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. (ECE) V and VI Semesters
With effect from 2020-21
(For the batch admitted in 2018-19)
(R-18)**

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
Phones: +91-40-23146040, 23146041
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

Striving for excellence in teaching, training and research in the areas of Electronics and Communication Engineering

Department Mission

To inculcate a spirit of scientific temper and analytical thinking, and train the students in contemporary technologies in Electronics & Communication Engineering to meet the needs of the industry and society with ethical values

B.E (ECE) Program Educational Objectives (PEO's)	
PEO I	Graduates will be able to identify, analyze and solve engineering problems.
PEO II	Graduates will be able to succeed in their careers, higher education, and research.
PEO III	Graduates will be able to excel individually and in multidisciplinary teams to solve engineering and societal problems.
PEO IV	Graduates will be able to exhibit leadership qualities and lifelong learning skills with ethical values.

B.E. (ECE) PROGRAM OUTCOMES (PO's)	
Engineering Graduates will be able to:	
PO1	Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.
PO2	Problem Analysis: Identify, formulate, review research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.
PO3	Design / development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety and the cultural, societal and environmental considerations.
PO4	Conduct investigations of complex problems: Use research based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of the information to provide valid conclusions.
PO5	Modern tool usage: Create, select and apply appropriate techniques, resources and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO6	The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO7	Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts and demonstrate the knowledge of and need for sustainable development.
PO8	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9	Individual and team work: Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary settings.
P1O	Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, give and receive clear instructions.
P11	Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
P12	Lifelong learning: Recognize the need, and for have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change.

B.E (ECE) PROGRAM SPECIFIC OUTCOMES (PSO's)	
PSO I	ECE students will be able to analyze and offer circuit and system level solutions for complex electronics engineering problems, keeping in mind the latest technological trends.
PSO II	ECE students will be able to apply the acquired knowledge and skills in modeling and simulation of wireless communication systems.
PSO III	ECE students will be able to implement signal and image processing techniques for real time applications.

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS) :: IBRAHIMBAGH, HYDERABAD – 500 031
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
SCHEME OF INSTRUCTION AND EXAMINATION (R-18) :: B.E. - ECE : FIFTH SEMESTER (2020 - 21)

Course Code	Name of the Course	Scheme of Instruction			Scheme of Examination			Credits
		Hours per Week			Duration in Hrs	Maximum Marks		
		L	T	P/D		SEE	CIE	
B.E (ECE) V - SEMESTER								
THEORY								
U18HS510EH	Skill Development - III : Soft skills	1	-	-	2	40	30	1
U18PC510EC	Control Systems Engineering	3	-	-	3	60	40	3
U18PC520EC	Integrated Circuits and Applications	3	-	-	3	60	40	3
U18PC530EC	Analog and Digital Communication	3	-	-	3	60	40	3
U18PC540EC	Computer Organization and Architecture	3	-	-	3	60	40	3
U18PE550EC	Skill Development - III : Technical Skills	1	-	-	2	40	30	1
U18OE5XXXX	Open Elective – III	3	-	-	3	60	40	3
PRACTICALS								
U18PC511EC	Sensors and Systems Lab	-	-	2	3	50	30	1
U18PC521EC	Integrated Circuits and Applications Lab	-	-	2	3	50	30	1
U18PC531EC	Analog and Digital Communication Lab	-	-	2	3	50	30	1
TOTAL		17	-	6		530	350	20
GRAND TOTAL		23			880			

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

DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES

Skill Development - III : Soft Skills

SYLLABUS FOR B.E. V – SEMESTER

L:T:P (Hrs./week): 1:0:0	SEE Marks : 40	Course Code: **U18HS510EH**
Credits : 1	CIE Marks : 30	Duration of SEE : 2 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
This is a foundation course and aims at enhancing employability skills in students. 1. Students will be introduced to higher order thinking skills and problem solving on the following areas - Arithmetic ability, Numerical ability and General reasoning. 2. Students will be trained to work systematically with speed and accuracy while problem solving.	At the end of the course students will be able to: 1. Solve questions on the above mentioned areas using short cuts and smart methods 2. Understand the fundamentals concepts of Aptitude skills 3. Perform calculations with speed and accuracy

UNIT – I : QUANTITATIVE APTITUDE - NUMERICAL ABILITY

- o Introduction to higher order thinking skills
- o Speed Maths
- o Number systems
- o LCM & HCF

UNIT – II : QUANTITATIVE APTITUDE- ARITHMETIC ABILITY FOUNDATION

- o Ratio proportions
- o Partnership
- o Ages
- o Allegations and mixtures
- o Averages

UNIT – III : QUANTITATIVE APTITUDE

- o Percentages
- o Profit and loss

UNIT – IV : REASONING ABILITY – GENERAL REASONING PART 1

- o Blood relations
- o Number Series
- o Coding and decoding

UNIT – V : QUANTITATIVE APTITUDE

- o Time and work
- o Chain Rule
- o Pipes and Cisterns

Learning Resources:

1. scoremore.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 Tests: 90 Minutes

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

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Control Systems Engineering
SYLLABUS FOR B.E. V – SEMESTER

L:T:P (Hrs./week): 3:0:0	SEE Marks : 60	Course Code: **U18PC510EC**
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
1. Apply principles of control theory to model physical system. 2. Analyze the performance of a given system in time and frequency domains and choose appropriate compensator if needed.	On completion of the course, students will be able to 1. Derive dynamic equations for electro mechanical systems and obtain transfer function using block diagram reduction technique, Mason's gain formula from given system model. 2. Analyze the stability of the system in time domain and determine its performance characteristics. 3. Apply Bode plot, Nyquist criteria techniques to determine the performance of the system in frequency domain. 4. Determine the transfer function and stability for digital control system. 5. Analyze the system in the presence of initial conditions and apply Kalman's test for controllability and observability.

UNIT - I : Control System fundamentals and Components:
Classification of control systems, Open and Closed loop systems. Mathematical modeling of mechanical systems and their conversion into electrical systems. Block diagram reduction and Signal flow graphs.

UNIT - II : Time response Analysis
Transfer function and Impulse response, types of input. Transient response of second order system for step input. Time domain specifications. Types of systems, static error coefficients, error series, Routh - Hurwitz criterion for stability.
Root locus techniques: Analysis of typical systems using root locus techniques. Effect of location of roots on system response.

UNIT - III : Frequency response Analysis

Bode plots, frequency domain specifications. Gain margin and Phase Margin. Principle of argument, Polar plot, Nyquist plot and Nyquist criterion for stability.

Compensation: Cascade and feedback compensation using Bode plots. Phase lag, lead, lag-lead compensators. PID controller

UNIT - IV : Digital Control Systems

Digital control, advantages and disadvantages, and digital control system architecture. The discrete transfer function. Sampled data system. Transfer function of sample data systems. Stability of Discrete data systems

UNIT - V : State space representation

Concept of state and state variables. State models of linear time invariant systems, State transition matrix, Solution of state equations. Design of digital control systems using state-space concepts. Controllability and observability.

<u>Learning Resources:</u>

1. Nagrath, I.J., and Gopal, M., "Control System Engineering," New Age Publishers, 5/e, 2009.
2. Ogata, K., "Modern Control Engineering," 5/e, PHI, 2010.
3. Benjamin C. Kuo, "Automatic Control Systems," 7/e, PHI, 2010.
4. Nise, Norman S. Control Systems Engineering. 5th ed. New York, NY: John Wiley & Sons, 2007
5. Richard C. Dorf & Robart H. Bishop, "Modern Control Systems," 11/e, Pearson, 2008.
6. Gopal, Madan, "Digital Control Engineering," 1/e, New Age Publishers, 2008.
7. http://www.nptelvideos.in/2012/11/control-engineeringprof-gopal.html
8. https://nptel.ac.in/courses/108101037/
9. https://nptel.ac.in/courses/108106098/

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 Tests: 90 Minutes

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

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Integrated Circuits and Applications

SYLLABUS FOR B.E. V – SEMESTER

L:T:P (Hrs./week): 3:0:0	SEE Marks : 60	Course Code: **U18PC520EC**
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
1. Students will acquire the knowledge of linear IC applications and design various circuits using IC's for any given specifications. 2. Student shall describe specifications of a digital IC for various logic families and design combinational and sequential circuits with digital ICs.	On completion of the course, students will be able to 1. Illustrate the internal circuit, parameters and features of op-amp. 2. Design of linear and non-linear circuits using op- amp. 3. Design and analyze various applications using ICs, such as 741, 555, 723 etc,. 4. Define specifications of digital IC and select appropriate IC based on specifications. 5. Design and analyze applications using different combinational and Sequential circuits (IC's)

UNIT - I : Integrated Circuits and Op-Amp Applications
Chip Size and Circuit Complexity, Ideal and Practical Op-Amp, Op-Amp Characteristics - DC, AC-Slew Rate and Frequency Response, 741 Op-Amp, Modes of Operation: Inverting, Non- Inverting, Differential.
Op-Amp Applications: Basic Applications of Op-Amp, Instrumentation Amplifier, V to I and I to V Converters, Sample & Hold Circuits, Differentiators and Integrators, Comparators, Schmitt Trigger

UNIT - II : Active filters, Timers & Phase Locked Loops
Active Filters: First Order and Second Order Low Pass, High Pass filters, Band Pass, Band Reject and All Pass Filters. Analysis and Design of Function Generators using IC 8038.
555 Timers: Functional Diagram, Monostable, Astable Operations and Applications.
Phase Locked Loop (PLL): Block Schematic, Principles and Description of Individual Blocks of 565, Applications.

UNIT - III : IC regulators & Data convertors

IC Regulators: Analysis and design of fixed voltage regulators & IC 723 voltage regulator

Data convertors : Basic DAC Techniques – Weighted Resistor Type, R-2R Ladder Type, Inverted R- 2R Type DAC's Different types of ADCs – Parallel Comparator Type, Counter Type, Successive Approximation Register Type and Dual Slope Type.

UNIT - IV : Logic Families

Digital Integrated Circuits: Classification of Digital Integrated Circuits, Standard TTL NAND Gate-Analysis & Characteristics, TTL Open Collector Outputs, Tristate TTL, MOS & CMOS Open Drain and Tristate Outputs,. Comparison of various Logic Families, IC Interfacing - TTL Driving CMOS & CMOS Driving TTL.

UNIT - V : Digital IC Applications

TTL-74XX Series & CMOS 40XX Series ICs, Arithmetic Circuit ICs-Parallel Binary Adder/Subtractor using 2's Complement System, Magnitude Comparator Circuits.

Sequential Circuits 74XX and CMOS 40XX Series ICs, Design of Synchronous and Asynchronous Counters , Shift Registers & Applications.

Learning Resources:

1. Op-amps and Linear Integrated Circuits, Ramakant A. Gayakwad, Prentice Hall, 2003.
2. Linear Integrated Circuits, D. Roy Chowdhury, 3rd Edition, New Age International(P) Ltd., 2008
3. Ronald J. Tocci, Neal S.Widmer & Gregory L.Moss, "Digital Systems: Principles and Applications,"PHI,10/e, 2009.
4. Sonde, B. S., "Introduction to system Design using IC's," Wiley, 2/e, 1994.
5. Digital Fundamentals, Floyd and Jain, 8th Edition, Pearson Education, 2005.
6. Modern Digital Electronics, RP. Jain, 4th Edition, Tata McGraw-Hill, 2010.
7. https://nptel.ac.in/courses/108106069/
8. https://nptel.ac.in/courses/108108111/
9. https://nptel.ac.in/courses/108108114/

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 Tests: 90 Minutes

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

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Analog and Digital Communication

SYLLABUS FOR B.E. V – SEMESTER

L:T:P (Hrs./week): 3:0:0	SEE Marks : 60	Course Code: **U18PC530EC**
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
To acquire knowledge on analog and digital modulation schemes and analyze the communication system in the presence of noise.	On completion of the course, students will be able to 1. Analyze analog modulation technique employed at the transmitter and design an analog receiver accordingly. 2. Perform pulse modulation and hence apply source coding techniques for digital processing of information. 3. Estimate the performance of various modulation schemes in the presence of noise to choose an appropriate receiver 4. Analyze various digital modulation schemes and compare their error performances. 5. Interpret spread spectrum modulation and its need in limited available band for transmission of signals.

UNIT - I : Analog Communication

Principle of modulation, generation and detection of AM, DSBSC, SSBSC, FM signals. Quantitative analysis of continuous wave modulation, frequency division multiplexing, Introduction to transmitters and receivers, Super heterodyne receiver.

UNIT - II : Pulse Communication

Principles of Pulse modulation- generation and detection of PAM, PWM and PPM signals, quantization, Pulse code modulation (PCM), Differential pulse code modulation, Delta modulation, Time Division multiplexing.

UNIT - III : Noise in communication systems

Gaussian and white noise characteristics, Noise in AM, FM systems, Pre emphasis and De-emphasis, Threshold effect in angle modulation. Noise considerations in PCM and DM, Optimum detection of signals in noise, Coherent receiver, matched filter -Probability of Error evaluations.

UNIT - IV : Digital communication
Baseband Pulse Transmission- Inter symbol Interference and Nyquist criterion. Pass band Digital Modulation schemes- PSK, FSK, QAM, CPM and MSK, Digital Modulation tradeoffs.

UNIT - V : Spread spectrum communications
Need for spreading a code, generation and characteristics of PN sequences. Direct Sequence Spread Spectrum and Frequency hopping spread spectrum systems and their applications. Acquisition schemes for spread spectrum receivers, Tracking of FH and DS signals.

Learning Resources:

1. Simon Haykin, "Communication Systems," 4/e, Wiley India, 2011.
2. Sam Shanmugham.K., "Digital and Analog Communication Systems," Wiley, 2005.
3. Communication Systems (Analog and Digital) by Dr. Sanjay Sharma, 2013
4. Singh, R.P. and Sapre, S.D., "Communication Systems," TMH, 2012.
5. https://nptel.ac.in/courses/117105143/
6. https://nptel.ac.in/courses/108104091/
7. https://nptel.ac.in/courses/117105144/
8. https://nptel.ac.in/courses/108104098/

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 Tests: 90 Minutes

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

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Computer Organization and Architecture
SYLLABUS FOR B.E. V – SEMESTER

L:T:P (Hrs./week): 3:0:0	SEE Marks : 60	Course Code: **U18PC540EC**
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
To familiarize the students with the concept of organization of a computer system, issues related to performance analysis of CPU in the aspect of memory and I/O interface.	On completion of the course, students will be able to 1. Apply digital engineering fundamentals to acquire knowledge of arithmetic algorithms for different processors 2. Interpret the concept of Basic processor system with reference to 8085 processor and Analyze the performance of Micro programmed Control unit organization. 3. Implementing the techniques of pipelining and parallelism to analyze the performance of a Processor. 4. Apply the conceptual knowledge of system development with appropriate I/O Interface. 5. Interpret various techniques for efficient memory utilization to develop a system application.

UNIT - I: DATA REPRESENTATION AND COMPUTER ARITHMETIC

Introduction to Computer Organization and architecture, evolution and computer generations; Fixed point representation of numbers, digital arithmetic algorithms for Addition, Subtraction, ripple carry adder, carry look-ahead adder, Multiplication using Booth's algorithm and Division using restoring and non restoring algorithms. Floating point representation with IEEE standards and its arithmetic operations.

UNIT-II: BASIC PROCESSOR ORGANIZATION AND ARCHITECTURE

8085 Architecture, CPU ,ALU UNIT, Register organization of 8085CPU, Memory organization of 8085CPU, Instruction set of Basic 8085 processor, Stored program organization, stack organization of basic processor system, Hardwired control unit, Micro programmed Control organization, address sequencing, micro instruction format and micro program sequencer.

UNIT - III: PIPELINIG & PARALLELISM

Features of CISC and RISC and their comparison,Amdhal's law ,Concept of Pipelining, Data path and control path pipelining, Design of Arithmetic pipeline, Instruction Pipeline, performance issues in pipelining, Pipeline hazards, and techniques of Reducing pipeline branch penalties. Concept of parallelism, vector processors, Array processors.

UNIT - IV: INPUT-OUTPUT ORGANIZATION

I/O Bus and interface modules, I/O versus Memory Bus, Asynchronous data transfer: Strobe control, Handshaking, Asynchronous serial transfer. Modes of Transfer: Programmed I/O, Interrupt driven I/O, Priority interrupt; Daisy chaining, Parallel Priority interrupt. Direct memory Access, DMA controller and transfer. Input output   Processor , CPU-IOP communication.

UNIT - V: MEMORY ORGANIZATION

Memory hierarchy, Mapping of memory with CPU, Primary memory, Concept of memory interleaving, Associative memory, Cache memory organization and performance measures, cache mapping functions, Virtual memory organization, paging mechanism ,address mapping using pages, Memory management hardware.

Learning Resources:

1. Morris Mano, M., "Computer System Architecture," 3/e, Pearson Education, 2005.
2. Hamacher, Vranesic, Zaky, "Computer Organization," 5/e, McGraw Hill, 2007.
3. William Stallings, "Computer Organization and Architecture: Designing for performance," 7/e, Pearson Education, 2006.
4. Govindarajulu, B., "Computer Architecture and Organization," 2/e, TMH, 2010.
5. John Hennessy and David Patterson, Computer Architecture : A Quantitative Approach, 5 th Edition,Elsevier.
6. Microprocessor Architecture, Programming, and Applications with the 8085, 5th Edition, Peaerson Education
7. Computer Organization and Architecture by IIT Delhi
   https://nptel.ac.in/courses/106102062/
8. Computer Organization and Architecture by Prof.V. kamkoti,IIT Madras
   https://onlinecourses.nptel.ac.in/noc17_cs35

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 Tests: 90 Minutes

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

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Sensors and Systems Lab

SYLLABUS FOR B.E. V – SEMESTER

L:T:P (Hrs./week): 0:0:2	SEE Marks : 50	Course Code: **U18PC511EC**
Credits : 1	CIE Marks : 30	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
1. To demonstrate data acquistion from sensors using NI lab view. 2. To design and analyze control systems using control system tool/box / simulink / MATLAB	On completion of the course, students will be able to 1. Model any system using MATLAB, simulink. 2. Perform data acquisition through NI myRIO, 3. Appreciate the operation of various measuring and control instruments which they encounter in their respective fields. 4. Perform stability analysis of a given system in time and frequency domain. 5. Design a compensator for given specifications.

CYCLE - I Experiments

1. Measurement of temperature/pressure/strain of physical quantities using sensors using experimental trainer kits.
2. Sense the temperature with PmodTMP3
3. Sense the ambient light with PmodALS
4. Measurement of displacement/velocity with PmodACL
5. Estimate the range for a given IR and Ultrasonic sensors

CYCLE - II Experiments

6. Determine the stability of a given system.
7. Determine the time domain specifications for a second order system.
8. Find the static error coefficients of a given loop transfer function for test input signals.
9. Test system stability using R-H criterion.
10. Effect of addition of poles and zeros to the loop transfer function using root locus technique.

11. Estimate gain margin and phase margin for given transfer function from Bode plot.
12. Estimate gain margin and phase margin for given transfer function from Nyquist plot.
13. Design of compensators for given specifications.
14. Compare the response of second order system with and without controllers.
15. Stability analysis of digital control system using ZOH.
16. Testing observability and controllability of a given system using kalman's test.

New Experiments
1. Characteristics of D.C servo motor.
2. Measurement of IR range

Mini Project(s)
Mini projects related to sensor applications

Learning Resources / Tools:
1. Sensors Interfacing With Labview: A Practical Guide to Sensors and Actuators Data Acquisition and Interfacing Using Myrio, Createspace Independent Pub; 1 edition (28 April 2016)
2. Modeling, Analysis and Design of Control Systems in MATLAB and Simulink, Dingyü Xue, North eastern University China Yang Quan Chen, University of California, World Scientific Publishing Co., 2015

The break-up of CIE :

1. No. of Internal Test   : 1

2. Max. Marks for internal tests   : 12

3. Marks for day-to-day laboratory class work : 18

Duration of Internal Tests: 3 Hours

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

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Integrated Circuits and Applications Lab
SYLLABUS FOR B.E. V – SEMESTER

L:T:P (Hrs./week): 0:0:2	SEE Marks : 50	Course Code: **U18PC521EC**
Credits : 1	CIE Marks : 30	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
Students will Design and verify circuits using IC's for the given specifications.	On completion of the course, students will be able to 1. Implementing and Testing Various Op-Amp based circuits. 2. Design and verify the combinational and sequential circuits. 3. Examine the performance of various filters and 555 timer Applications. 4. Design & verify regulator using IC723 for given specifications.

CYCLE - I Experiments

1. Measurement of parameters of Op-Amp. Voltage Follower, Inverting and Non Inverting Amplifiers, Level Translators using Op-Amp.
2. Arithmetic Circuits: Summer, Integrator Differentiator Op-Amp.
3. Active filters: LP, HP and BP using Op-Amp.
4. Op-Amp Oscillators: Astable, Monostable.
5. Triangle and Square wave Generators. Schmitt Trigger using Op-Amp.
6. Voltage Controlled Oscillator Using LM 566.
7. IC Regulators and current boosting.
8. Applications of 555 Timer.

CYCLE - II Experiments

1. Measurement of propagation delay, fan-out, Noise margin and transfer Characteristics of TTL and CMOS IC gates and open collector / drain gates.
2. Designing code converters using logic gates and standard code converters. Parity generator and checker circuit.
3. Flip-Flop conversions and latches using gates and ICs.
4. Designing Synchronous, Asynchronous up/down counters

5. Shift registers and ring counters using IC Flip-Flops & Standards IC counters.
6. Full Adders, Subtractors using logic gates and multiple bits IC Adder / Subtractor and arithmetic Circuits.
7. Mux - Demux applications.
8. Interfacing counters with 7-segment LED/LCD display units.

General Note:
1. At least 5 experiments from each part.
2. A total of not less than 10 experiments must be carried out during the semester.
3. Analysis and design of circuits, wherever possible, should be carried out using SPICE tools.

New Experiments
1. Sequence detector using Mealy and Moore type FSM.
2. PLL and its applications using IC565

Mini Project(s)

Learning Resources / Tools :
1. http://www.ti.com/lit/an/sboa092b/sboa092b.pdf
2. https://www.electrical4u.com/applications-of-op-amp/

The break-up of CIE :
1. No. of Internal Test   : 1
2. Max. Marks for internal test   : 12
3. Marks for day-to-day laboratory class work   : 18

Duration of Internal Tests: 3 Hours

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

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Analog and Digital Communication Lab

SYLLABUS FOR B.E. V – SEMESTER

L:T:P (Hrs./week): 0:0:2	SEE Marks : 50	Course Code: **U18PC531EC**
Credits : 1	CIE Marks : 30	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
To demonstrate analog and digital communication modulation and demodulation schemes for a given signal.	On completion of the course, students will be able to 1. Perform analog modulation and digital schemes. 2. Demonstrate source coding techniques by converting an analog signal to digital. 3. Perform multiplexing techniques. 4. Perform channel/ source coding techniques.

CYCLE - I Experiments

1. Generation and detection of Amplitude modulated signals
2. Generation and detection of Frequency modulation systems
3. Verifying the principle of pre emphasis and De emphasis
4. Frequency Division Multiplexing
5. Analog signal sampling and reconstruction.
6. Pulse modulation techniques.
7. Time division multiplexing

CYCLE - II Experiments

8. Pulse code modulation and demodulation
9. Delta modulation and demodulation
10. Channel encoding and decoding techniques
11. Data Formats/ Line coding
12. Generation and detection of ASK/FSK/PSK
13. Generation and detection of QPSK
14. Generation and detection of MSK

New Experiments
1. Characteristics of radio receiver.
2. Voice communication through analog modulation scheems

Mini Project(s)

Mini projects on communication system principles using simulation tools

Learning Resources/ Tools :

Tools: MATLAB, Simulink
1. Comunication systems by V. Chandra Sekar, SASTRA University, Oxford University Press, 2013, ISBN: 9780198078050
2. Digital Communication Systems Using MATLAB and Simulink, Second Editionby Dennis Silage
3. Communication Systems Modeling and Simulation using MATLAB and Simulink 1st Edition by K. C. Raveendranathan

The break-up of CIE :

1. No. of Internal Test : 1

2. Max. Marks for internal test : 12

3. Marks for day-to-day laboratory class work : 18

Duration of Internal Tests: 3 Hours

OPEN ELECTIVES OFFERED BY VARIOUS DEPARTMENTS IN B.E. V SEMESTER

Dept	Title	Code	credits
Civil	SPATIAL INFORMATION TECHNOLOGY	U18OE510CE	3
CSE	FUNDAMENTALS OF OBJECT ORIENTED PROGRAMMING	U18OE510CS	3
CSE	WEB DESIGN	U18OE520CS	3
ECE	SENSORS FOR ENGINEERING APPLICATIONS	U18OE520EC	3
EEE	SOLAR POWER AND APPLICATIONS	U18OE510EE	3
Mech.	INTRODUCTION TO ROBOTICS	U18OE510ME	3
Mech.	INTRODUCTION TO AUTOMOBILE ENGINEERING	U18OE520ME	3
Mech.	ADVANCED COURSE IN ENTREPRENEURSHIP*	U18OE530EH	3
IT	INTRODUCTION TO DATABASE MANAGEMENT SYSTEMS	U18OE510IT	3
IT	INTRODUCTION TO STATISTICAL PROGRAMMING	U18OE520IT	3
Maths.	NUMERICAL METHODS	U18OE510MA	3
Maths.	DISCRETE MATHEMATICS FOR ENGINEERS	U18OE520MA	3
Physics	VACUUM TECHNOLOGY & APPLICATIONS	U18OE510PH	3
HSS	TECHNICAL WRITING AND PROFESSIONAL PRESENTATIONS	U18OE010EH	3

VASAVI COLLEGE OF ENGINEERING (Autonomous)
IBRAHIMBAGH, HYDERABAD – 500 031
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: U18OE510CE
Credits : 3	CIE Marks:40	Duration of SEE:3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
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, introduction to digital data, elements of visual interpretation techniques. Applications of Remote sensing in various fields.

Unit III:
Global positioning Systems (GPS)
Overview of GNSS and Introduction to GPS, GLONASS, GALILEO, COMPASS, IRNSS systems , Applications of GPS.
GPS: Basic concepts, Functional system of GPS – Space segment, control segment and user segment, Working principle of GPS, Signal structure and code modulation, Pseudo-range measurements and navigation message

Unit IV
Errors and Positioning methods of GPS
Errors and biases in GPS measurements, Accuracy of navigation position: UERE and DOP, Intentional degradation of GPS signals: Selective availability (SA) and Anti-spoofing (AS) Differential GPS: Space based augmentation systems (e.g., SBAS, GAGAN) and Ground based augmentation systems (e.g., WASS, EGNOS)
GPS Carrier Phase measurements: Single Differencing, Double Differencing and Triple Differencing in GPS measurements.

Unit V
Basic Concepts: Introduction to GIS, History of GIS, Early development in GIS, Areas of GIS application, Components of GIS, Overview of GIS Software packages, Current issues and Trends in GIS.
Variables-Point, line, polygon, Geographic coordinate system, Map projections, Map Analysis.
GIS Data: Data types – spatial, non-spatial (attribute data) – data structure, data format – point line vector – Raster – Polygon
Data Input : Keyboard entry, Manual Digitizing, Scanner, Remotely sensed data, Existing Digital data Cartographic database, Digital elevation data
Data Editing: Detection and correction of errors, data reduction, edge matching

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-Wellenh of, Bernhard, Lichtenegger, Herbert, Wasle, Elmar, GNSS – GPS, GLONASS, Galileo and more, 2013
7. Thanappan Subash., Geographical Information System, Lambert Academic Publishing, 2011.
8. Paul Longley., Geographic Information systems and Science, John Wiley & Sons, 2005
9. John E. Harmon & Steven J. Anderson., The design and implementation of Geographic Information Systems, John Wiley & Sons, 2003
10. ArcGIS 10.1 Manuals, 2013.
11. Kang Tsung Chang., Introduction to Geographic Information Systems, Tata Mc Graw Hill Publishing Company Ltd, New Delhi, 2008.
12. Burrough, P.A., Principles of GIS for Land Resource Assessment, Oxford Publications, 2005.
13. C.P.Lo & Albert K. W.Yeung, Concepts and Techniques of Geographic Information Systems, Prentice Hall India Pvt.Ltd, 2002.

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

1	No. of Internal Tests	: 2	Max. Marks for each Internal Tests	: 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 Tests   :   90 Minutes

VASAVI COLLEGE OF ENGINEERING(Autonomous)
IBRAHIMBAGH, HYDERABAD – 500 031
Department of Computer Science & Engineering

FUNDAMENTALS OF OBJECT ORIENTED PROGRAMMING
(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 :**U18OE510CS**
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES *On completion of the course, students will be able to*
1 Apply object oriented 2 principles for developing an application using Java constructs. Design GUI using existing Java classes and interfaces.	1. Adopt the fundamentals of Object oriented system development for developing a application. 2. Apply basic features of OOP to design an application. 3. Employ runtime error handling, concurrent programming practices to develop a parallel processing application. 4. Perform string handling, read and write operations using console and files IO streams. 5. Design GUI for a java application using AWT classes.

UNIT-I: Object Oriented System Development: Understanding Object Oriented Development, Understanding Object Concepts, Benefits of Object Oriented Development.
Java Programming Fundamentals: Introduction, Overview of Java, Data types, Variables and Arrays, Operators, Control Statements.

UNIT-II: Building blocks of OOP: Classes and Methods, Constructor, Parameterized constructor, Garbage Collection, this, static, final keywords, Inheritance, types of inheritance, Method Overriding, Abstract class, Nested class, Interface, Package.

UNIT-III: Exception Handling: try, catch, throw, throws, finally, creating user defined exceptions

Multithreaded Programming: Types of Thread creation, multiple threads, isalive, join, thread priority, Thread Synchronization, Inter process communication.

UNIT-IV:String Handling: String constructors, operations, character extraction, comparison, search, modification. StringBuffer, methods, StringBuilder, StringTokenizer
Util: Date, Calendar, Random, Timer, Observable
IO: Files and Directories, I/O Classes and Interfaces, Byte Streams classes and Character Stream classes

UNIT-V: Applet: Applet Class, Applet architecture
Event Handling: The Delegation Event Model, Event Classes, Source of Events, Events Listener Interfaces
GUI Development: AWT: Classes, Working with Graphics, Frames, Menu, Layout Managers**.**

Learning Resources:
1. Herbert Schildt, The Complete Reference Java, 7th Edition, Tata McGraw Hill 2005.
2. P. Radha Krishna, Object Oriented Programming through Java, Universities Press, 2007.
3. Sachin Malhotra, Saurabh Choudhary, Programming in Java, 2nd Edition, Oxford Press, 2014.
4. https://docs.oracle.com/javase/tutorial/java

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

1 No. of Internal Tests   : 2   Max. Marks for each Internal Tests : 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 Tests   :   1 Hour 30 Minutes

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 :**U18OE520CS**
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES *On completion of the course, students will be able to*
To 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-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   : 2 Max. Marks for each Internal Tests   : 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 Tests   :   1 Hour 30 Minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
IBRAHIMBAGH, HYDERABAD – 500 031
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

SENSORS FOR ENGINEERING APPLICATIONS (OPEN ELECTIVE)
SYLLABUS FOR B.E. V - SEMESTER (for other branches)

L:T:P (Hrs./week) : 3:0:0	SEE Marks : 60	Course Code: **U18OE510EC**
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
1. The student will come to know the various stimuli that are to be measured in real life instrumentation.	*On completion of the course, students will be able to*
	1. Appreciate the operation of various measuring and control instruments which they encounter in their respective fields.
2. He will be able to select the right process or phenomena on which the sensor should depend on	2. Visualize the sensors and the measuring systems when they have to work in areas of interdisciplinary nature and also think of sensors and sensors systems when for a new situation they encounter in their career
3. He will be aware of the various sensors available for measurement and control applications.	3. Identify and select the right process or phenomena on which the sensor should depend on.
	4. Know various stimuli that are to be measured in real life instrumentation.

UNIT - I
Introduction: What is a sensor and what is a transducer? Electrical sensor – need for sensors in the modern world. Different fields of sensors based on the stimuli - various schematics for active and passive sensors.
General characteristics and specifications of sensors - Implications of specifications uses of sensors - measurement of stimuli - block diagram of sensor system. Brief description of each block.

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

UNIT – III

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

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

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

UNIT – IV

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

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

UNIT – V

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

High frequency sensors like microwave frequency sensors, wavelength measuring sensors.

MEMs and MEM based sensors.

Learning Resources :

1. Doebelin, "Measurement Systems: Application and Design", McGraw Hill Kogakusha Ltd.
2. Julian W. Gardner, Vijay K. Varadan, Osama O. Awadelkarim "Microsensors, MEMS and Smart Devices", New York: Wiley, 2001.
3. Henry Bolte, "Sensors – A Comprehensive Sensors", John Wiley.

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

1. No. of Internal Tests : 2 Max. Marks for each Internal Tests : 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 Tests: 90 Minutes

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

Solar Power and applications Open Elective-III
SYLLABUS FOR B.E. V SEMESTER

L: T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code:**U18OE510EE**
Credits:3	CIE Marks: 40	Duration of SEE: 3Hours

COURSE OBJECTIVES The course will enable the students to:	COURSE OUTCOMES On completion of the course, students will be able to
To impart the basics of solar energy harnessing and solar panel and array.	1. Compare different energy resources. 2. Identify and choose proper type of meter for solar radiation measurement. 3. Use proper solar thermal system according to the load requirements. 4. Categorize and compare photovoltaic cells. 5. Apply the knowledge of solar energy.

Unit – I

Fundamentals of Energy Sources: Oil crisis of 1973, Classifications of Energy Resources, Importance of Non-conventional energy sources, Advantages-disadvantages and salient features of Non-conventional energy sources.

Unit – II

Solar Energy Basics: Sun as a source of energy, the Earth, Radiation Spectrums, Extraterrestrial and Terrestrial Radiations, Depletion of solar Radiation, Pyranometer, Pyrheliometer, Sunshine Recorder.

Unit – III

Solar Thermal Systems: Solar Collectors, Solar Water Heater, Solar Passive space – heating and cooling systems, Solar Cookers, Solar furnaces, Solar thermal water pump, Vapour compression refrigeration and Solar pond Electric power plant.

Unit – IV
Solar Photovoltaic Systems: Solar Cell fundamentals, Cell characteristics, Cell classification, Module, Panel and Array, Maximizing the Solar PV output and load matching, MPPT.

Unit – V
Solar PV systems & Applications: Solar PV system classification - Stand-Alone Solar PV system and Grid-Interactive Solar PV system. Applications - Water Pumping, lighting, medical refrigeration, village power and Telecommunication.

Suggested Reading:
1. B H Khan, Non-Conventional Energy Resources, 2nd Edition, Tata McGraw Hill.
2. G. D. Rai, Non-Conventional Energy Sources, 13th Reprint 2014, Khanna Publications.

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 Tests : 90 Minutes

VASAVI COLLEGE OF ENGINEERING (Autonomous)
IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF MECHANICAL ENGINEERING
SYLLABUS FOR B.E. V-SEMESTER
INTRODUCTION TO ROBOTICS (Open Elective-III)

L:T:P(Hrs./week): 3:0:0	SEE Marks : 60	Course Code: U18OE510ME
Credits : 3	CIE Marks: 40	Duration of SEE : 3 Hours

Course objectives	Course Out comes
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 1. understand the anatomy of the robot and various robot configurations for it's selection depending on the task. 2. classify the end effectors , understand different types of joints,various types of mechanical actuation and robot drive systems for carrying out the assigned job effectively. 3. analyze a planar manipulator through forward kinematics and understand the control of robot manipulator for better reliability and efficiency. 4. classifythe various sensors used in robots for proper selection to an application. 5. summarize various industrial and non-industrial applications of robots for their selection to a particular task.

UNIT-I
ROBOT BASICS
Robot-Basic concepts, Need, Law, History, Anatomy, specifications.
Robot configurations-cartesian, cylindrical, polar ,articulated and SCARA.
Robot wrist mechanism, Precision and accuracy of robot.

UNIT-II
ROBOT ELEMENTS
End effectors-Classification, Types of Mechanical actuation, Gripper design, Robot drive system types: Electrical, pneumatic and hydraulic. Position and velocity feedback devices, Robot joints and links-Types, Motion interpolation.

UNIT-III
ROBOT KINEMATICS AND CONTROL

Robot kinematics – Basics of direct and inverse kinematics, Robot trajectories, 2D and 3D Transformation- Scaling, Rotation and Translation, Homogeneous transformation. 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.

UNIT-IV
ROBOT SENSORS
Sensors in robots – Touch sensors-Tactile sensors – Proximity and range sensors. Force sensors, Light sensors, Pressure sensors.
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. MikellP. 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 HillPublishing Company Limited, 2010.
3. KlafterR.D, Chmielewski T.A, and Negin. M, "Robotic Engineering: An Integrated Approach", Prentice Hall of India Pvt. Ltd.,1994.
4. K.S. Fu,R.C. Gonzalez and C.S.G.Lee , "Robotics control, sensing, vision and intelligence",TataMcGraw-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:	02	Max.Marks for each Internal Test:	30
2	No. of Assignments:	03	Max. Marks for each Assignment:	05
3	No. of Quizzes:	03	Max. Marks for each Quiz Test:	05

Duration of Internal Test: **1 Hour 30 Minutes**

VASAVI COLLEGE OF ENGINEERING (Autonomous)
IBRAHIMBAGH, HYDERABAD – 500 031
DEPARTMENT OF MECHANICAL ENGINEERING
SYLLABUS FOR B.E. V-SEMESTER

INTRODUCTION TO AUTOMOBILE ENGINEERING (OE-III)

L:T:P(Hrs./week): 3:0:0	SEE Marks : 60	Course Code: U18OE520ME
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

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

UNIT-I
Introduction: Types of automobiles: Hybrid Vehicles, Electrical, gas and Fuel cell vehicles. Chassis and body, Lay out of transmission system, Engine components: cylinder block, cylinder head, crankcase, crank shaft and cam shaft. Types 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 and Introduction to **CRDI** system for diesel engines.
Cooling system: air cooling, water cooling: Thermo syphon, pump circulation system.
Lubrication system: Petroil System, splash system, pressure lubrication: Wet sump and Dry Sump.

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

UNIT-III
Suspension system: Rigid axle, Independent suspension system:Double wish bone type, Macpherson strut system, Air suspension system.
Steering system: front axle, wheel alignment, 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, Ackermann steering mechanism.

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

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

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

Duration of Internal Test: **1 Hour 30 Minutes**

VASAVI COLLEGE OF ENGINEERING (Autonomous)
IBRAHIMBAGH, HYDERABAD-31
Department of Mechanical Engineering

ADVANCED COURSE INENTREPRENEURSHIP (OE-IV)
SYLLABUS FOR B.E.V-SEMESTER

L:T:P(Hrs/week):3:0:0	SEE Marks:60	Course Code:**U18OE530EH**
Credits :03	CIE Marks:40	Duration of SEE:03Hours

Courseobjectives	CourseOutcomes
The objectives of this course are to	*On completion of the course the student will be able to*
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 models, building brand strategy, making a sales and financial plan etc.	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 growth stage companies 5. Develop key metrics to track progress,

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; 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, 1st 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

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

Duration of Internal Test: **1 Hour 30 Minutes**

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 :**U18OE510IT**
Credits :3	CIE Marks: 40	Duration of SEE :3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
	On completion of the course, students will be able to
Apply the concepts of database management systems and design relational databases.	1. Understand functional components of the DBMS and develop ER model for a given problem and map ER it to Relational model
	2. Understand Relational model and basic relational algebra operations.
	3. Devise queries using SQL.
	4. Design a normalized database schema using different normal forms.
	5. Understand transaction processing and concurrency control techniques.

UNIT – I
Introduction: Database System Applications, Purpose of Database Systems, View of Data, Database Languages, Relational Databases, Database Architecture, Database Users and Administrators.
DatabaseDesign and the E-R Model: Overview of the Design Process, The E-R Model, Constraints, E-R Diagrams

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

UNIT – III
Structured Query Language: Introduction, Data Definition, Basic Structure of SQL Queries, Modification of the Database, Additional Basic

Operations, Set 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, 6th 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), Thomoson.
6. https://nptel.ac.in/courses/106105175/

The break-up of CIE: Internal Tests   + Assignments + Quizzes
1 No. of Internal Tests   : 2 Max. Marks for each Internal Tests   : 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 Tests   : 90 Minutes

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

INTRODUCTION TO STATISTICAL PROGRAMMING
(Open Elective-III)
SYLLABUS OF B.E V- SEMESTER
(Common for CIVIL, ECE, EEE & MECH)

L:T:P(Hrs./week): 3:0:0	SEE Marks :60	Course Code : **U18OE520IT**
Credits :3	CIE Marks: 40	Duration of SEE :3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
	On completion of the course, students will be able to
The course will enable the students to apply the statistical programming concepts and techniques using Python libraries in the analysis of Statistical data.	1. Understands the basics of statistical concepts and various data types in Numpy, Pandas.
	2. Cleans and Analyzes the data with descriptive statistics and EDA.
	3. Visualizes the data with matplotlib, seaborn graphic libraries.
	4. Analyzes data with various statistical inference techniques using Hypothesis testing.
	5. Understands and applies various data distributions, sampling and simulation of random variables.
	6. Applies various statistical models like linear regression, ANOVA to the data.

Unit I: Introduction to Statistical computing and Python libraries
Intro to statistics: Samples and Population, Descriptive statistics; intro to Computational statistics, Data analysis, knowledge discovery in Data, Various data types.
Intro to statistical computing software: Python libraries & R.

Unit II: Data Collection, Cleaning and Exploratory Data Analysis using Pandas.
Data types in Numpy, Pandas: list, vector, matrix, array, tensor, DataFrame. Operations on Data Types.
Data import using Pandas, Data cleaning, imputation, EDA case studies using Pandas.

Unit III: Data Visualization with matplotlib and Seaborn.

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

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

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

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

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

Unit V: Simulations and Statistical models

Random variables, sampling and simulation of data distributions.

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

Learning Resources:

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

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

1 No. of Internal Tests	: 2	Max. Marks for each Internal Tests	: 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 Tests	:	90 Minutes	

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
IBRAHIMBAGH, HYDERABAD – 500 031
DEPARTMENT OF MATHEMATICS

NUMERICAL METHODS
(Open Elective)
For B.E., V - Semester – CBCS
(*for CSE & IT only*)

Name of the Faculty : Mr. M. Venkateswar Rao

L:T:P (Hrs./week):2:0:0	SEE Marks :60	Course Code: **U18OE510MA**
Credits : 2	CIE Marks: 40	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the students to:	*At the end of the course students will be able to:*
1. **Study** various numerical methods to solve Algebraic and Transcendental equations.	1. **Apply** numerical methods to solve Algebraic and Transcendental equations which cannot be solved by traditional algebraic methods
2. **Understand** the methods to solve algebraic equations.	2. **Solve** simultaneous algebraic equations using direct and iteration methods.
3. **Understand** the numerical methods in interpolation and extrapolation.	3. **Use** various numerical methods in interpolation and extrapolation.
4. **Understand** numerical solutions of ordinary differential equations.	4. **Find** numerical solutions of ordinary differential equations.
5. **Understand** various numerical methods for evaluation of definite and double integrals.	5. **Apply** various numerical methods for evaluation of definite and double integrals.

Unit – I: (8 Hours)
Solution of Algebraic and Transcendental equations:
Errors in computation-Types of errors- Useful rules for estimating errors-Intermediate value property of equations-Solution of Algebraic and Transcendental equations: Bisection method, Newton-Raphson method Regula-Falsi method.

Unit – II: (8 Hours)
Solution of linear system of equations:

Direct methods- Gauss elimination method- Factorization method-Iterative methods: Jacobi's Iteration method- Gauss - Seidel Iteration method-Ill-conditioned system of equations.

Unit – III: (8 Hours)
Numerical differences
Introduction to finite differences -Central differences interpolation-Gauss's forwards and backward difference formulae-Stiriling's formula- Bessel's formula.

Unit – IV: (8 Hours)
Numerical Integration
Inroduction to Numerical Integration - Boole's Rule – Weddle's Rule – Evaluation of Double Integrals using Numerical Methods – Trapezoidal Rule - Simpson's Rule.

Unit – V: (8 Hours)
Numerical Solutions of Ordinary Differential Equations
Numerical Solutions of Ordinary Differential Equations: Euler's Method - Modified Euler's Method – Predictor–Corrector methods- Milne's method – Adam's Bashforth method.

Learning Resources:
1. Numerical methods in engineering and science by B.S.Grewal, Khanna publishers
2. Advanced Engineering Mathematics by R.K.Jain & S.R.K.Iyengar, Narosa publishing house.
3. Numerical Analysis by S.S.Sastry, PHI Ltd.

The break-up of CIE: Internal Tests   + Assignments + Quizzes
1 No. of Internal Tests   : 2 Max. Marks for each Internal Tests   : 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 Tests   : 90 Minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
IBRAHIMBAGH, HYDERABAD – 500 031
DEPARTMENT OF MATHEMATICS

DISCRETE MATHEMATICS FOR ENGINEERS
(OPEN ELECTIVE)
for B.E., V- Sem., (CBCS)
(For Civil, ECE, EEE & MECH only)

L:T:P (Hrs./week):3:0:0	SEE Marks :60	Course Code: **U18OE520MA**
Credits : 3	CIE Marks: 40	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the students to:	*At the end of the course students will be able to:*
1. *Understand* Propositions and their equivalences, predicates and quantifiers and learn various proof strategies.	1. *Use* **logical notation** to define and reason about **fundamental mathematical concepts and** *synthesize* **induction hypothesis and simple** *Induction* **proofs**.
2. *Study* the concepts of number theory such Modular Arithmetic, Congruences and basic cryptography etc.,	2. *Prove* **elementary properties of modular arithmetic** and basic cryptography and apply in Computer Science.
3. *Understand* the basics of counting, combinatory, and various methods of solving Recurrence relations.	3. *Calculate* **number of possible outcomes** of elementary combinatorial processes such as permutations and combinations *Model* **and analyze computational processes** using analytic and Combinatorial methods.
4. *Understand* Relations, Equivalence relations, Posets and Hasse diagrams.	4. *Prove* whether a given relation is an equivalence relation/poset and will be able to draw a Hasse diagram.
5. *Analyze* the concepts of Graphs.	5. *Apply* graph theory models of data structures and to solve problems of connectivity*.*

UNIT – I (10 Hours)
Logic: Logic- Logical connectives- Propositional equivalences– Predicates and quantifiers – Nested quantifiers.

Mathematical Reasoning, Induction: Proof Strategy- Methods of Proofs- Mathematical Induction- Second Principle of Mathematical Induction.

UNIT – II (8 Hours)
Number Theory: The Integers and Division- Division Algorithm- Fundamental Theorem of Arithmetic –Modular Arithmetic-Integers and

Algorithms- Euclidean Algorithm -Linear Congruences- Fermat's Little Theorem.

UNIT – III (8 Hours)

Counting: Basics of counting- Pigeonhole principle- Permutations and combinations – Pascal's Identity- Vandermonde's Identity- Generalized Permutations and combinations.

Advanced Counting Techniques: Recurrence relations: Solving Recurrence Relations- Linear Homogeneous and Non-Homogeneous Recurrence relations.

UNIT – IV (8 Hours)

Relations: Relations – Properties -Representing relations - Equivalence Relations - Partial Orderings- Poset.

UNIT –V (8 Hours)

Graph Theory: Introduction- Types of graphs- Graph terminology- Basic theorems- Representing Graphs and Graph Isomorphism - Connectivity- Euler and Hamiltonian paths -

Learning Resources:

1. Kenneth H.Rosen – Discrete Mathematics and its application – 5th edition, Mc Graw – Hill, 2003.
2. Joel. Mott. Abraham Kandel, T.P.Baker, Discrete Mathematics for Computer Scientist & Mathematicians, Prentice Hall N.J., 2nd edn, 1986.
3. Discrete and Combinatorial Mathematics by Ralph P. Grimaldi , Pearson International
4. J.P.Trembly, R.Manohar, Discrete Mathematical Structure with Application to Computer Science, Mc Graw- Hill – 1997.
5. R.K. Bisht, H.S.Dhami - Discrete Mathematics, Oxford University Press, 2015.

Online Resources:

1. **http://mathworld.wolfram.com/topics**
2. **http://www.nptel.ac.in/course.php**

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

1 No. of Internal Tests   : 2 Max. Marks for each Internal Tests   : 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 Tests   : 90 Minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
IBRAHIMBAGH, HYDERABAD – 500 031
DEPARTMENT OF PHYSICS
Open elective Course

VACUUM TECHNOLOGY AND APPLICATIONS

L:T:P (Hrs./week):3:0:0	SEE Marks :60	Course Code: U18OE510PH
Credits : 3	CIE Marks: 40	Duration of SEE: 3 Hrs

Course objectives	*Course outcomes*
Students will be able to learn	*At the end of the course students will be*
1. Learn basic terms and definitions of vacuum technology 2. Acquire knowledge on vacuum pump parameters 3. Gain insight of various vacuum production methods 4. Learn measurement of vacuum 5. Known various applications of vacuum.	1. Define various vacuum ranges and terms related to vacuum technology 2. List out vacuum pump parameters 3. Narrate working of various types of vacuum pumps 4. Explain working of different vacuum measuring devices 5. List our application and use of vacuum in various fields of engineering and technology.

UNIT-I: FUNDAMENTALS OF VACUUM
Vacuum Nomenclature and Definitions, units of vacuum,Vacuum ranges, Types of flow: turbulent flow, viscous or laminar flow,molecular flow, Knudsen flow Vacuum Physics-out gassing, Mean free path of the molecules, adsorption, desorption, evaporation theory-rate of evaporation, Hertz- Knudsen equation, types of evaporation.

UNIT-II: VACUUM TERMINOLOGY
Methods of production of vacuum, vacuum pump function basics, throughput, pumping speed, conductance, evacuation rate, forevacuum and high-vacuum pumping, Pump Choice, valve less, valved pumping system, Positive Displacement Vacuum Pumps, Momentum Transfer Vacuum Pumps, Entrapment Pumps, traps and baffles. Function of the oil in oil-sealed vacuum pumps. Effects of condensable vapours on mechanical pump performance, Water vapour tolerance of a pump, Back-streaming

UNIT-III: VACUUM PUMPS
Systems construction and working of vacuum pumps: Roots vacuum pumps, Rotary vane pump, multi stage rotary pumps, diffusion pump,Turbomolecular pumps, cryo-pump, ion getter pumps,

UNIT-IV: VACUUM MEASUREMENT

Overview of gauges, direct reading and indirect reading gauges, classification of pressure gauge, Vacuum gauges: thermocouple gauge, Pirani gauge, cold cathode and hot cathode ionization gauge, Penning gauge, leak detection, Leak detection methods-leak rate.

UNIT-V: VACUUM APPLICATIONS

Deposition of thin films, Vacuum technology in the semiconductor industry, Vacuum technology in metallurgical processes, Vacuum technology in the chemical industry,

Learning Resources:

1. Dorothy M. Hoffman and Bawa Singh, Handbook of Vacuum Science and Technology, Academic Press, 1998
2. M. N. Avadhanulu and P.G. Kshirsagar, Textbook of Engineering Physics, Revised Edition, S.Chand, 2015
3. David J. Hucknall, Vacuum Technology and Applications, Butterworth-Heinema Ltd,1991
4. John F. O'HanlonA User's Guide to Vacuum Technology, Jhon Willey and sons, 2006

The break-up of CIE: Internal Tests   + Assignments + Quizzes
1 No. of Internal Tests   : 2 Max. Marks for each Internal Tests   : 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 Tests   :   90 Minutes

VASAVI COLLEGE OF ENGINEERING (Autonomous)
IBRAHIMBAGH, HYDERABAD – 500 031
DEPARTMENT OF HUMANITIES AND SOCIAL SCIENCES
OPEN ELECTIVE B.E.-3/4- V Semester and VI Semester

Course Name: TECHNICAL WRITING AND PROFESSIONAL PRESENTATIONS
Common to all branches

L:T: P (Hrs/Week):3	SEE Marks:60	Course Code: U18OE010EH
Credits: 3	CIE Marks:40	Duration of SEE:Hours:03

COURSE OBJECTIVES	COURSE OUTCOMES
➢ This course introduces the principles and mechanics of technical writing for students of engineering. Students will learn: ➢ specific communications skills associated with reporting technical information and will write a series of papers ranging from process description and feasibility reports to research projects, project proposals, and statement of purpose, which are pre-requisites for start-up companies and getting into foreign universities as well. ➢ How to make effective presentations as part of today's workplace demands.	**At the end of the course the student will be able to** 1. write effective reports 2. research and write project proposals and SoPs 3. make persuasive presentations

UNIT I
A. TECHNICAL REPORTS- INFORMAL
Informal report formats, project and research reports
B. TECHNICAL REPORTS-FORMAL
Formal report components, feasibility reports, evaluation reports,
Analytical and informational reports, executive summaries.

UNIT II
TECHNICAL WRITING IN BUSINESS CORRESPONDENCE
Components of a letter, types of electronic communication, effective emails, instant and text messaging guidelines.

UNIT III
Technical Resume, Curriculum Vitae, Biodata, Cover letter, resume format.

UNIT IV
A. PROFESSIONAL PRESENTATIONS

Paper presentations, Poster presentations, PowerPoint presentations, video demos and tutorials

B. VIDEO DEMOS AND TUTORIALS

Storyboard writing, e-learning methods; video demos, training videos, webinars, conducting surveys, questionnaire, assessments, quiz, introduction to e-learning tools; Adobe Captivate, TechSmith Camtasia.

UNIT-V

HOW TO WRITE PROPOSALS AND STATEMENT OF PURPOSE
Types of proposals, persuasive elements, requests for proposals, stating your objective

METHODOLOGY: -   **ASSESSMENT: -**

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

Learning Resources: -

1. Effective Technical Communication, M Ashraf Rizvi, Tata McGraw-Hill Education, 2005
2. Raman, Meenakshi & Sangeeta Sharma. Technical Communication: Principles and Practice. Second Edition. New Delhi: Oxford University. Press, 2011.Hacking Your Statement of Purpose: A Concise Guide to Writing Your SOP, Milena Young, 2014.
3. How to prepare a feasibility study: a step-by-step guide including 3 model studies. Front Cover. Robert E. Stevens, Philip K. Sherwood. Prentice-Hall, 1982.
4. Successful Presentations (with DVD): John Hughes & Andrew Mallett. Oxford university Press.

The break-up of CIE: Internal Tests   + Assignments + Quizzes
1 No. of Internal Tests   : 2 Max. Marks for each Internal Tests   : 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 Tests   :   90 Minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS) :: IBRAHIMBAGH, HYDERABAD – 500 031.
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
SCHEME OF INSTRUCTION AND EXAMINATION (R-17) :: B.E. - ECE : SIXTH SEMESTER (2019 - 20)

Course Code	Name of the Course	Scheme of Instruction			Scheme of Examination			Credits
		Hours per Week			Duration in Hrs	Maximum Marks		
		L	T	P/D		SEE	CIE	
THEORY								
U18HS020EH	Human Values and Professional Ethics - II	1	-	-	2	40	30	1
U18HS610EH	Economics and Finance for Engineers	2	-	-	3	60	40	2
U18HS620EH	Skill Development - IV : Soft Skills	1	-	-	2	40	30	1
U18PC610EC	Microprocessors and Microcontrollers	3	-	-	3	60	40	3
U18PC620EC	Digital Signal Processing	3	-	-	3	60	40	3
U18PC630EC	Computer Networks	3	-	-	3	60	40	3
U18PC640EC	Antennas and Wave Propagation	3	-	-	3	60	40	3
U18PE640EC	Skill Development - IV : Technical Skills	1	-	-	2	40	30	1
U18OE6XXXX	Open Elective – IV	3	-	-	3	60	40	3
PRACTICALS								
U18PC611EC	Microprocessors and Microcontrollers Lab	-	-	2	3	50	30	1
U18PC621EC	Digital Signal Processing Lab	-	-	2	3	50	30	1
U18PC631EC	Computer Networks Lab	-	-	2	3	50	30	1
U18PW619EC	Theme Based Project	-	-	2	-	-	30	1
	TOTAL	20	-	6		630	450	24
	GRAND TOTAL	26				1080		

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

DEPARTMENT OF HUMANITIES AND SOCIAL SCIENCES

Human Values and Professional Ethics-II
COMMON FOR ALL BRANCHES – B.E. VI - SEMESTER

L:T:P (Hrs./week): 1:0:0	SEE Marks : 40	Course Code: **U18HS020EH**
Credits : 1	CIE Marks : 30	Duration of SEE : 2 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the students to:- 1. Get a holistic perspective of value-based education. 2. Grasp the meaning of basic human aspirations vis-a-vis the professional aspirations. 3. Understand professionalism in harmony with self and society. 4. Develop ethical human conduct and professional competence. 5. Enrich their interactions with the world around, both professional and personal.	On completion of the course, students will be able to 1. Gain a world view of the self, the society and the profession. 2. Start exploring themselves in relation to others and their work – constantly evolving into better human beings and professionals 3. Inculcate Human values into their profession. 4. Obtain a holistic vision about value-based education and professional ethics.

UNIT-I: PERSONAL ETHICS AND PROFESSIONAL ETHICS
a. PERSONAL ETHICS: A person's personal or self-created values and codes of conduct. Civic virtues and Civic sense.
b. NEED FOR ETHICAL CODES

Code of Professional Ethics-Observance of the code, Obligations towards the Features of professional ethics : Openness, Transparency, Privacy, Impartiality, Practicality, Loyalty.

Profession, Ethics and Information Security, Deterring Unethical and Illegal Behaviour, Work ethics.

UNIT-II: GENDER SENSITISATION
a. Social issues regarding women - Female infanticide and foeticide, dowry & property rights, violence against women.
b. Impact of globalization on the status of women - Political and legal empowerment
c. Women at work- Success stories.
{Post independence and current movements in India (Telengana movement 1948-50, Chipko movement 1973, Navnirman movement 1974, question of Representation in Politics)

Change makers - Shashi Deshpande, Taslima Nasreen, Kumkum sangari, Veena Mazumdar, Neera Desai.

Women's Studies in India--UGC's initiatives -- Centers for Women's Studies- Capacity building for Women leaders in education—Women development cells-- Women's Studies in the XIth Plan.

Women role models -- Case studies– Indira Gandhi, Kiran Mazumdar, Kiran Bedi, Ela Bhatt, Mother Teresa, PT Usha, Rukminidevi Arundale, Annie Beasant, Sarojini Naidu, Medha Padhkar, Kalpana Chawla, etc.}

Mode of Delivery

• Questionnaires	• Discussions
• Quizzes	• Skits
• Case-studies	• Short Movies/documentaries
• Observations and practice	• Team tasks and individual tasks
• Home and classroom assignments	• Research based tasks
	• Viva

Bibliography

- PL Dhar, RR Gaur, 1990, Science and Humanism, Commonwealth Purblishers.
- B.L Bajpai, 2004, Indian Ethos and Modern Management, New Royal Book Co., Lucknow. Reprinted 2008.
- A.N Tripathy, 2003 Human values, New Age International Publishers.
- EG Seebauer & Robert L. Berry,2000,Fundamentals of Ethics for Scientists and Engineers, Oxford University Press.

Relavant Websites, CD's and Documentaries

- Value Education website, Http://www.universalhumanvalues.info UPTU webiste, Http://www.uptu.ac.in
- Story of stuff, Http://www.storyofstuff.com
- AlGore, As Inconvenient Truth, Paramount Classics ,USA
- Charlie Chaplin, Modern Times, United Artists, USA
- IIT Delhi, Modern Technology-The Untold story-Anand Gandhi, Right Here Right Now, Cyclewala production.

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

1. No. of Internal Tests : 1 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 Tests: 90 Minutes

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

DEPARTMENT OF HUMANITIES & 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: **U18HS610EH**
Credits : 2	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The objective of the Course is to equip the prospective engineers with the concepts and tools of economics, finance, cost and taxes for business decisions.	On completion of the course, students will be able to 1. Decide appropriate price for goods and services with the company's given cost structure for an estimated profit of the companies. 2. Analyze the given financial statements of a firm to understand its past financial performance in the market. 3. Compare the long term financial investment proposals to decide whether a proposal is financially viable or not through capital budgeting techniques. 4. Identify the suitable sources of finance for the company by considering the functions of major banks such as SBI and RBI 5. Calculate the impact of the new tax policies on the company's financial structure/ individual incomes.

UNIT - I: Basics of Economics:
Scarcity Definition of Economics - Macro and Micro Economics - Managerial Economics - Meaning of a Firm - Objectives of a Firm - Profit Maximization - Demand Concept - Price Elasticity of Demand - Meaning of Supply - Equilibrium Price and Quantity - Production - Cobb Doughlas Production Function - Economies of Scale.

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

UNIT - III: Banking & Finance:
RBI and its role - Commercial Banks - Functions - Capital Budgeting - Discounting and Non discounting Techniques - Working Capital Management - Concepts and Components of Working Capital - Operating Cycle.

UNIT - IV: Understanding Financial Statements:
Financial Statements - Meaning - Types - Purpose - Ratios (Liquidity, Solvency & Profitability Ratios) (Problems can be asked on Ratios)

UNIT - V: Direct & Indirect Taxes:
Heads of Income - Income from Salaries - Income from House Property - Income from Business - Income from Capital Gains - Income from Other Sources - Latest Tax Rates - GST - CGST - SGST - IGST - GST network.

Learning Resources:
1. S.P.Jain and K.L Narang., "Cost Accounting", Kalyani Publishers, Twentieth Edition Revised – 2008.
2. S.P.Jain and K.L Narang., "Financial Accounting", Kalyani Publishers – 2002.
3. Mehta P.L., "Managerial Economics: Analysis, Problems and Cases", Thirteenth Edition, Sultan Chand and Sons, Nineteenth Edition - 2013.
4. M.Y.Khan and P.K. Jain., "Financial Management – Text, Problems and Cases", Mc Graw Hill Education Private Limited, New Delhi.
5. Vinod K Singhania and Kapil Singhania., "Direct Taxes Law and Practice", Taxmann Publications, Sixtieth Edition - 2018.
6. Dr,Vinod K Singhania., "Students' Guide to GST and Customs Law", Taxmann Publications, Edition - 2018.
7. Muralidharan., "Modern Banking", Prentice Hall of India.
8. M. L. Seth., "Micro Economics", Lakshmi Narain Agarwal.
9. Dr. R.P. Rustagi., "Fundamentals of Financial Management" Taxmann Publications.
10. Dr. D.M. Mithani, "Money Banking International Trade & Public Finance", Himalaya Publishing House - 2014.
11. Rajesh., "Banking Theory and Practice", Tata Mc Graw Hill Publishing

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

1. No. of Internal Tests : $\boxed{2}$ Max. Marks for each Internal Test : $\boxed{30}$

2. No. of Assignments : $\boxed{3}$ Max. Marks for each Assignment : $\boxed{5}$

3. No. of Quizzes : $\boxed{3}$ Max. Marks for each Quiz Test : $\boxed{5}$

Duration of Internal Tests: 90 Minutes

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

DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES

Skill Development – IV: Soft Skills

SYLLABUS FOR B.E. VI – SEMESTER

L:T:P (Hrs./week): 1:0:0	SEE Marks : 40	Course Code: **U18HS620EH**
Credits : 1	CIE Marks : 30	Duration of SEE : 2 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
This is a foundation course and aims at enhancing employability skills in students. 1. Students will be introduced to higher order thinking skills and problem solving on the following areas – Arithmetic ability, Numerical ability and General reasoning. 2. Students will be trained to work systematically with speed and accuracy while problem solving.	At the end of the course students will be able to: 1. Solve questions on the above mentioned areas using short cuts and smart methods. 2. Understand the fundamentals concepts of Aptitude skills. 3. Perform calculations and speed and accuracy.

UNIT I: QUANTITATIVE APTITUDE – ARITHMETIC ABILITY ADVANCED

- o Time speed and distance
- o Boats and streams
- o Problems on trains

UNIT II : REASONING ABILITY - LOGICAL REASONING

- o Seating Arrangements – Linear; Circular; Complex
- o Venn diagrams
- o Syllogism
- o Cubes & Cuboids
- o Dices

UNIT III : REASONING ABILITY – NON VERBAL REASONING

- o Figure Series
- o Directions
- o Clocks
- o Calendars

UNIT IV : QUANTITATIVE APTITUDE

- o Mensuration Part – 1
- o Mensuration Part – 2
- o Logarithms

UNIT V: QUANTITATIVE APTITUDE

- o Permutations and Combinations
- o Probability

Learning Resources:

1. scoremore.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 Tests: 90 Minutes

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

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Microprocessors and Microcontrollers

SYLLABUS FOR B.E. VI – SEMESTER

L:T:P (Hrs./week): 3:0:0	SEE Marks : 60	Course Code: **U18PC610EC**
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
1. To familiarize the students on 8086µp and 8051µc architecture so as to realize the concepts of SoC built-in peripheral programming in Assembly and embedded-C to develop a system.	On completion of the course, students will be able to 1. Describe 8086 architecture & summarize its features 2. Design x86 interfacing with memories and I/O 3. Summarize 8051 SoC Microcontroller architecture Design built-in peripheral programs using assembly and embedded C 4. Develop device drivers in embedded C for interfacing the I/O, memories, sensors and other ICs. 5. Differentiate microprocessor and microcontroller-based system design to design a real world problem.

UNIT - I: 8086 ARCHITECTURE
8086 Architecture, Register Organization, Memory segmentation, Pin configuration, latching of address bus, Buffering of data bus. Minimum and Maximum mode operations; control signal interfacing for read and write operations; Organization of stack, Interrupt Vector Table

UNIT - II: 8086 INTERFACING
Memory interfacing: RAM, EPROM IC Chips
I/O interfacing: 8255 PPI, 8257 DMA interface
Interfacing programmable interval timers – 8253/8254

UNIT - III: 8051 MICROCONTROLLER
Architecture of 8051, Pin configuration, built-in ROM & RAM organization, Stack organization.
Assembly language Programming with 8051: Instruction set, Data transfer, Arithmetic, logical and Branching instructions, Addressing modes.

UNIT - IV: Peripheral & interfacing programming in Assembly & Embedded-C
8051 Timers in different modes, counter programming, 8051 Serial data communication; Interrupt programming.
Off-chip EPROM, SRAM, Expansion of I/O using 8255; Sensor interface– ADC0804, ADC0808; DAC interface.

UNIT - V: Real world interfacing & Device drivers in Embedded-C
Interfacing Seven-segment display, 2x16 LCD, 4x3 Matrix Keyboard, DC Motor, Stepper Motor, DS12887 RTC. Applications of 8086 & 8051: Speed control in Industrial, Automotive with PWM generation; Home automation.

Learning Resources:
1. Ray A.K & Bhurchandhi K.M, "Advanced Microprocessor and Peripherals," 2/e, TMH, 2007.
2. Douglas V Hall, "Microprocessors and Interfacing Programming and Hardware," 2/e, THM, 2007.
3. Mazidi M.A, Mazidi J.G & Rolin D. Mckinlay, "The 8051 Microcontroller & Embedded Systems using Assembly and C," 2/e, Pearson Education, 2007.
4. Microprocessors and Microcontrollers by Dr. Santhanu chatopadhya, IIT Kharagpur
   https://onlinecourses.nptel.ac.in/noc18_ec03/course
5. Microprocessors and Microcontrollers, IIT Kanpur.
   https://nptel.ac.in/courses/Webcourse-contents/IIT- KANPUR/microcontrollers

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 Tests: 90 Minutes

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

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Digital Signal Processing

SYLLABUS FOR B.E. VI – SEMESTER

L:T:P (Hrs./week): 3:0:0	SEE Marks : 60	Course Code: **U18PC620EC**
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
Students will apply FFT algorithms, discuss various design methods of FIR & IIR filters, describe the concepts of multirate signal processing and identify important features of TMS320C67XX DSP processors.	On completion of the course, students will be able to 1. Apply the knowledge of FFT Algorithms for computation of DFT. 2. Design FIR & IIR filters using various methods. 3. Analyze the effects of finite word lengths in digital filters. 4. Apply decimation and interpolation concepts for the design of sampling rate converters. 5. Study TMS320C67XX DSP processors for the design of digital filters.

UNIT - I : Fast Fourier Transform

Overview of Discrete time Fourier Transform (DTFT), Discrete Fourier transform (DFT), – Efficient computation of DFT- Properties of DFT .
FFT algorithms –Radix-2 FFT algorithms – Decimation in Time – Decimation in Frequency algorithms - in place computation- bit reversal-Use of FFT algorithms in Linear Filtering and Correlation.

UNIT - II : Digital filters (FIR) Design

Amplitude and phase responses of FIR filters – Linear phase filters – Windowing techniques for design of Linear phase FIR filters – Rectangular, Bartlet, Hamming, Blackman, Kaiser FIR filter design, realization and finite word length effects.

UNIT - III : Digital filters (IIR) Design

Butterworth and Chebychev approximation- IIR digital filter design techniques- Impulse Invariant transformation - Bilinear transform techniques- Digital Butterworth- Chebychev filters,-comparisons between FIR and IIR filters. Digital filters structures.

UNIT - IV : Multirate Digital Signal Processing

Introduction -Decimation by a Factor D- Interpolation by a Factor I- Sampling Rate Conversion by a Rational Factor I/D- Implementation of Sampling Rate Conversion- Multistage implementation of Sampling Rate Conversion- Sampling Rate Conversion by an Arbitrary factor- Application of Multirate Signal Processing.

UNIT - V : Introduction to DSP Processors

Difference between DSP and other microprocessors architectures- Importance of DSP Processors- General purpose DSP processors- TMS320C67XX processor, architecture, registers, pipelining, addressing modes and introduction to instruction set.

Learning Resources:

1. Alan V. Oppenheim & Ronald W. Schafer, "Digital Signal Processing," PHI, 2/e, 2014.
2. John G. Proakis & Dimtris G. Manolakis, "Digital Signal Processing Principles, Algorithms and Application," PHI, 4/e, 2012.
3. Ashok Ambardar, "Digital Signal Processing: A Modern Introduction," Cengage Learning, 2009.
4. Li Tan, "Digital Signal Processing: Fundamentals and Applications," Elsevier, 2012.
5. B.Venkataramani & M. Bhaskar, "Digital Signal Processor Architecture, Programming and Application," TMH, 2e 2013.
6. RulphChassaing, "Digital Signal Processing and Applications with the C6713 and C6416 DSK", John wiley& sons, 2005.
7. https://nptel.ac.in/courses/117102060/
8. https://nptel.ac.in/courses/117104070/

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 Tests: 90 Minutes

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

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Computer Networks

SYLLABUS FOR B.E. VI – SEMESTER

L:T:P (Hrs./week): 3:0:0	SEE Marks : 60	Course Code: **U18PC630EC**
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
To experience the designing and managing of communication protocols while getting a good exposure to the TCP/IP protocol suite and to understand the different topologies and configurations in the area of computer networks	On completion of the course, students will be able to 1. Analyze the network requirements for a given organization and select most appropriate network architecture. 2. Design and analyze the performance of LAN for small and medium organizations. 3. Analyze the existing routing and congestion control algorithms. 4. Identify deficiencies in existing protocols and then formulate new and better protocols. 5. Apply and use of cryptography and network security in day to day applications.

UNIT - I :
Data communication, Network Topologies: LAN, WAN, MAN, Types-Bus, Star, Ring, Hybrid. Line configurations. Reference Models: OSI, TCP/IP, ATM.
Data Link Layer: Design issues, Framing, Error Detection and Correction, Flow control
Protocols: Stop and Wait, Sliding Window, ARQ Protocols.

UNIT - II :
MAC Sub Layer: Multiple Access Protocols: ALOHA, CSMA, Wireless LAN. IEEE 802.2, 802.3, 802.11, 802.16 standards. Bluetooth, Bridges and Routers. Circuit switching: Circuit Switching Principles and concepts. Packet switching: Virtual circuit and Datagram subnets.

UNIT - III :
Network Layer: Network layer Services, Routing algorithms: Shortest Path Routing, Flooding, Hierarchical routing, Broadcast, Multicast, Distance Vector Routing and Congestion Control Algorithms. Internet Working: The Network Layer in Internet, IPV4, IPV6 and Internet control protocols.

UNIT - IV :
Transport Layer: Transport Services, Elements of Transport Layer, Connection management, TCP and UDP protocols.

UNIT - V :
Application Layer: Domain Name System, SNMP, Electronic Mail, World Wide Web. Network Security: Cryptography Symmetric Key and Public Key algorithms, Digital Signatures, Authentication Protocols.

Learning Resource:
1. Andrew S Tanenbaum, "Computer Networks," 5/e, Pearson Education, 2011.
2. Behrouz A. Forouzan, "Data Communication and Networking," 5/e, TMH, 2008.
3. William Stallings, "Data and Computer Communications," 8/e, PHI, 2004.
4. S.Keshav, " An Engineering Approach t o Computer Networks," 2/e, Pearson Education.
5. https://onlinecourses.nptel.ac.in/noc18_cs38/preview

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 Tests: 90 Minutes

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

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Antennas and Wave Propagation
SYLLABUS FOR B.E. VI – SEMESTER

L:T:P (Hrs./week): 3:0:0	SEE Marks : 60	Course Code: **U18PC640EC**
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
1. Students will understand antenna fundamentals and parameters 2. Study the working of antennas at different frequencies 3. Acquire the knowledge of different modes of wave propagation	On completion of the course, students will be able to 1. Understand the basic principle of antennas and various antenna parameters 2. Analyse and design wire and loop antennas. 3. Analyse and design various array antennas. 4. Explain the operation of various VHF, UHF and Microwave antennas and also capable to designing the same. 5. Understand the concept of Smart antenna and various modes of wave propagation and describe the effect of atmosphere on radio wave propagation.

UNIT - I: Antenna basics
Principles of radiation-single wire, two wire and dipoles, current distribution on a thin wire antenna, retarded potential and isotropic radiator, Antenna parameters: Radiation pattern, Beam area, Beam efficiency, radiation intensity, Antenna temperature, Antenna field regions, Gain, directivity, Antenna Polarization, effective length, Antenna Impedance, effective aperture and aperture efficiency, Friis transmission equation.

UNIT - II: Analysis of Linear and Loop Antennas
Infinitesimal dipole, small dipole, region separation, Finite length dipole, Half wave dipole, quarter wave mono pole, Ground effects, small circular loop.

UNIT - III: Antenna Arrays

Introduction, Point sources, Array of two isotropic point sources, Non isotropic but similar point sources and the principle of pattern multiplication, Linear Arrays of n isotropic point sources of equal amplitude and spacing, null directions for arrays of n isotropic point sources of equal amplitude and spacing, Linear broad side arrays with non uniform amplitude distributions, Binomial Array, Introduction to synthesis of antenna arrays using Schelkunoff polynomial method

UNIT - IV: VHF, UHF and Microwave Antennas

Helical Antennas-Geometry, Helix modes, Design considerations for Helical Antenna, Horn Antenna, Reflector Antennas, Lens Antennas, Yagi_Uda Array and Log Periodic Array.
Micro strip Antennas- Basic characteristics of micro strip antennas, feeding methods, methods of analysis, design of rectangular and circular patch antennas.

UNIT - V: Smart Antennas and Wave Propagation

Basic Concepts of Smart Antennas-Concept and benefits of smart antennas, Beam forming basics
Different modes of Radio Wave propagation used in current practice.

Learning Resources:

1. J.D. Kraus, Antennas, McGraw Hill, 4th edition.
2. C.A. Balanis, Antenna Theory - Analysis and Design, John Wiley, 3rd edition.
3. R.E. Collin, Antennas and Radio Wave Propagation, McGraw Hill, 1985.
4. I.J. Bahl and P. Bhartia, Micro Strip Antennas, Artech House, 1980.
5. R.K. Shevgaonkar, Electromagnetic Waves, Tata McGraw Hill, 2005.
6. R.E. Crompton, Adaptive Antennas, John Wiley.

Nptel Links:

1. https://nptel.ac.in/courses/108101092/
2. https://nptel.ac.in/courses/117101056/

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 Tests: 90 Minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
IBRAHIMBAGH, HYDERABAD - 500 031

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Microprocessors and Microcontrollers Lab

SYLLABUS FOR B.E. VI – SEMESTER

L:T:P (Hrs./week): 0:0:2	SEE Marks : 50	Course Code: **U18PC611EC**
Credits : 1	CIE Marks : 30	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
1. To enable the students with 8086µp and 8051µc based programming with built in peripheral and interfacing off chip peripherals to develop an interface system using µVision5 IDE & simulate on proteus 7.2.	On completion of the course, students will be able to 1. Apply knowledge in writing the programs using Masm assembler tool for 8086 Microprocessor. 2. Apply knowledge in writing the programs in assembly using µVision5 for 8051 µc. 3. Develop assembly and C constructs for on-chip peripherals of 8051µc. 4. Interface off chip peripherals and I/O with interrupt programming to arrive at designs. 5. Design a mini-project based on given specifications using modern software tools.

Cycle – I:
Assembly language programming for 8086 µP using Assembler

1. Execution of basic programs on 8086 microprocessor (8 bit and 16 bit arithmetic operations).
2. Programs for data transfer, String searching and sorting

Embedded C programming for 8051 µC using Keil IDE

3. Programs related to arithmetic instructions.
4. Programs related to logical instructions.
5. Timer and counter programming.
6. Square wave generation with variable duty cycle (PWM).
7. Interrupt programming.
8. Serial communication using RS 232 UART protocols.
9. Sensor interfacing with off chip ADC applications.

10. Transducer interfacing with off chip DAC applications.
11. Program to control stepper motor
12. LCD display interfacing (4-bit and 8-bit mode).
13. Keypad interfacing.

Cycle – II :
Mini project
Mini project based on applications that possibly can be developed using 8051μC by interfacing with on-chip and off-chip peripherals.

New Experiments :
1. User centric Authentication Module.
2. Density Adjustable traffic light controller.

The break-up of CIE :

1. No. of Internal Test : | 1 |
2. Max. Marks for internal test : | 12 |
3. Marks for day-to-day laboratory class work : | 18 |

Duration of Internal Tests: 3 Hours

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

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Digital Signal Processing Lab

SYLLABUS FOR B.E. VI – SEMESTER

L:T:P (Hrs./week): 0:0:2	SEE Marks : 50	Course Code: **U18PC621EC**
Credits : 1	CIE Marks : 30	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
Students will develop C & MATLAB programs for operation of sequences, design and obtain the frequency response of various digital filters and to implement techniques of multirate processing.	On completion of the course, students will be able to 1. Develop MATLAB files for the verification of system response. 2. Design and analyze the digital filters using MATLAB. 3. Verify the functionality of FFT algorithms. 4. Experiment with multirate techniques using MATLAB & CCS. 5. Design and Implement the digital filters on DSP processor.

CYCLE - I Experiments
1. Basic matrix operations and Generation of test signals.
2. Linear Convolution
3. Circular convolution
4. Discrete Fourier Transform(DFT) and Fast Fourier Transform(FFT)
5. FIR filter design using different windows
6. IIR filter design: Butter worth, Chebyshev type 1 and 2: LPF, HPF, BPF & BSF filter.
7. Interpolation and Decimation.
8. I/D conversion using multistage.
   Conduct any Six experiments from Cycle-I

CYCLE - II Experiments
9. Study of procedure to work in real- time.
10. Solutions of difference equations.
11. Linear Convolution.
12. Circular Convolution.
13. Discrete Fourier Transform(DFT)
14. Implementation of FIR filters.
15. Implementation of IIR filters.
16. Decimation and Interpolation.
   Conduct any Six experiments from Cycle-I

New Experiments
1. Sine wave generation using CCS.
2. Raster Experiments for Image processing using CCS.

Mini Project(s)
Develop various programs for designing signal processing applications.

Learning Resources/Tools
1. MATLAB 2018a and TMS320C6748 OMAP Processor with CCS version 7.
2. Paul B. Zbar, Albert P. Malvino, Michael A. Miller, "Basic Electronics, A Text - Lab Manual", Vinay K. Ingle and John G. Proakis, "Digital Signal Processing using MATLAB", 4/e, Cengage learning, 2012.
3. Digital signal processing using MATLAB for students and researchers, John W. Leis, A John Wiley & Sons, Inc., Publication,1966.
4. B. Venkataramani and M. Bhaskar," Digital Signal Processor architecture, programming and application", 6/e, TMH, 2013.
5. Rulph Chassaing, "Digital Signal Processing and Applications with the C6713 and C6416 DSK", John wiley & sons, 2005.

The break-up of CIE :

1. No. of Internal Test   :   1

2. Max. Marks for internal test   :   12

3. Marks for day-to-day laboratory class work   :   18

Duration of Internal Tests: 3 Hours

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

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Computer Networks Lab

SYLLABUS FOR B.E. VI – SEMESTER

L:T:P (Hrs./week): 0:0:2	SEE Marks : 50	Course Code: **U18PC631EC**
Credits : 1	CIE Marks : 30	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
To provide comprehensive knowledge of networking devices, tools and skills required to implement, test and trouble computer networks	On completion of the course, students will be able to 1. Implement IP addressing schemes and different sub netting scenarios. 2. Perform basic configurations of networking devices like switches and routers 3. Build and implement simple networking topologies and troubleshooting the networks. 4. Implement and troubleshoot virtual LANs and inter-VLAN routing. 5. Implement and test routing protocols like RIPv1, RIPv2, single-area and multi-area OSPF.

CYCLE - I Experiments

1. Getting started with Packet Tracer tool and Internetworking Operating System.
2. Implementation of different sub netting scenarios and IP addressing schemes
3. Basic configuration of networking devices
4. Building and troubleshooting different networking topologies
5. Building and testing Wired Local Area Networks
6. Building and testing Wireless Local Area Networks
7. Implementation and understanding of different servers like HTTP, TFP, TFTP and DNS

CYCLE - II Experiments
8. Creating and testing Wide Area Networks
9. Implementation of routing protocols
10. Implementation of Virtual Local Area Networks (VLAN) and inter VLAN routing
11. Testing and troubleshooting networks with Protocol Data Units
12. Implementation of access lists for traffic control in networking
13. Implementation of Gateway protocols (Boarder Gateway Protocols)
14. Experiments on DATA LINK LAYER

New Experiments
1) Introduction to IOT using Packet tracer
2) IOT-Connecting things using Packet tracer

Mini Project(s)
1) Case Study: Vasavi College of Engineering Campus wide LAN network

Learning Resources / Tools :
1. Packet tracer
2. CCNA module 1CCNA Routing and Switching: Introduction to Networks
3. CCNA module-2 CCNA Routing and Switching: Routing and Switching Essentials www.netacad.com

The break-up of CIE :

1.   No. of Internal Test   :   1
2.   Max. Marks for internal test   :   12
3.   Marks for day-to-day laboratory class work   :   18

Duration of Internal Tests: 3 Hours

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

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Theme Based Project

SYLLABUS FOR B.E. VI – SEMESTER

L:T:P (Hrs./week): 0:0:2	SEE Marks : -	Course Code: **U18PW619EC**
Credits : 1	CIE Marks : 30	Duration of SEE : 3 Hours

1. Guidelines for theme based projects

Course for conducting theme-based projects as per the following:

- Batch size shall be 2 (or) 3 students per batch.
- Allocation by department based on their academic performance.
- Themes shall be different for each batch i.e., sometimes main theme may be same, but sub topic shall be independent as for as possible. In case of big size theme, part of the theme can be allotted to different groups for final integration.
- Output of the theme based project should be demonstrable / measurable / outcome based.
- Two overall coordinators for each section for theme based project supervision and faculty supervisors for different batches should be assigned.
- Two reviews – one after six weeks and another one after twelve weeks and final evaluation shall be conducted at the end of the semester.

2. Rubrics for evaluation of theme based project

Review of work progress	-	10 Marks
Project work carried out	-	10 Marks
Discussion of Results	-	10 Marks
Presentation and Demonstration skills	-	10 Marks
Report preparation and submission	-	10 Marks

3. Grades awarded to the theme based project.

Outstanding	– > 45 marks
Excellent	– > 40 and < 45 marks
Very Good	– > 35 and < 40 marks
Good	– > 30 and < 35 marks
Average	– > 25 and < 30 marks

OPEN ELECTIVES OFFERED BY VARIOUS DEPARTMENTS IN B.E. VI SEMESTER

Dept	Title	Code	Credits
Civil	PROJECT MANAGEMENT	U18OE610CE	3
CSE	INTRODUCTION TO DATABASES	U18OE610CS	3
CSE	INTRODUCTION TO OPERATING SYSTEMS	U18OE620CS	3
ECE	INTERNET OF THINGS AND APPLICATIONS	U18OE610EC	3
ECE	INTRODUCTION TO MOBILE COMMUNICATIONS	U18OE620EC	3
EEE	ELECTRICAL INSTALLATION & SAFETY	U18OE610EE	3
Mech.	ADDITIVE MANUFACTURING AND ITS APPLICATIONS	U18OE610ME	3
Mech.	INDUSTRIAL ADMINISTRATION AND FINANCIAL MANAGEMENT	U18OE620ME	3
IT	INTRODUCTION TO WEB APPLICATION DEVELOPMENT	U18OE610IT	3
IT	INTRODUCTION TO MACHINE LEARNING	U18OE620IT	3
HSS	ENGLISH FOR COMPETITIVE EXAMINATIONS	U18OE610EH	3
Physics	FUNDAMENTALS OF NANO MATERIALS AND THEIR APPLICATIONS	U20OE610PH	3

VASAVI COLLEGE OF ENGINEERING (Autonomous)
IBRAHIMBAGH, HYDERABAD – 500 031
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:U18OE610CE
Credits : 3	CIE Marks:40	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
The objectives of the course are to	Upon the completion of the course, students are expected to
1. Learn the concept of project management along with functions and objectives. 2. Understand the various techniques used for project planning such as bar charts, CPM, PERT and crashing of networks. 3. Acquire knowledge on various types of contracts, tenders.	1. Understand the objectives, functions and principles of management in projects. 2. Practice the network techniques like CPM and PERT for better planning and scheduling of engineering works. 3. Analyse the importance of cost and time in network analysis and planning the work accordingly. 4. Knowledge on Contracts, Tenders, and Work orders related to the projects. 5. Interpret the concept of Linear Programming and solve problems by Graphical and Simplex methods.

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

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

1 No. of Internal Tests   : 2 Max. Marks for each Internal Tests   : 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 Tests   :   90 Minutes

VASAVI COLLEGE OF ENGINEERING(Autonomous)
IBRAHIMBAGH, HYDERABAD – 500 031

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 :**U18OE610CS**
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

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

UNIT-I
Introduction: Database System Application, Purpose of Database Systems, View of Data, Database Languages, Relational Database, Database Architecture, Database Users and Administrators.
Database Design and E-R Model: Overview of the Design Process, the E-R Model, Constraints, E-R Diagrams.

UNIT-II
Relational Model: Structure of Relation Database, Relational Algebra Operations, Modification of the Database.
Structured Query Language: Introduction, Basic Structure of SQL Queries, Set Operations, Aggregate Functions, Null Values, Nested Sub queries, Views, Join Expressions.

UNIT-III

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

UNIT-IV

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

UNIT-V

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

<u>Learning Resources:</u>

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

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

| 1 | No. of Internal Tests | : | 2 | Max. Marks for each Internal Tests | : | 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 Tests   :   1 Hour 30 Minutes

VASAVI COLLEGE OF ENGINEERING(Autonomous)
IBRAHIMBAGH, HYDERABAD – 500 031

Department of Computer Science & Engineering
INTRODUCTION TO OPERATING SYSTEMS (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 :**U18OE620CS**
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES *On completion of the course, students will be able to*	
1 Understand different Operating system Structures and Services.	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.
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*, 9th Edition (2016), Wiley India.
2. Andrew S. Tanenbaum, *Modern Operating Systems*, 2nd Edition (2001), Pearson Education, Asia.
3. Dhananjay, Dhamdhere.M, *Operating System-concept based approach*, 3rd edition (2009), Tata McGraw Hill, Asia
4. Robet Love: *Linux Kernel Development*, (2004)Pearson Education
5. Richard Stevens, Stephen Rago, *Advanced Programming in the UNIX Environment*, 3rd Edition(2013), Pearson Education
6. http://web.stanford.edu/~ouster/cgi-bin/cs140-spring19/index.php
7. 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 Tests   : 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 Tests   :   1 Hour 30 Minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)

IBRAHIMBAGH, HYDERABAD – 500 031

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: **U18OE610EC**
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
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.

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, Phython 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 Tests: 90 Minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
IBRAHIMBAGH, HYDERABAD – 500 031
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
Introduction to Mobile Communications
(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: **U18OE620EC**
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

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

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

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

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

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

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

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

Learning Resources:
1. Theodore S. Rappaport, Wireless Communications Principles and Practices, 2nd edition, Pearson Education.
2. David Tse, Pramodh Viswanath, Fundamentals of Wireless Communication, 2005, Cambridge University Press.
3. Name of the course: Introduction to Wireless and Cellular Communications
   Course url: https://swayam.gov.in/nd1_noc19_ee48/preview

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 Tests: 90 Minutes

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

Electrical Installation and Safety
Open Elective-IV
SYLLABUS FOR B.E. VI SEMESTER

L: T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code:**U18OE610EE**
Credits:3	CIE Marks: 40	Duration of SEE: 3 Hours

COURSE OBJECTIVES The course will enable the students to:	**COURSE OUTCOMES** On completion of the course, students will be able to
Have a fair knowledge about the fundamentals of wiring systems, electrical safety procedures, Estimation of lighting & Power loads.	1. Identify and choose the proper type wiring for domestic & industrial applications. 2. Identify and choose the proper type wiring Accessories for domestic & industrial applications. 3. Apply and implement the Electrical safety procedures for repairs & hazards. 4. Design and Estimate the domestic lighting installation. 5. Design and Draw the wiring layout for a big office building, electrical laboratory, big industry and big hotel with lift arrangement

Unit – I
Wiring Systems: Introduction, size of wires, standard wires, types of wires, CTC, PVC, Lead sheathed VIR, weather proof wires, flexible wires different types of cable wires – Types and Installation of House Wiring Systems or Methods of installing wiring.

Unit – II
Wiring Accessories: - Clips, screws -round blocks switch boards, sockets socket pins - CTS wiring - Installation of surface conduit wiring.Rigid conduits, flexible conduits – Conduit accessories - elbows bushings - reducers, conduit box saddles, PVC conduit wiring - Concealed wiring.

Unit – III
Safety Devices: Distribution fuse boards - Main switches – Different types of fuses and fuse carriers, MCB, ELCB & MCCB.
Safety procedures – Electric shock and first aid, causes for fire hazards in Electrical installations

Unit – IV
Estimation of Lighting: Estimation of domestic lighting installation service main - types of wire - specification - quantity of materials required for service main – estimation and selection of interior wiring system suitable to a given building - number of circuits - quantity of accessories required - estimates of materials for execution of the domestic wiring installation.

Unit – V
Estimation of power loads: Power wiring installation - Drawing wiring layout for a big office building, electrical laboratory, big industry, big hotel with lift arrangement and a residential building with 2 bed room house.- estimation upto 20 kVA calculation of load current based on ratings of various equipment's to be installed - size of wire.

Learning Resources:
1. J.B.Gupta –A course in Electrical installation Estimating & costing-9th edition 2014, S.K.Kataria& Sons.
2. S.L.Uppal-Electrical Wiring ,Estimating& costing Electrical wiring
3. Balbir Singh-Electrical Drawing
4. Arora -Electrical wiring
5. BVS Rao -Maintenance and Operation of Electrical Equipment –Vol-I-TMH
6. S.Rao -Testing, Commissioning Operation & Maintenance of Electrical equipment -TMH
7. CRDargar -Electrical Installation design and drawing -New Asian publishers.

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 Tests : 90   Minutes

VASAVI COLLEGE OF ENGINEEING (Autonomous)
IBRAHIMBAGH, HYDERABAD – 500 031
DEPARTMENT OF MECHANICAL ENGINEERING
SYLLABUS FOR B.E VI Semester (2020-21)
Additive Manufacturing and its Applications (Open Elective-IV)

L:T:P (Hrs./week): 3:0:0	SEE Marks:60	Course Code : U18OE610ME
Credits: 3	CIE Marks:40	Duration of SEE : 3 Hours

Course objectives	Course Outcomes
The objectives of this course are to : understand the fundamentals of various additive manufacturing technologies and their applications in Engineering Industry.	On completion of the course the student will be able to: 1. understand the fundamentals of prototyping. 2. study the principle, process, advantages and limitations of liquid based AM systems. 3. study the principle, process, advantages and limitations of solid based AM systems. 4. study the principle, process, advantages and limitations of powder based AM systems. 5. study the applications of AMT in various engineering industries.

UNIT-I
Introduction, Prototyping fundamentals, Historical development, Fundamentals of rapid prototyping, Advantages of Rapid prototyping, Commonly used terms, Rapid prototyping process chain, 3D modelling, Data Conversion, and transmission, Checking and preparing, Building, Post processing, AM data formats, Classification of AM process

UNIT-II
Liquid based AM systems: Stereolithography Apparatus(SLA): Models and specifications, Process, Working principle, photopolymers, Photopolymerisation, Layering technology, laser and laser scanning, Applications, Advantages and disadvantages, Case studies
Solid ground curing(SGC): Models and specifications, Process, Working principle, Applications, Advantages and disadvantages, Case studies

UNIT-III
Solid based AM 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 AM systems: Selective laser sintering(SLS): Models and specifications, Process, Working principle, Applications, Advantages and disadvantages, Case studies.
Three dimensional printing (3DP): Models and specifications, Process, Working principle, Applications, Advantages and disadvantages, Case studies.

UNIT-V
Applications of AM systems: Applications in 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. abd LIM C.S., "World Rapid prototyping : Principles and Applications", 2nd Editon, Scientific Publications, 2004
2. D.T.Pham and S.S.Dimov, "Rapid Manufacturing", Springer, 2001.
3. AmithabaGhose, "Rapid prototyping", Eastern Law House, 1997.
4. Paul F.Jacobs, "Stereolithography and other RP & M Technologies", ASME Press, 1996.
5. Paul F.Jacobs, "Rapid Prototyping & Manufacturing", ASME Press, 1996.

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

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

Duration of Internal Test: **1 Hour 30 Minutes**

VASAVI COLLEGE OF ENGINEERING (Autonomous)
IBRAHIMBAGH, HYDERABAD – 500 031
DEPARTMENT OF MECHANICAL ENGINEERING
SYLLABUS FOR B.E VI Semester (2020-21)
Industrial Administration and Financial Management
(Open Elective-IV)

L:T:P (Hrs./week): 3:0:0	SEE Marks:60	Course Code : U18OE620ME
Credits: 3	CIE Marks:40	Duration of SEE : 3 Hours

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

UNIT – I
Industrial Organization : Types of various business organisations. Organisation structures and their relative merits and demerits. Functions of management.
Plant location and layouts: Factors affecting the location of plant and layout. Types of layouts and their merits and demerits.
UNIT – II
Work study: Definitions, Objectives of method study and time study. Steps in conducting method study. Symbols and charts used in method study. Principles of motion economy. Calculation of standard time– by– time study and work sampling. Performance rating factor. Types of ratings.

Jobs evaluation and performance appraisal. Wages, incentives, bonus, wage payment plans.

UNIT – III

Inspection and quality control: Types and objectives of inspection S.Q.C., its principles quality control by chart and sampling plans. Quality circles, introduction to ISO.

Production planning and control: Types of manufacture. Types of production. Principles of PPC and its function. Production control charts.

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. Duties of purchase manager. Determination of economic order quantities. Types of materials purchase.

UNIT – V

Cost accounting: elements of cost. Various costs. Types of overheads. 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. Cost of capital. financial leverage.

Learning Resources:
1. Pandey I.M., "Elements of Financial Management", Vikas Publ. House, New Delhi, 1994
2. Khanna O.P., "Industrial Engineering and Management", Dhanapat Rai & Sons.
3. Everrete E Admaa & Ronald J Ebert , "production and Operations Management", 5th Ed. , PHI , 2005
4. S N Chary, "Production and Operations Management", 3rd 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:	02	Max.Marks for each Internal Test:	30
2	No. of Assignments:	03	Max. Marks for each Assignment:	05
3	No. of Quizzes:	03	Max. Marks for each Quiz Test:	05

Duration of Internal Test: 1 Hour 30 Minutes

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

INTRODUCTION TO WEB APPLICATION DEVELOPMENT

(OPEN ELECTIVE-V) (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 : **U18OE610IT**
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
	On completion of the course, students will be able to
Acquire basic skills for designing static and dynamic Web Applications using HTML, CSS , Java script and PHP.	1. Design a static web pages using HTML, CSS. 2. Use JavaScript for creating dynamic web pages and client side validation. 3. Use built-in functions of PHP to perform server side validations and sending emails. 4. Use built-in functions of PHP to connect , query and fetch results from a database. 5. Build a PHP application using an MVC Framework.

UNIT-I: Introduction

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

UNIT-II: Basics of JavaScript

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

UNIT-III: Basics of PHP

Basics of PHP: Data Types, Variables and Operators, Control Structures: If else, Switch Case. Loop: For, ForEach, While, Do While. Functions in PHP, PHP Forms, Cookies & Sessions, File Processing.

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

UNIT-V: Introduction to MVC
Introduction to Model View Controller Architecture, Building Application using a PHP Framework, Testing and Deploying a PHP application.

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

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

1	No. of Internal Tests	:	2	Max. Marks for each Internal Tests	:	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 Tests   :   90 Minutes

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

INTRODUCTION TO MACHINE LEARNING
(OPEN ELECTIVE-V) (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: **U18OE620IT** |
| Credits : 3 | CIE Marks: 40 | Duration of SEE :3Hrs |

	COURSE OUTCOMES
COURSE OBJECTIVES	*On completion of the course, students will be able to*
Introduce the fundamental concepts and approaches in Artificial intelligence and Machine Learning field to effectively apply techniques to the real-world problems.	1. Demonstrate knowledge of the Artificial intelligence and machine learning literature. 2. Apply an appropriate algorithm for a given problem. 3. Apply machine learning techniques in the design of computer systems. 4. Prove basic results in the theory of learning 5. Explain the relative strengths and weaknesses of different machine learning methods and approaches.

UNIT-I:
Introduction to AIML: Foundations of AI, Sub areas of AI, Applications. Introduction to learning, Types of Learning: Supervised Learning, Unsupervised Learning, Reinforcement Learning.
Supervised learning: Linear Regression, Logistic Regression.

UNIT-II:
Supervised Non-parametric learning: Introduction to Decision Trees, K-Nearest Neighbor, Feature Selection.
Supervised Parametric learning: Support Vector Machine, Kernel function and Kernel SVM.

UNIT-III:
Supervised Parametric learning (Neural networks): Perceptron, Multilayer Neural Network, Backpropagation.

UNIT-IV:
Supervised Parametric Bayesian learning: Introduction, Naive Bayes Classification, Bayesian Network.

UNIT-V:
Unsupervised leaning: Clustering, K-means Clustering, DBSCAN

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

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

1	No. of Internal Tests	: 2	Max. Marks for each Internal Tests	: 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 Tests : 90 Minutes

VASAVI COLLEGE OF ENGINEERING(Autonomous)
IBRAHIMBAGH, HYDERABAD – 500 031
DEPARTMENT OF HUMANITIES AND SOCIAL SCIENCES
(OPEN ELECTIVE) - B.E 3/4 -VI SEMESTER

ENGLISH FOR COMPETITIVE EXAMINATIONS
(Common to all branches)

L:T: P (Hrs/Week):3	SEE Marks:60	Course Code: U18OE610EH
Credits: 3	CIE Marks:40	Duration of SEE:Hours:03

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the students to:	**On completion of the course, students will be able to:**
➢ To familiarise the students to various types of competitive examinations.	➢ The student will be able to solve various types of questions in competitive English examinations effectively.
➢ To practice questions and prepare for GATE, GRE, CAT, TOEFL.	➢ Provide logical conclusions for the questions on aptitude and reasoning within the stipulated time.

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

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

 ANALYTICAL WRITING:
- Articulating complex ideas effectively and with clarity
- Supporting ideas with relevant reasons and examples

- Examining claims and accompanying evidence
- Sustaining a well-focused, coherent discussion

CAT :

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

TOEFL:
- Basic understanding, speed and accuracy, learning from reading, pronoun reference, author's point of view.
- Good delivery including clarity of speech, fluidity, natural pacing and correct intonation patterns.
- Correct use of language showing a good grasp of grammar, vocabulary and speech structures.
- Topic development in which you are able to show a well-structured. organized response that effectively connects ideas with enough support for each point you are making.
- Writing strategy and format execution skills.

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

1 No. of Internal Tests   : 2 Max. Marks for each Internal Tests   : 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 Tests   : 90 Minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
IBRAHIMBAGH, HYDERABAD – 500 031
DEPARTMENT OF PHYSICS
Open elective Course
FUNDAMENTALS OF NANO MATERIALS AND THEIR APPLICATIONS

L:T:P (Hrs./week): 3:0:0	SEE Marks:60	Course Code : U20OE610PH
Credits: 3	CIE Marks:40	Duration of SEE : 3 Hours

Course objectives	*Course outcomes*
Students will be able to learn	*At the end of the course students will be*
1. Learn bulk, thin and nano stru 2. Acquire knowledge on properties of nano materials 3. Appreciate fabrication techniques of nano materials 4. Learn nanomaterial characterization techniques. 5. Appreciate application of nano materials	1. Distinguish bulk, thin and nano materials from the point of view of size effects 2. List various properties of nano materials 3. Narrate various nanonmaterial preparation techniques 4. Describe necessary characterization techniques of nano materials 5. Write various applications of CNTS and nano structures.

UNIT-I:INTRODUCTION TO NANOSCIENCE
Distinction between bulk, thin and nano materials-surface to volume ratio, change of electronic structure, density of states of thin and nano materials, quantum confinement-quantum size effect-Reduction of dimensionality, Quantum wells (two dimensional),Quantum wires (one dimensional), Quantum dots (zero dimensional).

UNIT-II: PROPERTIES OF NANO MATERIALS
Material behavior at reduced dimensions, Electrical properties: conductivity, surface scattering, ballistic transport Magnetic properties: Soft magnetic Nano-crystalline alloy, Permanent magnetic Nano-crystalline materials, Giant Magnetic Resonance, chemical properties, optical properties and thermal properties.

UNIT-III: NANOMATERIALS PREPARATION TECHNIQUES
Bottom-up and Top-down approaches. Preparation techniques Bottom-up methods: Physical Vapor Deposition, Laser Ablation, Chemical Vapor

Deposition, Molecular Beam Epitaxy, Solgel method ,Self assembly, top-down methods: ball milling, Nano-lithography, Spark plasma sintering.

UNIT-IV: NANO 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-V: CARBON NANO MATERIALS AND APPLICATIONS
Graphene, Elementary ideas on Carbon nanotubes, CNTs, types of CNTs-single wall (SWCNT) and multiwall carbon nanotubes (MWCNT), properties and characteristics of SWCNTS and MWCNTS.Applications of nano materials in Cosmetic sector, Food, Agricultural, engineering, automotive Industry, environment, medical applications, Textiles, Paints, Energy, space Applications, nanosensors and nanocatalysts.

Learning Resources:
1. B.S. Murthy, P. Shankar, Baldev Raj, B.B. Rath and James Munday, Text Book of Nano Science and Nano Technology –University Press (India) 2013
2. K.K. Chattopadhyay and A.N. Benerjee, Introduction to Nanoscience and Nanotechnology , PHI, 2019

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

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

Duration of Internal Test: 90 Minutes