

**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 2023-24  
(For the batch admitted in 2021-22)  
(R-21)**



**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-21)::B.E. - EEE : FIFTH SEMESTER(2023-24)

**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>									
U21PC510EE	AC Machines	3	1	-	3	60	40	4	
U21PC520EE	Digital Electronics	3	-	-	3	60	40	3	
U21PC530EE	Linear Integrated Circuits & Applications	3	-	-	3	60	40	3	
U21PC540EE	Control Systems	3	-	-	3	60	40	3	
U21OE5XXXX	Open Elective –III	3	-	-	3	60	40	3	
U21HS510EH	Skill Development Course V - Communication Skills-II	1	-	-	2	40	30	1	
U21PE510EE	Skill Development Course VI - Technical Skills-II	1	-	-	2	40	30	1	
<b>PRACTICALS</b>									
U21PC511EE	AC Machines Lab	-	-	2	3	50	30	1	
U21PC521EE	Control Systems and Simulation Lab	-	-	2	3	50	30	1	
U21PC531EE	Linear Integrated Circuits & Applications Lab	-	-	2	3	50	30	1	
U21PW519EE	Mini Project			2	3	50	30	1	
<b>ECA-II</b>		-	-	-	-	-	-	-	
<b>CCA-III ( Paper Presentation)</b>		-	-	-	-	-	-	-	
<b>Library/Sports/Mentor- Mentee Interaction</b>		-	-	-	-	-	-	-	
<b>Total</b>		<b>17</b>	<b>1</b>	<b>8</b>		<b>580</b>	<b>380</b>	<b>22</b>	
<b>Grand Total</b>		<b>26</b>			-	<b>960</b>		<b>22</b>	

**B.E students shall complete one NPTEL Certificate equivalent Course of 8 weeks equivalent to 2 Credits by the end of VI semester**

With effect from the Academic Year 2023-24

**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>U21PC510EE</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.SBimbhra, 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 2023-24

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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>U21PC520EE</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/ GoutamSaha :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

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2. No. of Assignments	:	<input type="text" value="3"/>	Max. Marks for each Assignment	:	<input type="text" value="5"/>
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Duration of Internal Test: 90 minutes

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**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**

**Linear Integrated Circuits & Applications**

SYLLABUS FOR B.E. V SEMESTER

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code: <b>U21PC530EE</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 feedback 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, 6<sup>th</sup> Edition, Prentice hall of India,2003.

With effect from the Academic Year 2023-24

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	:	<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 2023-24

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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>U21PC540EE</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 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 2023-24

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

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IBRAHIMBAGH, HYDERABAD – 500 031

**DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES**

**SKILL DEVELOPMENT COURSE V -COMMUNICATION SKILLS -II**

SYLLABUS FOR B.E. V-SEMESTER

L:T: P (Hrs/Week):1:0:0	SEE Marks: 40	Course Code: <b>U21HS510EH</b>
Credits: 1	CIE Marks: 30	Duration of SEE : 2 Hours

<b>COURSE OBJECTIVES</b>	<b>COURSE OUTCOMES</b>
The course will enable the learners to: 1. Get students proficient in both receptive and productive skills 2. Enable students to build strategies for effective group interaction and help them in developing decisive awareness and personality while maintaining emotional balance. 3. To introduce students to an ideal structure for a presentation 4. To develop and improve writing and study skills needed for college work.	At the end of the course the learners will be able to :- 1. Participate in group and forum discussions by providing factual information, possible solutions, and examples 2. Present a topic by picking up the key points from the arguments placed. 3. Read between the lines and write informed opinions. 4. Prepare, present, and analyze reports

**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 2023-24

- 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**

- 4.1 Report writing
- 4.2 Image Writing
- 4.3 Book Reviews
- 4.4 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	:	<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

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**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**

Skill Development Course VI -Technical Skills-II

SYLLABUS FOR B.E. V SEMESTER

L:T:P (Hrs/Week): 1:0:0	SEE Marks: 40	Course Code: <b>U21HS510EE</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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**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>U21PC511EE</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.
8. Load characteristics of Induction Generator.

With effect from the Academic Year 2023-24

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 2023-24  
**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>U21PC521EE</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  1. Demonstrate the characteristics of AC, DC servo motors, second order system and synchro pair. 2. Infer the effect of P,PI,PD and PID controllers on closed loop control system 3. Analyze AC and DC position control systems. 4. Design lead and lag compensators and obtain the frequency response characteristics.

**LIST OF EXPERIMENTS:**

1. Characteristics of DC and AC Servo motors.
2. Step response of second order system.
3. Closed loop P,PI,PD and PID controller.
4. ON/ OFF Temperature control system.
5. Water Level Control System using LabVIEW.
6. Simulation of Root locus, Nyquist plot, Bode plot using Matlab/Simulink & LabVIEW
7. Design of lead compensators using MATLAB
8. Conversion of state to transfer function and transfer function statespace using MATLAB
9. Time response of Second order system using MATLAB(Simulink)
10. Tuning of PID controller to meet required specifications



With effect from the Academic Year 2023-24

11. Frequency response of compensating network.
12. Implementation of PID Controllers using MATLAB
13. Inverted Pendulum Control using Quanser Control Board
14. Speed Control of Servo Motor , DC Motor , Stepper and BLDC Motor using Quanser Mechatronics Actuator Board.

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 2023-24

**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. V SEMESTER

L:T: P (Hrs/Week):0:0:2	SEE Marks: 50	Course Code: <b>U21PC531EE</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.	<ol style="list-style-type: none"><li>1. Analyze and design various applications of Op-Amp.</li><li>2. Construct and troubleshoot circuits containing linear integrated circuits.</li><li>3. Design combinational and sequential logic circuits using ICs.</li><li>4. Identify the suitable ICs in the applications of adders, counters, converters and multiplexers.</li><li>5. Compute the Triangle and square wave using op-amp and ICs.</li></ol>

**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 2023-24

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

13.D/A converters.

14.A/D converters

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 2023-24  
**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>U21PW519EE</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 week and another during 10 week and

With effect from the Academic Year 2023-24

final evaluation shall be conducted during 15<sup>th</sup> to 16<sup>th</sup> week.

- 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.

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 2023-24

**OPEN ELECTIVES OFFERED BY VARIOUS DEPARTMENTS IN  
B.E. V SEMESTER (2023-24)**

<b>Dept</b>	<b>Title</b>	<b>Code</b>	<b>credits</b>
Civil	Spatial Information Technology	U21OE510CE	3
CSE	Introduction to operating System	U21OE510CS	3
CSE	Web Design	UI20OE520CS	3
ECE	Introduction to Biomedical Electronics	U21OE510EC	3
Mech.	Introduction To Robotics	U21OE510ME	3
Mech.	Introduction To Automobile Engineering	U21OE520ME	3
Phy.	Thin Film Technology and Applications	U21OE510PH	3
H&SS	Basics of Entrepreneurship	U21OE530EH	3
IT	Introduction To Database Management Systems	U21OE510IT	3
IT	Essentials of Operating Systems	U21OE520IT	3

With effect from the Academic Year 2023-24  
**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>U21OE510CE</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
1. To provide fundamental knowledge on geo spatial technology such as Remote sensing GPS and GIS.	1. Select the type of remote sensing technique/data, identify and analyze the earth surface features from the satellite images. 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. 3. Analyse the basic components of GIS, process spatial and attribute data, identify and rectify mapping inaccuracies and prepare thematic maps

**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 hyperspectral remote sensing. Some remote sensing satellites and their features, Map and Image, color composites,

With effect from the Academic Year 2023-24  
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, Areas of GIS application, Components of GIS, Overview of GIS Software packages, Current issues and Trends in GIS. Variables-Point, line, polygon, 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

### **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



With effect from the Academic Year 2023-24

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	:	<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 2023-24  
**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>U21OE510CS</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  1. Compare CPU scheduling algorithms and Operating system structures 2. Apply different techniques for Main memory management. 3. Describe file management techniques.  4. Describe deadlock handling methods 5. Analyze Disk scheduling algorithms and I/O operation implementation techniques

**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 2023-24

**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 2023-24

**VASAVI COLLEGE OF ENGINEERING(Autonomous)**

IBRAHIMBAGH, HYDERABAD – 500 031

**Department of Computer Science & Engineering**

WEB DESIGN (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>U200E520CS</b>
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

<b>COURSE OBJECTIVES</b>	<b>COURSE OUTCOMES</b>
	<i>On completion of the course, students will be able to</i>
1 Develop web application using HTML, CSS, JavaScript and PHP.	1 Design static web pages.
	2 Apply styles to the web pages.
	3 Create dynamic web pages using JavaScript.
	4 Design DTD and schema for a given XML file.
	5 Develop server side components using PHP.

**UNIT-I:** Web Basics and overview: Introduction to Internet, World Wide Web, Web Browsers, Web Servers, URL, MIME, HTTP, Web Programmers Tool Box, Introduction to HTML Purpose of HTML and XHTML, Text Formatting, Hypertext Links, Images, Lists, Tables, Forms and Frames.

**UNIT-II:** Cascading Style Sheets- Levels of Stylesheet, Style Specification Formats, Selector Formats, Property Value Forms, Font Properties, List Properties, Alignment of Text, Box Model, Background Images, Borders, div and span tags, Conflict Resolution.

**UNIT-III:** JavaScript - Object Orientation and JavaScript, Primitives, Operations, Expressions, Control Statements, Object Creation, Arrays, Functions- Introduction, Program Modules in JavaScript, Programmer-

With effect from the Academic Year 2023-24

Defined Functions, Function Definitions, Random-Number Generation, Scope Rules, JavaScript Global Functions, Recursion, Constructors, Regular Expressions, DOM Model, Events, Event Handling in JavaScript, JavaScript objects.

**UNIT-IV:** Introduction to XML, Syntax of XML, XML Document Structure, Document type Definition, Namespaces and Schemas.  
Client-Server Architecture, Multi-tier Architecture, Web server.

**UNIT-V:** PHP- Overview of PHP, General Syntactic Characteristics, Primitives, Operations, and Expressions, Output, Control Statements, Arrays, Functions, Pattern Matching, Form Handling, Cookies and Session Tracking.

**Learning Resources:**

1. Robert W. Sebesta, "Programming the World Wide Web", Pearson Education.(3rd)
2. Uttam K.Roy, "Web Technologies", Oxford publishers.
3. <http://www.w3schools.com>
4. <https://www.php.net/manual/en/tutorial.php>

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 2023-24

**VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)**

ACCREDITED BY NAAC WITH 'A++' GRADE

IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

**Introduction to Biomedical Electronics**

**(Open Elective - III)**

SYLLABUS FOR B.E. V – SEMESTER (Civil, CSE, IT, EEE & Mechanical)

L:T:P (Hrs./week) : 3:0:0	SEE Marks : 60	Course Code: <b>U21OE510EC</b>
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

<b>COURSE OBJECTIVES</b>	<b>COURSE OUTCOMES</b>
To provide fundamental knowledge of biomedical signals, transducers and various instruments.	On completion of the course, students will be able to 1. recite the basic need of biomedical signals and basic instruments. 2. comprehend the principles of basic bioelectric signals, electrodes and transducers in biomedical electronics. 3. demonstrate the principle of various therapeutic, prosthetic and non invasive instruments for use and prediction of diseases. 4. understand the mathematical, physical and computational principles underlying modern medical imaging system for visualization and analysis of medical image data.

**UNIT - I :**

**Basics of Biomedical Electronics:** Physiological systems of the body, sources of biomedical signals, basic medical instrumentation system, performance requirements of medical instrumentation systems, Intelligent medical instrumentation systems, General constraints in design of medical instrumentation systems.

**UNIT - II :**

**UNIT - III :**

**Therapeutic and Prosthetic Devices:** Cardiac pacemaker, defibrillators, hemodynamic & haemodialysis, ventilators, infant incubators, surgical instruments, therapeutic applications of laser.

**UNIT - IV :**

**Non-invasive Instrumentation:** Temperature measurements, principles of ultrasonic measurements and its applications in medicine, medical thermography, physics of thermography infrared detectors and thermographic detectors.

With effect from the Academic Year 2023-24

**UNIT - V :**

**Modern Medical Imaging System:** Radiography: Production of X-rays, units of X-radiation, block diagram of X-ray machine, MRI, computed tomography: Block diagram and working.

**Learning Resources:**

1. L. Cromwell, Biomedical Instrumentation and Measurements, Prentice Hall.
2. Handbook of Biomedical Instrumentation by R.S. Khandpur.
3. S.K. Venkata Ram, Bio-medical Electronics and Instrumentation, Galgotia Publications, Pvt. Ltd.

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 Tests: 90 Minutes

With effect from the Academic Year 2023-24

**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>U21OE510ME</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
The objectives of this course are to: Identify robots and its peripherals for satisfactory operation and control of robots for industrial and non-industrial applications.	On completion of the course, the student will be able to <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>

**UNIT-I**

**ROBOT BASICS**

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

Robot configurations-cartesian, cylindrical, polar ,articulated and SCARA, Serial



With effect from the Academic Year 2023-24

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.
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

With effect from the Academic Year 2023-24

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	:	<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 2023-24  
**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>U21OE520ME</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
The objectives of this course are to: 1. familiarize the student with the different types of automobiles and engine components along with its working. 2. impart adequate knowledge in fuel supply, cooling, lubrication and ignition of IC engines. 3. understand the steering geometry, steering mechanism and types of suspension systems. 4. gain the knowledge about working of clutch, gear box mechanism, and brakes 5. make the student conversant with types of wheels, tyres and pollution control techniques.	On completion of the course, the student will be able to: 1. identify types of Automobiles and engine components and describe its working. 2. describe the engine fuel Supply system in petrol and Diesel engines, cooling system, and lubrication systems. 3. describe the steering mechanism, suspension systems 4. describe the working principle and operation of clutch, gear mechanism and brakes. 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.

## With effect from the Academic Year 2023-24

**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.

### 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 2023-24  
**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>U21OE510PH</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 measurement-ellipsometry, quartz crystal oscillator techniques,structure and microstructure of thin films.

With effect from the Academic Year 2023-24

### **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 2023-24

**VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)**

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

**DEPARTMENT OF H&SS**

Basics of Entrepreneurship (Open Elective-III)

SYLLABUS FOR B.E.V-SEMESTER

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code: <b>U21OE530EH</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. Deeply understand and discover entrepreneurship 2. Build a strong foundation for the students to start, build, and grow a viable and sustainable venture 3. Develop an entrepreneurial mind-set equipped with the critical skills and knowledge required	1. Take-up entrepreneurship as a career choice 2. Create and Validate business models. Build a Minimum Viable Product (MVP). 3. Identify various costs and revenue streams for a venture. 4. Build successful teams and acquire sales skills. 5. Understand the business regulations and various Government schemes available.

**UNIT-I**

**Introduction to Entrepreneurship:** Definition of Entrepreneurship, Entrepreneurship as a career choice, Benefits and Myths of Entrepreneurship; Characteristics, Qualities and Skills of an Entrepreneur. Impact of entrepreneurship on the Economy and Society.

**Opportunity and Customer Analysis:** Identify your Entrepreneurial Style, Identify Business Opportunities, Methods of finding and understanding Customer Problems, Process of Design Thinking, Identify Potential Problems, Customer Segmentation and Targeting, Customer Adoption Process, Crafting your Value Propositions, Customer-Driven Innovation.

## **UNIT-II**

**Business Model and its Validation:** Types of Business Models, Lean Approach, the Problem-Solution Test, Solution Interview Method, Difference between Start-up Venture and small Business, Industry Analysis, Identify Minimum Viable Product (MVP), Build-Measure-Learn Feedback Loop, Product-market fit test.

## **UNIT-III**

**Economics and Financial Analysis:** Revenue streams and pricing, Income analysis and Cost Analysis-Product Cost and Operation Cost, Basics of Unit Costing, Profit Analysis, Customer Value Analysis, Different Pricing Strategies, Investors' Expectations, Pitching to Investors and Corporate.

## **UNIT-IV**

**Team Building and Project Management:** Leadership Styles, Team Building in Venture, Role of good team in Venture, Roles and Respondents, Explore Collaboration Tools and Techniques-brainstorming, Mind Mapping. Importance of Project Management, Time Management, Work Flow, Network Analysis Techniques.

## **UNIT-V**

**Marketing & Business Regulations:** Positioning, Positioning Strategies, Building Digital Presence and Leveraging Social Media, Measuring effectiveness of Channels, Customer Decision-making Process, Sales plans and Targets, Unique Sales Proposition (USP), Follow-up and Close Sales. Business Regulations of starting and operating a Business, Start-up Ecosystem, Government schemes.

### **Learning Resources:**

1. Robert D. Hisrich, Michael P Peters, "Entrepreneurship", Sixth edition, McGraw-Hill Education.
2. Thomas W. Zimmerer, Norman M. Scarborough, "Essentials of Entrepreneurship and small businessManagement", Fourth edition, Pearson, New Delhi, 2006.



With effect from the Academic Year 2023-24

3. Alfred E. Osborne, "Entrepreneurs Toolkit", Harvard Business Essentials, HBS Press, USA, 2005
4. MadhurimaLall and ShikhaSahai, "Entrepreneurship", Excel Books, First Edition, New Delhi,2006

**Web Resource:** <http://www.learnwise.org>

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 2023-24  
**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>U21OE510IT</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

With effect from the Academic Year 2023-24

SQL Queries, Modification of the Database, Additional Basic Operations, Set 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	:	<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 2023-24  
**VASAVI COLLEGE OF ENGINEERING (Autonomous)**  
 IBRAHIMBAGH, HYDERABAD – 500 031  
**DEPARTMENT OF INFORMATION TECHNOLOGY**

**Essentials of Operating Systems**  
 (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>U21OE520IT</b>
Credits :3	CIE Marks: 40	Duration of SEE :3 Hours

<b>COURSE OBJECTIVES</b>	<b>COURSE OUTCOMES</b> <i>On completion of the course, students will be able to</i>
Learn the principles of modern operating systems i.e various functionalities provided by an operating system such as process management, memory management, Storage and I/O management.	<ol style="list-style-type: none"> <li>1. Analyze the importance and its key principles by differentiating and categorizing the functionalities of an operating system</li> <li>2. Examine mechanisms involved in memory management to handle processes and threads.</li> <li>3. Evaluate and solve deadlocks by assessing various handling strategies related to each of the conditions for deadlock.</li> <li>4. Interpret the mechanisms adopted for storage organization and access.</li> <li>5. Interpret the mechanisms adopted for I/O organization and access.</li> </ol>

**UNIT-I: Introduction and Process Management:**

Operating System Functionalities, Types of Operating Systems, User Operating System Interface, System calls, System Boot. Process Concept: Overview, Threads. Process Scheduling - Uniprocessor scheduling algorithms, Multiprocessor and Real-time scheduling algorithms.

**UNIT-II: Memory Management:**

Background, Swapping, Contiguous Memory Allocation, Paging, Segmentation. Virtual Memory Management: Demand Paging, Page replacement algorithms, Thrashing.

With effect from the Academic Year 2023-24

**UNIT-III: Process Synchronization:**

Inter Process Communication, Process Synchronization - Peterson's Solution, Bakery Algorithm, Semaphores, Critical Section, Monitors. Classical problems of synchronization. Deadlocks: Deadlock prevention, deadlock avoidance and Deadlock Detection and Recovery - Bankers Algorithm.

**UNIT-IV: Storage Management:**

File System-Basic Concepts, File System Structure, File System Mounting, Directory Structure, Allocation Methods, Free Space Management.

**UNIT-V: I/O Management:**

I/O Management: Disk Structure, RAID Structure, Disk Scheduling, Protection: Goals of Protection, Principles of Protection, Domain of Protection, Access Matrix.

**Learning Resources:**

1. Operating System Concepts - Operating System Concepts, Tenth Edition, Abraham Silberschatz, Peter Baer Galvin, Greg Gagne, John Wiley & Sons Inc.
2. Modern Operating Systems- Andrew S Tanenbaum, Prentice Hall
3. Operating Systems - Operating System: Internals and Design Principles , William Stallings
4. Operating Systems - System Programming and Operating Systemes D M Dhamdhare, Tata Mc Graw Hill
5. Operating Systems - Operating Systems: A Modern Perspective, Gary Nutt, Addison Wesley
6. Operating Systems - Operating Systems, Achyut S Godbole, Tata Mc Graw Hill
7. <https://nptel.ac.in/courses/106108101/>
8. <https://www.classcentral.com/course/udacity-introduction-to-operating-systems-3419>

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

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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 2023-24  
 VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS) :: IBRAHIMBAGH, HYDERABAD – 500 031.  
 DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING  
 SCHEME OF INSTRUCTION AND EXAMINATION (R-21) :: B.E. - EEE : SIXTH SEMESTER (2023-24)

**B.E (EEE) VI 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>T HEORY</b>								
U21HS040EH	Economics and finance for Engineers	2	-	-	3	60	40	2
U21PC610EE	Power Electronics	3	-	-	3	60	40	3
U21PC620EE	Microprocessor and Microcontrollers Applications	3	-	-	3	60	40	3
U21PC630EE	Signals and Systems	3	-	-	3	60	40	3
U21OE6XXXX	Open Elective –IV	3	-	-	3	60	40	3
U21HS610EH	Skill Development Course VII - Verbal Aptitude	1	-	-	2	40	30	1
U21PE610EE	Skill Development Course VIII - Technical Skills-III	1	-	-	2	40	30	1
<b>PRACTICALS</b>								
U21PC611EE	Power Electronics and Simulation Lab	-	-	2	3	50	30	1
U21PC621EE	Microprocessor and Microcontrollers Applications Lab	-	-	2	3	50	30	1
U21PW619EE	Theme Based Project	-	-	2	3	50	30	1
	Online NPTEL certification course 8 weeks/ 12 weeks							
<b>Library/Sports/Mentor- Mentee Interaction</b>		-	-	-				
<b>Total</b>		<b>16</b>	<b>-</b>	<b>6</b>		<b>530</b>	<b>350</b>	<b>21</b>
<b>Grand Total</b>		<b>22</b>				<b>880</b>		<b>21</b>

**B.E students shall complete one NPTEL Certificate equivalent Course of 8 weeks equivalent to 2 Credits by the end of VI semester**

With effect from the Academic Year 2023-24

**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>U21HS040EH</b>
Credits: 2	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> Understand the concepts and tools of economics, cost and finance that will equip them for decision making.	<b>The end of the course the learner will be able to :</b> <ol style="list-style-type: none"><li>1. Gain a conceptual understanding economics as a discipline.</li><li>2. Construct a cost sheet and classify costs and make use of break-even analysis in decision making.</li><li>3. Evaluate the accounting cycle and explain its importance in recording business transactions</li><li>4. Interpret the ratios and dissect comparative and common size statements</li><li>5. Compare the sources of finance and evaluate them</li></ol>

**Unit I: Concepts in Economics**

Scarcity of Resources-Relevance of Economics for Engineers- Scope of Managerial Economics

Law of Demand- assumptions and exceptions - Price elasticity of demand (Application-oriented approach)

**Unit II: Cost Analysis and Profit Planning**

Concept of Cost -Costing –Classification of Costs – Preparation of Cost Sheet (Simple Problems)

–Breakeven Analysis (Application-oriented approach)

**Unit III: Conceptual Understanding of Accounting**

Accounting Cycle-Journal-Subsidiary Books- Ledger-Trial Balance-Final Accounts (Manufacturing/Trading, Profit and Loss Account, Balance Sheet

With effect from the Academic Year 2023-24

(Theory Only)

#### **UNIT IV: Financial Statement Analysis**

Financial Statements- Meaning - Types –Purpose-Comparative and Common Size Statements

Ratio Analysis-Liquidity, Solvency, Activity & Profitability Ratios(including simple problems on Ratio Analysis)

#### **Unit V: Long Term Sources and Uses of Finance**

Long term sources of finance-Debt, Equity, Hybrid, Start- Up finances, Crowd Funding, Peer to Peer lending platforms.

Capital Budgeting –Traditional and DCF Techniques (including simple problems)

#### **Learning Resources for students:**

1. S.P.Jain and K.L Narang., "Financial Accounting", Kalyani Publishers – Latest edition.
2. S.P.Jain and K.LNarang., "Cost Accounting", Kalyani Publishers, Latest edition.
3. M.Y.Khan and P.K. Jain., "Financial Management – Text, Problems and Cases", Mc Graw Hill Education Private Limited, New Delhi. Latest edition
4. M. Kasi Reddy &Saraswathi, Managerial Economics and Financial Analysis, PHI New Delhi, Latest edition.

#### **Reference books:**

1. Mehta P.L., "Managerial Economics: Analysis, Problems and Cases", Sultan Chand and Sons. Latest edition.
2. Narayanaswamy, "Financial Accounting: A Managerial Perspective", Prentice Hall India
3. *M. L. Seth., "Micro Economics", Lakshmi Narain Agarwal.* Latest edition
4. Dr. R.P. Rustagi., "Fundamentals of Financial Management"Taxmann Publications. Latest edition

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

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With effect from the Academic Year 2023-24

**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>U21PC610EE</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 inverters.</li><li>5. Analyze the operation of 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; Three-phase fully controlled thyristor rectifier and three phase

With effect from the Academic Year 2023-24  
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° and 120° 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.

#### **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,

With effect from the Academic Year 2023-24  
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

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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 2023-24  
**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>U21PC620EE</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.

With effect from the Academic Year 2023-24

### **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 2023-24

**VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)**

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

**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**

**Signals and Systems**

SYLLABUS FOR B.E. VI SEMESTER

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code: <b>U21PC630EE</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 define and classify continuous and discrete time signals & systems 2.To determine the frequency domain characteristics of continuous and discrete time signals using transform techniques. 3.To verify the causality and stability of LTI system and find its response using convolution.	1. Analyze continuous time signals and systems and transform them to frequency domain. 2. Convert continuous time signals to discrete time signals using sampling. 3. Analyze discrete time signals and systems and transform them to frequency domain using ZT. 4. Determine the convolution and Correlation of signals.

**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

With effect from the Academic Year 2023-24 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. 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.

With effect from the Academic Year 2023-24

3. Signals and Systems – A.Anand Kumar, PHI, 2012.
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	:	<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 2023-24

**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>U21HS610EH</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. Introduce students to higher order thinking and problem solving via vocabulary and its various components</li><li>2. Train students to understand context &amp; theme and use it to complete sentences.</li><li>3. Train students to identify the structure of sentences &amp; paragraphs</li><li>4. Train students to analyze text, e.g., simple outlining and note taking, summarize, draw conclusions, and apply information to personal experiences</li><li>5. Train students to improve the quality of sentences by fixing errors</li></ol>	<b>At the end of the course the learners will be able to: -</b> <ol style="list-style-type: none"><li>1. Use vocabulary as a tool to solve questions in verbal ability</li><li>2. Identify meanings of words using theme and context</li><li>3. Solve questions based on jumbles-sentences and paragraphs</li><li>4. Develop skills to critically analyze texts and then the ability to identify its theme</li><li>5. Improve the quality of their writing by being aware of the common errors</li></ol>

**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

With effect from the Academic Year 2023-24

- 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
- 4.2 Article & Article Based Passages
- 4.3 Theme Detection

With effect from the Academic Year 2023-24

## 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 2023-24

**VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)**

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

**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**

**Skill Development Course VIII - Technical Skills – III**

SYLLABUS FOR B.E. VI SEMESTER

L:T: P (Hrs/Week):1:0:0	SEE Marks: 40	Course Code: <b>U21PE610EE</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 2023-24

**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>U21PC611EE</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.

With effect from the Academic Year 2023-24

12. PSPICE Simulation of Single phase voltage source inverters
13. PSPICE Simulation of three phase voltage source inverters.
14. MATLAB Simulation of Buck and Boost Converters.
15. Study and simulation of bidirectional power 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 2023-24

**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>U21PC621EE</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 2023-24

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 2023-24  
**VASAVI COLLEGE OF ENGINEERING (Autonomous)**  
 IBRAHIMBAGH, HYDERABAD – 500 031  
**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**

**Theme Based Project**  
 SYLLABUS FOR B.E. VI SEMESTER

L:T:P(Hrs./week):0:0:2	SEE Marks:50	Course Code: <b>U21PW619EE</b>
Credits : 1	CIE Marks:30	Duration of SEE: 3 Hours

<b>COURSE OBJECTIVES</b>	<b>COURSE OUTCOMES</b>
	On completion of the course, students will be able to
1. Learn contemporary technologies. 2. Design/Develop/Implement/Solve an engineering problem in the relevant areas of Electrical and Electronics Engineering.	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 miniproject.

➤ 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.

➤ Students are required to give Presentations / Demonstration of

With effect from the Academic Year 2023-24  
the work during the reviews.

- Students are required to submit mini project report along with working model if applicable.

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 2023-24  
**OPEN ELECTIVES OFFERED BY VARIOUS DEPARTMENTS IN  
B.E. VI SEMESTER (2023-24)**

<b>Dept</b>	<b>Title</b>	<b>Code</b>	<b>credits</b>
Civil	Project Management	U21OE610CE	3
CSE	Introduction To Databases	U21OE610CS	3
CSE	Fundamentals Of Cloud Computing	U21OE620CS	3
ECE	Internet Of Things And Applications	U21OE610EC	3
IT	Web application development & Security	U21OE610IT	3
IT	Introduction To Machine Learning	U21OE620IT	3
IT	Fundamentals of Machine Learning	U21OE630IT	3
Mech.	Additive Manufacturing And Its Applications	U21OE610ME	3
Mech.	Industrial Administration And Financial Management	U21OE620ME	3
H&SS	Advanced course in entrepreneurship	U20OE630EH	3

With effect from the Academic Year 2023-24  
**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>U21OE610CE</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 function 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 organization.

With effect from the Academic Year 2023-24

## 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.

### Learning Resources:

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

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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 2023-24  
**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>U21OE610CS</b>
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

<b>COURSE OBJECTIVES</b>	<b>COURSE OUTCOMES</b>
<ol style="list-style-type: none"><li>1. Identify different issues involved in the design and implementation of a database system.</li><li>2. Understand transaction processing.</li></ol>	<p>On completion of the course, students will be able to</p> <ol style="list-style-type: none"><li>1. Identify the functional components of database management system. Create conceptual data model using Entity Relationship Diagram</li><li>2. Transform a conceptual data model into a relational model</li><li>3. Design database using normalization techniques</li><li>4. Apply indexing and hashing techniques for effective data retrieval</li><li>5. Explain transaction processing.</li></ol>

### **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 2023-24

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

### **UNIT-III**

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

### **UNIT-IV**

**Indexing and Hashing: Basic** Concepts, Ordered Indices, B+ Tree Index Files, 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	:	<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 2023-24  
**VASAVI COLLEGE OF ENGINEERING(Autonomous)**  
IBRAHIMBAGH, HYDERABAD – 500 031

**Department of Computer Science & Engineering**

FUNDAMENTALS OF CLOUD COMPUTING(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>U20OE620CS</b>
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

<b>COURSE OBJECTIVES</b>	<b>COURSE OUTCOMES</b> <i>On completion of the course, students will be able to</i>
1. Understand the basic principles of Cloud computing and compare the various Levels of Virtualization. 2. Use the theoretical principles for Architectural Design of Compute and Storage Clouds. 3. Develop Confidentiality Protection and Improve User Access to Cloud Computing using Parallel and Distributed Programming Paradigms	1 Explain the cloud enabling technologies and the Cloud service models.
	2 Choose the levels of virtualization and tools for resource provisioning.
	3 Compare the cloud platform architectures for virtualized data centers and Inter-cloud Resource Management.
	4 Analyze the principles of Security and Trust management to protect confidentiality of data in the Cloud.
	5 Create an instance on AWS or Google Cloud.

### **UNIT-I**

**Introduction to Cloud Computing:** Cloud Computing in a Nutshell, System Model for Distributed and Cloud Computing, Roots of Cloud Computing, Grid and Cloud, Layers and Types of Clouds, Desired Features of a Cloud, Basic Principles of Cloud Computing, Challenges and Risks, Service Models.



With effect from the Academic Year 2023-24

## **UNIT-II**

**Virtual Machines and Virtualization** of Cluster and Data Centers, Levels of Virtualization, Virtualization structures/Tools and Mechanism, Virtualization of CPU, Memory and I/O Devices, Virtual Clusters and Resources Management, Virtualization Data-Center Automation.

## **UNIT-III**

**Cloud computing architecture over Virtualized data Centers:** Data-Center design and inter connection network, Architectural Design of Compute and Storage Clouds, Public Cloud Platforms, Google Cloud, AWS, Azure, Inter-cloud Resource Management.

## **UNIT -IV**

**Cloud Security and Trust Management, Data Security in the Cloud:** An Introduction to the Idea of Data Security, The Current State of Data Security in the Cloud CryptDb: Onion Encryption layers- DET, RND, OPE, JOIN, SEARCH, HOM, and Homomorphism Encryption, FPE. Trust, Reputation and Security Management.

## **UNIT -V**

**Cloud Programming and Software Environments:** Features of Cloud Platforms, Parallel and distributed Programming Paradigms, Programming Support of Google Cloud, Programming on Amazon AWS and Microsoft Azure, Emerging Cloud Software Environments.

## **Suggested Books:**

1. Rajkumar Buyya, James Broberg and Andrzej M. Goscinski, Cloud Computing: principles and paradigms (Wiley Series on Parallel and Distributed Computing), (2011), Wiley Publishing (c).

With effect from the Academic Year 2023-24

2. Kai Hwag, Geoffrey C. Fox, Jack J. Dongarra, Distributed and Cloud Computing from parallel processing to the internet of things, (2012), Elsevier.
3. Raluca Ada Popa, Catherine M.S. Redfield, Nikolai Zeldovich, and Hari Balakrishnan, crypt DB Protecting confidentiality with encrypted Query Processing, 23<sup>rd</sup> ACM Symposium on Operating Systems principles (SOSP 2011), Cascais, Portugal October 2011.
4. John W. Rittinghouse, Cloud Computing: Implementation, management, and security, James F. Ransome, (2009), CRC Press.

### Reference Books:

1. A fully Homomorphic Encryption Scheme, Craig Gentry, September 2009.
2. David Marshall, Wade A. Reynolds, Advanced server virtualization: VMware and Microsoft platform in the virtual Data Center, (2006), Aucrbach publications.

### Online resources:

1. <https://cloudacademy.com/cloud-computing/what-is-cloud-computing-introductory-course/>
2. <http://cloudschool.com/courses>

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 2023-24  
**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>U21OE610EC</b>
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

<b>COURSE OBJECTIVES</b>	<b>COURSE OUTCOMES</b>
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	On completion of the course, students will be able to 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 2023-24  
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 2023-24

**VASAVI COLLEGE OF ENGINEERING (Autonomous)**  
IBRAHIMBAGH, HYDERABAD – 500 031  
**DEPARTMENT OF INFORMATION TECHNOLOGY**  
**WEB APPLICATION DEVELOPMENT AND SECURITY**

(OPEN ELECTIVE-IV) (Common for CIVIL, ECE, EEE & MECH)

SYLLABUS FOR B.E VI- SEMESTER

L:T:P(Hrs./week): 3:0:0	SEE Marks : 60	Course Code : <b>U210E610IT</b>
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hrs

<b>COURSE OBJECTIVES</b>	<b>COURSE OUTCOMES</b> <i>On completion of the course, students will be able to</i>
1) Acquire basic skills for designing static and dynamic Web Applications using HTML, CSS, Java Script, Bootstrap and XML. 2) Acquire fundamental knowledge of Web Security concepts	1. Design a static web pages using HTML, CSS. 2. Create dynamic web pages and client side validation using JavaScript. 3. Develop responsive web applications using Bootstrap. 4. Build an application using an MVC Framework and XML 5. Analyze and evaluate web security attacks.

**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: Bootstrap**

**Bootstrap:** The Grid system, Layout components: Tables, Images, alerts, buttons, badges, progress bars, cards, drop downs, pagination, Collapse,

With effect from the Academic Year 2023-24

Navbar, Carousel.

#### **UNIT-IV: XML**

XML- The Syntax of XML, XML Document Structure, Document Type Definitions.

**Introduction to MVC** - Introduction to Model View Controller Architecture

#### **UNIT-V: Web Security Fundamentals**

Web Hacking Basics, HTTP & HTTPS URL, Evolution of Web Applications - Web Application Security - Core Defence Mechanisms - Handling User Access - Handling User Input- Handling Attackers - Managing the Application, Introduction to Web 2.0

#### **Learning Resources:**

1. Robert W. Sebesta, Programming the World Wide Web, 7th Edition (2014), Pearson Education.
2. "Web Technologies", 7th Edition, Uttam K.Roy,2012.
3. Paul J. Deitel, Harvey M. Deitel, Abbey Deitel, Internet & World Wide Web How to Program, 5th Edition, Pearson Education.
4. <http://getbootstrap.com/>

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

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With effect from the Academic Year 2023-24

**VASAVI COLLEGE OF ENGINEERING (Autonomous)**

IBRAHIMBAGH, HYDERABAD – 500 031

**DEPARTMENT OF INFORMATION TECHNOLOGY**

**INTRODUCTION TO MACHINE LEARNING**

(OPEN ELECTIVE-IV)

SYLLABUS FOR B.E VI- SEMESTER

(Common for ECE & EEE)

L:T:P (Hrs./week): 3:0:0	SEE Marks :60	Course Code: <b>U21OE620IT</b>
Credits: 3	CIE Marks: 40	Duration of SEE :3Hrs

<b>COURSE OBJECTIVES</b>	<b>COURSE OUTCOMES</b> <i>On completion of the course, students will be able to</i>
Introduce the fundamental concepts, techniques and modern tools in Artificial intelligence and Machine Learning field to effectively apply it 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. Understand and apply latest Python libraries for Machine learning models.</li><li>3. Apply an appropriate algorithm for a given problem.</li><li>4. Apply machine learning techniques in the design of computer systems.</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.

**Introduction to Python and ML libraries:** intro to python data types, control flow, loops, functions, modules & packages. Intro to NumPy & Scikit-learn.

**UNIT-II:**

**Supervised learning:** ML Task, ML Experience or Data, ML Performance metric, Linear Regression, Linear regression Simulator, Logistic Regression.

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

**UNIT-III:**

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

With effect from the Academic Year 2023-24

**UNIT-IV:**

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

**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. Ethem Alpaydin, 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/>
6. <https://www.w3schools.com/python/>
7. <https://www.w3schools.com/python/numpy/default.asp>
8. <https://scikit-learn.org/stable/>
9. [Linear Regression Simulator \(mladdict.com\)](http://mladdict.com)
10. [Neural Network Playground simulator](http://mladdict.com)
11. <https://www.mladdict.com/neural-network-simulator>

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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3							
5							
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3							
5							

Duration of Internal Test: 90 minutes



With effect from the Academic Year 2023-24

**VASAVI COLLEGE OF ENGINEERING (Autonomous)**  
IBRAHIMBAGH, HYDERABAD – 500 031  
**DEPARTMENT OF INFORMATION TECHNOLOGY**

**FUNDAMENTALS OF MACHINE LEARNING**  
(OPEN ELECTIVE-IV)  
SYLLABUS FOR B.E VI- SEMESTER  
(Common for CIVIL & MECH)

L:T:P (Hrs./week): 3:0:0	SEE Marks :60	Course Code: <b>U21OE630IT</b>
Credits: 3	CIE Marks: 40	Duration of SEE :3Hrs

<b>COURSE OBJECTIVES</b>	<b>COURSE OUTCOMES</b> <i>On completion of the course, students will be able to</i>
Introduce the fundamental concepts, techniques and modern tools in Artificial intelligence and Machine Learning field to effectively apply it 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. Understand and apply latest Python libraries for Machine learning models.</li><li>3. Apply an appropriate algorithm for a given problem.</li><li>4. Apply machine learning techniques in the design of computer systems.</li><li>5. Explain the relative strengths and weaknesses of different machine learning methods and approaches.</li></ol>

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**Introduction to Python and ML libraries:** intro to python data types, control flow, loops, functions, modules & packages. Intro to NumPy & Scikit-learn.

**UNIT-II:**

**Supervised learning:** ML Task, ML Experience or Data, ML Performance metric, Linear Regression, Linear regression Simulator, Logistic Regression.

**UNIT-III:**

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

**UNIT-IV:**

With effect from the Academic Year 2023-24

**Supervised Parametric learning:** Support Vector Machine.

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

**UNIT-V:**

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

**Learning Resources:**

12. Tom Mitchell, Machine Learning, First Edition, McGraw-Hill, 1997
13. Christopher Bishop. Pattern Recognition and Machine Learning. Second Edition.
14. Ethem Alpaydin, Introduction to Machine Learning, Second Edition
15. T. Hastie, R. Tibshirani, J. Friedman. The Elements of Statistical Learning, 2e, 2008.
16. <http://nptel.ac.in/courses/106106139/>
17. <https://www.w3schools.com/python/>
18. <https://www.w3schools.com/python/numpy/default.asp>
19. <https://scikit-learn.org/stable/>
20. [Linear Regression Simulator \(mladdict.com\)](http://mladdict.com)
21. [Neural Network Playground simulator](http://mladdict.com/neural-network-simulator)
22. <https://www.mladdict.com/neural-network-simulator>

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

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3							
5							
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3							
5							

Duration of Internal Test: 90 minutes

With effect from the Academic Year 2023-24  
**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>U21OE610ME</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.	1. Understand the fundamentals of prototyping and the various data formats used in Additive Manufacturing. 2. Study the principle, process, advantages, limitations and case studies of liquid based AM systems. 3. Study the principle, process, advantages, limitations and case studies of solid based AM systems. 4. Study the principle, process, advantages, limitations and case studies of powder based AM systems. 5. Study the applications of AM in various engineering industries as well as the medical field.

**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 2023-24

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	:	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 2023-24

**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>U21OE620ME</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. aware about types of business forms, organization structures, plant layouts, merits, demerits and applications.	1. understand business forms, organization structures and plant layouts.
2. understand method study procedure, PME, time study techniques and wage incentives.	2. implementation of method study and estimation of standard time.
3. importance of PPC and improving quality by control charts and sampling plants.	3. understand types of production, functions of PPC, quality control by charts and sampling.
4. optimization of inventory to minimize total cost and other optimization techniques like LPP, project	4. implement optimization techniques like LPP, assignment and project management techniques.
5. estimate selling price of a product, TVM and budgeting techniques, depreciation methods.	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 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.

With effect from the Academic Year 2023-24

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	:	<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 2023-24  
**VASAVI COLLEGE OF ENGINEERING (Autonomous)**  
 IBRAHIMBAGH, HYDERABAD-31  
**Department of H&SS**  
**ADVANCED COURSE IN ENTREPRENEURSHIP (OE-IV)**  
 SYLLABUS FOR B.E.VI-SEMESTER

L:T:P(Hrs/week):3:0:0	SEE Marks:60	Course Code: <b>U20OE630EH</b>
Credits :03	CIE Marks:40	Duration of SEE:03Hours

<b>Courseobjectives</b>	<b>CourseOutcomes</b>
<i>The objectives of this course are</i>	<i>On completion of the course the student will</i>
1. Acquire additional knowledge and skills for developing early customer traction into a repeatable business. 2. They will learn the tools and methods for achieving sustainable growth, such as refining the product or service and business	1. Develop an A-team 2. Refine business models and expand customer segments, brand strategy and create digital presence, channel strategy for customer outreach 3. Develop strategies to grow revenues and markets, understand Advance Concepts of business finance, do Financial Planning, find Funding for growth 4. Leverage technologies and platforms for

### **Unit I: Pivoting and New Business Model**

Introduction to Advance Course and Recapping the key concepts; Revisit of idea/solution, business model and team members, Need for a mentor; Pivoting and its need; Types of Business models; Refining business model; Analyzing the Business Model of Competitors; Adding new customer segments to existing business model.

### **Unit II: Business Planning**

Product Management: Need for a product management with examples; Making a sales plan; Building sales organization: Entrepreneur interview, Hiring sales team; Making a people plan for the venture; Introduction and understanding financial planning and forecasting template; Discussing financial planning and revisiting business model; Creating a procurement plan; Negotiation.

### **Unit III: Customer Life cycle and Building the A-team**

Customer life cycle; identifying secondary revenue streams; Funding Landscape: Funding options for an entrepreneur; Investor hunt: Creating funding plan and designing the pitch deck; Attracting right talent – I: Intro to building the A-team;



With effect from the Academic Year 2023-24

Examples; Setting the team for success.

#### **Unit IV: Branding and Channel Strategy, Leveraging Technologies**

Creating brand Strategy: Drawing venture's golden circle; Defining the positioning statement: values; Creating a Public Image and Presence of the Venture; Identifying the right channel; Platforms for Marketing and Promotion; Platforms for Communication and Collaboration; Making the Tech Plan.

#### **Unit V: Measuring Progress, Legal Matters and Role of Mentors & Advisors**

Metrics for Customer Acquisition and Retention; Financial Metrics: Finding new revenue streams based on key financial metrics; Re-forecasting financial plan to increase margin; Professional Help and Legal & Compliance Requirements; Selecting IP for organization; Identifying mentors and advisors; Scouting board of directors; Capstone Project.

#### **Learning Resources:**

1. <http://www.learnwise.org>
2. Clancy, Ann L. & Binkert, Jacqueline, "Pivoting- A coach's guide to igniting substantial change" Palgrave Macmillan US 2017
3. Porter, Michael, E., "Competitive Advantage: Creating and Sustaining Superior Performance", Free press, 1<sup>st</sup>edi.
4. Schwetje, Gerald & Vaseghi Sam, "The Business Plan", Springer-Verlag Berlin Heidelberg.
5. LeMay, Matt, "Product Management in Practice", O'Reilly Media Inc.
6. Smart, Geoff & Randy, Street., "Who: The A method of hiring", Ballantine books, 2008.
7. Blokdyk, Gerardus., "Customer Lifecycle Management - A complete guide", 5starcooks, 2018

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

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Duration of Internal Test:		90 minutes		