

**VASAVI COLLEGE OF ENGINEERING  
(AUTONOMOUS)**

Ibrahimbagh, Hyderabad-31

Approved by A.I.C.T.E., New Delhi and

Affiliated to Osmania University, Hyderabad-07

**Sponsored  
by  
VASAVI ACADEMY OF EDUCATION  
Hyderabad**



**SCHEME OF INSTRUCTION AND SYLLABI UNDER CBCS FOR  
B.E. (EEE) V and VI Semesters  
With effect from 2022-23  
(For the batch admitted in 2020-21)  
(R-20)**



DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Phones: +91-40-23146030, 23146031

Fax: +91-40-23146090

## **INSTITUTE VISION**

Striving for a symbiosis of technological excellence and human values.

## **INSTITUTE MISSION**

To arm young brains with competitive technology and nurture holistic development of the individuals for a better tomorrow.

## **DEPARTMENT VISION**

Excellence in quality education by keeping pace with rapidly changing technologies and to create man power of global standards in the field of Electrical and Electronics Engineering.

## **DEPARTMENT MISSION**

To impart in-depth knowledge to students through inductive teaching and learning practices, so that they acquire the skill to innovate, excel and lead in their profession with values and ethics that will benefit society.

## **PROGRAM EDUCATIONAL OBJECTIVES (PEOs)**

PEO 1: Graduates will acquire technical competence to analyze, design and solve engineering problems in the field of Electrical and Electronics engineering and use modern engineering tools, techniques and software.

PEO 2: Graduates will be able to acquire necessary skills and obtain employment and will be productive in the professional practice of Electrical and Electronics Engineering and related fields.

PEO 3: Graduates will be sensitive to professional and social contexts, committed to ethical action and engaged in lifelong learning skills.

## **PROGRAM SPECIFIC OUTCOMES (PSOs)**

- EEE students will be able to design, analyze Power Systems & Electrical Machines to solve complex engineering problems.
- EEE students will be able to design and analyze Electrical and Power Electronic Circuits.
- EEE students will be able to use and apply modern software tools and techniques related to Electrical Engineering.

**B.E. (EEE) PROGRAM OUTCOMES (PO's)**

<b>PO1</b>	<b>Engineering Knowledge:</b> Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
<b>PO2</b>	<b>Problem Analysis:</b> Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
<b>PO3</b>	<b>Design/development of solutions:</b> 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.
<b>PO4</b>	<b>Conduct investigations of complex problems:</b> 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.
<b>PO5</b>	<b>Modern tool usage:</b> 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.
<b>PO6</b>	<b>The engineer and society:</b> 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.
<b>PO7</b>	<b>Environment and sustainability:</b> Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
<b>PO8</b>	<b>Ethics:</b> Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
<b>PO9</b>	<b>Individual and team work:</b> Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
<b>P10</b>	<b>Communication:</b> 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.
<b>P11</b>	<b>Project management and finance:</b> 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.
<b>P12</b>	<b>Lifelong learning:</b> Recognize the need for, and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change.

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS):: IBRAHIMBAGH, HYDERABAD – 500 031.  
 DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING  
 SCHEME OF INSTRUCTION AND EXAMINATION (R-20)::B.E. - EEE : FIFTH SEMESTER(2022 - 23)

**B.E (EEE) V Semester**

Course Code	Name of the Course	Scheme of Instruction			Scheme of Examination				
		Hours per Week			Duration in Hrs	Maximum Marks		Credits	
		L	T	P/D		SEE	CIE		
<b>THEORY</b>									
U20PC510EE	AC Machines	3	1	-	3	60	40	4	
U20PC520EE	Digital Electronics	3	-	-	3	60	40	3	
U20PC530EE	Signals and Systems	3	-	-	3	60	40	3	
U20PC540EE	Control Systems	3	-	-	3	60	40	3	
U20OE5XXXX	Open Elective -III	3	-	-	3	60	40	3	
U20HS510EH	Skill Development Course-V (Communication Skills-II)	1	-	-	2	40	30	1	
U20PE510EE	Skill Development Course-VI (Technical Skills-II)	1	-	-	2	40	30	1	
U20MC010CE	Environmental Science	2	-	-	3	60	40	-	
<b>PRACTICALS</b>									
U20PC511EE	AC Machines Lab	-	-	2	3	50	30	1	
U20PC531EE	Control Systems and Simulation Lab	-	-	2	3	50	30	1	
U20PW519EE	Mini Project	-	-	2	3	50	30	1	
<b>ECA-II</b>		-	-	-	-	-	-	-	
<b>CCA-III ( Paper Presentation)</b>		-	-	-	-	-	-	-	
<b>Library/Sports/Proctorial Interaction</b>		-	-	-	-	-	-	-	
<b>Total</b>		<b>19</b>	<b>1</b>	<b>6</b>		<b>590</b>	<b>390</b>	<b>21</b>	
<b>Grand Total</b>		<b>26</b>			<b>-</b>	<b>980</b>		<b>21</b>	

Student should acquire one online course certification equivalent to two credits during III Sem to VII sem.

**Note: 1. One hour is allocated for Library/Sports/Proctorial Interaction 2. Two hours are allocated for CCA-III 3. Two hours are allocated for ECA-II**

With effect from the Academic Year 2022-23

**VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)**

9-5-81, Ibrahimbagh, Hyderabad-500031, Telangana State

**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**

**AC Machines**

SYLLABUS FOR B.E. V SEMESTER

L:T: P (Hrs/Week):3:1:0	SEE Marks: 60	Course Code: <b>U20PC510EE</b>
Credits: 4	CIE Marks: 40	Duration of SEE : 3 Hours

<b>COURSE OBJECTIVES</b>	<b>COURSE OUTCOMES</b>
The course will enable the students to:	On completion of the course, students will be able to
To study the performances and applications of AC machines like Induction machines and Synchronous machines.	<ol style="list-style-type: none"><li>1. Demonstrate basic concepts of AC machines windings, Analyze the concepts of constant magnetic field and rotating magnetic fields.</li><li>2. Analyze speed torque characteristics and control the speed of induction motors</li><li>3. Identify and analyze the operation of Single –phase machines.</li><li>4. Analyze the operation and characteristics of synchronous generator.</li><li>5. Analyze the operation and characteristics of synchronous motor.</li></ol>

**UNIT-I:**

Fundamentals of AC machine windings and generation of magnetic field:

Physical arrangement of windings in stator and cylindrical rotor; slots for windings; single-turn coil - active portion and overhang; full-pitch coils, concentrated winding, distributed winding, Air-gap MMF distribution with fixed current through winding - concentrated and distributed, winding distribution factor. Constant magnetic field, Conditions for the generation of RMF, Generation of RMF by spatially displaced two windings and three phase windings.

## **UNIT-II:**

Three Phase Induction Motors:

Construction, Types (squirrel cage and slip-ring), Torque Slip Characteristics, Starting and Maximum Torque, Equivalent circuit. Phasor Diagram, Power Flow diagram, Losses and Efficiency. No load and Blocked rotor test, Starting methods of squirrel cage and wound rotor induction motor, Modes of operation, Speed control methods – Resistance control, Voltage control, Variable frequency control,

## **UNIT-III:**

Single-phase induction motors:

Constructional features, working principle, double revolving field theory, equivalent circuit, determination of equivalent circuit parameters. Split-phase starting methods and applications

## **UNIT-IV:**

Synchronous machines:

Constructional features, Salient and non-salient pole synchronous machines  
Synchronous Generator (Alternator) generated EMF, equivalent circuit and phasor diagram, armature reaction, synchronous impedance, voltage regulation- Synchronous impedance method, Ampere-turns and Z.P.F Method. Power angle characteristics, Slip test, V-curves power angle characteristics. Parallel operation of alternators - synchronization.

## **UNIT-V:**

Synchronous Motors:

Operating Principle, Two reaction theory, Power flow equations of cylindrical and salient pole machines, Operating characteristics. Synchronous Motor-Starting methods, Effect of varying field current at different loads, V- curves, Hunting & damping, Synchronous condenser.

## **Suggested Books:**

1. Nagarath I.J., Kothari D.P., Electrical Machines. 4th Edition 2010, Tata McGraw Hill.
2. Gupta J.B., Theory and Performance of Electrical Machines, 2003, S.K. Kataria & Sons.
3. A. E. Fitzgerald and C. Kingsley, "Electric Machinery", McGraw Hill Education, 2013.
4. A. S. Langsdorf, "Alternating current machines", McGraw Hill Education, 1984.



5. P. C. Sen, "Principles of Electric Machines and Power Electronics", John Wiley & Sons, 2007
6. Bhimbra P.S., Generalized Theory of Electrical Machines, Khanna Publications
7. Dr. P. S. Bimbhra, Electrical Machinery, 7<sup>th</sup> Edition, Khanna Publishers
8. M.G. Say, The Performance and Design of A.C. Machines – Pitman Publications.
- Online resources: <http://nptel.ac.in/courses/>; <http://ocw.tufts.edu>;  
<http://ocw.upm.es>; [www.open.edu/openlearn/](http://www.open.edu/openlearn/)

The break-up of CIE: Internal Tests+ Assignments + Quizzes

1. No. of Internal Tests	:	<input type="text" value="2"/>	Max. Marks for each Internal Test	:	<input type="text" value="30"/>
2. No. of Assignments	:	<input type="text" value="3"/>	Max. Marks for each Assignment	:	<input type="text" value="5"/>
3. No. of Quizzes	:	<input type="text" value="3"/>	Max. Marks for each Quiz Test	:	<input type="text" value="5"/>

Duration of Internal Test: 90 minutes

With effect from the Academic Year 2022-23

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**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**

**Digital Electronics**

SYLLABUS FOR B.E. V SEMESTER

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code: <b>U20PC520EE</b>
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

<b>COURSE OBJECTIVES</b>	<b>COURSE OUTCOMES</b>
The course will enable the students to:	On completion of the course, students will be able to
1. To understand number representation and conversion between different representation in digital electronic circuits.	1. Understand working of logic families and logic gates.
2. To analyze logic processes and implement logical operations using combinational logic circuits.	2. Design and implement Combinational and Sequential logic circuits.
3. To understand characteristics of memory, sequential circuits, Programmable Devices, PLA, PAL and FPGA and their classification, A/D, D/A Converters.	3. Understand the process of Analog to Digital conversion and Digital to Analog conversion. 4. Be able to use PLDs to implement the given logical problem.

**UNIT-I:**

**Fundamentals of Digital Systems and logic families:**

Digital circuits, AND, OR, NOT, NAND, NOR and Exclusive-OR operations, Boolean algebra, examples of IC gates, number systems-binary, signed binary, octal hexadecimal number, binary arithmetic, one's and two's complements arithmetic, codes, error detecting and correcting codes, characteristics of digital ICs, digital logic families, TTL, Schottky TTL and CMOS logic.

**UNIT-II:**

**Combinational Digital Circuits :**

Standard representation for logic functions, K-map representation,

simplification of logic functions using K-map, minimization of logical functions. Don't care conditions, Q-M method of function realization,

Multiplexer, DeMultiplexer/Decoders, Adders, Subtractors, BCD arithmetic, carry look ahead adder, serial adder, digital comparator, parity checker/generator, code converters, priority encoders.

### **UNIT-III:**

#### **Sequential circuits and systems:**

The clocked SR flip flop, J- K-and D types flip flops, applications of flip flops, shift registers, applications of shift registers, serial to parallel converter, parallel to serial converter, ring counter, ripple (Asynchronous) counters, synchronous counters, counters design using flip flops.

### **UNIT-IV:**

#### **A/D and D/A Converters :**

Digital to analog converters: weighted resistor/converter, R-2R Ladder D/A converter, specifications for D/A converters, examples of D/A converter ICs, Analog to digital converters: Successive approximation A/D converter, Dual slope A/D converter, specifications of A/D converters, example of A/D converter ICs

### **UNIT-V:**

#### **Semiconductor memories and Programmable logic devices.:**

Memory organization and operation, expanding memory size, classification and characteristics of memories, sequential memory, read only memory (ROM), read and write memory(RAM), content addressable memory (CAM), commonly used memory chips, ROM as a PLD, Programmable logic array, Programmable array logic.

### **Learning Resources:**

- 1.Morris Mano M., Digital Design, Prentice Hall of India, Second Edition, 1994.
- 2.ZviKohavi, Switching and Finite Automata Theory, Tata McGraw Hill, Second Edition, 1991
- 3.Tocci&Widmer\_Digital Systems-Pearson Education-Eight Edition, 2003.

4. Donald Pleach/Albert Paul Malvino/ Goutam Saha : "Digital Principles and Applications" McGraw-Hill, 2006.

5. B. Somnath Nair, "Digital Electronics and Logic Design", Prentice Hall, India, 2002

6. R. P. Jain, "Modern Digital Electronics", McGraw Hill Education, 2009.

7. A. Kumar, "Fundamentals of Digital Circuits", Prentice Hall India, 2016.

The break-up of CIE: Internal Tests + Assignments + Quizzes

1. No. of Internal Tests	:	<table border="1"><tr><td>2</td></tr></table>	2	Max. Marks for each Internal Test	:	<table border="1"><tr><td>30</td></tr></table>	30
2							
30							
2. No. of Assignments	:	<table border="1"><tr><td>3</td></tr></table>	3	Max. Marks for each Assignment	:	<table border="1"><tr><td>5</td></tr></table>	5
3							
5							
3. No. of Quizzes	:	<table border="1"><tr><td>3</td></tr></table>	3	Max. Marks for each Quiz Test	:	<table border="1"><tr><td>5</td></tr></table>	5
3							
5							

Duration of Internal Test: 90 minutes

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**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**

**Signals and Systems**

SYLLABUS FOR B.E. V SEMESTER

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code: <b>U20PC530EE</b>
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

<b>COURSE OBJECTIVES</b> The course will enable the students to:	<b>COURSE OUTCOMES</b> On completion of the course, students will be able to
<ol style="list-style-type: none"> <li>1.To define and classify continuous and discrete time signals &amp; systems</li> <li>2.To determine the frequency domain characteristics of continuous and discrete time signals using transform techniques.</li> <li>3.To verify the causality and stability of LTI system and find its response using convolution.</li> </ol>	<ol style="list-style-type: none"> <li>1. Analyze continuous time signals and systems and transform them to frequency domain.</li> <li>2. Convert continuous time signals to discrete time signals using sampling.</li> <li>3. Analyze discrete time signals and systems and transform them to frequency domain using ZT.</li> <li>4. Determine the convolution and Correlation of signals.</li> </ol>

**UNIT - I**

**Continuous Time Signals & Systems:** Introduction, elementary signals, classification of signals and basic operations on signals. Introduction to systems and its classification.

**Fourier Series:** Review of Fourier series, existence and convergence, trigonometric and exponential Fourier series representations and their relations, symmetry conditions, properties, complex Fourier spectrum.

**UNIT - II**

**Signal Representation by Continuous Exponentials:** Introduction to Fourier Transform, existence, Fourier transform of singularity functions and signals, properties, Fourier transform of a periodic function.

Introduction to Linear Time Invariant (LTI) system, Unit impulse and step response, Transfer function of an LTI system.

### **UNIT - III**

**Sampling:** Introduction to sampling, sampling theorem, aliasing, sampling Techniques, reconstruction, quantizing and encoding.

**Signal Representation by Generalized Exponentials :** Introduction to Laplace transforms, Existence, Region of convergence (ROC) and its properties. Properties of Laplace transform. Inverse Laplace transform, analysis and characterization of continuous LTI systems using Laplace Transform.

### **UNIT - IV**

**Discrete Time Signals & Systems:** Introduction, elementary signals, classification of signals and basic operations on signals. Introduction to systems and its classification. Linear shift invariant systems, Stability and Causality, Linear constant coefficient systems. Discrete Fourier Series (DFS), Discrete Time Fourier Transform (DTFT).

**Z-Transforms:** Introduction to Z-Transform, existence, Region of Convergence (ROC) and its properties. S-plane and Z-plane correspondence, properties of Z-Transform, Inverse Z-Transform, analysis and characterization of discrete LTI systems using Z-Transform.

### **UNIT - V**

**Convolution & Correlation:** Continuous convolution - graphical interpretation and convolution properties. discrete convolution- graphical interpretation and convolution properties. Continuous correlation-cross correlation and auto correlation, their graphical interpretation and properties. Discrete correlation- cross correlation and auto correlation, their graphical interpretation and properties, Power Spectral Density (PSD), Energy Spectral Density (ESD).

### **Learning Resources:**

1. Signals and Systems - A.V. Oppenheim, A.S. Willsky and S.H. Nawab, 2 Ed., PHI, 2013.
2. Signals, Systems & Communications - B.P. Lathi, 2013, BSP.
3. Signals and Systems – A.Anand Kumar, PHI, 2012.

With effect from the Academic Year 2022-23

4. Signals & Systems - Simon Haykin and Van Veen, Wiley, 2 Ed. 2003.
5. "Fundamentals of signals and systems", M.J. Robert, McGraw Hill, 2008.

The break-up of CIE: Internal Tests+ Assignments + Quizzes

1. No. of Internal Tests	:	<table border="1"><tr><td>2</td></tr></table>	2	Max. Marks for each Internal Test	:	<table border="1"><tr><td>30</td></tr></table>	30
2							
30							
2. No. of Assignments	:	<table border="1"><tr><td>3</td></tr></table>	3	Max. Marks for each Assignment	:	<table border="1"><tr><td>5</td></tr></table>	5
3							
5							
3. No. of Quizzes	:	<table border="1"><tr><td>3</td></tr></table>	3	Max. Marks for each Quiz Test	:	<table border="1"><tr><td>5</td></tr></table>	5
3							
5							

Duration of Internal Test: 90 minutes

With effect from the Academic Year 2022-23

**VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)**

9-5-81, Ibrahimbagh, Hyderabad-500031, Telangana State

**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**

**Control Systems**

SYLLABUS FOR B.E. V SEMESTER

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code: <b>U20PC540EE</b>
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

<b>COURSE OBJECTIVES</b>	<b>COURSE OUTCOMES</b>
The course will enable the students to:	On completion of the course, students will be able to
1. Control system modeling: modeling of electric, mechanical and electro mechanical systems, using differential equations, transfer functions, block diagrams, and state variables;	1. Model different electrical, mechanical and electromechanical systems using differential equations, transfer functions and block diagrams and also simplify the complex systems using signal Flow graphs
2. Control system analysis: analysis of properties of control systems, such as sensitivity, stability, controllability, tracking, in time and frequency domains; and	2. obtain the time response of systems and analyze the stability in time domain using Routh Hurwitz criterion and Root locus techniques and also design the feedback controller such as PID controller to meet the desired performance specifications.
3. Control system design: design of feedback controllers, such as PID, lead and lag compensator or to meet desired system performance specifications.	3. Obtain the frequency response of systems and analyze the stability in frequency domain and also design the feedback controllers, such as lead and lag compensators to meet the desired performance specifications using bode plots and polar plots
	4. Analyze the stability in frequency domain using Nyquist stability criterion
	5. Obtain state space Models and response for various electrical and electromechanical systems and also analyze the systems controllability and observability of the systems.



**UNIT – I:**

Open and closed loop systems: Continuous time and discrete time control systems, Mathematical modelling of mechanical and electrical systems. control system components, AC – DC servo motors – Block diagram representation, Transfer function and impulse response – signal flow graphs.

**UNIT – II:**

Time Response: Types of input, Transient response of second order systems for step input. Time domain specifications – Types of system – static error coefficients, Error series – Routh-Hurwitz criterion of stability. Root locus technique – Typical systems analyzed by root locus technique – Effect of location of roots on system response, Effect of PID controllers -Tuning of PID using Ziegler-Nichlos rules for tuning PID Controllers .

**UNIT – III:**

Frequency Response – I: Introduction, Frequency domain specifications. MP, wP for a second order system, Frequency response analysis using Bode plots , Relative stability analysis, gain margin and phase margin, transfer function from Bode plot-Compensation: Lead, Lag, Lead – Lag Compensation using bode plot.

**UNIT – IV:**

Frequency Response – II: Polar plot, Nyquist plot, Mapping Theorem, Nyquist stability criterion, Principle of argument, Analysis of Typical systems using Nyquist stability criterion, Gain Margin , phase margin .

**UNIT – V :**

State Space Representation: Concept of state, State Variable, State Models of linear time invariant systems. Derivation of state models from transfer functions and differential equations. State transition matrix – solution of state equations by time domain method. Observability and Controllability.

**Learning Resources:**

1. I.J. Nagrath, M. Gopal, Control System Engineering, 6<sup>th</sup> edition, New Age International Publishers, 2017
2. M. Gopal, Control System Principles and Design – Tata McGraw Hill, 4<sup>th</sup> edition, 2012.

With effect from the Academic Year 2022-23

3. A.NagoorKani, Control systems Engineering-CBS pub &DistPvt Limited, June-2020
4. K. Ogata, Modern Control Engineering, 5<sup>th</sup> Edition, PHI, 2015
5. Farid Golnaraghi, Benjamin C.Kuo, Automatic Control Systems, tenth Edition, McGraw-Hill Education, 2017
6. Norman S. Nise Control Systems Engineering, Wiley 2018

The break-up of CIE: Internal Tests+ Assignments + Quizzes

1. No. of Internal Tests	:	2	Max. Markhs for each Internal Test	:	30
2. No. of Assignments	:	3	Max. Marks for each Assignment	:	5
3. No. of Quizzes	:	3	Max. Marks for each Quiz Test	:	5

Duration of Internal Test: 90 minutes

With effect from the Academic Year 2022-23  
**VASAVI COLLEGE OF ENGINEERING (Autonomous)**  
IBRAHIMBAGH, HYDERABAD – 500 031

**DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES**

**SKILL DEVELOPMENT COURSE V – COMMUNICATION SKILLS IN ENGLISH II**

SYLLABUS FOR B.E. V-SEMESTER

L:T: P (Hrs/Week):1:0:0	SEE Marks: 40	Course Code: <b>U20HS510EH</b>
Credits: 1	CIE Marks: 30	Duration of SEE : 2 Hours

<b>COURSE OBJECTIVES</b>	<b>COURSE OUTCOMES</b>
<b>The course will enable the learners to:</b> <ol style="list-style-type: none"><li>1. Get students proficient in both receptive and productive skills</li><li>2. Enable students to build strategies for effective group interaction and help them in developing decisive awareness and personality while maintaining emotional balance.</li><li>3. To introduce students to an ideal structure for a presentation</li><li>4. To develop and improve writing and study skills needed for college work.</li></ol>	<b>At the end of the course the learners will be able to: -</b> <ol style="list-style-type: none"><li>1. Participate in group and forum discussions by providing factual information, possible solutions, and examples</li><li>2. Present a topic by picking up the key points from the arguments placed.</li><li>3. Read between the lines and write informed opinions.</li><li>4. Prepare, present, and analyze reports</li></ol>

**Unit 1: Delightful Discussions**

- 1.1 Six Thinking Hats
- 1.2 Group Discussion Techniques (Initiation Techniques, Generating Points, Summarization techniques)
- 1.3 Case Study Based Group Discussions

**Unit 2: Powerful Presentations**

- 2.1 Concise Cogent Presentation

With effect from the Academic Year 2022-23

- 2.2 Persuasion skills
- 2.3 Toulmin Model
- 2.4 BikerB - JAM and Extempore

### **Unit 3: Fact, Observation and Inference**

- 3.1 Discernment of fact and opinion
- 3.2 Note making and Inference
- 3.3 Main idea identification
- 3.4 Logical Conclusions

### **Unit 4: Effective Technical Writing**

- a. Report writing
- b. Image Writing
- c. Book Reviews
- d. Movie Reviews

### **Learning Resources:**

1. How to Win Friends and Influence People by Dale Carnegie. ...
2. Crucial Conversations: Tools for Talking When Stakes Are High by Kerry Patterson, Joseph Grenny, Ron McMillan, and Al Switzler. ...
3. Difficult Conversations: How to Have Conversations that Matter the Most by Douglas Stone, Bruce Patton, Sheila Heen, and Roger Fisher.

The break-up of CIE: Internal Tests + Assignments + Quizzes

1	No. of Internal tests	:	2	Max. Marks	:	20
2	No. of assignments	:	2	Max. Marks	:	5
3	No. of Quizzes	:	2	Max. Marks	:	5

Duration of Internal Tests : 90 Minutes

With effect from the Academic Year 2022-23  
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9-5-81, Ibrahimbagh, Hyderabad-500031, Telangana State

**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**

Skill Development – VI: Technical Skills

SYLLABUS FOR B.E. V SEMESTER

L:T:P (Hrs/Week): 1:0:0	SEE Marks: 40	Course Code: <b>U20HS510EE</b>
Credits: 1	CIE Marks: 30	Duration of SEE: 2 Hours

COURSE OBJECTIVES	COURSE OUTCOMES

The break-up of CIE: Internal Tests+ Assignments + Quizzes

1. No. of Internal Tests	: 1	Max. Marks for each Internal Test	: 30
2. No. of Assignments	: -	Max. Marks for each Assignment	: -
3. No. of Quizzes	: -	Max. Marks for each Quiz Test	: -

Duration of Internal Test: 90 minutes

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9-5-81, Ibrahimbagh, Hyderabad-500031, Telangana State

**DEPARTMENT OF CIVIL ENGINEERING**

**Environmental Science**

SYLLABUS FOR B.E. V SEMESTER

L:T: P (Hrs/Week):2:0:0	SEE Marks: 60	Course Code: <b>U20MC010CE</b>
Credits: -	CIE Marks: 40	Duration of SEE : 3 Hours

<b>COURSE OBJECTIVES</b>	<b>COURSE OUTCOMES</b>
The course will enable the students to:	On completion of the course, students will be able to
<ol style="list-style-type: none"><li>1. Describe various types of natural resources available on the earth surface.</li><li>2. Explain the concepts of an ecosystem and the biotic and abiotic components of various aquatic ecosystems.</li><li>3. Identify the values, threats of biodiversity, endangered and endemic species of India along with the conservation of biodiversity.</li><li>4. Explain the causes, effects and control measures of various types of environmental pollutions.</li><li>5. Describe the methods for water conservation, the causes, effects of global warming, climate change, acid rain, ozone layer depletion, population explosion.</li></ol>	<ol style="list-style-type: none"><li>1. Describe the various types of natural resources.</li><li>2. Differentiate between various biotic and abiotic components of ecosystem.</li><li>3. Examine the values, threats of biodiversity, the methods of conservation, endangered and endemic species of India.</li><li>4. Illustrate causes, effects, control measures of various types of environmental pollutions.</li><li>5. Explain the methods of water conservation, causes, effects of climate change, global warming, acid rain and ozone layer depletion, population explosion.</li></ol>

**UNIT-I: Environmental Studies:** Definition, importance of environmental studies. Natural resources: Water resources; floods, drought, conflicts over water, dams-benefits and problems. Food resources; Effects of modern agriculture, fertilizer-pesticide problems, water logging salinity. Energy resources: Renewable and non-renewable

With effect from the Academic Year 2022-23  
energy resources. Land Resources, soil erosion and desertification.

**UNIT-II: Ecosystems:** Structure and function of an ecosystem, producers, consumers and decomposers, food chains, food webs, ecological pyramids, aquatic ecosystems (ponds, oceans, estuaries).

**UNIT-III: Biodiversity:** Genetic, species and ecosystem diversity. Values of biodiversity, threats to biodiversity, endangered and endemic species of India, conservation of biodiversity.

**UNIT-IV: Environmental Pollution:** Causes, effects and control measures of air pollution, water pollution, soil pollution, noise pollution, thermal pollution and solid waste & e-waste management.

**UNIT-V: Social Aspects and the Environment:** Water conservation, Climate change, global warming, acid rain, ozone layer depletion. Environmental Impact Assessment, population explosion.

#### **Learning Resources:**

1. Deswal S. and Deswal A., A Basic Course on Environmental studies, Dhanpat Rai & Co Pvt. Ltd. 2013.
2. Benny Joseph, Environmental Studies, Tata McGraw -Hill, 2006.
3. Suresh K. Dhameja, Environmental Studies, S.K. Kataria& Sons, 2010.
4. De A.K., Environmental Chemistry, New Age International, 2003.
5. Odum E.P., Fundamentals of Ecology, W.B. Saunders Co., USA, 2004.
6. Sharma V.K., Disaster Management, National Centre for Disaster Management, IIEPE, Delhi, 2013.
7. Rajagopalan R., Environmental Studies, Second Edition, Oxford University Press, 2013.

The break-up of CIE: Internal Tests+ Assignments + Quizzes

1. No. of Internal Tests	:	2	Max. Marks for each Internal Test	:	30
2. No. of Assignments	:	2	Max. Marks for each Assignment	:	5
3. No. of Quizzes	:	2	Max. Marks for each Quiz Test	:	5

Duration of Internal Test: 90 minutes

With effect from the Academic Year 2022-23

**VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)**

9-5-81, Ibrahimbagh, Hyderabad-500031, Telangana State

**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**

**AC Machines Lab**

SYLLABUS FOR B.E. V SEMESTER

L:T: P (Hrs/Week):0:0:2	SEE Marks: 50	Course Code: <b>U20PC511EE</b>
Credits: 1	CIE Marks: 30	Duration of SEE : 3 Hours

<b>COURSE OBJECTIVES</b>	<b>COURSE OUTCOMES</b>
The course will enable the students to:	On completion of the course, students will be able to
To expose the students to practical experiments of AC machines.	1. Test the performance of 3-phase induction motor 2. Predetermine the voltage regulation of Non- salient and Salient Alternators by conducting suitable tests. 3. Test the performance of performance of 3-phase synchronous motor 4. Test the performance of Induction generator 5. Test the performance of 1-phase induction motor

**List of Experiments:**

1. No-load test, blocked rotor test and load test on 3-phase Induction motor
2. Voltage regulation of Alternator by Synchronous impedance method
3. Voltage regulation of Alternator by Ampere – turn method
4. Voltage regulation of Alternator by Z.P.F. method.
5. Regulation of Alternator by slip test.
6. Determination of V curves and inverted V curves of Synchronous motor.
7. Power angle characteristics of a Synchronous motor.



With effect from the Academic Year 2022-23

8. Load characteristics of Induction Generator.
9. P.F. improvement of Induction motor using capacitors.
10. Synchronization of Alternator using three dark lamp method.
11. Torque –speed characteristics of single phase Induction Motor.
12. Parallel operation of Alternators

From the above experiments, each student should perform at least 10 (Ten) experiments.

No. of Internal Tests:	01	Max. Marks for Internal Test:	12
Marks for assessment of each experiment			18
Duration of Internal Test: <b>3 Hours</b>			

With effect from the Academic Year 2022-23  
**VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)**  
9-5-81, Ibrahimbagh, Hyderabad-500031, Telangana State

**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**

**Control Systems and Simulation Lab**

SYLLABUS FOR B.E. V SEMESTER

L:T: P (Hrs/Week):0:0:2	SEE Marks: 50	Course Code: <b>U20PC531EE</b>
Credits: 1	CIE Marks: 30	Duration of SEE : 3 Hours

<b>COURSE OBJECTIVES</b>	<b>COURSE OUTCOMES</b>
The objective of the lab is to provide an experience in working with various control system components and control systems for understanding analyzing them and also enhance the analyzing capability by introducing simulation tools for control systems.	On completion of the course, students will be able to <ol style="list-style-type: none"><li>1. Demonstrate the characteristics of AC, DC servo motors, second order system and synchro pair.</li><li>2. Infer the effect of P,PI,PD and PID controllers on closed loop control system</li><li>3. Analyze AC and DC position control systems.</li><li>4. Design lead and lag compensators and obtain the frequency response characteristics.</li></ol>

**LIST OF EXPERIMENTS:**

1. Characteristics of DC and AC Servo motors.
2. Frequency response of compensating networks.
3. Step response of second order system.
4. Closed loop P,PI,PD and PID controller.
5. Step response and frequency response of a given plant.
6. ON/ OFF Temperature control system.
7. Water Level Control System using LabVIEW.
8. Simulation of Root locus, Nyquist plot, Bode plot using Matlab/Simulink & LabVIEW
9. Design of lead and lag compensators using MATLAB
10. Conversion of state to transfer function and transfer function

With effect from the Academic Year 2022-23  
statespace using MATLAB

11. Time response of Second order system using MATLAB(Simulink)
12. Tuning of PID controller to meet required specifications

From the above experiments, each student should perform at least 10  
(Ten) experiments.

No. of Internal Tests:	01	Max. Marks for Internal Test:	12
Marks for assessment of each experiment			18
Duration of Internal Test: <b>3 Hours</b>			

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**VASAVI COLLEGE OF ENGINEERING (Autonomous)**

IBRAHIMBAGH, HYDERABAD – 500 031

**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**

**Mini Project**

SYLLABUS FOR B.E. V SEMESTER

L:T:P(Hrs./week):0:0:2	SEE Marks:50	Course Code: <b>U20PW519EE</b>
Credits : 1	CIE Marks:30	Duration of SEE: 3 Hours

<b>COURSE OBJECTIVES</b>	<b>COURSE OUTCOMES</b>
1. Learn contemporary technologies. 2. Design/Develop/Implement/Solve an engineering problem in the relevant areas of Electrical and Electronics Engineering.	On completion of the course, students will be able to 1. Apply the knowledge acquired in the electrical engineering. 2. Demonstrate the ability to locate and use technical information from multiple sources. 3. Demonstrate the ability to communicate effectively through a technical report. 4. Demonstrate independent learning and professional ethics. 5. Demonstrate the project management capabilities.

The students are required to carry out mini projects irrelevant areas of Power Systems, Power Electronics, Electrical Machines, Measurements, Control Systems, Circuits, Micro Processors Controller and digital signal processing.

Students are required to submit a report on the mini project.

➤ Batch size shall be 2 (or) 3 students per batch.

➤ Allocation by department.

➤ Two reviews – One during 5<sup>th</sup> week and another during 10<sup>th</sup> week and final evaluation shall be conducted during 15<sup>th</sup> to 16<sup>th</sup> week.

With effect from the Academic Year 2022-23

- Students are required to give Presentations / Demonstration of the work during the reviews.
- Students are required to submit mini project report along with working model if applicable.

From the above experiments, each student should perform at least 12 (Twelve) experiments.

No. of Internal Tests:	01	Max. Marks for Internal Test:	12
Marks for assessment of each experiment			18
Duration of Internal Test: <b>3 Hours</b>			

With effect from the Academic Year 2022-23

**OPEN ELECTIVES OFFERED BY VARIOUS DEPARTMENTS IN  
B.E. V SEMESTER (2020-21)**

<b>Dept</b>	<b>Title</b>	<b>Code</b>	<b>credits</b>
Civil	Spatial Information Technology	U200E510CE	3
CSE	Introduction to operating System	U200E510CS	3
ECE	Sensors For Engineering Applications	U200E510EC	3
ECE	Mathematical Programming for Engineers	U200E010EC	3
Mech.	Introduction To Robotics	U200E510ME	3
Mech.	Introduction To Automobile Engineering	U200E520ME	3
Phy.	Thin Film Technology and Applications	U200E520PH	3
H&SS	Design Thinking	U200E610EH	3
H&SS	Technical Writing and Professional Presentations	U200E520EH	3
IT	Introduction To Database Management Systems	U200E510IT	3
IT	Introduction To Statistical Programming	U200E520IT	3

With effect from the Academic Year 2022-23  
**VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)**  
9-5-81, Ibrahimbagh, Hyderabad-500031, Telangana State

**DEPARTMENT OF CIVIL ENGINEERING**  
SPATIAL INFORMATION TECHNOLOGY (Open Elective-III)

SYLLABUS FOR B.E.V-SEMESTER

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code: <b>U20OE510CE</b>
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

<b>COURSE OBJECTIVES</b>	<b>COURSE OUTCOMES</b>
The objectives of this course are to:	Upon the completion of the course, students are expected to
To provide fundamental knowledge on geo spatial technology such as Remote sensing GPS and GIS.	<ol style="list-style-type: none"><li>1. Select the type of remote sensing technique/data, identify and analyze the earth surface features from the satellite images.</li><li>2. Identify GPS components, interpret the navigational message and signals received by the GPS satellites, Identify the error sources and apply corrections for accurate positioning.</li><li>3. Analyse the basic components of GIS, process spatial and attribute data, identify and rectify mapping inaccuracies and prepare thematic maps.</li></ol>

### **Unit I:**

#### **Introduction and Basic Concepts of Remote Sensing**

Introduction, Basic concepts of remote sensing, Airborne and space born sensors, Passive and active remote sensing, EMR Spectrum, Energy sources and radiation principles, Energy interactions in the atmosphere, Energy interactions with earth surface features, Atmospheric windows, Spectral reflectance curves

### **Unit II:**

#### **Remote Sensing Systems**

Satellites and orbits, Polar orbiting satellites, Image characteristics and different resolutions in Remote Sensing, Multispectral, thermal and hyper

With effect from the Academic Year 2022-23

spectral remote sensing. Some remote sensing satellites and their features, Map and Image, color composites, introduction to digital data, elements of visual interpretation techniques. Applications of Remote sensing in various fields.

### **Unit III:**

#### **Global positioning Systems (GPS)**

Overview of GNSS and Introduction to GPS, GLONASS, GALILEO, COMPASS, IRNSS systems , Applications of GPS.

GPS: Basic concepts, Functional system of GPS – Space segment, control segment and user segment, Working principle of GPS, Signal structure and code modulation, Pseudo-range measurements and navigation message

### **Unit IV**

#### **Errors and Positioning methods of GPS**

Errors and biases in GPS measurements, Accuracy of navigation position: UERE and DOP, Intentional degradation of GPS signals: Selective availability (SA) and Anti-spoofing (AS) Differential GPS: Space based augmentation systems (e.g., SBAS, GAGAN) and Ground based augmentation systems (e.g., WASS, EGNOS)

GPS Carrier Phase measurements: Single Differencing, Double Differencing and Triple Differencing in GPS measurements.

### **Unit V**

**Basic Concepts:** Introduction to GIS, History of GIS, Early development in GIS, Areas of GIS application, Components of GIS, Overview of GIS Software packages, Current issues and Trends in GIS.

Variables-Point, line, polygon, Geographic coordinate system, Map projections, Map Analysis.

**GIS Data:** Data types – spatial, non-spatial (attribute data) – data structure, data format – point line vector – Raster – Polygon

**Data Input :** Keyboard entry, Manual Digitizing, Scanner, Remotely sensed data, Existing Digital data Cartographic database, Digital elevation data

**Data Editing:** Detection and correction of errors, data reduction, edge matching



## With effect from the Academic Year 2022-23

### Learning Resources:

1. James B. Campbell & Randolph H. Wynne., Introduction to Remote Sensing, The Guilford Press, 2011
2. Lillesand, Kiefer, Chipman., Remote Sensing and Image Interpretation, Seventh Edition, 2015
3. Leick, A., GPS Satellite Survey, John Wiley: NJ, 2015
4. Hofmann, B., Lichtenegger H. and Collins J., Global Positioning System: Theory and Practice, Springer: Berlin, 2011.
5. Basudeb Bhatta, Remote Sensing and GIS, Oxford University Press, 2011.
6. Hofmann-Wellenhof, Bernhard, Lichtenegger, Herbert, Wasle, Elmar, GNSS – GPS, GLONASS, Galileo and more, 2013
7. Thanappan Subash., Geographical Information System, Lambert Academic Publishing, 2011.
8. Paul Longley., Geographic Information systems and Science, John Wiley & Sons, 2005
9. John E. Harmon & Steven J. Anderson., The design and implementation of Geographic Information Systems, John Wiley & Sons, 2003
10. ArcGIS 10.1 Manuals, 2013.
11. Kang Tsung Chang., Introduction to Geographic Information Systems, Tata Mc Graw Hill Publishing Company Ltd, New Delhi, 2008.
12. Burrough, P.A., Principles of GIS for Land Resource Assessment, Oxford Publications, 2005.
13. C.P.Lo & Albert K. W. Yeung, Concepts and Techniques of Geographic Information Systems, Prentice Hall India Pvt.Ltd, 2002.

The break-up of CIE: Internal Tests+ Assignments + Quizzes

1. No. of Internal Tests	:	<table border="1"><tr><td>2</td></tr></table>	2	Max. Marks for each Internal Test	:	<table border="1"><tr><td>30</td></tr></table>	30
2							
30							
2. No. of Assignments	:	<table border="1"><tr><td>3</td></tr></table>	3	Max. Marks for each Assignment	:	<table border="1"><tr><td>5</td></tr></table>	5
3							
5							
3. No. of Quizzes	:	<table border="1"><tr><td>3</td></tr></table>	3	Max. Marks for each Quiz Test	:	<table border="1"><tr><td>5</td></tr></table>	5
3							
5							

Duration of Internal Test: 90 minutes

With effect from the Academic Year 2022-23  
**VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)**  
9-5-81, Ibrahimbagh, Hyderabad-500031, Telangana State

**Department of Computer Science & Engineering**  
Introduction to Operating System (Open Elective-III)

SYLLABUS FOR B.E.V-SEMESTER

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code: <b>U20OE510CS</b>
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

<b>COURSE OBJECTIVES</b>	<b>COURSE OUTCOMES</b>
Understand different Operating system Structures and Services	On completion of the course, students will be able to <ol style="list-style-type: none"><li>1. Compare CPU scheduling algorithms and Operating system structures</li><li>2. Apply different techniques for Main memory management.</li><li>3. Describe file management techniques.</li><li>4. Describe deadlock handling methods</li><li>5. Analyze Disk scheduling algorithms and I/O operation implementation techniques</li></ol>

**UNIT-I:**

**Introduction to operating systems:** Definition, User view and System view of the Operating system, Operating system structure, Operating system services.

**Process:** Process concept, Process Control block, Context switching.

**CPU Scheduling:** Scheduling Criteria, Scheduling Algorithms: FCFS, SJF, Round Robin

**UNIT-II:**

**Memory Management:** Swapping, Contiguous memory allocation: Fixed Partitioning, Variable Partitioning. Non-Contiguous memory allocation: Paging.

With effect from the Academic Year 2022-23

**Virtual memory:** Demand paging, Page replacement Algorithms: FIFO, Optimal, LRU.

**UNIT –III:**

**File System Interface:** File Concept, Access Methods: Sequential, Indexed, and Direct

**File System Implementation:** File-System Structure, Allocation Methods: Contiguous, Linked and Indexed.

**UNIT –IV:**

**Deadlocks:** System model, deadlock characterization: Mutual Exclusion, Hold and Wait, Non pre-emption, Circular wait. Deadlock Prevention, Deadlock Avoidance: Banker's algorithm.

**UNIT-V:**

**Device Management:** Disk Scheduling algorithms: FCFS, SSTF, SCAN.

**I/O System:** I/O hardware, Application I/O Interface.

**Learning Resources:**

1. Abraham Silberschatz, Peter B. Galvin, Greg Gagne, Operating System Concepts, 9<sup>th</sup> Edition (2016), Wiley India.
2. Andrew S. Tanenbaum, Modern Operating Systems, 2<sup>nd</sup> Edition (2001), Pearson Education, Asia.
3. Dhananjay, Dhamdhere.M, Operating System-concept based approach, 3<sup>rd</sup> edition (2009), Tata McGraw Hill, Asia
4. Robert Love: Linux Kernel Development, (2004) Pearson Education
5. Richard Stevens, Stephen Rago, Advanced Programming in the UNIX Environment, 3<sup>rd</sup> Edition (2013), Pearson Education
6. <http://web.stanford.edu/~ouster/cgi-bin/cs140-spring19/index.php> <https://nptel.ac.in/courses/106106144/>

The break-up of CIE: Internal Tests+ Assignments + Quizzes

1. No. of Internal Tests	:	2	Max. Marks for each Internal Test	:	30
2. No. of Assignments	:	3	Max. Marks for each Assignment	:	5
3. No. of Quizzes	:	3	Max. Marks for each Quiz Test	:	5

Duration of Internal Test: 90 minutes

With effect from the Academic Year 2022-23

**VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)**

9-5-81, Ibrahimbagh, Hyderabad-500031, Telangana State

**DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING**

**SENSORS FOR ENGINEERING APPLICATIONS (OPEN ELECTIVE)**

SYLLABUS FOR B.E.V-SEMESTER (for other branches)

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code: <b>U20OE510EC</b>
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

<b>COURSE OBJECTIVES</b>	<b>COURSE OUTCOMES</b> On completion of the course, students will be able to
<ol style="list-style-type: none"><li>1. The student will come to know the various stimuli that are to be measured in real life instrumentation.</li><li>2. He will be able to select the right process or phenomena on which the sensor should depend on</li><li>3. He will be aware of the various sensors available for measurement and control applications.</li></ol>	<ol style="list-style-type: none"><li>1. Appreciate the operation of various measuring and control instruments which they encounter in their respective fields.</li><li>2. Visualize the sensors and the measuring systems when they have to work in areas of interdisciplinary nature and also think of sensors and sensors systems when for a new situation they encounter in their career</li><li>3. Identify and select the right process or phenomena on which the sensor should depend on.</li><li>4. Know various stimuli that are to be measured in real life instrumentation.</li></ol>

**UNIT - I**

Introduction to sensors and transducers .Need for sensors in the modern world. Different fields of sensors based on the stimuli - various schematics for active and passive sensors. Static and dynamic characteristics of sensors - zero, I and II order sensors – Response to impulse, step, ramp and sinusoidal inputs. Environmental factors and reliability of sensors.

## **UNIT – II**

Sensors for mechanical systems or mechanical sensors - Displacement - acceleration and force - flow of fluids - level indicators - pressure in fluids - stress in solids. Typical sensors - wire and film strain gauges, anemometers, piezo electric and magnetostrictive accelerometers, potentiometric sensors, LVDT.

## **UNIT – III**

**Thermal sensors** – temperature – temperature difference – heat quantity. Thermometers for different situation – thermocouples thermistors – color pyrometry.

**Optical sensors:** light intensity – wavelength and color – light dependent resistors, photodiode, photo transistor, CCD, CMOS sensors.

**Radiation detectors:** radiation intensity, particle counter – Gieger Muller counter (gas based), Hallide radiation detectors.

## **UNIT – IV**

**Magnetic sensors:** magnetic field, magnetic flux density – magneto resistors, Hall sensors, super conduction squids.

**Acoustic or sonic sensors:** Intensity of sound, frequency of sound in various media, various forms of microphones, piezo electric sensors.

## **UNIT – V**

**Electrical sensors:** conventional volt and ammeters, high current sensors, (current transformers), high voltage sensors, High power sensors.

**High frequency sensors** like microwave frequency sensors, wavelength measuring sensors. MEMs and MEM based sensors.

### **Learning Resources :**

1. Doebelin, "Measurement Systems: Application and Design", McGraw Hill Kogakusha Ltd.
2. Julian W. Gardner, Vijay K. Varadan, Osama O. Awadelkarim "Microsensors, MEMS and Smart Devices", New York: Wiley, 2001.
3. Henry Bolte, "Sensors – A Comprehensive Sensors", John Wiley.
4. Jacob Fraden," Handbook of Modern Sensors, Physics, Designs, and Applications", Springer.
5. Manabendra Bhuyan," Intelligent Instrumentation Principles and Applications", CRC Press.

With effect from the Academic Year 2022-23

6. Randy Frank, " Understanding Smart Sensors", Second edition, Artech House.

The break-up of CIE: Internal Tests+ Assignments + Quizzes

1. No. of Internal Tests	:	<input type="text" value="2"/>	Max. Marks for each Internal Test	:	<input type="text" value="30"/>
2. No. of Assignments	:	<input type="text" value="3"/>	Max. Marks for each Assignment	:	<input type="text" value="5"/>
3. No. of Quizzes	:	<input type="text" value="3"/>	Max. Marks for each Quiz Test	:	<input type="text" value="5"/>

Duration of Internal Test: 90 minutes

With effect from the Academic Year 2022-23

**VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)**

9-5-81, Ibrahimbagh, Hyderabad-500031, Telangana State

**DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING**

**MATHEMATICAL PROGRAMMING FOR ENGINEERS (OPEN ELECTIVE)**

SYLLABUS FOR B.E.V-SEMESTER (for other branches)

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code: <b>U200E010EC</b>
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

<b>COURSE OBJECTIVES</b>	<b>COURSE OUTCOMES</b>
To provide fundamental knowledge of programming language for solving problems.	On completion of the course, students will be able to <ol style="list-style-type: none"><li>1. Generate arrays and matrices for numerical problems solving.</li><li>2. Represent data and solution in graphical display.</li><li>3. Write scripts and functions to easily execute series of tasks in problem solving.</li><li>4. Use arrays, matrices and functions in Engineering applications</li><li>5. Design GUI for basic mathematical applications.</li></ol>

**UNIT - I : Introduction:**

Basics of MATLAB, MATLAB windows, Advantages of MATLAB, on-line help, file types.

**MATLAB Basics:** Variables and Constants – Vectors and Matrices- Arrays - manipulation- Built-in MATLAB Functions. Creating and printing simple plots, Creating, Saving and Executing a Script File, Creating and Executing a function file.

**Programming Basics:** Data types-Operators – Hierarchy of operations, Relational and logical operators, if-end structure, if-else-end structure, if-elseif-else-end structure, switch-case statement, for-end loop, while-end loop, break and continue commands.

**UNIT - II : Scripts and Functions**

Script Files, Function Files, Debugging methods in MATLAB.

**Graphics: Basic 2D plots:** Printing labels- grid and axes box- Entering text in a box- Axis control-Style options-Multiple plots-subplots-specialized 2D plots: stem-, bar, hist, pi, stairs, loglog , semilog , polar , comet 3D plots: Mesh, Contour, Surf, Stem3, ezplot.

With effect from the Academic Year 2022-23

### **UNIT - III : Numerical Methods Using MATLAB**

Numerical Differentiation, Numerical integration- Newton-Cotes integration formulae, Multi-step application of Trapezoidal rule, Simpson's 1/3 Rule for Numerical Integration. MATLAB functions for integration.

**Linear Equations-** Linear algebra in MATLAB, Solving a linear system, Gauss Elimination, Finding eigen values and eigen vectors, Matrix factorizations, Advanced topics.

### **UNIT - IV : Nonlinear Equations**

System of Non-linear equations, Solving System of Equations Using MATLAB function fsolve, Interpolation-Lagrange Interpolation, Two dimensional Interpolation, Straight line fit using Least Square Method, Curve fitting using built-in functions ployval and polyfit, cubic fit using least square method. Finding roots of a polynomial -roots function, Newton-Raphson Method.

### **UNIT - V :**

**Solution of Ordinary differential Equations(ODEs)**-The 4<sup>th</sup> order Runge-kutta Method, ODE Solvers in MATLAB, Solving First -order equations using ODE23 and ODE45.

**Structures and Graphical user interface using app Designer:** Advanced data Objects, How a GUI works, Creating and displaying a GUI. GUI components, Dialog Boxes.

### **Learning Resources:**

1. Getting started with MATLAB "A quick introduction for scientist and engineers by Rudra Pratap, Oxford publications.
2. Advanced Guide to MATLAB-Practical Examples in Science and Engineering by S.N.Alam, S.Islam, S.K. Patel-I.K. International Publishing House Pvt. Ltd.
3. Stephen J. Chapman-"MATLAB Programming for Engineers"- 5th Edition- Cengage Learning- 2015. Getting started with MATLAB (Version 9) The Math works.
4. An Introduction to MATLAB® Programming and Numerical Methods for Engineers 1st Edition by Timmy Siau Alexandre Bayen, Elsevier-18th April 2014.
5. <https://nptel.ac.in/courses/103106118/2>
6. <https://www.udemy.com/numerical-methods/>

The break-up of CIE: Internal Tests+ Assignments + Quizzes

1. No. of Internal Tests	: 2	Max. Marks for each Internal Test	: 30
2. No. of Assignments	: 3	Max. Marks for each Assignment	: 5
3. No. of Quizzes	: 3	Max. Marks for each Quiz Test	: 5

Duration of Internal Test: 90 minutes



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**VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)**

9-5-81, Ibrahimbagh, Hyderabad-500031, Telangana State

**DEPARTMENT OF MECHANICAL ENGINEERING**

INTRODUCTION TO ROBOTICS (Open Elective-III)

SYLLABUS FOR B.E.V-SEMESTER

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code: <b>U200E510ME</b>
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

<b>COURSE OBJECTIVES</b> The objectives of this course are to:	<b>COURSE OUTCOMES</b> On completion of the course, students will be able to
Identify robots and its peripherals for satisfactory operation and control of robots for industrial and non-industrial applications.	<ol style="list-style-type: none"><li>1. understand the anatomy of the robot and various robot configurations for it's selection depending on the task.</li><li>2. classify the end effectors , understand different types of joints, various types of robot drive systems for carrying out the assigned job effectively.</li><li>3. analyze a planar manipulator through forward kinematics and understand the control of robot manipulator for better reliability and efficiency using python programming.</li><li>4. Classify the various sensors used in robots for proper selection to an application.</li><li>5. summarize various industrial and non-industrial applications of robots for their selection to a particular task.</li></ol>

With effect from the Academic Year 2022-23

## **UNIT-I**

### **ROBOT BASICS**

Robot-Basic concepts, Definition, Need, Law, History, Anatomy, specifications.

Robot configurations-cartesian, cylindrical, polar ,articulated and SCARA, Serial manipulator &Parallel Manipulator

Robot wrist mechanism, Precision and accuracy of robot.

## **UNIT-II**

### **ROBOT ELEMENTS**

End effectors-Classification, Robot drive system types: Electrical, pneumatic and hydraulic. Robot joints and links-Types, Motion interpolation, Robot trajectories 2D and 3D Transformation- Scaling, Rotation and Translation, Homogeneous transformation

## **UNIT-III**

### **ROBOT KINEMATICS AND CONTROL**

Robot kinematics – Basics of direct and inverse kinematics. D-H matrix. Forward kinematics for a 2-link RR planar manipulator.

Control of robot manipulators – Point to point and Continuous Path Control. Robot programming methods. Introduction to Solve any robotic kinematic problem using python programming.

## **UNIT-IV**

### **ROBOT SENSORS**

Sensors in robots – Touch sensors-Tactile sensors – Proximity and range sensors. Force sensors, Light sensors, Pressure sensors, position and velocity feedback devices.

Introduction to Machine Vision and Artificial Intelligence.

## **UNIT-V**

### **ROBOT APPLICATIONS**

Applications of robots in Industries, Medical, Household, Entertainment, Space, Underwater, Defense, and Disaster management.

Applications of Micro and Nanorobots, Future Applications of robots.

### **Learning Resources:**

1. Mikell P. Groover, Mitchell Weiss, Roger N Nagel and Nicholas G Odrey, "Industrial Robotics Technology, Programming and Applications", TataMcGraw-Hill Publishing Company Limited , 2008.

With effect from the Academic Year 2022-23

2. Deb.S.R and Sankha Deb, "Robotics Technology and Flexible Automation", Tata McGraw Hill Publishing Company Limited, 2010.
3. Klafter R.D, Chmielewski T.A, and Negin. M, "Robotic Engineering: An Integrated Approach", Prentice Hall of India Pvt. Ltd., 1994.
4. K.S. Fu, R.C. Gonzalez and C.S.G. Lee, "Robotics control, sensing, vision and intelligence", Tata McGraw-Hill Publishing Company Limited, 2008
5. R.K. Mittal and I.J. Nagrath "Robotics and Control", Tata McGraw-Hill Publishing Company Limited, 2003.

The break-up of CIE: Internal Tests+ Assignments + Quizzes

1. No. of Internal Tests	:	<input type="text" value="2"/>	Max. Marks for each Internal Test	:	<input type="text" value="30"/>
2. No. of Assignments	:	<input type="text" value="3"/>	Max. Marks for each Assignment	:	<input type="text" value="5"/>
3. No. of Quizzes	:	<input type="text" value="3"/>	Max. Marks for each Quiz Test	:	<input type="text" value="5"/>

Duration of Internal Test: 90 minutes

With effect from the Academic Year 2022-23

**VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)**

9-5-81, Ibrahimbagh, Hyderabad-500031, Telangana State

**DEPARTMENT OF MECHANICAL ENGINEERING**

INTRODUCTION TO AUTOMOBILE ENGINEERING (OE-III)

SYLLABUS FOR B.E.V-SEMESTER

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code: <b>U20OE520ME</b>
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

<b>COURSE OBJECTIVES</b>	<b>COURSE OUTCOMES</b>
The objectives of this course are to:	On completion of the course, students will be able to
1.familiarize the student with the different types of automobiles and engine components along with its working.	1. identify types of Automobiles and engine components and describe its working.
2.impart adequate knowledge in fuel supply, cooling, lubrication and ignition of IC engines.	2. describe the engine fuel system in petrol and Diesel engines, cooling, lubrication systems.
3.understand the steering geometry, steering mechanism and types of suspension systems.	3. describe the steering mechanism, suspension systems
4.gain the knowledge about working of clutch, gear mechanism, brakes	4. describe the working principle and operation of clutch, gear mechanism and brakes.
5. make the student conversant with types of wheels, tyres and pollution control techniques.	5. know the pollutants from automobile and pollution control techniques and identify the types of wheels, tyres.

**UNIT-I**

**Introduction:** Types of automobiles: Hybrid Vehicles, Electrical, gas and Fuel cell vehicles. Chassis and body, Lay out of transmission system, Engine components: cylinder block, cylinder head, crankcase, crank shaft and cam shaft. Types and working of IC Engines: SI and CI engines, two stroke and four stroke engines.

## **UNIT-II**

**Fuel system:** Fuel supply system for SI engines and CI engines. Simple carburettor, Introduction to Multipoint fuel injection system (**MPFI**) of petrol engines, Introduction to **CRDI** system for diesel engines.

**Cooling system:** air cooling, water cooling: Thermo syphon, pump circulation system.

**Lubrication system:** Petroil System, splash system, pressure lubrication: Wet sump and Dry Sump.

**Ignition system:** Battery Ignition System, Magneto Ignition System and Electronic Ignition System.

## **UNIT-III**

**Suspension system:** Rigid axle, Independent suspension system: Double wish bone type, Macpherson strut system, Air suspension system.

**Steering system:** wheel alignment, Ackermann steering mechanism, steering geometry: camber, caster, toe-in, toe-out, steering linkage for vehicle with rigid axle front suspension, steering linkage for vehicle with independent front suspension.

## **UNIT –IV**

**Power Train:** Single plate clutch, Multi plate clutch. Manual Gear Box: sliding mesh gear box, constant mesh gear box, synchromesh gear box and Automatic Gear Box. Working principle of Differential.

**Brakes:** Types: Drum and Disc brakes, Mechanical and Hydraulic Brakes, **ABS** system.

## **UNIT –V**

**Wheels and Tyres:** Types of Wheels: wire wheels, disc wheels, alloy wheels. Types of tyres: Tube type, tubeless type.

**Automobile Emissions and control:** Automobile pollutants and sources of pollution. Pollution Control Techniques: Catalytic Converters, EGR and PCV. Bharath emission Norms.

With effect from the Academic Year 2022-23

**Learning Resources:**

1. Crouse & Anglin, "Automobile Engineering", 10<sup>th</sup> Edition, Tata McGraw Hill Publishing Co. Ltd., New Delhi, 2007.
2. Kirpal Singh, "Automobile Engineering", Vol.I& II, 13<sup>th</sup> Edition, Standard Publishers, New Delhi 2013.
3. R.B Gupta, "Automobile Engineering" 7<sup>th</sup> Edition, Satya Prakashan, New Delhi, 2015.
4. Joseph Heitner, "Automotive Mechanics", 2<sup>nd</sup> Edition, Affiliated East West Pvt. Ltd., 2013.
5. C.P. Nakra, "Basic Automobile Engineering", 7<sup>th</sup> Edition, Dhanpat Rai Publishing C (P) Ltd., 2016.

The break-up of CIE: Internal Tests+ Assignments + Quizzes

1. No. of Internal Tests	: 2	Max. Marks for each Internal Test	: 30
2. No. of Assignments	: 3	Max. Marks for each Assignment	: 5
3. No. of Quizzes	: 3	Max. Marks for each Quiz Test	: 5

Duration of Internal Test: 90 minutes

With effect from the Academic Year 2022-23  
**VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)**  
9-5-81, Ibrahimbagh, Hyderabad-500031, Telangana State

**DEPARTMENT OF PHYSICS**  
**THIN FILM TECHNOLOGY AND APPLICATIONS (OE)**

SYLLABUS FOR B.E.V-SEMESTER

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code: <b>U20OE510PH</b>
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

<b>COURSE OBJECTIVES</b>	<b>COURSE OUTCOMES</b>
	On completion of the course, students will be able to
<ol style="list-style-type: none"><li>1. Learn the fundamental atomistic mechanisms.</li><li>2. Narrate thin film deposition techniques</li><li>3. Acquire knowledge on thin film devices</li><li>4. Appreciate applications of thin films</li></ol>	<ol style="list-style-type: none"><li>1. State fundamental definitions of thin film technology</li><li>2. Describe thin film deposition techniques</li><li>3. Illustrate thin film devices and their use</li><li>4. Apply thin films coatings for a variety industrial applications</li></ol>

**UNIT-I: THIN FILM GROWTH**

Classification of films- formation of thin films- Condensation and nucleation, growth and coalescence of islands, -nucleation theories: capillarity and atomistic models, sticking coefficient, adhesion, substrate effect, film thickness effect.

**UNIT-II: DEPOSITION TECHNIQUES**

Thin film deposition techniques- simple thermal evaporation- Chemical vapor deposition technique-Advantages and disadvantages of Chemical Vapor deposition (CVD), physical vapour deposition electron beam evaporation- RF sputtering, flash evaporation, Laser ablation- spin coating- molecular beam epitaxy (MBE), Spin coating, Film thickness

With effect from the Academic Year 2022-23 measurement-ellipsometry, quartz crystal oscillator techniques, structure and microstructure of thin films.

### **UNIT-III: THIN FILM MATERIAL CHARACTERIZATION TECHNIQUES**

Characterization techniques: X-Ray Diffraction (XRD), working principles of Scanning Electron Microscopy (SEM), working of Transmission Electron Microscopy (TEM), Atomic Force Microscopy (AFM), Scanning Tunneling Microscope (STM), Field Ion Microscope (FEM).

### **UNIT-IV: PROPERTIES OF THIN FILMS**

Electrical conduction in continuous and discontinuous metallic thin films. Transport and optical properties of metallic, semiconducting and dielectric films.

### **UNIT-V: THIN FILM DEVICES AND APPLICATIONS**

Anti-reflection coatings, fabrication of thin film resistor, capacitor, diode, gas sensors and temperature sensors. Thin film solar cells, Quantum well and Quantum dot solar cells. Application of thin films in different areas such as electronics, medical, defense, sports, automobiles, applications of thin films in various fields etc.

#### **Learning resources:**

1. Kasturi Chopra Thin Film Device Applications, Mac Graw Hill, New York, 2012
2. A. Goswami, thin film fundamentals, New age international, 2006

The break-up of CIE: Internal Tests+ Assignments + Quizzes

1. No. of Internal Tests	:	2	Max. Marks for each Internal Test	:	30
2. No. of Assignments	:	3	Max. Marks for each Assignment	:	5
3. No. of Quizzes	:	3	Max. Marks for each Quiz Test	:	5

Duration of Internal Test: 90 minutes



With effect from the Academic Year 2022-23

**VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)**

9-5-81, Ibrahimbagh, Hyderabad-500031, Telangana State

**DEPARTMENT OF HUMANITIES AND SOCIAL SCIENCES**

**DESIGN THINKING (OE)**

**SYLLABUS FOR B.E.V-SEMESTER**

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code: <b>U200E510EH</b>
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

<b>COURSE OBJECTIVES</b>	<b>COURSE OUTCOMES</b>
<b>The course will enable the learners to:</b> <ol style="list-style-type: none"><li>1. Understand the critical design thinking skills needed to either improve an existing product or thinking design a new product.</li><li>2. Learn to identify customer needs and draft customer needs statements as your first step toward user innovations.</li><li>3. Learn how to translate user needs into product specifications quantitatively, and how establishing product metrics can help to define those specifications.</li><li>4. Learn to apply creativity, brainstorming, and concept generation process in designing needs solutions.</li><li>5. Learn to select and implement a product development process that's aligned with your project needs. Explore prototyping methods, strategies, and real-life examples where these have been applied to create a design that represents customer needs and product specifications.</li></ol>	<b>At the end of the course the learners will be able to: -</b> <ol style="list-style-type: none"><li>1. Learn the concepts that drive design thinking.</li><li>2. Submit project ideas around user Innovations.</li><li>3. Identify prospective customer needs and user groups.</li><li>4. Translate needs into product specifications</li><li>5. Build out the product architecture, Create a prototype and present the prototype.</li></ol>

With effect from the Academic Year 2022-23

## **Unit 1: Design Thinking Skills**

Understand the critical design thinking skills needed to either improve an existing product or design a new product.

- 1.1 The Need for Design Thinking
- 1.2 What makes design thinking unique?
- 1.3 Design thinking checklist

## **Unit 2: Identifying Customer Needs**

Learn to identify customer needs and draft customer needs statements as your first step towards user innovations.

- 2.1 Think Users' First
- 2.2 Users' inherent needs
- 2.3 Empathy and Design Thinking
- 2.4 Asking the Right Questions
- 2.5 Persona Empathy map

## **Unit 3: Product Specifications**

Learn how to translate user needs into product specifications quantitatively, and how establishing product metrics can help define those specifications

- 3.1 Creating a Design Brief Template
- 3.2 Stakeholder map template
- 3.3 Customer journey template
- 3.4 Context map template
- 3.5 Opportunity map template

## **Unit 4: Applied Creativity**

Learn to apply creativity, brainstorming, and concept generation process in designing needs solutions.

- 4.1 The need to ideate
- 4.2 The Rules of ideation
- 4.3 Participating in an ideation session

4.4 Building a Creative Culture

4.5 Divergent—5 common ideation techniques

**Unit 5: Product Development Processes and Prototyping**

Learn to select and implement a product development process that's aligned to your project needs. Explore prototyping methods, strategies, and real-life examples where these have been applied to create a design that represents customer needs and product specifications.

5.1 The need for a prototype

5.2 The Need to Test and how to conduct a structured test

5.3 How to conduct the observers' debrief

**METHODOLOGY**

- Case Studies
- Demonstration
- Presentations
- Expert lectures
- Writing and Audio-visual lessons

**ASSESSMENTS**

- Online assignments
- Individual and Group

**Suggested Books**

- The Art of Innovation, by Tom Kelley\*
- Insight Out, by Tina Seelig\*
- Change by Design, Tim Brown
- Weird Ideas That Work, by Robert Sutton\*
- Wired to Care, by Dev Patnaik
- Rapid Viz, by Kurt Hanks and Larry Belliston

The break-up of CIE: Internal Tests+ Assignments + Quizzes

1. No. of Internal Tests	:	<table border="1"><tr><td>2</td></tr></table>	2	Max. Marks for each Internal Test	:	<table border="1"><tr><td>30</td></tr></table>	30
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2. No. of Assignments	:	<table border="1"><tr><td>3</td></tr></table>	3	Max. Marks for each Assignment	:	<table border="1"><tr><td>5</td></tr></table>	5
3							
5							
3. No. of Quizzes	:	<table border="1"><tr><td>3</td></tr></table>	3	Max. Marks for each Quiz Test	:	<table border="1"><tr><td>5</td></tr></table>	5
3							
5							

Duration of Internal Test: 90 minutes

With effect from the Academic Year 2022-23  
VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)  
9-5-81, Ibrahimbagh, Hyderabad-500031, Telangana State

**DEPARTMENT OF HUMANITIES AND SOCIAL SCIENCES**  
TECHNICAL WRITING AND PROFESSIONAL PRESENTATIONS (OE)

SYLLABUS FOR B.E.V-SEMESTER

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code: <b>U20OE510EH</b>
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

<b>COURSE OBJECTIVES</b>	<b>COURSE OUTCOMES</b>
<b>The course will enable the learners to:</b> <ol style="list-style-type: none"><li>1. Understand the principles and mechanics of technical writing for students of engineering.</li><li>2. Identify different kinds of business correspondences and the dos and don'ts for each of them.</li><li>3. Make effective presentations as part of today's workplace demands.</li><li>4. Recognize the need for Video and Written CVs with focus on specific elements.</li><li>5. Comprehend skills associated with technical writing and understand different papers ranging from process description and feasibility reports to research projects, project proposals, and SOPs</li></ol>	<b>At the end of the course the learners will be able to -</b> <ol style="list-style-type: none"><li>1. Write effective reports.</li><li>2. Articulate business correspondences based on need.</li><li>3. Make persuasive presentations.</li><li>4. Design their videos CVs.</li><li>5. Write papers ranging from process description and feasibility reports to research projects, project proposals, and statement of purpose</li></ol>

**UNIT 1: FORMAL & INFORMAL TECHNICAL REPORTS**

- 1.1 Informal Report Formats
- 1.2 Project and Research Reports
- 1.3 Formal Report Components, Feasibility Reports, Evaluation reports
- 1.4 Analytical and Informational reports
- 1.5 Executive summaries.

**UNIT 2: BUSINESS CORRESPONDENCE**

With effect from the Academic Year 2022-23

- 2.1 Electronic communication
- 2.2 Effective emails
- 2.3 Instant and text messaging guidelines

### **UNIT 3: PROFESSIONAL PRESENTATIONS**

- 3.1 Paper presentations & Poster presentations
- 3.2 PowerPoint presentations
- 3.3 Storyboard writing

### **UNIT 4: RESUME & CVs**

- 4.1 Technical Resume
- 4.2 Cover letter, resume format
- 4.3 Video CVs

### **UNIT 5: WRITING PROPOSALS & SOPs**

- 5.1 Types of proposals
- 5.2 Request for proposals
- 5.3 Stating your objective.

### **METHODOLOGY**

- Case Studies
- Demonstration
- Presentations
- Expert lectures
- Writing and Audio-visual lessons

### **ASSESSMENTS**

- Online assignments
- Individual and Group

### **LEARNING RESOURCES**

[learn.talentsprint.com](https://www.talentsprint.com)

1. Read Me First!: A Style Guide for the Computer Industry by Sun Technical Publications
2. Eats, Shoots and Leaves Paperback – 18 February 2010 by Lynne Truss
3. Don't Make Me Think, Revisited: A Common Sense Approach to Web & Mobile Usability | Third Edition | By Pearson Paperback –
4. The Design of Everyday Things: Revised and Expanded Edition Paperback – Illustrated, 5 November 2013 by Don Norman (Author)

The break-up of CIE: Internal Tests+ Assignments + Quizzes

- |                          |   |   |   |                                   |   |  |    |
|--------------------------|---|---|---|-----------------------------------|---|--|----|
| 1. No. of Internal Tests | : | <table border="1"><tr><td>2</td></tr></table> | 2 | Max. Marks for each Internal Test | : | <table border="1"><tr><td>30</td></tr></table> | 30 |
| 2                        |   |   |   |                                   |   |  |    |
| 30                       |   |   |   |                                   |   |  |    |
| 2. No. of Assignments    | : | <table border="1"><tr><td>3</td></tr></table> | 3 | Max. Marks for each Assignment    | : | <table border="1"><tr><td>5</td></tr></table>  | 5  |
| 3                        |   |   |   |                                   |   |  |    |
| 5                        |   |   |   |                                   |   |  |    |
| 3. No. of Quizzes        | : | <table border="1"><tr><td>3</td></tr></table> | 3 | Max. Marks for each Quiz Test     | : | <table border="1"><tr><td>5</td></tr></table>  | 5  |
| 3                        |   |   |   |                                   |   |  |    |
| 5                        |   |   |   |                                   |   |  |    |

Duration of Internal Test: 90 minutes

With effect from the Academic Year 2022-23  
**VASAVI COLLEGE OF ENGINEERING (Autonomous)**  
 IBRAHIMBAGH, HYDERABAD – 500 031  
**DEPARTMENT OF INFORMATION TECHNOLOGY**

**Introduction To Database Management Systems** (Open Elective-III)

SYLLABUS FOR B.E. V SEMESTER  
 (Common for CIVIL, ECE, EEE & MECH)

L : T : P (Hrs./week): 3:0:0	SEE Marks :60	Course Code : <b>U20OE510IT</b>
Credits :3	CIE Marks: 40	Duration of SEE :3 Hours

<b>COURSE OBJECTIVES</b>	<b>COURSE OUTCOMES</b>
	On completion of the course, students will be able to
Apply the concepts of database management systems and design relational databases.	<ol style="list-style-type: none"> <li>1. Understand functional components of the DBMS and develop ER model for a given problem and map ER it to Relational model</li> <li>2. Understand Relational model and basic relational algebra operations.</li> <li>3. Devise queries using SQL.</li> <li>4. Design a normalized database schema using different normal forms.</li> <li>5. Understand transaction processing and concurrency control techniques.</li> </ol>

**UNIT – I**

**Introduction:** Database System Applications, Purpose of Database Systems, View of Data, Database Languages, Relational Databases, Database Architecture, Database Users and Administrators.

**Database Design and the E-R Model:** Overview of the Design Process, The E-R Model, Constraints, E-R Diagrams

**UNIT – II**

**Relational Model:** Structure of Relational Databases, Database Schema, Keys, Schema Diagrams, Relational Query Languages, Fundamental Relational-Algebra Operations.

**UNIT – III**

**Structured Query Language:** Introduction, Data Definition, Basic Structure of SQL Queries, Modification of the Database, Additional Basic Operations, Set

With effect from the Academic Year 2022-23

Operations, Null Values, Aggregate Functions, Nested Subqueries, Join Expressions, Views.

**UNIT – IV**

**Relational Database Design:** Features of Good Relational Design, Normalization-Decomposition Using Functional Dependencies, Functional-Dependency Theory.

**UNIT – V**

**Transactions:** Transaction Concepts, Transaction State, Concurrent Executions, Serializability

**Concurrency Control:** Lock-Based Protocols, Timestamp-Based Protocols.

**Learning Resources :**

1. Abraham Silberschatz, Henry F Korth, S. Sudarshan, Database System Concepts, 6th Edition, McGraw-Hill International Edition, 2011.
2. Raghu Ramakrishnan, Johannes Gehrke, Database Management Systems, Third Edition, McGraw-Hill International Edition, 2003.
3. Elmasri, Navathe, Somayajulu and Gupta, Fundamentals of Database System, 6<sup>th</sup> Edition, Pearson Education, 2011.
4. Patric O'Neil, Elizabeth O'Neil, Database-principles, programming, and performance, Morgan Kaufmann Publishers, 2001.
5. Peter Rob, Carlos coronel, Database Systems, (2007), Thomson.
6. <https://nptel.ac.in/courses/106105175/>

The break-up of CIE: Internal Tests+ Assignments + Quizzes

1. No. of Internal Tests	:	2	Max. Marks for each Internal Test	:	30
2. No. of Assignments	:	3	Max. Marks for each Assignment	:	5
3. No. of Quizzes	:	3	Max. Marks for each Quiz Test	:	5

Duration of Internal Test: 90 minutes

With effect from the Academic Year 2022-23  
**VASAVI COLLEGE OF ENGINEERING (Autonomous)**  
 IBRAHIMBAGH, HYDERABAD – 500 031  
**DEPARTMENT OF INFORMATION TECHNOLOGY**

**INTRODUCTION TO STATISTICAL PROGRAMMING**

(Open Elective-III)

SYLLABUS OF B.E V- SEMESTER

(Common for CIVIL, ECE, EEE & MECH)

L:T:P(Hrs./week): 3:0:0	SEE Marks :60	Course Code : <b>U200E520IT</b>
Credits :3	CIE Marks: 40	Duration of SEE :3 Hours

<b>COURSE OBJECTIVES</b>	<b>COURSE OUTCOMES</b>
<p>The course will enable the students to apply the statistical programming concepts and techniques using Python libraries in the analysis of Statistical data.</p>	<p>On completion of the course, students will be able to</p> <ol style="list-style-type: none"> <li>1. Understands the basics of statistical concepts and various data types in Numpy, Pandas.</li> <li>2. Cleans and Analyzes the data with descriptive statistics and EDA.</li> <li>3. Visualizes the data with matplotlib, seaborn graphic libraries.</li> <li>4. Analyzes data with various statistical inference techniques using Hypothesis testing.</li> <li>5. Understands and applies various data distributions, sampling and simulation of random variables.</li> <li>6. Applies various statistical models like linear regression, ANOVA to the data.</li> </ol>

**Unit I: Introduction to Statistical computing and Python libraries**

Intro to statistics: Samples and Population, Descriptive statistics; intro to Computational statistics, Data analysis, knowledge discovery in Data, Various data types.

Intro to statistical computing software: Python libraries & R.

**Unit II: Data Collection, Cleaning and Exploratory Data Analysis using Pandas.**

Data types in Numpy, Pandas: list, vector, matrix, array, tensor, DataFrame. Operations on Data Types.

Data import using Pandas, Data cleaning, imputation, EDA case studies using Pandas.



With effect from the Academic Year 2022-23

### **Unit III: Data Visualization with matplotlib and Seaborn.**

Intro to matplotlib and Seaborn graphic libraries, basic visualizations using matplotlib, Advanced visualizations with Seaborn, Data correlation chart. Case studies on visualizations.

### **Unit IV: Data distributions, Statistical Inference using Hypothesis testing.**

Understanding various data distributions: Bernoulli, Binomial, Exponential, Poisson & Gaussian.

Intro to Hypothesis testing: p-value, critical value, interpretation of test results.

Types of Hypothesis testing using Scipy.stats: Normality tests, Correlation tests, Comparing samples.

### **Unit V: Simulations and Statistical models**

Random variables, sampling and simulation of data distributions.

Statistical models: Linear algebra, Optimizations, Linear regression, Intro to Statistical or Machine learning.

### **Learning Resources:**

1. <https://machinelearningmastery.com/statistics-for-machine-learning/>
2. <https://scipy-lectures.org/packages/statistics/index.html>
3. [Udemy: Python for Statistical Analysis](#)
4. [courseera: Statistics with Python specialization](#)
5. <https://numpy.org/>
6. <https://pandas.pydata.org/>
7. <https://matplotlib.org/>
8. <https://seaborn.pydata.org/>
9. <https://www.statsmodels.org/stable/index.html>
10. <https://scikit-learn.org/stable/>
11. A first Course in Statistical Programming with R, W. John Braun, Duncan J. Murdoch, Cambridge University Press, 2007.
12. <https://cran.r-project.org/manuals.htm>

The break-up of CIE: Internal Tests+ Assignments + Quizzes

1. No. of Internal Tests	:	<table border="1"><tr><td>2</td></tr></table>	2	Max. Marks for each Internal Test	:	<table border="1"><tr><td>30</td></tr></table>	30
2							
30							
2. No. of Assignments	:	<table border="1"><tr><td>3</td></tr></table>	3	Max. Marks for each Assignment	:	<table border="1"><tr><td>5</td></tr></table>	5
3							
5							
3. No. of Quizzes	:	<table border="1"><tr><td>3</td></tr></table>	3	Max. Marks for each Quiz Test	:	<table border="1"><tr><td>5</td></tr></table>	5
3							
5							

Duration of Internal Test: 90 minutes

With effect from the Academic Year 2022-23

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS) :: IBRAHIMBAGH, HYDERABAD – 500 031.

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

SCHEME OF INSTRUCTION AND EXAMINATION (R-20) :: B.E. - EEE : SIXTH SEMESTER (2022 - 23)

**B.E (EEE) VI Semester**

Course Code	Name of the Course	Scheme of Instruction			Scheme of Examination			Credits
		Hours per Week			Duration in Hrs	Maximum Marks		
		L	T	P/D		SEE	CIE	
<b>T THEORY</b>								
U20HS040EH	Economics and finance for Engineers	2	-	-	3	60	40	2
U20PC610EE	Linear Integrated Circuits & Applications	3	-	-	3	60	40	3
U20PC620EE	Power Electronics	3	-	-	3	60	40	3
U20PC630EE	Microprocessor and Microcontrollers Applications	3	-	-	3	60	40	3
U20PC640EE	Digital Signal Processing	3	-	-	3	60	40	3
U20OE6XXXX	Open Elective -IV	3	-	-	3	60	40	3
U20HS610EH	Skill Development Course-VII (Aptitude-III)	1	-	-	2	40	30	1
U20PE610EE	Skill Development Course-VIII (Technical Skills-III)	1	-	-	2	40	30	1
U20HS020EH	Human values and Professional Ethics-II	1	-	-	2	40	30	1
<b>PRACTICALS</b>								
U20PC611EE	Linear Integrated Circuits & Applications	-	-	2	3	50	30	1
U20PC621EE	Power Electronics and Simulation Lab	-	-	2	3	50	30	1
U20PC631EE	Microprocessor and Microcontrollers Applications Lab	-	-	2	3	50	30	1
U20PW619EE	Theme Based Project	-	-	2	3	50	30	1
<b>Library/Sports/Proctorial Interaction</b>		-	-	-				
<b>Total</b>		<b>20</b>	<b>-</b>	<b>8</b>		<b>680</b>	<b>450</b>	<b>24</b>
<b>Grand Total</b>		<b>28</b>				<b>1130</b>		<b>24</b>

**Student should acquire one online course certification equivalent to two credits during III Sem to VII sem.**

**Note: 1. One hour is allocated for Library/Sports/Proctorial Interaction 2. Four hours are allocated for CCA-IV**

With effect from the Academic Year 2022-23

**VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)**

9-5-81, Ibrahimbagh, Hyderabad-500031, Telangana State

**DEPARTMENT OF HUMANITIES AND SOCIAL SCIENCES**

**Economics and Finance for Engineers**

SYLLABUS FOR B.E. VI SEMESTER

L:T: P (Hrs/Week):2:0:0	SEE Marks: 60	Course Code: <b>U20HS040EH</b>
Credits: 2	CIE Marks: 40	Duration of SEE : 3 Hours

<b>COURSE OBJECTIVES</b>	<b>COURSE OUTCOMES</b>
The objective of the Course is to equip the prospective engineers with the concepts and tools of economics, finance, cost and taxes for business decisions.	<ol style="list-style-type: none"><li>1. Enable students to identify the essential components such as production quantity limits, elasticity, demand and supply in business decision making.</li><li>2. Facilitate students in calculation of cost components to enable control of costs.</li><li>3. Make better investment decisions both in short and long run by understanding the financial viability of given investment proposals.</li><li>4. Analyze the given financial statements of a firm to understand the past performance and to make decisions for future.</li><li>5. Identify the impact of the new tax policies on the company's financial structure/ individual's incomes.</li></ol>

**Unit I: Basics of Economics:**

Scarcity Definition of Economics - Macro and Micro Economics - Managerial Economics - Meaning of a Firm - Objectives of a Firm - Profit Maximization - Demand Concept -Price Elasticity of Demand -Meaning of Supply -Equilibrium Price and Quantity -Production -Cobb Doughlas

With effect from the Academic Year 2022-23

Production Function - Economies of Scale. (Simple problems on computation of elasticity)

**Unit II: Cost and Price:**

Cost - Meaning -Classification of Costs -Short run and Long run costs - Cost Sheet - Break even Analysis - Methods of Pricing (Problems on Cost Sheet, Breakeven Analysis and Methods of Pricing can be asked).

**Unit III: Banking & Finance:**

RBI and its role –Commercial Banks - Functions -Capital Budgeting - Discounting and Non discounting Techniques- Working Capital Management - Concepts and Components of Working Capital - Operating Cycle.

**UNIT IV: Understanding Financial Statements:**

Financial Statements- Meaning - Types -Purpose – Ratios(Liquidity, Solvency & Profitability Ratios)(Problems can be asked on Ratios)

**Unit V: Direct & Indirect Taxes:**

Heads of Income - Income from Salaries - Income from House Property - Income from Business - Income from Capital Gains -Income from Other Sources - Latest Tax Rates - GST -CGST - SGST - IGST - GST network.

**Learning Resources :**

1. S.P.Jain and K.L.Narang., "Cost Accounting", Kalyani Publishers, Twentieth Edition Revised– 2008.
2. S.P.Jain and K.L. Narang., "Financial Accounting", Kalyani Publishers – 2002.
3. Mehta P.L., "Managerial Economics: Analysis, Problems and Cases", Thirteenth Edition, Sultan Chand and Sons, Nineteenth Edition - 2013.
4. M.Y.Khan and P.K. Jain., "Financial Management – Text, Problems and Cases", Mc Graw Hill Education Private Limited, New Delhi.
5. Vinod K Singhanian and Kapil Singhanian., "Direct Taxes Law and Practice", Taxmann Publications, Sixtieth Edition - 2018.
6. Dr, Vinod K Singhanian., "Students' Guide to GST and Customs Law", Taxmann Publications, Edition - 2018.
7. Muralidharan., "Modern Banking", Prentice Hall of India.

With effect from the Academic Year 2022-23

**Learning Resources:**

1. M. L. Seth., "Micro Economics", Lakshmi Narain Agarwal.
2. Dr. R.P. Rustagi., "Fundamentals of Financial Management"TaxmannPublications.
3. Dr. D.M. Mithani, "Money Banking International Trade & PublicFinance", Himalaya Publishing House - 2014.
4. Rajesh., "Banking Theory and Practice", Tata Mc Graw Hill Publishing

The break-up of CIE: Internal Tests+ Assignments + Quizzes

1. No. of Internal Tests	:	2	Max. Marks for each Internal Test	:	30
2. No. of Assignments	:	3	Max. Marks for each Assignment	:	5
3. No. of Quizzes	:	3	Max. Marks for each Quiz Test	:	5

Duration of Internal Test: 90 minutes

With effect from the Academic Year 2022-23  
**VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)**  
9-5-81, Ibrahimbagh, Hyderabad-500031, Telangana State

**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**

**Linear Integrated Circuits & Applications**

SYLLABUS FOR B.E. VI SEMESTER

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code: <b>U20PC610EE</b>
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

<b>COURSE OBJECTIVES</b>	<b>COURSE OUTCOMES</b>
The course will enable the students to:	On completion of the course, students will be able to
To impart fundamental concepts of linear and non linear devices and circuits namely Operational Amplifier, Multivibrator, 555 timer, voltage regulators and provide an overview on design of active filters for linear IC applications.	<ol style="list-style-type: none"><li>1. Demonstrate and understand fundamentals of linear integrated circuits.</li><li>2. Analyze the non-linear circuit applications based on particular linear integrated circuit.</li><li>3. Select and use an appropriate linear integrated circuit to build a given application.</li><li>4. Analyze the voltage regulators for a given linear circuit applications.</li><li>5. Select and design a second order active filter for IC applications.</li></ol>

**UNIT-I:**

**Operation amplifiers:** Internal structure of an operational amplifier, ideal op-amp Characteristics, non-idealities in an op-amp -Output offset voltage, input bias current, input offset current, effect of CMRR, slew rate, gain bandwidth product, Frequency response - Stability, frequency compensation of op-amp.

**Linear applications of op-amp:** Inverted summer, subtractor, add-subtractor, analog integrator, differentiator, multiplier, analog divider, V - I and I-V converter, voltage follower, AC amplifiers.

### **UNIT-II:**

Instrumentation amplifier circuits using op-amps.

**Nonlinear applications of op-amp:** Voltage limiter, precision rectifiers, peak detector, clipper and clamper, comparator, zero crossing detector, hysteretic comparator, monostable, astable multi vibrator circuits using op-amps, logarithmic amplifiers.

### **UNIT-III:**

**Waveform generation using op-amps:** sine, Square, Triangular, phase shift, Wein bridge and quadrature oscillators, voltage controlled oscillator, voltage to frequency converter, 555 timer functional diagram, operation as monostable and astable. phase locked loop- lock in range and captured range frequency.

### **UNIT-IV:**

**Voltage regulators using op-amps:** Series voltage regulator, shunt regulators, and switching regulators using OP-amp, dual voltage regulator, fixed voltage regulators, dual tracking regulators, current sensing and current feed back protection.

### **UNIT-V:**

**RC Active filters using op-amps:** Low pass, high pass and band pass, band reject, notch, first order, second order transformation, state variable filter, switched capacitor filter. P, PI and PID controllers and lead/lag compensator using an op-amp.

### **Learning Resources:**

1. D.RoyChoudhury, Linear Integrated Circuits, ShailB.Jain, 4<sup>th</sup> Edition, New Age International(P) Ltd.,2010.
2. R.A. Gayakwad, Op-Amps and Linear Integrated Circuits, 4<sup>th</sup> Edition, Prentice Hall of India,2009.
3. Coughlin and Driscoll, Operational Amplifiers and Linear Integrated Circuits, 6th Edition, Prentice hall of India,2003.

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4. Malvino Albert Paul, Electronic Principles, 7th Edition, Tata McGraw Hill, 2006.
5. S. Franco, "Design with Operational Amplifiers and Analog Integrated Circuits", McGraw Hill Inc.,2002

The break-up of CIE: Internal Tests+ Assignments + Quizzes

1. No. of Internal Tests	:	2	Max. Marks for each Internal Test	:	30
2. No. of Assignments	:	3	Max. Marks for each Assignment	:	5
3. No. of Quizzes	:	3	Max. Marks for each Quiz Test	:	5

Duration of Internal Test: 90 minutes



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**VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)**

9-5-81, Ibrahimbagh, Hyderabad-500031, Telangana State

**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**

**Power Electronics**

SYLLABUS FOR B.E. VI SEMESTER

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code: <b>U20PC620EE</b>
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

<b>COURSE OBJECTIVES</b>	<b>COURSE OUTCOMES</b>
The course will enable the students:	On completion of the course, students will be able to
To provide the fundamentals of power semiconductor devices and inculcate the knowledge of controlled rectifiers, DC-DC converters, Inverters, AC Voltage controllers and Cyclo-converters	<ol style="list-style-type: none"><li>1. Apply power switching devices for power conversion.</li><li>2. Analyze controlled rectifier circuits.</li><li>3. Analyze the operation of DC-DC Converters.</li><li>4. Analyze the operation of single phase inverters.</li><li>5. Analyze the operation of three phase voltage source inverters, Single phase AC Voltage controllers and Single phase Cyclo-converters.</li></ol>

**UNIT-I:**

**Power switching devices:**

Diode, Thyristor, GTO, TRIAC, MOSFET, IGBT: I-V Characteristics; Firing circuit for thyristor; Voltage and current commutation of a thyristor; Gate drive circuits for MOSFET and IGBT.

**UNIT-II:**

**Phase Controlled Rectifiers:**

Single-phase half-wave and full-wave rectifiers, Single-phase full-bridge thyristor rectifier with R-load and highly inductive load;

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Three-phase fully controlled thyristor rectifier and three phase semi-converter with R-load and highly inductive load; Input current wave shape and power factor and THD.

### **UNIT-III: DC-DC converters**

#### **DC-DC buck converter:**

Elementary chopper with an active switch and diode, concepts of duty ratio and average voltage, power circuit of a buck converter, analysis and waveforms at steady state, duty ratio control of output voltage.

#### **DC-DC boost converter:**

Power circuit of a boost converter, analysis and waveforms at steady state, relation between duty ratio and average output voltage.

#### **DC-DC buck-boost converter:**

Power circuit of a buck-boost converter, analysis and waveforms at steady state, relation between duty ratio and average output voltage.

### **UNIT-IV:**

#### **Inverters:**

Introduction, principle of operation, performance parameters; single phase bridge inverters with R and RL loads; three phase bridge inverters with  $180^\circ$  and  $120^\circ$  modes of operation; voltage control of single phase inverters – Single pulse width modulation, multiple pulse width modulation, sinusoidal pulse width modulation, three-phase sinusoidal pulse width modulation.

### **UNIT-V:**

#### **AC -AC and Bidirectional Converters:**

Principle of operation of single-phase ac voltage controllers for R and RL loads; Principle of operation of single phase cyclo-converter; Bidirectional converter; Applications of power electronics.

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**Learning Resources:**

1. M. H. Rashid, "*Power electronics: circuits, devices, and applications*", Pearson Education India, 4<sup>th</sup> Edition, 2018.
2. N. Mohan and T. M. Undeland, "Power Electronics: Converters, Applications and Design", John Wiley & Sons, 3<sup>rd</sup> Edition, 2007.
3. L. Umanand, "Power Electronics: Essentials and Applications", Wiley India, 2009.
4. Dr. P. S. Bimbhra, "Power Electronics", Khanna Publishers, 2009
5. M.D Singh and K.B Khanchandani, " Power Electronics", Tata McGraw Hill, 2nd Edition, 2006.

The break-up of CIE: Internal Tests+ Assignments + Quizzes

1. No. of Internal Tests	:	<input type="text" value="2"/>	Max. Marks for each Internal Test	:	<input type="text" value="30"/>
2. No. of Assignments	:	<input type="text" value="3"/>	Max. Marks for each Assignment	:	<input type="text" value="5"/>
3. No. of Quizzes	:	<input type="text" value="3"/>	Max. Marks for each Quiz Test	:	<input type="text" value="5"/>

Duration of Internal Test: 90 minutes

With effect from the Academic Year 2022-23  
**VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)**  
9-5-81, Ibrahimbagh, Hyderabad-500031, Telangana State

**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**

**Microprocessors & Microcontrollers Applications**

SYLLABUS FOR B.E. VI SEMESTER

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code: <b>U20PC630EE</b>
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

<b>COURSE OBJECTIVES</b>	<b>COURSE OUTCOMES</b>
The course will enable the students to:	On completion of the course, students will be able to
The objective of this course is become familiar with the architecture and instruction sets of 8086 and 8051 processors and as well as interfacing an external device to these processors	<ol style="list-style-type: none"><li>1. Applying the basic concepts of digital fundamentals to Intel 8086 architecture.</li><li>2. Apply the know ledge of 8086 instruction set and identify a detail software and hardware structure of the microprocessor.</li><li>3. Illustrate the different peripherals (8255, 8257, 8259 etc) interfacing with the microprocessor.</li><li>4. Design, Develop and interface microcontroller base systems to peripheral devices and systems at the chip level.</li></ol>

**UNIT I**

Over view of microcomputer structure and operation- Microprocessor Architecture of 8086- segmented memory, addressing modes, Introduction set, Minimum and Maximum mode operations.

**UNIT II**

Construction of machine codes for MOVE 8086 instruction- Assembly language programming , Assembler directives, simple programs using Assembler, strings, procedures, macros, timing.

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### **UNIT III**

Memory and I/O interfacing, A/D and D/A interfacing, 8255 (PPI), Keyboard and display interface, interrupts of 8086, seven segment display, 8237 DMA controller, 8251 USART

### **UNIT IV**

Microcontrollers- 8051 microcontroller, architecture, I/O ports, connecting external memory, Instruction set, Assembly language programming.

### **UNIT V**

Interrupts programming concepts with examples, serial communication programming concepts with examples, timers, counters, applications of micro controllers interfacing LEDs, seven segment display, keyboard interfacing, LCD interfacing, stepper motor interfacing.

### **Learning Resources**

1. Douglas.V.Hall-Microprocessors and Interfacing-RaraMcgraw Hill-Revised 2nd edition, 2006.
2. Krishna Kant – Microprocessors and Microcontrollers – Architecture, Programming and System Design 8085, 8086 8051, 80996, Prentice-Hall India-2007.
3. Kenneth.J.Ayala \_ "the 8051 , Microprocessors Architecture , Programming and Application, Thomson publishers, 2nd edition.
4. Walter A. TRiebel& Avatar Singh- The 8088 and 8086 Microprocessor –Fourth Edition, pearson

The break-up of CIE: Internal Tests+ Assignments + Quizzes

1. No. of Internal Tests	:	2	Max. Marks for each Internal Test	:	30
2. No. of Assignments	:	3	Max. Marks for each Assignment	:	5
3. No. of Quizzes	:	3	Max. Marks for each Quiz Test	:	5

Duration of Internal Test: 90 minutes

With effect from the Academic Year 2022-23  
**VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)**  
9-5-81, Ibrahimbagh, Hyderabad-500031, Telangana State

**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**

**Digital Signal Processing**

SYLLABUS FOR B.E. VI SEMESTER

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code: <b>U20PC640EE</b>
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

<b>COURSE OBJECTIVES</b>	<b>COURSE OUTCOMES</b>
The course will enable the students to:	On completion of the course, students will be able to
<ol style="list-style-type: none"><li>1.To impart the knowledge on digital processing of a signal.</li><li>2.To introduce the analysis techniques based on discrete Fourier transforms.</li><li>3.To explain the use of circular convolution.</li><li>4.To provide a glimpse of filter design.</li><li>5.To provide a glimpse on DSP processor features and its applications.</li></ol>	<ol style="list-style-type: none"><li>1. Compare analog and digital processing of a signal.</li><li>2. Convert and analyze, discrete signals and systems in time and frequency domains.</li><li>3. Perform circular convolution and compare it with linear convolution.</li><li>4. Design and suggest hardware implementation of digital filter for the given specifications.</li><li>5. Explain the architecture of digital Signal processor and its applications.</li></ol>

**UNIT-I**

**Introduction to Digital Signal Processing:** Introduction to discrete signals & systems, scheme for the digital processing of a signal, advantages of digital signal processing, representation of discrete systems using linear constant co-efficient difference equations - zero input response and zero state response, applications of DSP.

## **UNIT-II**

**Discrete Fourier Transform:** Discrete Fourier transform, Phase and amplitude spectra, Properties of discrete Fourier transform, linear convolution of sequences using DFT, circular convolution: overlap save method and overlap add method.

**Fast Fourier transform:** Radix- 2 decimation in time and decimation in frequency FFT algorithms, Inverse FFT.

## **UNIT-III**

**IIR filters:** Types of filters, IIR filters – design of Butterworth & Chebyshev filters, IIR filter design by impulse invariance and bilinear transformation. Realization of IIR filters using direct, canonic, cascade and parallel forms.

## **UNIT-IV**

**FIR Filters:** Design and characteristics of FIR digital filters, Frequency response of linear phase filters, Window techniques – rectangular window, Hamming window, Bartlet window and Kaiser window. Realization of linear – phase FIR filters.

## **UNIT-V**

**Introduction to TMS320LF2407 DSP controller:** Basic features – physical memory – software tools.

General purpose input output (GPIO): Pin multiplexing and general purpose I/O overview.

**Applications of DSP:** DSP based control for DC – DC buck – boost converter and brushless DC motor.

**Learning Resources:**

1. "Digital Signal Processing, Principles, Algorithms and Applications", John G. Proakis, Dimitris, G.Manolakis, Pearson education, 4<sup>th</sup> Edition, 2014.
2. "Digital Signal Processing, A Computer – Based Approach", Sanjit K Mitra, 3<sup>rd</sup> Edition, McGraw Hill, 2011.
3. "DSP based electro mechanical motion control", Hamid A. Tolyat, CRC press, 2019.
4. "Digital Signal Processing", Oppenheim AV, and Schafer R. W, Pearson education, 2015.

The break-up of CIE: Internal Tests+ Assignments + Quizzes

1. No. of Internal Tests	: 2	Max. Marks for each Internal Test	: 30
2. No. of Assignments	: 3	Max. Marks for each Assignment	: 5
3. No. of Quizzes	: 3	Max. Marks for each Quiz Test	: 5

Duration of Internal Test: 90 minutes



With effect from the Academic Year 2022-23

**VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)**

9-5-81, Ibrahimbagh, Hyderabad-500031, Telangana State

**DEPARTMENT OF HUMANITIES AND SOCIAL SCIENCES**

**SKILL DEVELOPMENT COURSE VII – VERBAL APTITUDE**

(Common to all branches) SYLLABUS FOR B.E. 3/4 – VI SEMESTER

L:T: P (Hrs/Week):2:0:0	SEE Marks: 40	Course Code: <b>U20BS630EH</b>
Credits: 1	CIE Marks: 30	Duration of SEE : 2 Hours

<b>COURSE OBJECTIVES</b>	<b>COURSE OUTCOMES</b>
<b>The course will enable the learners to:</b> 1. Introduce students to higher order thinking and problem solving via vocabulary and its various components 2. Train students to understand context & theme and use it to complete sentences. 3. Train students to identify the structure of sentences & paragraphs 4. Train students to analyze text, e.g., simple outlining and note taking, summarize, draw conclusions, and apply information to personal experiences 5. Train students to improve the quality of sentences by fixing errors	<b>At the end of the course the learners will be able to: -</b> 1. Use vocabulary as a tool to solve questions in verbal ability 2. Identify meanings of words using theme and context 3. Solve questions based on jumbles-sentences and paragraphs 4. Develop skills to critically analyze texts and then the ability to identify its theme 5. Improve the quality of their writing by being aware of the common errors

**Unit 1: Vocabulary- Reading for Content and Context**

**Overview:**

This course is designed for students to not just understand the importance of vocabulary but also to build on it by using the appropriate tools and methods. After which they will be able to solve vocabulary based questions and also use vocabulary as a tool to solve problems.

1.1 Concepts & Context Rules: Collocations & Phrasal Verbs

1.2 Prefixes/ Suffixes & Root Words

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- 1.3 Phrases & Idioms; Questions based on it
- 1.4 One Word Substitution; Questions based on it
- 1.5 Antonyms, Synonyms & Incorrect Word Usage

## **Unit 2: Fill in the Blanks- Applying Content and Context**

### **Overview:**

This course is designed for students to identify the clue/ theme words in sentences, then understand the context in which the words are used and finally apply concepts like collocation, antonyms, and synonyms to solve questions.

- 2.1 Concepts & Rules: Single Fill in the Blanks
- 2.2 Double/ Triple Fill in the Blanks
- 2.3 Cloze Test

## **Unit 3: Jumbles**

### **Overview:**

This course is designed to develop and improve reading and study skills needed for college work. Topics include identifying main idea and supporting details, determining author's purpose and tone, distinguishing between fact and opinion, identifying patterns of organization in a sentence or passage and the transition words associated with each pattern, recognizing the relationships between words and sentences, identifying and using context clues to determine the meanings of words, identifying logical inferences and conclusions.

- 3.1 Concepts- Purpose, Tone, Point of view
- 3.2 Parajumbles
- 3.3 Jumbled Sentences

## **Unit 4: Critical Reading Skills**

### **Overview:**

Research shows that good reading skills can lead to well written assignments. In this unit, students will learn, develop and improve reading and study skills needed for college work. Building on these basic strategies, students will develop skills to critically analyze texts and then the ability to identify its theme.

- 4.1 Concepts- Basic Introduction & Short Passages

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4.2 Article & Article Based Passages

4.3 Theme Detection

## **Unit 5: Spotting the Errors**

### **Overview:**

In this unit students will focus on identifying errors in sentences, rectifying them and improving the quality of sentences. Building on these skills will also have an impact on the written and spoken skills of students since they will be aware of the common and often made errors and therefore be able to avoid them while using language.

5.1 Concepts- Basic Introduction & Sentence Fillers

5.2 Spot the Errors

5.3 Sentence Improvement

### **METHODOLOGY**

- Demonstration
- Presentations
- Expert lectures
- Writing and Audio-visual lessons

### **ASSESSMENTS**

- Online assignments
- Individual and Group

### **Learning Resources:**

[learn.talentsprint.com](https://learn.talentsprint.com)

The break-up of CIE: Internal Tests+ Assignments + Quizzes

1. No. of Internal Tests	:	2	Max. Marks for each Internal Test	:	20
2. No. of Assignments	:	2	Max. Marks for each Assignment	:	5
3. No. of Quizzes	:	2	Max. Marks for each Quiz Test	:	5

Duration of Internal Test: 90 minutes

With effect from the Academic Year 2022-23  
**VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)**  
9-5-81, Ibrahimbagh, Hyderabad-500031, Telangana State

**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**  
**Skill Development – VIII: Technical Skills - III**

SYLLABUS FOR B.E. VI SEMESTER

L:T: P (Hrs/Week):1:0:0	SEE Marks: 40	Course Code: <b>U20PE610EE</b>
Credits: 1	CIE Marks: 30	Duration of SEE : 2 Hours

<b>COURSE OBJECTIVES</b>	<b>COURSE OUTCOMES</b>
The course will enable the students to:	On completion of the course, students will be able to

The break-up of CIE: Internal Tests+ Assignments + Quizzes

1. No. of Internal Tests	:	<input type="text" value="1"/>	Max. Marks for each Internal Test	:	<input type="text" value="30"/>
2. No. of Assignments	:	<input type="text" value="-"/>	Max. Marks for each Assignment	:	<input type="text" value="-"/>
3. No. of Quizzes	:	<input type="text" value="-"/>	Max. Marks for each Quiz Test	:	<input type="text" value="-"/>

Duration of Internal Test: 90 minutes

With effect from the Academic Year 2022-23  
**VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)**  
 9-5-81, Ibrahimbagh, Hyderabad-500031, Telangana State

**DEPARTMENT OF HUMANITIES AND SOCIAL SCIENCES**  
**Human Values and Professional Ethics II**

SYLLABUS FOR B.E. VI SEMESTER

L:T: P (Hrs/Week):1:0:0	SEE Marks: 40	Course Code: <b>U20HS010EH</b>
Credits: 1	CIE Marks: 30	Duration of SEE :2 Hours

<b>COURSE OBJECTIVES</b>	<b>COURSE OUTCOMES</b>
<p><b>The course will enable the learners to:</b></p> <ol style="list-style-type: none"> <li>1. Create an awareness on the interrelation between Society, Ethics and Human Values</li> <li>2. Understand how ethical dilemmas apply to real life scenarios</li> <li>3. Develop ethical human conduct and professional competence</li> <li>4. Understand the role of good ethical practices and apply it in a project</li> </ol>	<p><b>At the end of the course the learners will be able to: -</b></p> <ol style="list-style-type: none"> <li>1. Identify ethical risks in everyday life and in societies that can lead to unethical choices, such as structures that diffuse responsibility or a group that has collectively de-stigmatized unethical behaviour</li> <li>2. Identify ethical concerns in research and intellectual contexts, including academic integrity, use and citation of sources, and the objective presentation of data.</li> <li>3. Assess their own ethical values and the social context of problems and articulate what makes a particular course of action ethically defensible</li> <li>4. Demonstrate knowledge of ethical values in non-classroom activities, such as service learning, internships, and field work integrate, synthesize, and apply knowledge of ethical dilemmas and resolutions in academic settings, including focused and interdisciplinary research</li> </ol>

**UNIT1 - NORMATIVE ETHICS & SOCIETAL ETHICS**

This unit deals with normative ethics, the branch of moral philosophy, or ethics, concerned with criteria of what is morally right and wrong. It includes the

With effect from the Academic Year 2022-23 formulation of moral rules that have direct implications for what human actions, institutions, and ways of life should be like. This unit also covers societal ethics which is the systematic reflection on the moral dimensions of social structures, systems, issues, and communities.

### **UNIT 2 - PROFESSIONAL ETHICS - NEED FOR ETHICAL CODES**

This unit covers the code of Professional Ethics- it is designed to ensure that students learn the necessary skills that groom them to behave like employees should, one that is socially acceptable and respectful of one another. It establishes the rules for behavior and sends a message to every employee that universal compliance is expected.

### **UNIT 3 - PRIVACY**

This unit covers "Cyber ethics" - the code of responsible behavior on the Internet. Just as we are taught to act responsibly in everyday life with lessons such as "Don't take what doesn't belong to you" and "Do not harm others," we must act responsibly in the cyber world as well.

The basic rule is "Do not do something in cyberspace that you would consider wrong or illegal in everyday life."

### **UNIT 4- MEDIA AND MEDICAL ETHICS**

This unit covers Media and Medical ethics is the best division of applied ethics dealing with the specific ethical principles and standards of media (including broadcast media, film, theatre, the arts, print media and the internet) and medicine (practice of clinical medicine and related scientific research)

### **MODE OF DELIVERY**

- |  |   |
|--|---|
| <ul style="list-style-type: none"><li>• Questionnaires</li><li>• Quizzes</li><li>• Case-studies</li><li>• Observations and practice</li><li>• Home and classroom assignments</li></ul> | <ul style="list-style-type: none"><li>• Discussions</li><li>• Skits</li><li>• Short Movies/documentaries</li><li>• Team tasks and individual tasks</li><li>• Research based tasks</li><li>• Project</li></ul> |
|--|---|

With effect from the Academic Year 2022-23

### Relevant Websites, CD's and Documentaries

- <https://plato.stanford.edu/>

### Learning Resources:

- [learn.talentsprint.com](https://www.talentsprint.com)

The break-up of CIE: Internal Tests+ Assignments + Quizzes

1. No. of Internal Tests	:	<table border="1"><tr><td>1</td></tr></table>	1	Max. Marks for each Internal Test	:	<table border="1"><tr><td>20</td></tr></table>	20
1							
20							
2. No. of Assignments	:	<table border="1"><tr><td>2</td></tr></table>	2	Max. Marks for each Assignment	:	<table border="1"><tr><td>5</td></tr></table>	5
2							
5							
3. No. of Quizzes	:	<table border="1"><tr><td>2</td></tr></table>	2	Max. Marks for each Quiz Test	:	<table border="1"><tr><td>5</td></tr></table>	5
2							
5							

Duration of Internal Test: 90 minutes

With effect from the Academic Year 2022-23

**VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)**

9-5-81, Ibrahimbagh, Hyderabad-500031, Telangana State

**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**

**Linear Integrated Circuits & Applications Lab**

SYLLABUS FOR B.E. VI SEMESTER

L:T: P (Hrs/Week):0:0:2	SEE Marks: 50	Course Code: <b>U20PC611EE</b>
Credits: 1	CIE Marks: 30	Duration of SEE : 3 Hours

<b>COURSE OBJECTIVES</b>	<b>COURSE OUTCOMES</b>
To acquire skills of designing and testing of digital and analog integrated circuits.	On completion of the course, students will be able to 1. Analyze and design various applications of Op-Amp. 2. Construct and troubleshoot circuits containing linear integrated circuits. 3. Design combinational and sequential logic circuits using ICs. 4. Identify the suitable ICs in the applications of adders, counters, converters and multiplexers. 5. Compute the Triangle and square wave using op-amp and ICs.

**List of Experiments:**

1. Generation of Triangle and square wave using op-amp.
2. PLL (Phase locked loop).
3. Design of astable multi vibrator using 555 timer.
4. Active filters.
5. Design of integrator and differentiator using op-amp.
6. Multiplexer applications for logic Realization of combinational circuits.
7. Synchronous counter.
8. Asynchronous counter.
9. Study of clipping and clamping circuits using op-amps.
10. Design of mono stable multi vibrator using IC's.
11. Instrumentation amplifier using op-amp.



With effect from the Academic Year 2022-23

12.Study of half adder, full adder and subtractor using IC's.

13.D/A converters.

14.A/D converters

From the above experiments, each student should perform at least 10 (Ten) experiments.

No. of Internal Tests:	01	Max. Marks for Internal Test:	12
Marks for assessment of each experiment			18
Duration of Internal Test: <b>3 Hours</b>			

With effect from the Academic Year 2022-23  
**VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)**  
9-5-81, Ibrahimbagh, Hyderabad-500031, Telangana State

**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**  
**Power Electronics and Simulation Lab**

SYLLABUS FOR B.E. VI SEMESTER

L:T: P (Hrs/Week):0:0:2	SEE Marks: 50	Course Code: <b>U20PC621EE</b>
Credits: 1	CIE Marks: 30	Duration of SEE : 3 Hours

<b>COURSE OBJECTIVES</b>	<b>COURSE OUTCOMES</b>
The objective of the power electronics and simulation lab is to provide an experience in working with power converters and enhance the analyzing capability by introducing simulation tools for power converters.	On completion of the course, students will be able to 1. Examine the characteristics of power switching devices. 2. Analyze thyristor controlled rectifiers. 3. Analyze DC-DC converters. 4. Analyze voltage source inverters and bidirectional converter 5. Analyze AC-AC Controller

**List of experiments:**

1. I-V Characteristics of SCR, BJT, MOSFET and IGBT
2. Gate triggering circuits of thyristor: R, R – C and UJT triggering circuits.
3. Study of Voltage and current commutation techniques of thyristor.
4. 1 –  $\emptyset$  bridge rectifiers: Full converter and Semi-converter with R & R – L loads
5. Buck-Boost Converter
6. Single phase diode bridge rectifier- R, RL and RC load
7. Three phase diode bridge rectifier- R, RL and RC load
8. Single phase inverter- R and RL load
9. Three phase inverter– R and RL load
10. PSPICE Simulation of Single phase full-bridge thyristor rectifier with R-load and highly inductive load.
11. PSPICE Simulation of three phase full-bridge thyristor rectifier with R-load and highly inductive load.
12. PSPICE Simulation of Single phase voltage source inverters

With effect from the Academic Year 2022-23

13. PSPICE Simulation of three phase voltage source inverters.
14. MATLAB Simulation of Buck and Boost Converters.
15. Bidirectional power converter

From the above experiments, each student should perform at least 10 (Ten) experiments.

No. of Internal Tests:	01	Max. Marks for Internal Test:	12
Marks for assessment of each experiment			18
Duration of Internal Test: <b>3 Hours</b>			

With effect from the Academic Year 2022-23  
**VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)**  
9-5-81, Ibrahimbagh, Hyderabad-500031, Telangana State

**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**

**Microprocessors & Microcontrollers Applications Lab**

SYLLABUS FOR B.E. VI SEMESTER

L:T: P (Hrs/Week):0:0:2	SEE Marks: 50	Course Code: <b>U20PC631EE</b>
Credits: 1	CIE Marks: 30	Duration of SEE : 3 Hours

<b>COURSE OBJECTIVES</b>	<b>COURSE OUTCOMES</b>
The course will enable the students to:	On completion of the course, students will be able to
To introduce to students the basics of microprocessor and microcontroller programming and their applications.	1. Apply the fundamentals of assembly level programming of microprocessors and microcontrollers. 2. Design circuits for various applications using microprocessor and microcontrollers. 3. An in-depth know ledge of applying the concepts on real- time applications. 4. Use Real time programming software to interface hardware.

**List of Experiments:**

**I. Microprocessor 8086 : using MASM/TASM**

1. Programs for signed/unsigned multiplication and division
2. Program for finding average of N 16 bit
3. Program for finding largest number in an array
4. Program for code conversion like BCD to 7-segment
5. Program for compute factorial of a positive integer number.
6. String Manipulation instructions
7. Use of JUMP and CALL instructions
8. Macro and Procedure instructions

**II. Interfacing :using 8086 Kit**

1. 8255– PPI : Write an ALP to generate triangular wave, square wave, sawtooth waveform using DAC.
2. LCD interfacing

With effect from the Academic Year 2022-23

3. ADC interfacing
4. Stepper motor interfacing
5. Traffic signal controller

**III. Microcontroller 8051 :**

1. Data transfer- Block of move, exchange, sorting, finding largest element in an array.
2. Arithmetic instructions: Multi byte operations
3. Boolean & logical instructions(Bit manipulations)
4. Programs to generate delay, programs using serial port and onchip timer/counter.
5. Use of JUMP and CALL instructions

**IV .Proteus Software**

1. Introduction to Proteus software
2. LED Interfacing
3. LCD Interfacing
4. Keyboard Interfacing
5. Stepper Motor Interfacing
6. DC motor Interfacing

**Learning Resources:**

From the above experiments, each student should perform at least 10 (Ten) experiments.

No. of Internal Tests:	01	Max. Marks for Internal Test:	12
Marks for assessment of each experiment			18
Duration of Internal Test:	<b>3 Hours</b>		

With effect from the Academic Year 2022-23

**OPEN ELECTIVES OFFERED BY VARIOUS DEPARTMENTS IN  
B.E. VI SEMESTER (2020-21)**

<b>Dept</b>	<b>Title</b>	<b>Code</b>	<b>credits</b>
Civil	Project Management	U20OE610CE	3
CSE	Introduction To Databases	U20OE610CS	3
ECE	Internet Of Things And Applications	U20OE610EC	3
ECE	Introduction To Mobile Communications	U20OE620EC	3
IT	Introduction To Web Application Development	U20OE610IT	3
IT	Introduction To Machine Learning	U20OE620IT	3
Mech.	Additive Manufacturing And Its Applications	U20OE610ME	3
Mech.	Alternative Fuels and Energy Systems	U20OE620ME	3
Mech.	Industrial Administration And Financial Management	U20OE630ME	3
H&SS	English For Competitive Examinations	U20OE610EH	3

With effect from the Academic Year 2022-23  
**VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)**  
9-5-81, Ibrahimbagh, Hyderabad-500031, Telangana State

**DEPARTMENT OF CIVIL ENGINEERING**  
PROJECT MANAGEMENT (Open Elective-IV)

SYLLABUS FOR B.E.VI-SEMESTER

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code: <b>U200E610CE</b>
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

<b>COURSE OBJECTIVES</b>	<b>COURSE OUTCOMES</b>
The objectives of this course are to:	On completion of the course, students will be able to
<ol style="list-style-type: none"><li>1. Learn the concept of project management along with functions and objectives.</li><li>2. Understand the various techniques used for project planning such as bar charts, CPM, PERT and crashing of networks.</li><li>3. Acquire knowledge on various types of contracts, tenders.</li></ol>	<ol style="list-style-type: none"><li>1. Understand the objectives, functions and principles of management in projects.</li><li>2. Practice the network techniques like CPM and PERT for better planning and scheduling of engineering works.</li><li>3. Analyse the importance of cost and time in network analysis and planning the work accordingly.</li><li>4. Knowledge on Contracts, Tenders, and Work orders related to the projects.</li><li>5. Interpret the concept of Linear Programming and solve problems by Graphical and Simplex methods.</li></ol>

### **UNIT-I**

**Significance of Project Management:** Objectives and functions of project management, management team, principles of organization and types of organisation.

With effect from the Academic Year 2022-23

## **UNIT-II**

**Project Planning:** Project Planning, bar charts, network techniques in project management - CPM Expected likely, pessimistic and optimistic time, normal distribution curve and network problems of PERT

## **UNIT-III**

**Time Cost Analysis:** Cost time analysis in network planning, updating

## **UNIT-IV**

**Contracts:** Introduction, types of contracts and their advantages and disadvantages, conditions of contracts, Introduction to Indian contract act.

**Tender:** Tender form, Tender Documents, Tender Notice, Work Order

## **UNIT-V**

**Linear programming and optimization Techniques:** Introduction to optimization – Linear programming, Importance of optimization, Simple problems on formulation of LP, Graphical method, Simplex method.

### **LearningResources:**

1. Srinath L.S., PERT and CPM: Principles and Application, East-West Press, 2001.
2. Peret, F, Construction Project Management an Integrated approach, Taylor and Francis, Taylor and Francis Group, London & New York, 2009
3. Punmia B.C., and Khandelwal, PERT and CPM, Laxmi Publications, 2006.
4. <http://nptel.ac.in/courses/>

The break-up of CIE: Internal Tests+ Assignments + Quizzes

1. No. of Internal Tests	:	<table border="1"><tr><td>2</td></tr></table>	2	Max. Marks for each Internal Test	:	<table border="1"><tr><td>30</td></tr></table>	30
2							
30							
2. No. of Assignments	:	<table border="1"><tr><td>3</td></tr></table>	3	Max. Marks for each Assignment	:	<table border="1"><tr><td>5</td></tr></table>	5
3							
5							
3. No. of Quizzes	:	<table border="1"><tr><td>3</td></tr></table>	3	Max. Marks for each Quiz Test	:	<table border="1"><tr><td>5</td></tr></table>	5
3							
5							

Duration of Internal Test: 90 minutes



With effect from the Academic Year 2022-23

**VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)**

9-5-81, Ibrahimbagh, Hyderabad-500031, Telangana State

**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING**

INTRODUCTION TO DATABASES (OPEN ELECTIVE-IV)

SYLLABUS FOR B.E. VI-SEMESTER

(COMMON FOR CIVIL, ECE, EEE & MECH)

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code: <b>U200E610CS</b>
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

<b>COURSE OBJECTIVES</b>	<b>COURSE OUTCOMES</b>
1. Identify different issues involved in the design and implementation of a database system.  2. Understand transaction processing.	On completion of the course, students will be able to  1. Identify the functional components of database management system. Create conceptual data model using Entity Relationship Diagram  2. Transform a conceptual data model into a relational model  3. Design database using normalization techniques  4. Apply indexing and hashing techniques for effective data retrieval  5. Explain transaction processing.

**UNIT-I**

**Introduction:** Database System Application, Purpose of Database Systems, View of Data, Database Languages, Relational Database, Database Architecture, Database Users and Administrators.

**Database Design and E-R Model:** Overview of the Design Process, the E-R Model, Constraints, E-R Diagrams.

**UNIT-II**

**Relational Model:** Structure of Relation Database, Relational Algebra Operations, Modification of the Database.

With effect from the Academic Year 2022-23

**Structured Query Language:** Introduction, Basic Structure of SQL Queries, Set Operations, Aggregate Functions, Null Values, Nested Sub queries, Views, Join Expressions.

### UNIT-III

**Relational Database Design:** Features of Good Relational Designs, Atomic Domains and first Normal form, Decomposition Using Functional Dependencies, functional Dependency Theory.

### UNIT-IV

**Indexing and Hashing: Basic** Concepts, Ordered Indices, B+ Tree Index Files, B-Tree Files, Multiple – Key Access, Static Hashing, Dynamic Hashing, Comparison of Ordered Indexing and Hashing.

### UNIT-V

**Transaction Management:** Transaction concept, Storage Structure, Transaction Atomicity and Durability, Transaction Isolation and Atomicity, Serializability, Recoverability.

### Learning Resources:

1. Abraham Silberschatz, Henry F Korth, Sudharshan S, Database System Concepts, 6th Edition(2011), McGraw-Hill International Edition.
2. Date CJ, Kannan A, Swamynathan S, An Introduction to Database System , 8th Edition(2006) Pearson Education.
3. Raghu Ramakrishna, and Johannes Gehrke, Database Management Systems, 3rd Edition(2003), McGraw Hill.
4. RamezElmasri, Durvasul VLN Somyazulu, Shamkant B Navathe, Shyam K Gupta, Fundamentals of Database Systems, 4th Edition(2006), Pearson Education.
5. Peter rob, Carlos coronel, Database Systems, (2007), Thomoson.
6. <http://nptel.ac.in/courses/106106093/>

The break-up of CIE: Internal Tests+ Assignments + Quizzes

1. No. of Internal Tests	:	2	Max. Marks for each Internal Test	:	30
2. No. of Assignments	:	3	Max. Marks for each Assignment	:	5
3. No. of Quizzes	:	3	Max. Marks for each Quiz Test	:	5

Duration of Internal Test: 90 minutes

With effect from the Academic Year 2022-23

**VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)**

9-5-81, Ibrahimbagh, Hyderabad-500031, Telangana State

**DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING**

Internet of Things and Applications (OPEN ELECTIVE – IV)

SYLLABUS FOR B.E.VI-SEMESTER (for other branches)

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code: <b>U20OE610EC</b>
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

<b>COURSE OBJECTIVES</b>	<b>COURSE OUTCOMES</b>
	On completion of the course, students will be able to
1. The purpose of this course is to impart knowledge on IoT Architecture, practical constrains. 2. To study various protocols And to study their implementations	1. Understand the Architectural Overview of IoT 2. Enumerate the need and the challenges in Real World Design Constraints 3. Compare various IoT Protocols. 4. Build basic IoT applications using Raspberry Pi. 5. Understand IoT usage in various applications.

**UNIT - I : OVERVIEW**

Introduction to IoT – Improving Quality of life.

IoT-An Architectural Overview, M2M and IoT Technology Fundamentals- Devices and gateways, Local and wide area networking, Data management, Business processes in IoT.

**UNIT - II : Real-World Design Constraints**

Real-World Design Constraints- Introduction, Technical Design constraints- hardware is popular again, Data representation and visualization, Interaction and remote control. Power Management in IoT device, Power conditioning using energy harvesting.

**UNIT - III : IOT PROTOCOLS**

Introduction to MQTT, Quality of services in MQTT, standards and security in MQTT.

With effect from the Academic Year 2022-23

Introduction and implementation of AMQP, Implementation of CoAP and MDNS.

#### **UNIT - IV : Device for IoT**

Choice of Microcontroller, Introduction to Raspberry Pi ,Features of Pi, Programming platform, Python programming for Pi. Building basic IoT Applications using Raspberry Pi.

#### **UNIT - V : IoT case studies**

Smart Cities and Smart Homes, Connected Vehicles, Agriculture, Healthcare, Activity Monitoring.

#### **Learning Resources:**

1. Jan Holler, VlasiosTsiatsis, Catherine Mulligan, Stefan Avesand, StamatisKarnouskos, David Boyle, "From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence", 1 st Edition, Academic Press, 2014.
2. Peter Waher, "Learning Internet of Things", PACKT publishing, BIRMINGHAM – MUMBAI
3. Bernd Scholz-Reiter, Florian Michahelles, "Architecting the Internet of Things", ISBN 978-3-642-19156-5 e-ISBN 978-3-642-19157-2, Springer
4. Daniel Minoli, "Building the Internet of Things with IPv6 and MIPv6: The Evolving World of M2M Communications", ISBN: 978-1-118- 47347-4, Willy Publications
5. <https://nptel.ac.in/courses/106105166/5>
6. <https://nptel.ac.in/courses/108108098/4>

The break-up of CIE: Internal Tests+ Assignments + Quizzes

1. No. of Internal Tests	: 2	Max. Marks for each Internal Test	: 30
2. No. of Assignments	: 3	Max. Marks for each Assignment	: 5
3. No. of Quizzes	: 3	Max. Marks for each Quiz Test	: 5

Duration of Internal Test: 90 minutes

With effect from the Academic Year 2022-23

**VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)**

9-5-81, Ibrahimbagh, Hyderabad-500031, Telangana State

**DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING**

Introduction to Mobile Communications (OPEN ELECTIVE - IV)

SYLLABUS FOR B.E. VI - SEMESTER

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code:U20OE620EC
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

<b>COURSE OBJECTIVES</b>	<b>COURSE OUTCOMES</b>
	On completion of the course, students will be able to
1. To understand the technology trends changing from generation to generation.	1. Analyze various methodologies to improve the cellular capacity.
2. To have an insight into the various propagation models and the effects of fading.	2. Identify various Propagation effects.
3. To understand the multiple access techniques and Mobile communication system specifications.	3. Identify the effects of fading and multi path propagation.
	4. Categorize various multiple access techniques for Mobile Communications.
	5. Analyze the specifications of GSM based Mobile Communication Systems.

**UNIT - I:**

**Introduction to Wireless Communication Systems:** Evolution of Mobile Radio Communications, Examples of Wireless Communications Systems, Trends in Cellular Radio and Personal Communication Systems.

**The Cellular Concept – System Design Fundamentals:** Introduction, Frequency Reuse, Channel Assignment Strategies, Handoff Strategies, Interference and System Capacity, Improving Coverage and Capacity in Cellular Systems.

**UNIT - II:**

**Mobile Radio Propagation - Large Scale Path Loss:** Introduction to Radio wave Propagation, Free Space Propagation Model, Reflection, Ground Reflection (Two-Ray) Model, Diffraction, Scattering.

With effect from the Academic Year 2022-23

**UNIT - III:**

**Mobile Radio Propagation - Small Scale Fading and Multipath:** Small Scale Multipath Propagation, Small – Scale Multipath Measurements, Parameters of Mobile Multipath Channels, Types of Small-Scale Fading, Rayleigh and Ricean Distributions.

**UNIT -IV:**

**Multiple Access Techniques for Wireless Communications:** Introduction, Frequency Division Multiple Access (FDMA), Time Division Multiple Access (TDMA), Code Division Multiple Access (CDMA), Space Division Multiple Access (SDMA).

**UNIT -V:**

**Wireless Systems and Standards:** Global System for Mobile (GSM) – Services and features, System architecture, GSM Radio subsystem, channel types, Frame structure for GSM.

**Learning Resources:**

1. Theodore S. Rappaport, Wireless Communications Principles and Practices, 2<sup>nd</sup> edition, Pearson Education.
2. David Tse, Pramodh Viswanath, Fundamentals of Wireless Communication, 2005, Cambridge University Press.
3. Name of the course: Introduction to Wireless and Cellular Communications  
Course url: [https://swayam.gov.in/nd1\\_noc19\\_ee48/preview](https://swayam.gov.in/nd1_noc19_ee48/preview)

The break-up of CIE: Internal Tests+ Assignments + Quizzes

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2							
30							
2. No. of Assignments	:	<table border="1"><tr><td>3</td></tr></table>	3	Max. Marks for each Assignment	:	<table border="1"><tr><td>5</td></tr></table>	5
3							
5							
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3							
5							

Duration of Internal Test: 90 minutes

With effect from the Academic Year 2022-23  
**VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)**  
9-5-81, Ibrahimbagh, Hyderabad-500031, Telangana State

**DEPARTMENT OF INFORMATION TECHNOLOGY**  
**INTRODUCTION TO WEB APPLICATION DEVELOPMENT**

SYLLABUS FOR B.E.VI-SEMESTER (Common for CIVIL, ECE, EEE & MECH)

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code: <b>U20OE610IT</b>
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

<b>COURSE OBJECTIVES</b> The objectives of this course are to:	<b>COURSE OUTCOMES</b> On completion of the course, students will be able to
Acquire basic skills for designing static and dynamic Web Applications using HTML, CSS , Java script and PHP.	<ol style="list-style-type: none"><li>1. Design a static web pages using HTML, CSS.</li><li>2. Use JavaScript for creating dynamic web pages and client side validation.</li><li>3. Use built-in functions of PHP to perform server side validations and sending emails.</li><li>4. Use built-in functions of PHP to connect , query and fetch results from a database.</li><li>5. Build a PHP application using an MVC Framework.</li></ol>

### **UNIT-I: Introduction**

Introduction: World Wide Web, Web Browsers, Web Servers, URL, HTTP, TCP Port. HTML: Standard HTML document structure, Basic Tags, Images, Hypertext Links, Lists, Tables, Frames. CSS: In-line style sheets, Internal Style sheets and External Style sheets.

### **UNIT-II: Basics of JavaScript**

JavaScript: Introduction, Basics of JavaScript-variables, data types and operators, Control Structures, Arrays, Functions, HTML Forms, Events and event handling.

### **UNIT-III: Basics of PHP**

Basics of PHP: Data Types, Variables and Operators, Control Structures: If else,

With effect from the Academic Year 2022-23

Switch Case. Loop: For, ForEach, While, Do While. Functions in PHP, PHP Forms, Cookies & Sessions, File Processing.

**UNIT-IV: Advanced PHP**

**Advanced PHP: PHP E-Mail**, Filters, Database Access, OOPS in PHP. Application using PHP.

**UNIT-V: Introduction to MVC**

Introduction to Model View Controller Architecture, Building Application using a PHP Framework, Testing and Deploying a PHP application.

**Learning Resources:**

1. "Web Technologies", 7<sup>th</sup> Edition, Uttam K.Roy,2012.
2. "Internet & World Wide Web How to Program", 5/e, Paul J. Deitel, Harvey M. Deitel, Abbey Deitel,2012.

The break-up of CIE: Internal Tests+ Assignments + Quizzes

1. No. of Internal Tests	:	<table border="1"><tr><td>2</td></tr></table>	2	Max. Marks for each Internal Test	:	<table border="1"><tr><td>30</td></tr></table>	30
2							
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3							
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3							
5							

Duration of Internal Test: 90 minutes



With effect from the Academic Year 2022-23

**VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)**

9-5-81, Ibrahimbagh, Hyderabad-500031, Telangana State

**DEPARTMENT OF INFORMATION TECHNOLOGY**

**INTRODUCTION TO MACHINE LEARNING**

SYLLABUS FOR B.E VI- SEMESTER (Common for CIVIL, ECE, EEE & MECH)

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code: <b>U200E620IT</b>
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

<b>COURSE OBJECTIVES</b> The objectives of this course are to:	<b>COURSE OUTCOMES</b> On completion of the course, students will be able to
Introduce the fundamental concepts and approaches in Artificial intelligence and Machine Learning field to effectively apply techniques to the real-world problems.	<ol style="list-style-type: none"><li>1. Demonstrate knowledge of the Artificial intelligence and machine learning literature.</li><li>2. Apply an appropriate algorithm for a given problem.</li><li>3. Apply machine learning techniques in the design of computer systems.</li><li>4. Prove basic results in the theory of learning</li><li>5. Explain the relative strengths and weaknesses of different machine learning methods and approaches.</li></ol>

**UNIT-I:**

**Introduction to AIML:** Foundations of AI, Sub areas of AI, Applications. Introduction to learning, Types of Learning: Supervised Learning, Unsupervised Learning, Reinforcement Learning.

**Supervised learning:** Linear Regression, Logistic Regression.

**UNIT-II:**

**Supervised Non-parametric learning:** Introduction to Decision Trees, K-Nearest Neighbor, Feature Selection.

**Supervised Parametric learning:** Support Vector Machine, Kernel function and Kernel SVM.

With effect from the Academic Year 2022-23

**UNIT-III:**

**Supervised Parametric learning (Neural networks):** Perceptron, Multilayer Neural Network, Backpropagation.

**UNIT-IV:**

**Supervised Parametric Bayesian learning:** Introduction, Naive Bayes Classification, Bayesian Network.

**UNIT-V:**

**Unsupervised learning:** Clustering, K-means Clustering, DBSCAN

**Learning Resources:**

1. Tom Mitchell, Machine Learning, First Edition, McGraw-Hill, 1997
2. Christopher Bishop. Pattern Recognition and Machine Learning. Second Edition.
3. EthemAlpaydin , Introduction to Machine Learning, Second Edition
4. T. Hastie, R. Tibshirani, J. Friedman. The Elements of Statistical Learning, 2e, 2008.
5. <http://nptel.ac.in/courses/106106139/>

The break-up of CIE: Internal Tests+ Assignments + Quizzes

1. No. of Internal Tests	:	<input type="text" value="2"/>	Max. Marks for each Internal Test	:	<input type="text" value="30"/>
2. No. of Assignments	:	<input type="text" value="3"/>	Max. Marks for each Assignment	:	<input type="text" value="5"/>
3. No. of Quizzes	:	<input type="text" value="3"/>	Max. Marks for each Quiz Test	:	<input type="text" value="5"/>

Duration of Internal Test: 90 minutes

With effect from the Academic Year 2022-23  
**VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)**  
9-5-81, Ibrahimbagh, Hyderabad-500031, Telangana State

**DEPARTMENT OF MECHANICAL ENGINEERING**  
Additive Manufacturing and its Applications

SYLLABUS FOR B.E.VI-SEMESTER

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code: <b>U200E610ME</b>
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

<b>COURSE OBJECTIVES</b>	<b>COURSE OUTCOMES</b>
The objectives of this course are to:	On completion of the course, students will be able to
understand the fundamentals of various additive manufacturing technologies and their applications in Engineering Industry.	<ol style="list-style-type: none"><li>1. Understand the fundamentals of prototyping and the various data formats used in Additive Manufacturing.</li><li>2. Study the principle, process, advantages, limitations and case studies of liquid based AM systems.</li><li>3. Study the principle, process, advantages, limitations and case studies of solid based AM systems.</li><li>4. Study the principle, process, advantages, limitations and case studies of powder based AM systems.</li><li>5. Study the applications of AM in various engineering industries as well as the medical field.</li></ol>

### **Unit-I**

Introduction, Prototyping fundamentals, Historical development, Advantages of AMT, Commonly used terms, **Fundamental Automated Processes**, process chain, 3D modeling, Data Conversion, and transmission, Checking and preparing, Building, Post processing, RP data formats, **Newly Proposed formats**, Classification of AMT process.

### **Unit-II**

**Liquid based systems:** Stereo lithography apparatus (SLA): Models and specifications, process, working principle, photopolymers, photo polymerization, layering technology, laser and laser scanning, applications, advantages and disadvantages, case studies.

With effect from the Academic Year 2022-23

Solid ground curing (SGC): Models and specifications, process, working, principle, applications, advantages and disadvantages, case studies.

### UNIT III

**Solid based systems:** Laminated object manufacturing (LOM): Models and specifications, Process, Working principle, Applications, Advantages and disadvantages, Case studies.

Fused Deposition Modeling (FDM): Models and specifications, Process, Working principle, Applications, Advantages and disadvantages, Case studies.

### Unit-IV

**Powder Based Systems:** Selective laser sintering (SLS): Models and specifications, process, **materials**, working principle, applications, advantages and disadvantages, case studies.

Three dimensional printing (3DP): Models and specification, process, working principle, applications, advantages and disadvantages, case studies.

### UNIT-V

Applications of AM systems: Applications in **Design**, aerospace industry, automotive industry, jewellery industry, coin industry, GIS Application, arts and architecture.

RP medical and bio engineering Application: planning and simulation of complex surgery, customized implant and prosthesis, design and production of medical devices, forensic science and anthropology, visualization of bio-molecules.

### Learning Resources:

1. Chua C.K., Leong K.F. and LIM C.S Rapid prototyping: Principles an Applications, World Scientific publications, 3rdEd., 2010
2. D.T. Pham and S.S. Dimov, "Rapid Manufacturing", Springer, 2001
3. Terry Wohlers, " Wholers Report 2000", Wohlers Associates, 2000
4. Paul F. Jacobs, " Rapid Prototyping and Manufacturing"--, ASME Press, 1996
5. Ian Gibson, Davin Rosen, Brent Stucker "Additive Manufacturing Technologies, Springer, 2nd Ed, 2014.

The break-up of CIE: Internal Tests+ Assignments + Quizzes

1. No. of Internal Tests	:	<input type="text" value="2"/>	Max. Marks for each Internal Test	:	<input type="text" value="30"/>
2. No. of Assignments	:	<input type="text" value="3"/>	Max. Marks for each Assignment	:	<input type="text" value="5"/>
3. No. of Quizzes	:	<input type="text" value="3"/>	Max. Marks for each Quiz Test	:	<input type="text" value="5"/>

Duration of Internal Test: 90 minutes

With effect from the Academic Year 2022-23

**VASAVI COLLEGE OF ENGINEERING (Autonomous)**

IBRAHIMBAGH, HYDERABAD – 500 031

**DEPARTMENT OF MECHANICAL ENGINEERING**

**SYLLABUS FOR B.E VI Semester**

**Alternative Fuels and Energy Systems (Open Elective-IV)**

L:T: P (Hrs./week):3: 0 : 0	SEE Marks:60	Course Code : U20OE620ME
Credits: 3	CIE Marks:40	Duration of SEE : 3 Hours

<b>Course objectives</b>	<b>Course Out comes</b>
The objectives of this Course are: To broaden the knowledge of alternate fuels and energy system and to understand the manufacturing and operating characteristics of alternative fuels.	On completion of the Course, the student will be able to: 1. Identify the need for alternative fuels. 2. Explain the characteristic features of bio-fuels. 3. Elucidate the properties of biogas, LPG & CNG. 4. Identify the merits and challenges of hydrogen and fuel cell based vehicles. 5. Explain the characteristics of electric and hybrid vehicles.

**UNIT – I**

**Need for Alternative Fuels:**

Working of I.C. Engine; Properties of Fuels; Fuel Rating; Study of various performance parameters related to properties of different types of fuels; Fossil Fuels: Sources, scope of availability; Need for Alternative Fuels; Effects of constituents of Exhaust gas emission on environment; Green house effect, Factors affecting green house effect.

**UNIT – II**

**Alcohols:**

Sources of Methanol and Ethanol, methods of it's production. Properties of methanol & ethanol as engine fuels, Use of alcohols in S.I. and C.I. engines, performance of blending methanol with gasoline. Emulsification of alcohol and diesel. Dual fuel systems. Improvement / Change in emission characteristics with respect to % blending of Alcohol.

**Bio-diesels:**

Base materials used for production of Bio-diesel; Properties of Diesel blended with vegetable oils and difference in performance characteristics of Engine.

**Synthetic Alternative Fuels:** Di-Methyl Ether (DME), P-Series, Eco-friendly Plastic fuels (EPF).

With effect from the Academic Year 2022-23

### **UNIT – III**

#### **Biogas:**

Introduction to Biogas system; Extraction process; Factors affecting biogas formation; Usage of Biogas in SI engine & CI engine;

**LPG & CNG:** Properties of LPG & CNG as engine fuels, fuel metering systems, combustion characteristics, effect on performance, emission, cost and safety.

### **UNIT – IV**

#### **Hydrogen:**

Hydrogen as a substitute fuel; Properties, Sources and methods of Production of Hydrogen; Storage and Transportation of hydrogen; Advantages of hydrogen (Liquid hydrogen) as fuel for IC engine/ hydrogen car; Layout of a hydrogen car;

**Fuel Cells:** Concept of fuel cells based on usage of Hydrogen and Methanol; Power rating and performance; Layout of fuel cell vehicle.

### **UNIT – V**

#### **Electric & Hybrid Vehicles:**

Layout of an electric vehicle; Systems and components; electronic controlled systems; high energy and power density batteries; Types of hybrid vehicles; advantages & limitations.

#### **Solar Powered Vehicles:**

Solar cells for energy collection, Storage batteries; Layout of solar powered automobiles; Advantages and limitations.

#### **The break-up of CIE: Internal Tests+ Assignments + Quizzes**

1	No. of Internal Tests:	02	Max.Marks for each Internal Test:	30
2	No. of Assignments:	03	Max. Marks for each Assignment:	05
3	No. of Quizzes:	03	Max. Marks for each Quiz Test:	05
	Duration of Internal Test:	90 minutes		

With effect from the Academic Year 2022-23  
**VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)**  
 9-5-81, Ibrahimbagh, Hyderabad-500031, Telangana State

**DEPARTMENT OF MECHANICAL ENGINEERING**  
 Industrial Administration and Financial Management (Open Elective-IV)

SYLLABUS FOR B.E.VI-SEMESTER

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code: <b>U20OE630ME</b>
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

<b>COURSE OBJECTIVES</b> The objectives of this course are to:	<b>COURSE OUTCOMES</b> On completion of the course, students will be able to
1. aware about types of business forms, organization structures, plant layouts, merits, demerits and applications. 2. understand method study procedure, PME, time study techniques and wage incentives. 3. importance of PPC and improving quality by control charts and sampling plants. 4. optimization of inventory to minimize total cost and other optimization techniques like LPP, project management techniques. 5. estimate selling price of a product, TVM and budgeting techniques, depreciation methods.	1. understand business forms, organization structures and plant layouts. 2. implementation of method study and estimation of standard time. 3. understand types of production, functions of PPC, quality control by charts and sampling. 4. implement optimization techniques like LPP, assignment and project management techniques. 5. understand BEA, estimation of depreciation, selling price of a product and capital budgeting techniques.

**UNIT – I**

Industrial Organization : Types of various business organisations. Organisation structures and their relative merits and demerits. Functions of management. Plant location and layouts: Factors affecting the location of plant and layout. Types of layouts and their merits and demerits.

**UNIT – II**

Work study: Definitions, Objectives of method study and time study. Steps in conducting method study. Symbols and charts used in method study. Principles of motion economy. Calculation of standard time– by– time study and work

With effect from the Academic Year 2022-23

sampling. Performance rating factor. Types of ratings. Jobs evaluation and performance appraisal. Wages, incentives, bonus, wage payment plans.

### **UNIT – III**

Inspection and quality control: Kinds and Types, objectives of inspection, Sampling inspection quality control by chart and sampling plans. Quality circles.

Production planning and control: Types of manufacture. Types of production.

Principles of PPC and its functions.

### **UNIT – IV**

Optimisation: Introduction to linear programming and graphical solutions. Assignment problems.

Project Management: Introduction to CPM and PERT. Determination of critical path.

Material Management: Classification of materials. Materials planning. Purchasing procedure of a material for an industry Duties of purchase manager and Stores department. Determination of economic order quantities. Types of materials purchase.

### **UNIT – V**

Cost accounting: elements of cost. Various costs. Types of overheads, calculation of selling price. Break even analysis and its applications. Depreciation. Methods of calculating depreciation fund. Nature of financial management. Time value of money. Techniques of capital budgeting and methods.

### **Learning Resources:**

1. Pandey I.M., "Elements of Financial Management", Vikas Publ. House, New Delhi, 1994
2. Khanna O.P., "Industrial Engineering and Management", Dhanapat Rai & Sons.
3. Everrete E Admaa & Ronald J Ebert , "production and Operations Management", 5<sup>th</sup> Ed. , PHI , 2005
4. S N Chary, "Production and Operations Management", 3<sup>rd</sup> Ed. , Tata McGraw Hill, , 2006
5. Pannerselvam, "production and Operations Management", Pearson Education, 2007

The break-up of CIE: Internal Tests+ Assignments + Quizzes

1. No. of Internal Tests	:	2	Max. Marks for each Internal Test	:	30
2. No. of Assignments	:	3	Max. Marks for each Assignment	:	5
3. No. of Quizzes	:	3	Max. Marks for each Quiz Test	:	5

Duration of Internal Test: 90 minutes



With effect from the Academic Year 2022-23  
**VASAVI COLLEGE OF ENGINEERING (Autonomous)**  
IBRAHIMBAGH, HYDERABAD – 500 031

**DEPARTMENT OF HUMANITIES AND SOCIAL SCIENCES**  
(OPEN ELECTIVE) - B.E 3/4 -VI SEMESTER

**ENGLISH FOR COMPETITIVE EXAMINATIONS**  
(Common to all branches)

L: T: P (Hrs/Week): 3:0:0	SEE Marks: 60	Course Code: U20OE610EH
Credits: 3	CIE Marks: 40	Duration of SEE: Hours: 3

<b>COURSE OBJECTIVES</b>	<b>COURSE OUTCOMES</b>
<b>The course will enable the learners to:</b> <ul style="list-style-type: none"><li>To familiarize the students to various types of competitive examinations.</li><li>To practice questions and prepare for GATE.GRE.CAT.TOEFL.</li></ul>	<b>At the end of the course the learners will be able to: -</b> <ul style="list-style-type: none"><li>The students will be able to solve various types of questions in competitive English examinations effectively.</li><li>Provide logical conclusions for the questions aptitude and reasoning within the stipulated time.</li></ul>

**GATE :**

- Concentrating on English grammar
- Recognizing suitable option in sentence completion
- Solving verbal analogies
- Categorizing word groups
- Ignoring distractions in critical reasoning questions
- Providing reasoning in verbal deduction

**GRE :**

**VERBAL REASONING:**

## With effect from the Academic Year 2022-23

- Analysing and drawing add value to incomplete data; identify the perception of the author
- Identifying vital points and differentiating between relevant and irrelevant points
- Understanding and summarising the structure of a text
- Understanding the given words, sentences and entire texts; ability to focus on the meaning of the entire sentence
- Understanding relationships among words and concepts

### **ANALYTICAL WRITING:**

- Articulating complex ideas effectively and with clarity
- Supporting ideas with relevant reasons and examples
- Examining claims and accompanying evidence
- Sustaining a well-focused, coherent discussion

### **CAT :**

#### **VERBAL ABILITY AND READING COMPREHENSION:**

- Reading comprehension (antonyms/synonyms)
- Sentence correction
- Fill in the blanks & cloze passage
- Jumbled sentences
- Jumbled paragraph (word meaning based questions)
- Analogies
- Para odd one out
- Summary (facts, assumptions, judgements)
- Verbal reasoning (paragraph formation)

### **TOEFL:**

- Basic understanding, speed and accuracy, learning from reading, pronoun reference, author's point of view.
- Good delivery including clarity of speech, fluidity, natural pacing and correct intonation patterns.

With effect from the Academic Year 2022-23

- Correct use of language showing a good grasp of grammar, vocabulary and speech structures.
- Topic development in which you are able to show a well-structured, organized response that effectively connects ideas with enough support for each point you are making.
- Writing strategy and format execution skills.

## **METHODOLOGY ASSESSMENTS**

- Case Studies
- Demonstration
- Presentations
- Expert lectures
- Writing and Audio-visual lessons
- Online assignments
- Individual and Group

## **LEARNING RESOURCES**

[learn.talentsprint.com](http://learn.talentsprint.com)

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Duration of Internal Test: 90 minutes