents of Design and manufacturing oriented topics for identifying recent studies on the specified area.
- CO 2 :** Discuss the current energy scenario in all aspects and its remedies.
- CO 3 :** Develop managerial skills by adopting team coordination, communication and proper execution.
- CO 4 :** Executing statistical data analysis on the assigned technical contents.
- CO 5 :** Use of modern tools on technical content preparation and delivery.

ME1821

PROJECT WORK

L	T	P	C
0	0	20	10

OBJECTIVES:

- To develop the ability to solve a specific problem right from its identification and literature review till the successful solution of the same. To train the students in preparing project reports and to face reviews and viva voce examination.

Project reports and to face reviews and viva voce examination. The students in a group of 3 to 4 works on a topic approved by the head of the department under the guidance of a faculty member and prepares a comprehensive project report after completing the work to the satisfaction of the supervisor. The progress of the project is evaluated based on a minimum of three reviews. The review committee may be constituted by the Head of the Department. A project report is required at the end of the semester. The project work is evaluated based on oral presentation and the project report jointly by external and internal examiners constituted by the Head of the Department.

TOTAL: 300 PERIODS

OUTCOMES

- CO 1 :** Identifying a potential problem based on literature survey/impending industrial/real time needs.
- CO 2 :** Categorizing various solution methodologies to solve problem taken for study.
- CO 3 :** Carry out design/experimental procedure relevant to the problem.
- CO 4 :** Analyze design/experimental results.
- CO 5 :** Draw conclusion based on analysis and recommend solution to potential engineering problems.



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**B.E. MECHANICAL ENGINEERING
REGULATIONS – 2021
AUTONOMOUS SYLLABUS
CHOICE BASED CREDIT SYSTEM
V & VI SEMESTER CURRICULUM AND SYLLABUS**

VISION:

To make the Department of Mechanical Engineering the unique of its kind in the field of Research and Development activities in the prominent field of Mechanical Engineering in this part of the world.

MISSION:

To impart highly innovative and technical knowledge in the field of Mechanical Engineering to the urban and unreachable rural student folks through Total Quality Education.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

- PEO 1:** Graduates of the Programme will excel in Technical Knowledge and Apply Innovative skills in the field of Mechanical Engineering.
- PEO 2:** Graduates will contribute to the Technological Development and Research Activities through “Total Quality Education”.
- PEO 3:** Graduates of the Programme will accomplish Leadership Qualities and Social Responsibilities through “Life Long Learning”.

PROGRAM OUTCOMES:

After going through the four years of study, the Mechanical Engineering graduates will have the ability to

POs	Graduate Attribute	Programme Outcome
1	Engineering knowledge	Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2	Problem analysis	Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, 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 modeling to complex engineering activities with an understanding of the limitations.
6	The engineer and society	Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7	Environment and sustainability	Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8	Ethics	Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9	Individual and team work	Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10	Communication	Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write 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.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO:1 Graduates will be able to Create and Analyze the Research and Development activities related to Design and Manufacturing.

PSO:2 Graduates will be able to Design and Develop need based products in Mechanical Engineering and Allied Industries.

REGULATIONS - 2021
CHOICE BASED CREDIT SYSTEM
B.E. MECHANICAL ENGINEERING
V TO VI SEMESTER CURRICULUM
SEMESTER V

S.NO.	COURSE CODE	COURSE TITLE	CATE GORY	CONTACT PERIODS	L	T	P	C
THEORY								
1	ME2301	Design of Machine Elements	PC	3	3	0	0	3
2	ME2302	Fluid Power Automation [#]	PC	4	2	0	2	3
3	ME2303	Metrology and Measurements [#]	PC	4	2	0	2	3
4		Professional Elective I	PE	3	3	0	0	3
5		Professional Elective II	PE	3	3	0	0	3
6		Professional Elective III	PE	3	3	0	0	3
PRACTICALS								
7	ME2304	CAD and 3D Printing Laboratory	PC	3	0	0	3	1
8	ME2305	IC Engine and Steam Laboratory	PC	3	0	0	3	1
9	EM2301	Internship**	EM	-	0	0	0	1
10	EM2252	An Introduction to Advanced Reading and writing	EM	2	0	0	2	1
TOTAL				28	16	0	12	22

[#] Theory cum Lab

^{**} Two weeks Internship carries one credit and it will be done during IV semester summer vacation and same will be evaluated in V semester.

SEMESTER VI

S.NO.	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
THEORY								
1	ME2351	Heat and Mass Transfer	PC	3	3	0	0	3
2		Professional Elective IV	PE	3	3	0	0	3
3		Professional Elective V	PE	3	3	0	0	3
4		Professional Elective VI	PE	3	3	0	0	3
5		Professional Elective VII	PE	3	3	0	0	3
6		Open Elective 1	OE	3	3	0	0	3
PRACTICALS								
7	ME2352	Heat Transfer and Refrigeration and Air Conditioning Laboratory	PC	3	0	0	3	1
8	ME2353	Simulation and Analysis Laboratory	PC	3	0	0	3	1
9	ME2354	Design Project and Prototyping	EM	3	0	0	3	1
TOTAL				27	18	0	9	21

Course Code	Course Name	L	T	P	C
ME2354	DESIGN PROJECT AND PROTOTYPING	0	0	3	1

Category: Employability Enhancement Course

a. Preamble

The main objective is to give an opportunity to the student to get hands on training in the fabrication of one or more components of a complete working model, which is designed by them.

b. Course Outcome

After successful completion of the course, the students will be able to

CO. No.	Course Outcome	Knowledge Level
CO1	Identify, select the need based potential problem related to engineering.	K3
CO2	Develop the solution by applying the design principles.	K3
CO3	Create the design model and find solution.	K3
CO4	Develop the detailed design in manufacturing aspect by preparing the bill of materials and cost estimation.	K4
CO5	Fabrication of the model and implementation / Testing.	K4

c. Guideline For Review and Evaluation

Total : 45 Periods

The students may be grouped into 2 to 4 and work under a project supervisor. The device/ system/component(s) to be fabricated may be decided in consultation with the supervisor and if possible with an industry. A project report to be submitted by the group and the fabricated model, which will be reviewed and evaluated for internal assessment by a Committee constituted by the Head of the Department. At the end of the semester examination the project work is evaluated based on oral presentation and the project report submitted by students .



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**B.E. MECHATRONICS ENGINEERING
REGULATION – 2020
AUTONOMOUS SYLLABUS
CHOICE BASED CREDIT SYSTEM
VII TO VIII SEMESTER CURRICULUM AND SYLLABI**

VISION:

To make the Department of Mechatronics Engineering of this Institution the unique of its kind in the field of Research and Development activities in this part of world.

MISSION:

To impart highly innovative and technical knowledge in the field of Mechatronics Engineering to the urban and unreachable rural student folks through Total Quality Education.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

- PEO 1:** Graduates will be able to apply their multi-disciplinary knowledge to formulate, design, develop and analyse Mechatronics Systems.
- PEO 2:** Graduates will be able to come up with solution for any real time problems in the field of Mechatronics Engineering and allied areas demanded by the Industry and Society.
- PEO 3:** Graduates will be able to get familiarized with economical issues in Mechatronics Engineering and work in multi-disciplinary teams with ethical code of conduct.

PROGRAM OUTCOMES:

After going through the four years of study, the Mechatronics Engineering graduates will have the ability to

POs	Graduate Attribute	Programme Outcome
1	Engineering knowledge	Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2	Problem analysis	Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, 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 modeling to complex engineering activities with an understanding of the limitations
6	The engineer and society	Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice

7	Environment and sustainability	Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8	Ethics	Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9	Individual and team work	Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10	Communication	Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write 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.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO1 : Graduates will be able to apply their knowledge in sensors, drives, actuators, controls, mechanical design and modern software & hardware tools to design & develop cost effective Mechatronics systems.

PSO2 : Graduates will be able to become Technocrats and Entrepreneurs, build the attitude of developing new concepts on emerging fields and pursuing higher studies.

SEMESTER VII

S.NO.	COURSE CODE	COURSE TITLE	CATE GORY	CONTACT PERIODS	L	T	P	C
THEORY								
1	GE1771	Principles of Management	HS	3	3	0	0	3
2	MT1701	Computer Aided Design and Manufacturing	PC	3	3	0	0	3
3	MT1702	Robotics and Machine Vision System	PC	3	3	0	0	3
4	PE IV	Professional Elective–IV	PE	3	3	0	0	3
5	PE V	Professional Elective–V	PE	3	3	0	0	3
6	OE II	Open Elective*	OE	3	3	0	0	3
		Online Course	OC	NPTEL/SWAYAM				3
PRACTICALS								
7	MT1711	Computer Aided Design and Manufacturing Laboratory	PC	4	0	0	4	2
8	MT1712	Robotics and Machine Vision System Laboratory	PC	4	0	0	4	2
TOTAL				26	18	0	8	25

SEMESTER VIII

S.NO.	COURSE CODE	COURSE TITLE	CATE GORY	CONTACT PERIODS	L	T	P	C
PRACTICALS								
1	MT1821	Project Work	EEC	16	0	0	16	8
TOTAL				16	0	0	16	8

* Course from the Curriculum of other UG programmes.

MT1821

PROJECT WORK

L	T	P	C
0	0	16	8

OBJECTIVES:

- To develop knowledge to formulate a real world problem and project's goals.
- To identify the various tasks of the project to determine standard procedures.
- To identify and learn new tools, algorithms and techniques.
- To understand the various procedures for validation of the product and analysis the cost effectiveness.
- To understand the guideline to Prepare report for oral demonstrations.

Students in the form of group, not exceeding 3 members in a group to carry out their main project. It should be a Mechatronics project. However, special considerations can be given for interdisciplinary measurement and computer based simulation projects. This exception should be recorded and approved by the department committee. Management related projects will not be allowed. The interdisciplinary projects will carry more weightage. It is mandatory to publish their main project in national/international level conferences to appear in the viva-voce exam.

TOTAL: 240 PERIODS

OUTCOMES:

Students will be able to

- CO1 To identify specific problems prevailing in the society or industry in the field of Mechatronics Engineering & allied areas.
- CO2 To carry out the literature survey for the identified problem.
- CO3 Integrate various systems into one Mechatronics product.
- CO4 To develop an appropriate solution for the identified problem using modern tool or methodology.
- CO5 To impart communication and presentation skills through effective documentation and delivery.



(An Autonomous Institution - AFFILIATED TO ANNA UNIVERSITY, CHENNAI)

S.P.G.Chidambara Nadar - C.Nagammal Campus

S.P.G.C. Nagar, K.Vellakulam – 625 701 (Near VIRUDHUNAGAR).

**B.E. MECHATRONICS ENGINEERING
REGULATIONS – 2021
AUTONOMOUS SYLLABUS
CHOICE BASED CREDIT SYSTEM
V & VI SEMESTER CURRICULUM AND SYLLABUS**

VISION:

To make the Department of Mechatronics Engineering of this Institution the unique of its kind in the field of Research and Development activities in this part of world.

MISSION:

To impart highly innovative and technical knowledge in the field of Mechatronics Engineering to the urban and unreachable rural student folks through Total Quality Education.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

- PEO 1:** Graduates will be able to apply their multi-disciplinary knowledge to formulate, design, develop and analyse Mechatronics Systems.
- PEO 2:** Graduates will be able to come up with solution for any real time problems in the field of Mechatronics Engineering and allied areas demanded by the Industry and Society.
- PEO 3:** Graduates will be able to get familiarized with economical issues in Mechatronics Engineering and work in multi-disciplinary teams with ethical code of conduct.

PROGRAM OUTCOMES:

After going through the four years of study, the Mechatronics Engineering graduates will have the ability to

POs	Graduate Attribute	Programme Outcome
1	Engineering knowledge	Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2	Problem analysis	Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, 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 modeling to complex engineering activities with an understanding of the limitations
6	The engineer and society	Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice

7	Environment and sustainability	Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8	Ethics	Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9	Individual and team work	Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10	Communication	Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write 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.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

- PSO1 :** Graduates will be able to apply their knowledge in sensors, drives, actuators, controls, mechanical design and modern software & hardware tools to design & develop cost effective Mechatronics systems.
- PSO2 :** Graduates will be able to become Technocrats and Entrepreneurs, build the attitude of developing new concepts on emerging fields and pursuing higher studies.

REGULATIONS - 2021
CHOICE BASED CREDIT SYSTEM
B.E. MECHATRONICS ENGINEERING
CURRICULUM AND SYLLABI FOR SEMESTER V TO VI
SEMESTER V

S.NO.	COURSE CODE	COURSE TITLE	CATE GORY	CONTACT PERIODS	L	T	P	C
THEORY								
1	MT2301	Embedded Systems and Programming	PC	3	3	0	0	3
2	MT2302	Kinematics and Dynamics of Machinery	PC	3	3	0	0	3
3		Professional Elective I	PE	3	3	0	0	3
4		Professional Elective II	PE	3	3	0	0	3
5		Professional Elective III	PE	3	3	0	0	3
6		Professional Elective IV	PE	3	3	0	0	3
PRACTICALS								
7	MT2303	Embedded Systems Laboratory	PC	3	0	0	3	1
8	ME2258	Theory of Machines Laboratory	PC	3	0	0	3	1
9	EM2351	Professional Communication	EM	2	0	0	2	1
10	EM2301	Internship**	EM	0	0	0	0	1
TOTAL				26	18	0	8	22

** Credits earned by the student through internship will be given in the final consolidated mark statement.

SEMESTER VI

S.NO.	COURSE CODE	COURSE TITLE	CATE GORY	CONTACT PERIODS	L	T	P	C
THEORY								
1	MT2351	Fluid Power Systems #	PC	4	2	0	2	3
2	MT2352	Industrial Automation#	PC	4	2	0	2	3
3	MT2353	Robotics and Machine Vision System	PC	3	3	0	0	3
4		Professional Elective V	PE	3	3	0	0	3
5		Professional Elective VI	PE	3	3	0	0	3
6		Professional Elective VII	PE	3	3	0	0	3
7		Open Elective I*	OE	3	3	0	0	3
PRACTICALS								
8	MT2354	Design and Fabrication Project for Mechatronics Engineering	EM	3	0	0	3	1
9	MT2355	Robotics and Machine Vision System Laboratory	PC	3	0	0	3	1
TOTAL				29	19	0	10	23

Course Code	Course Name	L	T	P	C
MT2354	DESIGN AND FABRICATION PROJECT FOR MECHATRONICS ENGINEERING	0	0	3	1

Category: Employability Enhancement Course

a. Preamble

The main objective is to give an opportunity to the student to get hands on training in the fabrication of one or more components of a complete working model, which is designed by them.

b. Course Outcome

After successful completion of the course, the students will be able to

CO. No.	Course Outcome	Knowledge Level
CO1	Identify specific problems prevailing in the society or industry in the field of Mechatronics Engineering & allied areas.	K3
CO2	Carry out the literature survey for the identified problem.	K3
CO3	Develop Mechatronics product from various systems.	K3
CO4	Develop an appropriate solution for the identified problem using modern tool or methodology	K3
CO5	Impart communication and presentation skills through effective documentation and delivery.	K3

c. Course Instruction

Total : 45 Periods

The students may be grouped into 2 to 4 and work under a project supervisor. The device/system/component(s) to be fabricated may be decided in consultation with the supervisor and if possible with an industry. A project report to be submitted by the group and the fabricated model, which will be reviewed and evaluated for internal assessment by a Committee constituted by the Head of the Department. At the end of the semester examination the project work is evaluated based on oral presentation and the project report jointly by external and internal examiners constituted by the Head of the Department.



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S.P.G.Chidambara Nadar - C.Nagammal Campus

S.P.G.C. Nagar, K.Vellakulam – 625 701 (Near VIRUDHUNAGAR).

**B.Tech. INFORMATION TECHNOLOGY
REGULATION – 2020
AUTONOMOUS SYLLABUS
CHOICE BASED CREDIT SYSTEM
VII TO VIII SEMESTER CURRICULUM AND SYLLABI**

VISION:

To make the department of Information Technology the unique of its kind in the field of Research and Development activities in this part of world

MISSION:

To impart highly innovative and technical knowledge in the field of Information Technology to the urban and unreachable rural student folks through Total Quality Education.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

- PEO 1:** Technical Knowledge : Graduates will be able to identify, analyze and create solutions for real life, industrial and societal needs by applying the principles and practices of Information Technology.
- PEO 2:** Teamwork & Ethics : Graduates will be able to collaborate effectively and ethically in a multi-disciplinary team as a member &/ as a leader.
- PEO 3:** Lifelong Learning : Graduates will be able to adopt the contemporary technologies in the field of Information Technology to provide solutions for challenging environments.

PROGRAM OUTCOMES:

After going through the four years of study, the B.Tech. Information Technology graduates will have the ability to

POs	Graduate Attribute	Programme Outcome
1	Engineering knowledge	Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2	Problem analysis	Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, 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 modeling to complex engineering activities with an understanding of the limitations
6	The engineer and society	Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice

7	Environment and sustainability	Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8	Ethics	Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9	Individual and team work	Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10	Communication	Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write 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.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO1 : Demonstrate technical and interpersonal skills to design and develop IT enabled solutions to meet the real time industrial and societal needs

PSO2 : Exhibit an ability to adapt to the evolutionary changes in computing

SEMESTER VII

S.NO.	COURSE CODE	COURSE TITLE	CATE GORY	CONTACT PERIODS	L	T	P	C
THEORY								
1	CS1771	Cloud Computing	PC	3	3	0	0	3
2	IT1701	Software Project Management Techniques	PC	3	3	0	0	3
3	GE1471	Professional Ethics and Human Values	HS	3	3	0	0	3
4	PE4	Professional Elective – IV [#]	PE	4	2	0	2	3
5	PE5	Professional Elective – V	PE	3	3	0	0	3
6	OE2	Open Elective II [*]	OE	3	3	0	0	3
PRACTICALS								
8	CS1781	Cloud Computing Laboratory	PC	4	0	0	4	2
9	IT1721	Project Development	EEC	4	0	0	4	2
TOTAL				27	17	0	10	22

SEMESTER VIII

S.NO.	COURSE CODE	COURSE TITLE	CATE GORY	CONTACT PERIODS	L	T	P	C
PRACTICALS								
1	IT1821	Project Work	EEC	16	0	0	16	8
TOTAL				16	0	0	16	8

* Course from the Curriculum of other UG programmes.

Theory cum Laboratory Course

PROFESSIONAL ELECTIVES (PEs)

PROFESSIONAL ELECTIVE IV (SEMESTER VII)

S.NO.	COURSE CODE	COURSE TITLE	CATE GORY	CONTACT PERIODS	L	T	P	C
1	IT1731	Applied Virtual Reality and Augmented Reality [#]	PE	4	2	0	2	3
2	IT1732	Essentials of .NET Framework [#]	PE	4	2	0	2	3
3	IT1733	Intrusion Detection System and Prevention System [#]	PE	4	2	0	2	3



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S.P.G.Chidambara Nadar - C.Nagammal Campus

S.P.G.C. Nagar, K.Vellakulam – 625 701 (Near VIRUDHUNAGAR).

**B.TECH. POLYMER TECHNOLOGY
REGULATION – 2020
AUTONOMOUS SYLLABUS
CHOICE BASED CREDIT SYSTEM
VII TO VIII SEMESTER CURRICULUM AND SYLLABI**

VISION:

To make the Department of Polymer Technology of this Institution the unique of its kind in the field of Research and Development activities in this part of world.

MISSION:

To impart highly innovative and technical knowledge in the field of Polymer Technology to the urban and unreachable rural student folks through Total Quality Education.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

- PEO 1:** Graduates will be technically proficient in Polymer Technology with a commitment to quality, timeliness and compete with confidence in their career
- PEO 2:** Graduates will contribute towards research and professional development and entrepreneurship
- PEO 3:** Graduates will engage in lifelong learning or continuous education opportunities.

PROGRAM OUTCOMES:

After going through the four years of study, the B.Tech Polymer Technology graduates will have the ability to

POs	Graduate Attribute	Programme Outcome
1	Engineering knowledge	Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2	Problem analysis	Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, 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 modeling to complex engineering activities with an understanding of the limitations
6	The engineer and society	Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice

7	Environment and sustainability	Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8	Ethics	Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9	Individual and team work	Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10	Communication	Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write 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.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO1 : **Polymer industry oriented preparedness:** Reveal an ability to identify careers in polymer technology's domains like, synthesis of polymers, processing and quality with adept skills required to work in polymer technology laboratory or manufacturing facility.

PSO2 : **Higher Education Preparedness:** Demonstrate an ability to appear for competitive examinations to pursue higher studies.

SEMESTER VII

S.NO.	COURSE CODE	COURSE TITLE	CATE GORY	CONTACT PERIODS	L	T	P	C
THEORY								
1	PT1701	Polymer Composites	PC	3	3	0	0	3
2	PT1702	Rubber Product Manufacturing	PC	3	3	0	0	3
3	GE1773	Total Quality Management	HS	3	3	0	0	3
4		Professional Elective III	PE	3	3	0	0	3
5		Professional Elective IV	PE	3	3	0	0	3
6		Open Elective II*	OE	3	3	0	0	3
PRACTICALS								
7	PT1711	Computer Aided Mold Design Laboratory -II	PC	4	0	0	4	2
8	PT1712	Polymer Blends and Composites lab	PC	4	0	0	4	2
9	PT1721	Mini project	EEC	4	0	0	4	2
TOTAL				30	18	0	12	24

SEMESTER VIII

S.NO.	COURSE CODE	COURSE TITLE	CATE GORY	CONTACT PERIODS	L	T	P	C
THEORY								
1		Online course-II	OL	3	3	0	0	3
PRACTICALS								
2	PT1821	Project Work	EEC	8	0	0	16	8
TOTAL				11	3	0	16	11

* Course from the Curriculum of other UG programmes.

PROFESSIONAL ELECTIVES (PEs)

PROFESSIONAL ELECTIVE III (SEMESTER VII)

S.NO.	COURSE CODE	COURSE TITLE	CATE GORY	CONTACT PERIODS	L	T	P	C
1	PT1731	Biodegradable Polymers	PE	3	3	0	0	3
2	PT1732	Fiber Technology	PE	3	3	0	0	3
3	PT1733	Plastics Packaging Technology	PE	3	3	0	0	3
4	PT1734	Polymer Structure Property Relations	PE	3	3	0	0	3
5	PT1735	Polymers in Civil and Geopolymer	PE	3	3	0	0	3

PT1721

MINI PROJECT

L	T	P	C
0	0	4	2

OBJECTIVES:

To enable the students to

- Demonstrate a sound technical knowledge of their project topic
- Analyze a problem with an in depth literature review in the selected domain
- Train the students in preparing project reports and to face reviews and viva voce examination

Each student will be assigned a project involving theoretical literature review on issues related to Polymer Technology. Continuous internal assessment marks for the project will be given during project review meeting. The student has to prepare and present a project report based on literature review at the end of the semester and give a presentation about the work done. End semester examination mark will be based on viva voce examination.

TOTAL: 60 PERIODS

OUTCOMES:

- CO1:** Identify challenging engineering problems to propose project based solutions
- CO2:** Build critical thinking and analytical decision making capabilities to find solution by formulating proper methodology
- CO3:** Design and development of solution relevant to the problem.
- CO4:** Analyze the design/experimental results
- CO5:** Conduct literature Survey to gain knowledge about the recent technological advancements.

PT1821

PROJECT WORK

L	T	P	C
0	0	16	8

OBJECTIVES:

To enable the students to

- Develop the ability to solve specific problem right from its identification and literature review till the successful solution of the same
- Train the students in preparing project reports and to face reviews and viva voce examination
- To inculcate the habit of working in teams.

Each student will be assigned a project involving some design and fabrication work as well as theoretical and experimental studies on issues related to Polymer Technology. Continuous internal assessment marks for the project will be given during project review meeting. The student has to prepare and present a detailed project report at the end of the semester and give a presentation about the work done. End semester examination mark will be based on viva voce examination.

TOTAL: 240 PERIODS

OUTCOMES:

- CO1:** Identify challenging engineering problems to propose project based solutions
- CO2:** Build critical thinking and analytical decision making capabilities to find solution by formulating proper methodology
- CO3:** Design and development of solution relevant to the problem.
- CO4:** Analyze the design/experimental results
- CO5:** Demonstrate the conclusion based on analysis and recommend solution to potential engineering problems.



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S.P.G.Chidambara Nadar - C.Nagammal Campus

S.P.G.C. Nagar, K.Vellakulam – 625 701 (Near VIRUDHUNAGAR).

**B.Tech. BIOTECHNOLOGY
REGULATION – 2020
AUTONOMOUS SYLLABUS
CHOICE BASED CREDIT SYSTEM
VII TO VIII SEMESTER CURRICULUM AND SYLLABI**

VISION:

To make the Department of Biotechnology, unique of its kind in the field of research and development activities pertaining to the field of biotechnology in this part of the world.

MISSION:

To impart highly innovative and technical knowledge in the field of biotechnology to the urban and rural student folks through “Total Quality Education”.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

- PEO 1:** Program Specific Academic Excellence: The student will be able to pursue higher education in India/Abroad in Biotechnology and its related fields by taking up competitive exams like GATE, CSIR, TANCET, GRE, TOEFL etc
- PEO 2:** Professional Attitude: The student will be able to come up with solutions for any scientific or technical problems related to Biotechnological industries/institutes by engaging in independent and life-long learning.
- PEO 3:** Core Competence: The student will be able to plan and conduct experiments in modern biotechnology and allied field laboratories using modern tools including interpreting the significance of resulting data, reporting results and writing technical reports
- PEO 4:** Collaboration: The students will be able to work in multidisciplinary team with confidence and will be able to venture out with entrepreneurial activities.

PROGRAM OUTCOMES:

After going through the four years of study, the biotechnology graduates will have the ability to

POs	Graduate Attribute	Programme Outcome
1	Engineering knowledge	Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2	Problem analysis	Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, 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 modeling to complex engineering activities with an understanding of the limitations
6	The engineer and society	Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice

7	Environment and sustainability	Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8	Ethics	Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9	Individual and team work	Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10	Communication	Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write 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.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO1 : Future ready graduates: The student will be able to identify, choose and perform to their best ability in the next career step: Higher education/Job/Entrepreneurial initiatives.

PSO2 : Industry ready graduates: The student will be able to apply the acquired knowledge to provide cost-effective and sustainable solutions in Biotechnology.

SEMESTER VII

S.NO.	COURSE CODE	COURSE TITLE	CATE GORY	CONTACT PERIODS	L	T	P	C
THEORY								
1	BT1701	Downstream Processing	PC	3	3	0	0	3
2	BT1702	Immunology	PC	3	3	0	0	3
3	GE1671	Total Quality Management	ES	3	3	0	0	3
4		Professional Elective VI	PE	3	3	0	0	3
5		Professional Elective VII	PE	3	3	0	0	3
6		Open Elective II*	OE	3	3	0	0	3
PRACTICALS								
7	BT1711	Downstream Processing Laboratory	PC	4	0	0	4	2
8	BT1712	Immunology Laboratory	PC	4	0	0	4	2
9	BT1721	Mini Project	EE	4	0	0	4	2
TOTAL				30	18	0	12	24

SEMESTER VIII

S.NO.	COURSE CODE	COURSE TITLE	CATE GORY	CONTACT PERIODS	L	T	P	C
THEORY								
1	OL2	Online Course - II	OL	NPTEL/SWAYAM				3
PRACTICALS								
2	BT1821	Project work	EE	16	0	0	16	8
TOTAL				16	0	0	16	11

* Course from the Curriculum of other UG programmes.

PROFESSIONAL ELECTIVES (PEs)

PROFESSIONAL ELECTIVE VI (SEMESTER VII)

S.NO.	COURSE CODE	COURSE TITLE	CATE GORY	CONTACT PERIODS	L	T	P	C
1	BT1731	Algal Technology	PE	3	3	0	0	3
2	BT1732	Bioconjugate Technology and Applications	PE	3	3	0	0	3
3	BT1733	Biopharmaceutical Technology	PE	3	3	0	0	3
4	BT1734	Foundation Skills in Integrated Product Development	PE	3	3	0	0	3
5	BT1735	Instrumentation and Process Control	PE	3	3	0	0	3

L	T	P	C
0	0	4	2

OBJECTIVES:**To enable the students to**

- Develop the ability to solve specific problem right from its identification and literature review and identify appropriate solutions for the same
- Prepare and deliver effective scientific solutions

The students will be working in single or group of 3 to 4 on a scientific problem approved by the Head of the Department under the guidance of the faculty member and prepare a comprehensive report after completing the work to the satisfaction of the supervisor. The progress of the project is evaluated based on a minimum of three reviews. The review committee may be constituted by the Head of the Department. A project report is required at the end of the semester. The project work is evaluated based on oral presentation on project topic jointly by external and internal examiners constituted by the Head of the Department

TOTAL: 60 PERIODS**OUTCOMES**

- CO1:** Identifying a potential problem based on literature survey/impending industrial/real time needs.
- CO2:** Categorizing various solution methodologies to solve problem taken for study.
- CO3:** Carry out design/experimental procedure relevant to the problem.
- CO4:** Analyze design/experimental results.
- CO5:** Draw conclusion based on analysis and recommend solution to potential engineering problems.

L	T	P	C
0	0	16	8

OBJECTIVES:**To enable the students to**

- Develop the ability to solve specific problem right from its identification and literature review and identify appropriate solutions for the same
- Prepare and deliver effective scientific solutions

The students will be working in single or group of 3 to 4 on a scientific problem approved by the Head of the Department under the guidance of the faculty member and prepare a comprehensive report after completing the work to the satisfaction of the supervisor. The progress of the project is evaluated based on a minimum of three reviews. The review committee may be constituted by the Head of the Department. A project report is required at the end of the semester. The project work is evaluated based on oral presentation on project topic jointly by external and internal examiners constituted by the Head of the Department

TOTAL: 240 PERIODS**OUTCOMES**

- CO1:** Identifying a potential problem based on literature survey/impending industrial/real time needs.
- CO2:** Categorizing various solution methodologies to solve problem taken for study.
- CO3:** Carry out design/experimental procedure relevant to the problem.
- CO4:** Analyze design/experimental results.
- CO5:** Draw conclusion based on analysis and recommend solution to potential engineering problems.



(An Autonomous Institution - AFFILIATED TO ANNA UNIVERSITY, CHENNAI)

S.P.G.Chidambara Nadar - C.Nagammal Campus

S.P.G.C. Nagar, K.Vellakulam – 625 701 (Near VIRUDHUNAGAR).

**B.Tech. ARTIFICIAL INTELLIGENCE AND DATA SCIENCE
REGULATION – 2020
AUTONOMOUS SYLLABUS
CHOICE BASED CREDIT SYSTEM
VII TO VIII SEMESTER CURRICULUM AND SYLLABI**

VISION:

To make the Department of Computer Science and Engineering of this Institution the unique of its kind in the field of Research and Development activities in this part of world.

MISSION:

To impart highly innovative and technical knowledge to the urban and unreachable rural student folks in Computer Science and Engineering through "Total Quality Education".

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

- PEO 1:** Apply the basic engineering skills and domain knowledge for developing effective computing solutions to address various social issues.
- PEO 2:** Able to have successful career in technical / managerial roles in multi-disciplinary environment.
- PEO 3:** To confront the evolving technical challenges and problems in the areas of computing.

PROGRAM OUTCOMES:

After going through the four years of study, the Artificial Intelligence and Data Science graduates will have the ability to

POs	Graduate Attribute	Programme Outcome
1	Engineering knowledge	Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2	Problem analysis	Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, 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 modeling to complex engineering activities with an understanding of the limitations
6	The engineer and society	Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice

7	Environment and sustainability	Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8	Ethics	Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9	Individual and team work	Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10	Communication	Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write 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.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO1 : **Professional Skills:** To apply learned skills to build optimized solutions pertaining to Data Processing, Artificial Intelligence and Machine Learning.

PSO2 : **Problem - Solving Skills:** To analyze data using domain knowledge to get insights and develop appropriate solutions.

SEMESTER VII

S.NO.	COURSE CODE	COURSE TITLE	CATE GORY	CONTACT PERIODS	L	T	P	C
THEORY								
1	AD1701	Data Exploration and Visualization	PC	3	3	0	0	3
2	AD1702	Natural Language Processing	PC	3	3	0	0	3
3	CS1636	Full Stack Development#	PC	4	2	0	2	3
4	PE5	Professional Elective – V	PE	3	3	0	0	3
5	PE6	Professional Elective – VI	PE	3	3	0	0	3
6	OE2	Open Elective – II*	OE	3	3	0	0	3
		Online Course**						
PRACTICALS								
7	AD1711	Data Visualization Laboratory	PC	4	0	0	4	2
8	AD1712	Natural Language Processing Laboratory	PC	4	0	0	4	2
9	AD1721	Capstone Project	EEC	4	0	0	4	2
TOTAL				31	17	0	14	24

* Course from the Curriculum of other UG programmes.

Theory cum Laboratory Course

** Students shall complete online course in this semester. Credits earned will be added in consolidated mark statement.

SEMESTER VIII

S.NO.	COURSE CODE	COURSE TITLE	CATE GORY	CONTACT PERIODS	L	T	P	C
THEORY								
1		Online Course – II***	OL	0	0	0	0	3
PRACTICALS								
2	AD1821	Project Work	EEC	16	0	0	16	8
TOTAL				16	0	0	16	11

***The students shall complete the online course in this semester and credits would be added in consolidated marksheet

AD1821

PROJECT WORK

L	T	P	C
0	0	16	8

OBJECTIVES:

To enable the students to

- Develop the ability to solve a specific problem right from its identification and literature review till the successful solution of the same
- Train the students in preparing project reports and to face reviews and viva voce examination

The students in a group of 3 to 4 works on a topic approved by the Head of the Department under the guidance of a faculty member and prepares a comprehensive project report after completing the work to the satisfaction of the supervisor. The progress of the project is evaluated based on a minimum of three reviews. The review committee may be constituted by the Head of the Department. A project report is required at the end of the semester. The project work is evaluated based on oral presentation and the project report jointly by external and internal examiners constituted by the Head of the Department..

TOTAL: 240 PERIODS

OUTCOMES

- CO1:** Identify challenging engineering problems/Societal needs to propose project-based solutions
- CO2:** Build critical-thinking and analytical decision-making capabilities to find solution by formulating proper methodology
- CO3:** Analyze various algorithmic strategies using technological tools to provide software solutions
- CO4:** Develop solutions to identified problems
- CO5:** Complete an independent project, resulting in at least a publication in reputed journals or conference proceedings



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S.P.G.C. Nagar, K.Vellakulam – 625 701 (Near VIRUDHUNAGAR).

B.Tech. ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

REGULATION - 2021

AUTONOMOUS SYLLABUS

CHOICE BASED CREDIT SYSTEM (CBCS)

CURRICULUM AND SYLLABI

(SEM V & VI)

VISION:

To make the Department of Computer Science and Engineering the unique of its kind in the field of Research and Development activities in this part of world.

MISSION:

To impart highly innovative and technical knowledge to the urban and unreachable rural student folks in Computer Science and Engineering through "Total Quality Education".

PROGRAM EDUCATIONAL OBJECTIVES:

PEO 1: Apply the basic engineering skills and domain knowledge for developing effective computing solutions to address various social issues.

PEO 2: Able to have successful career in technical / managerial roles in multi-disciplinary environment.

PEO 3: To confront the evolving technical challenges and problems in the areas of computing.

PROGRAM OUTCOMES:

After going through the four years of study, the Artificial Intelligence and Data Science will have the ability to

	Graduate Attribute	Programme Outcome
1	Engineering knowledge	Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2	Problem analysis	Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
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4	Conduct investigations of complex problems	Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions
5	Modern tool usage	Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations
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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.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1: Professional Skills: To apply learned skills to build optimized solutions pertaining to Data Processing, Artificial Intelligence and Machine Learning.

PSO 2: Problem - Solving Skills: To analyze data using domain knowledge to get insights and develop appropriate solutions.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
B.Tech. ARTIFICIAL INTELLIGENCE AND DATA SCIENCE
REGULATION 2021
III YEAR CURRICULUM & SYLLABI
SEMESTER V

S.NO.	COURSE CODE	COURSE TITLE	CATE GORY	CONTACT PERIODS	L	T	P	C
THEORY								
1	AI2301	Big Data Tools and Techniques [#]	PC	4	2	0	2	3
2	AI2302	Computer Networks and Security [#]	PC	4	2	0	2	3
3	AI2303	Fundamentals of Deep Learning	PC	3	3	0	0	3
4	CS2301	Internet Programming	PC	3	3	0	0	3
5		Professional Elective I	PE	-	-	-	-	3
6		Professional Elective II	PE	-	-	-	-	3
PRACTICALS								
7	AI2304	Deep Learning Laboratory	PC	4	0	0	4	2
8	CS2307	Internet Programming Laboratory	PC	4	0	0	4	2
9	EM2301	Internship**	EM	0	0	0	0	1
10	EM2202	Interpersonal skills – Listening and Speaking	EM	2	0	0	2	1
TOTAL				-	-	-	-	24

[#] Theory cum Laboratory Course

****Credits earned by the students through Internship will be given in the final consolidated mark statement.**

SEMESTER VI

S.NO.	COURSE CODE	COURSE TITLE	CATE GORY	CONTACT PERIODS	L	T	P	C
THEORY								
1	AI2351	Fundamentals of Natural Language Processing	PC	3	3	0	0	3
2		Professional Elective III	PE	-	-	-	-	3
3		Professional Elective IV	PE	-	-	-	-	3
4		Professional Elective V	PE	-	-	-	-	3
5		Professional Elective VI	PE	-	-	-	-	3
6		Open Elective – I*	OE	3	3	0	0	3
PRACTICALS								
7	AI2352	Mini project	EM	3	0	0	3	1
8	AI2353	Natural Language Processing Laboratory	PC	4	0	0	4	2
9	EM2351	Professional Communication	EM	2	0	0	2	1
TOTAL				-	-	-	-	22

*** Open Elective shall be chosen from the list of open electives offered by other Programmes**

Course Code	Course Name	L	T	P	C
AI2352	MINI PROJECT	0	0	3	1

Category: Employability Enhancement Course

a. Preamble

This course develops the ability to solve a specific problem right from its identification and literature review till the successful solution of the same. It is used to train the students in preparing project reports and to face reviews and viva voce examination

b. Course Outcome

After successful completion of the course, the students will be able to

CO. No.	Course Outcome	Knowledge Level
CO1	Identify challenging engineering problems/Societal needs to propose project-based solutions	K3
CO2	Build critical-thinking and analytical decision-making capabilities to find solution by formulating proper methodology	K3
CO3	Analyze various algorithmic strategies using technological tools to provide software solutions	K4
CO4	Develop solutions to identified problems	K3
CO5	Build an independent project, resulting in at least a publication in reputed journals or conference proceedings	K3

Total : 45 Periods

The students will be working in single or group of 3 to 4 on a scientific problem approved by the Head of the Department under the guidance of the faculty member and prepare a comprehensive report after completing the work to the satisfaction of the supervisor. The progress of the project is evaluated based on a minimum of three reviews. The review committee may be constituted by the Head of the Department. A project report is required at the end of the semester. The project work is evaluated based on project evaluation process as recommended in the respective regulation

The student can also be permitted to work on the project in Industry/Research organization with the due permission from Head of the Department. The Engineer/Scientist from Industry/ Research Organization can jointly act as supervisor in addition to the Project Supervisor. The student should undergo project evaluation process as recommended in the respective regulations.