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 2019-20
(For the batch admitted in 2017-18)
(R-17)

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	To provide the required foundation in mathematics and engineering sciences that will enable the graduates to identify, analyze and solve engineering problems.
PEO II	To impart indepth knowledge and training in Electronics and Communication Engineering and help them succeed in their careers, higher education and research.
PEO III	To inculcate professional and ethical values in the graduates to excel individually and in multi disciplinary teams to solve engineering and societal problems.
PEO IV	To provide the graduates with an environment that is conducive for developing excellence in leadership and encourage lifelong learning.

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, and 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 for, and 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 graduates 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 graduates will be able to apply the acquired knowledge and skills in modeling and simulation of wireless communication systems.
PSO III	ECE graduates 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-17) :: B.E. - ECE : FIFTH 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	
B.E (ECE) V - SEMESTER								
THEORY								
HS510EH	Finishing School - III : Soft skills	1	-	-	2	40	30	1
PC510EC	Control Systems Engineering	3	-	-	3	60	40	3
PC520EC	Integrated Circuits and Applications	3	-	-	3	60	40	3
PC530EC	Analog and Digital Communication	3	-	-	3	60	40	3
PC540EC	Computer Organization and Architecture	3	-	-	3	60	40	3
MC510EC	Finishing School - III : Technical Skills	1	-	-	2	40	30	1
OE5XXXX	Open Elective – IV	3	-	-	3	60	40	3
PRACTICALS								
PC511EC	Sensors and Systems Lab	-	-	2	3	50	30	1
PC521EC	Integrated Circuits and Applications Lab	-	-	2	3	50	30	1
PC531EC	Analog & 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

Finishing School – III: Soft Skills
SYLLABUS FOR B.E. V – SEMESTER

L:T:P (Hrs./week): 1:0:0	SEE Marks : 40	Course Code: **HS510EH**
Credits : 1	CIE Marks : 30	Duration of SEE : 2 Hours

COURSE OBJECTIVES	COURSE OUTCOMES

1. This is a foundation course and aims at enhancing employability skills in students. Students will be introduced to higher order thinking skills and problem solving on the following areas - Arithmetic ability, Numerical ability and General reasoning. Students will be trained to work systematically with speed and accuracy while problem solving.
 2. The three major areas covered in this course include
   1. Numerical Ability
   2. Arithmetic Ability
   3. General reasoning
	On completion 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 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 Arithmetic Ability
- o Percentage
- o Profit loss and discounts
- o Ratio proportions Allegations and mixtures
- o Averages

UNIT – III : QUANTITATIVE APTITUDE- ARITHMETIC ABILITY ADVANCED
- o Arithmetic Ability
- o Time speed and distance
- o Time and work
- o Interest calculations

UNIT – IV : REASONING ABILITY – GENERAL REASONING PART 1
- o General Reasoning
- o Coding decoding
- o Directions
- o Series completions

UNIT – V : REASONING ABILITY- GENERAL REASONING PART 2
- o General Reasoning
- o Analogies
- o Classification
- o Alphabet test
- o Mathematical operations

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)
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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: **PC510EC**
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.

Learning Resources:

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)
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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: **PC520EC**
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 : $\boxed{2}$ 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)
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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: **PC530EC** |
| Credits : 3 | CIE Marks : 40 | Duration of SEE : 3 Hours |

COURSE OBJECTIVES	COURSE OUTCOMES
To acquire knowledge on analog and digital modulation schemes and analyse the communication system in the presence of noise	On completion of the course, students will be able to 1. Compare different analog modulation schemes for their efficiency and bandwidth 2. Analyse different digital modulation techniques and compare bite error performance. 3. Estimate the behaviour of a communication system in presence of noise 4. Describe different pulse modulation schemes 5. Apply analog, digital and pulse modulation schemes to multiplexing techniques

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, Superheterodyne 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 : Detection techniques of digital signals
Optimum demodulation of digital signals over band limited channels: Maximum likelihood detection (Viterbi receiver), Equalization Techniques, Synchronization and Carrier Recovery for Digital modulation.

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)
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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: **PC540EC**
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   : $\boxed{2}$ 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 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: **PC511EC**
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

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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: **PC521EC**
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)
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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: **PC531EC**
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 (2019-20)

Dept	Title	Code	credits
Civil	Remote Sensing and GPS	OE510CE	3
CSE	Fundamentals of Object Oriented Programming	OE510CS	3
CSE	Web Design	OE520CS	3
ECE	Mathematical Programming for Engineers	OE510EC	3
ECE	Sensors for Engineering Applications	OE520EC	3
EEE	Solar Power and Applications	OE510EE	3
IT	Introduction to Database Management Systems	OE510IT	3
IT	Introduction to Statistical Programming	OE520IT	3
Mech.	Optimization Methods	OE510ME	3
Mech.	Introduction to Robotics	OE520ME	3
Maths.	Numerical Methods	OE510MA	3
Maths.	Discrete Mathematics for Engineers	OE520MA	3
Physics	Vacuum Technology and Applications	OE510PH	3
H&SS	Technical Writing And Professional Presentations	OE010EH	3

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

DEPARTMENT OF CIVIL ENGINEERING
REMOTE SENSING AND GPS
(Open Elective-IV)

SYLLABUS FOR B.E. V SEMESTER

L : T : P (Hrs./week):3:0: 0	SEE Marks:60	Course Code: **OE510CE**
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 and GPS	1. Understand the characteristics of the electromagnetic radiation and their interactions with the atmosphere and surface features for better analysis and interpretation of the remote sensing data. 2. Explain the various remote sensing systems, satellite characteristics and elements of visual interpretation techniques 3. Describe the fundamental theory and concepts of the Global Positioning System to provide 3D positioning with great accuracy. 4. Compute errors and biases in GPS measurements and understand the differences between point and relative GPS positioning. 5. Present the applications of remote sensing and GPS in various fields

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.

Unit III: Global positioning Systems (GPS)

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

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.

Surveying with GNSS: Point positioning, Relative positioning, Static and Kinematic positioning.

Unit V : Applications of remote sensing and GPS

Applications of remote sensing and GPS in various fields, Integration of remote sensing, GPS and GIS.

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

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-IV)

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 : **OE510CS**
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-IV)

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 : **OE520CS**
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 Electrical & Electronics Engineering
Solar Power and Applications
(Open Elective – IV)
SYLLABUS FOR B.E. V-SEMESTER

L:T:P(Hrs/week):3:0:0	SEE Marks: 60	Course Code: **OE510EE**
Credits :3	CIE Marks: 40	Duration of SEE: 3Hours

COURSE OBJECTIVES	COURSE OUTCOMES
	On completion of the course, students will be able to
1. 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.

Learning Resources:
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:	02	Max.Marks for each Internal Tests:	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

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

INTRODUCTION TO DATABASE MANAGEMENT SYSTEMS

(Open Elective-IV)

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 :**OE510IT**
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.
Database Design and the E-R Model: Overview of the Design Process, The E-R Model, Constraints, E-R Diagrams

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

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

Operations, Set 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-IV)
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 :**OE520IT**
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 R programming language in the analysis of Statistical data.	1. Write simple programs in R language to manipulate and visualize the data. 2. Write complex program using different constructs of R language to solve simple problems. 3. Use R programming language in the simulation of different types of random variables. 4. Write programs using R language in the analysis and computation of different matrix operations. 5. Use R programming language in the simulating multivariate random numbers, Markov chain, and Monte carlo integration

Unit I: Introduction to R Language
Basic features of R, Built-in functions, logical vectors and relational operators, Data input and output, programming statistical graphs- High-level plots, low level graphic functions.

Unit II: Programming with R
Flow control, Managing complexity through functions, Miscellaneous programming tips, Debugging and maintenance, Efficient programming.

Unit III: Simulation
Montecarlo simulation, Generation of pseudo random numbers, Simulation of other random variables-Bernouli, Binomial, Poisson, Exponential and Normal random variables.

Unit IV: Computational Linear Algebra

Vectors and matrices in R, Matrix multiplication and inversion, Eigen values and Eigen vectors

Unit V: Advances Simulation methods

Multivariate random number generation, Markov Chain Simulation, Monte Carlo Integration, other Advanced Simulation methods

Learning Resources:

1.   A first Course in Statistical Programming with R, W. John Braun, Duncan J. Murdoch, Cambridge University Press, 2007.
2.   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 Mechanical Engineering

OPTIMIZATION METHODS (OE-IV)
SYLLABUS FOR B.E.V-SEMESTER

L:T:P(Hrs/week):3:0:0	SEE Marks:60	Course Code: **OE510ME**
Credits :03	CIE Marks:40	Duration of SEE: 03Hours

COURSE OBJECTIVE	COURSE OUTCOMES *On completion of the course, students will be able to*	
The objective of the course is to understand Linear & non-linear programming, transportation modeling , CPM & PERT for project scheduling and control, and application of various optimization techniques for respective field engineering (Inter disciplinary)	1	optimization of resources in multi disciplinary areas through linear programming under different conditions.
	2	sensitivity analysis of a linear programming problem as per customer requirements tosuit various Organizations.
	3	minimization of total cost to apply for transportation techniques for the transhipment of Goods and products and Implement techniques like project management to analyze about material management.
	4	optimization of resources in multi disciplinary areas through non-linear programming under different conditions.

UNIT-I: OPTIMIZATION-AN OVERVIEW
Meaning of Optimization-Origin of Optimization-Introduction to Linear programming problems (LPP) -Formulation of LPP- Graphical method, simplex method.

UNIT-II: ADVANCED TOPICS IN LINEAR PROGRAMMING
Duality in LPP, Differences between primal and dual, shadow prices, Dual simplex method, sensitivity analysis. special cases in LPP.

UNIT-III

Transportation Model: Definition of the transportation model-matrix of Transportation model-Formulation and solution of transportation models- Methods for calculating Initial basic feasible solution-Optimization of transportation model using MODI method.

Project Scheduling: Introduction to network analysis, Rules to draw network diagram, Fulkerson rule for numbering events, Critical path method, PERT.

UNIT-IV

Non linear programming problems: Optimization methods for single variable, multivariable functions, Maxima-Minima

One Dimensional Minimization: Uni-modal Function, Unrestricted search, Exhaustive search,Dichtomous search, Interval Halving method, Fibonacci and golden bisection Method , Newton and Quasi Newton method.

UNIT-V

Non Linear - Unconstrained Optimization

classification, scaling of design variables, Random search methods, Univeriate search, pattern Directions, Hook Jeeves, Powel method, Rosenbrock method.

Learning Resources:

1. Singiresu S.Rao, "Engineering optimization- Theory and Practice", 4th Edition, John Wiley and Sons, 2009.
2. NVS Raju, "Optimization methods for Engineers ", PHI Learning Pvt. Ltd., 2014.
3. Prem Kumar Gupta and Dr. DS Hira, "Operations Research", S.Chand & Company Pvt. Ltd., 2014.
4. R. Paneerselvam, "Operations Research", PHI Learning Pvt Ltd., 2009.
5. Kalyanmoy Deb, Optimization for Engineering Design- algorithms and examples, PHI Pvt. Ltd., 1st Edition 2003, Delhi.

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

INTRODUCTION TO ROBOTICS (OE-IV)
SYLLABUS FOR B.E.V-SEMESTER

L:T:P(Hrs/week):3:0:0	SEE Marks:60	Course Code: **OE520ME**
Credits :03	CIE Marks:40	Duration of SEE: 03Hours

COURSE OBJECTIVE	COURSE OUTCOMES	
	On completion of the course, students will be able to	
The objective of the course is to identify robots and their peripherals for satisfactory operation and control of robots for industrial and non-industrial applications.	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	Classify 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. Mikell P. Groover, Mitchell Weiss, Roger N Nagel and Nicholas G Odrey, "Industrial Robotics Technology, Programming and Applications", Tata McGraw-Hill Publishing Company Limited, 2nd Edition , 2008.
2. Deb. S.R and Sankha Deb, "Robotics Technology and Flexible Automation", Tata McGraw Hill Publishing Company Limited, 2nd Edition, 2010.
3. Klafter R.D, Chmielewski T.A, and Negin. M, "Robotic Engineering: An Integrated Approach", Prentice Hall of India Pvt. Ltd., 1994.
4. K.S. Fu,R.C. Gonzalez and C.S.G. Lee , "Robotics control, sensing, vision and intelligence",Tata Mc Graw-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)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

DEPARTMENT OF MATHEMATICS
(OPEN ELECTIVE-IV)

DISCRETE MATHEMATICS FOR ENGINEERS for
SYLLABUS FOR B.E. V- SEMESTER

L:T:P(Hrs/week):3:0:0	SEE Marks:60	Course Code: **OE520MA**
Credits :03	CIE Marks:40	Duration of SEE: 03Hours

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. 2. **Study** the concepts of number theory such Modular Arithmetic, Congruences and basic cryptography etc., 3. **Understand** the basics of counting, combinatory, and various methods of solving Recurrence relations. 4. **Understand** Relations, Equivalence relations, Posets and Hasse diagrams. 5. **Analyze** the concepts of Graphs.	1. **Use logical notation** to define and reason about **fundamental mathematical concepts and synthesize induction hypothesis and simple Induction proofs**. 2. **Prove elementary properties of modular arithmetic** and basic cryptography and apply in Computer Science. 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. **Prove** whether a given relation is an equivalence relation/ poset and will be able to draw a Hasse diagram. 5. **Apply** graph theory models of data structures and to solve problems of connectivity**.**

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

UNIT –V 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.
6. http://mathworld.wolfram.com/topics
7. 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, Telangana State
DEPARTMENT OF PHYSICS
Open elective Course
VACUUM TECHNOLOGY AND APPLICATIONS

L:T:P(Hrs/week):3:0:0	SEE Marks:60	Course Code: **OE510PH**
Credits :03	CIE Marks:40	Duration of SEE: 03Hours

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, fore vacuum 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,

SUGGESTED BOOKS:

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   : $\boxed{2}$ Max. Marks for each Internal Tests   : $\boxed{30}$

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 AND SOCIAL SCIENCES
OPEN ELECTIVE
TECHNICAL WRITING AND PROFESSIONAL PRESENTATIONS
Common to all branches

SYLLABUS FOR B.E. V SEMESTER

L: T: P (Hrs/Week): 3	SEE Marks: 60	Course Code: **OE010EH**
Credits: 3	CIE Marks: 40	Duration of SEE: Hours: 03

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the students to:	**At the end of the course the student will be able to**
1. understand the principles and mechanics of technical writing for students of engineering.	1. write effective reports
2. comprehend 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.	2. research and write project proposals and SoPs
	3. make persuasive presentations
3. make effective presentations as part of today's workplace demands.	

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.
3. Hacking Your Statement of Purpose: A Concise Guide to Writing Your SOP, Milena Young, 2014.
4. 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.
5. Successful Presentations (with DVD): John Hughes & Andrew Mallett. Oxford university Press.

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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			
		Hours per Week			Duration in Hrs	Maximum Marks		Credits
		L	T	P/D		SEE	CIE	
B.E (ECE) VI - SEMESTER								
THEORY								
HS040EH	Economics and Finance for Engineers	2	-	-	3	60	40	2
HS610EH	Finishing School - IV : Soft Skills	1	-	-	2	40	30	1
PC610EC	Microprocessors and Microcontrollers	3	-	-	3	60	40	3
PC620EC	Digital Signal Processing	3	-	-	3	60	40	3
PC630EC	Computer Networks	3	-	-	3	60	40	3
PC640EC	Transmission Lines and Antennas	3	-	-	3	60	40	3
MC610EC	Finishing School - IV : Technical Skills	1	-	-	2	40	30	1
OE6XXXX	Open Elective –V	3	-	-	3	60	40	3
MC040EH	Human Values & Professional Ethics - II	1	-	-	2	40	30	1
PRACTICALS								
PC611EC	Microprocessors and Microcontrollers Lab	-	-	2	3	50	30	1
PC621EC	Digital Signal Processing Lab	-	-	2	3	50	30	1
PC631EC	Computer Networks Lab	-	-	2	3	50	30	1
TOTAL		20	-	6		630	420	23
GRAND TOTAL		26			1050			

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: **HS040EH**
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.

<u>Learning Resources:</u>
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

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3. No. of Quizzes : | 3 | Max. Marks for each Quiz Test : | 5 |

Duration of Internal Tests: 90 Minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
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DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES

Finishing School – IV: Soft Skills

SYLLABUS FOR B.E. VI – SEMESTER

L:T:P (Hrs./week): 1:0:0	SEE Marks : 40	Course Code: **HS610EH**
Credits : 1	CIE Marks : 30	Duration of SEE : 2 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
1. This course aims at enhancing the employability skills. Students will be trained in higher order thinking skills including analytical skills, problem solving skills and critical & logical reasoning skills. Students will be trained to work systematically and develop logical and analytical thinking. 2. Students will be trained in the following areas 1. Critical and Non-verbal reasoning 2. Pure Maths 3. Verbal ability 4. Logical reasoning 5. Data Interpretation and Analysis	On completion of the course, students will be able to 1. Understand the fundamentals concepts of Aptitude and verbal skills 2. Solve questions using short cuts and smart methods 3. Perform calculations with speed and accuracy 4. Develop Analytical thinking and problem solving skills

UNIT I: VERBAL ABILITY

- o Finding errors
- o Vocabulary
- o Synonyms
- o Antonyms
- o Idioms and Phrases
- o Fill in the blanks and sentence Jumbles
- o Reading comprehension

UNIT II : LOGICAL REASONING

- o Logical Reasoning
- o Assignments
- o Puzzles
- o Blood relations
- o Syllogisms

UNIT III : CRITICAL AND NON VERBAL REASONING
- o Critical Reasoning
- o Nonverbal reasoning
- o Figure series and completions

UNIT IV : QUANTITATIVE APTITUDE - PURE MATHS
- o Pure maths
- o Algebra
- o Probability
- o Permutations and combinations

UNIT V: DATA INTERPRETATION AND ANALYSIS
- o Data Interpretation
- o Line graph
- o Pie chart
- o Bar Graph
- o Tabulations

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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: **PC610EC**
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
1. To familiarize the students on 8086 microprocessor architecture and interfacing with memories and I/O 2. To understand the architecture of 8051 microcontroller so as to realize the concepts of SoC built-in peripheral programming in Assembly and interfacing in embedded-C	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.

<u>**Learning Resources:**</u>

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

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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: **PC620EC**
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 and Parks-McClellan FIR filter design algorithm ,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/

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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: **PC630EC**
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

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Duration of Internal Tests: 90 Minutes

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

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Transmission Lines and Antennas

SYLLABUS FOR B.E. VI – SEMESTER

L:T:P (Hrs./week): 3:0:0	SEE Marks : 60	Course Code: **PC640EC**
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
Students will know the basic concepts of electromagnetic wave radiation and reception in the Antenna.	On completion of the course, students will be able to 1. To know the fundamentals theory and its properties in transmission lines. 2. Analyze Impedance matching using transmission line for any arbitrary load. 3. To Analyze the fundamental parameters of a Antenna. 4. To familiarize various types of array antennas. 5. To analyze the performance of VHF and UHF antennas

UNIT - I: Transmission Lines – I:
Types, Parameters, Transmission Line Equations, Primary & Secondary Constants, Expressions for Characteristic Impedance, Propagation Constant, Phase and Group Velocities, Infinite Line Concepts, Lossless / Low Loss Characterization, Distortion – Conditions for Distortion less and Minimum Attenuation, Types of Loading.

UNIT - II: Transmission Lines – II :
Input Impedance Relations, SC and OC Lines, Reflection Coefficient, VSWR. Distribution of voltages and currents on loss less line. UHF Lines as Circuit Elements, $\lambda/4$, $\lambda/2$, $\lambda/8$ Lines – Impedance Transformations. Transmission line matching , Smith Chart – Constructions and Applications, Single Stub Matching.

UNIT - III: Antenna fundamentals and wire antennas:
Principles of radiation, retarded potential and isotropic radiator, Basic antenna parameters: patterns, radiation intensity, far field, near field, Gain and directivity, Friis transmission, Antenna Polarization, effective

aperture, antenna temperature, aperture efficiency. Point sources, Current distribution, infinitesimal dipole. Half-wave dipole, quarter wave monopole, Loop antenna, Far field pattern of circular loop with uniform current.

UNIT - IV: Antenna arrays:
Arrays of point sources, two element arrays, Linear array with uniform distribution; binomial array; principle of pattern multiplication. Broadside and End fire arrays, effect of inter element phase shift on beam scanning. Effect of earth on vertical and horizontal patterns; Turnstile antenna, Rhombic Antenna, Yagi - Uda Array and Log periodic array Antennas.

UNIT - V: VHF, UHF & MW antennas
Helical Antennas – Geometry, Helix modes, Design considerations for Mono-filar Helical antenna, Horn, Parabolic Reflector, Lens antennas. Micro strip antennas: different types, advantages and disadvantages of Micro strip antennas.

Learning Resources:
1. John D Ryder, "Networks Lines and Fields", Pearson Education, 2015
2. Edward C. Jordan and Kenneth G. Balmain, "Electromagnetic Waves and Radiating Systems," 2/e, PHI, 2001.
3. John D. Krauss, Ronald J. Marhefka & Ahmad S. Khan, "Antennas and Wave Propagation," 4/e, TMH, 2010.
4. Constantine A. Balanis, "Antenna Theory: Analysis and Design," 3/e, John Wiley, 2005.
5. https://nptel.ac.in/courses/117101056/
6. https://nptel.ac.in/courses/108101092/
7. https://nptel.ac.in/courses/117107035/
8. https://nptel.ac.in/courses/108105114/

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Duration of Internal Tests: 90 Minutes

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: **MC040EH**
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 : | 1 | Max. Marks for each Assignment : | 5 |

3. No. of Quizzes : | 1 | Max. Marks for each Quiz Test : | 5 |

Duration of Internal Tests: 90 Minutes

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: **PC611EC**
Credits : 1	CIE Marks : 30	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
1. To enable the students with 8086 microprocessor programming and to do interfacing with hardware kits for interfacing different I/O. 2. To design 8051 microcontroller SoC solution with the built in peripheral programming and develop device drivers in Keil 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: **PC621EC**
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: **PC631EC**
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

OPEN ELECTIVES OFFERED BY VARIOUS DEPARTMENTS IN B.E. VI SEMESTER (2019-20)

Dept	Title	Code	credits
Civil	Project Management	OE610CE	3
CSE	Introduction to Databases	OE610CS	3
CSE	Introduction to Operating Systems	OE620CS	3
EEE	Basics of Power Systems	OE610EE	3
IT	Introduction to Web Application Development	OE610IT	3
IT	Introduction to Machine Learning	OE620IT	3
Mech.	Introduction to Automobile Engineering	OE610ME	3
Mech.	Additive Manufacturing and its applications	OE620ME	3
Physics	Fundamentals of Nano Materials And their Applications	OE610PH	3
H&SS	English for Competitive Examinations	OE610EH	3
H&SS	Technical Writing and Professional Presentations	OE010EH	3

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

DEPARTMENT OF CIVIL ENGINEERING
PROJECT MANAGEMENT (Open Elective-V)

SYLLABUS FOR B.E. VI SEMESTER

L : T : P (Hrs./week): 3:0:0	SEE Marks:60	Course Code: **OE610CE**
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

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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-V)

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 : **OE610CS**
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.

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

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

1   No. of Internal Tests :   2   Max. Marks for each Internal 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-V)

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 : **OE620CS**
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 Electrical & Electronics Engineering
Basics of Power Systems
(Open Elective – V)

SYLLABUS FOR B.E. VI-SEMESTER

L:T:P(Hrs./week):3:0:0	SEE Marks: 60	Course Code: **OE610EE**
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. To comprehend the various ways of power generation.	1. Identify the various and major ways of generation of power in India.
2. To determine the per unit cost of a power generating station.	2. Estimate the energy generated by hydel generating station.
	3. Calculate the capacitance value for p.f. improvement.
	4. Assess the tariffs of domestic and commercial loads

UNIT – I: **Thermal Power Station:**
Line diagram of Thermal Power Station (TPS) showing paths of coal, steam, water, air, ash and flue gasses. Brief description of TPS components-Economizers, Boilers, Super heaters, Turbines, Condensers, Chimney and cooling towers, choice of site for steam power station.

UNIT – II :**Hydro Power Stations:**
Power Generation Principles, Choice of site, layout and various parts of generating stations, Estimation of power in Hydel, flow duration curve, hydrograph, mass curve etc., Types of Hydel stations.

UNIT – III: Nuclear Power Stations:
Nuclear Fission and Chain reaction, Principle of operation of Nuclear reactor, Reactor Components- Moderators, Control rods, Reflectors and Coolants

UNIT – IV: Economics of Power Generation:

Load Curve, Load duration curve, load demand and diversity factors, base load and peak load operation, types of costs and depreciation fund calculations, Tariffs-Desirable characteristics of a tariff, types of tariff

UNIT – V: Power Factor:
Disadvantages of low p.f, Causes of low P.F, Power factor improvement, Methods of power factor improvement, Numerical problems.

Learning Resources:
1. C.L. Wadhwa, Electrical Power Systems, Wiley Eastern Ltd. 5th Edition, 2005
2. C.L. Wadhwa, Generation, Distribution and Utilisation of Electrical Energy, Wiley Eastern Ltd., 5th Edition, 2005
3. S.N.Singh- Electrical Power Generation, Transmission and Distribution- Prentice Hall pvt.ltd. New-2003.

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

1 No. of Internal Tests: 02   Max.Marks for each Internal Tests: 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

VASAVI COLLEGE OF ENGINEERING (Autonomous)
IBRAHIMBAGH, HYDERABAD – 500 031
Department of Information Technology

INTRODUCTION TO WEB APPLICATION DEVELOPMENT

(OPEN ELECTIVE-V)

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 : **OE610IT**
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.

Learning Resources:
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)

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: **OE620IT** |
| 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

<u>Learning Resources:</u>
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 Mechanical Engineering

INTRODUCTION TO AUTOMOBILE ENGINEERING (OE-V)

SYLLABUS FOR B.E.VI-SEMESTER

L:T:P(Hrs/week):3:0:0	SEE Marks:60	Course Code: **OE610ME**
Credits :03	CIE Marks:40	Duration of SEE:03Hours

	COURSE OBJECTIVES		COURSE OUTCOMES *On completion of the course, students 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 – 500 031

Department of Mechanical Engineering

ADDITIVE MANUFACTURING AND ITS APPLICATIONS
SYLLABUS FOR B.E.VI-SEMESTER

L:T:P(Hrs/week):3:0:0	SEE Marks:60	Course Code: **OE620ME**
Credits :03	CIE Marks:40	Duration of SEE:03Hours

COURSE OBJECTIVES	COURSE OUTCOMES *On completion of the course, students will be able to*	
The objective of the course is to understand the fundamentals of various additive manufacturing technologies and their applications in Engineering Industry.	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", 2ndEditon, 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.

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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, Telangana State

DEPARTMENT OF PHYSICS

FUNDAMENTALS OF NANO MATERIALS AND THEIR APPLICATIONS

SYLLABUS FOR B.E.VI-SEMESTER

L:T:P(Hrs/week):3:0:0	SEE Marks:60	Course Code: OE610PH
Credits :03	CIE Marks:40	Duration of SEE:03Hours

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 structures	1. Distinguish bulk, thin and nano materials from the point of view of size effects
2. Acquire knowledge on properties of nano materials	2. List various properties of nano materials
3. Appreciate fabrication techniques of nano materials	3. Narrate various nanonmaterial preparation techniques
4. Learn nanomaterial characterization techniques.	4. Describe necessary characterization techniques of nano materials
5. Appreciate application 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

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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 HUMANITIES AND SOCIAL SCIENCES

(OPEN ELECTIVE)

SYLLABUS FOR VI SEMESTER

ENGLISH FOR COMPETITIVE EXAMINATIONS

(Common to all branches)

L: T: P (Hrs/Week): 3	SEE Marks: 60	Course Code: OE610EH
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:**
1. To familiarise the students to various types of competitive examinations.	1. The student will be able to solve various types of questions in competitive English examinations effectively.
2. To practice questions and prepare for GATE, GRE, CAT, TOEFL.	3. 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.

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IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF HUMANITIES AND SOCIAL SCIENCES

OPEN ELECTIVE

SYLLABUS FOR B.E. V Semester

Technical Writing and Professional Presentations
Common to all branches

L: T: P (Hrs/Week): 3	SEE Marks: 60	Course Code: **OE010EH**
Credits: 3	CIE Marks: 40	Duration of SEE: Hours: 03

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the students to:	**At the end of the course the student will be able to**
4. understand the principles and mechanics of technical writing for students of engineering.	4. write effective reports
5. comprehend 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.	5. research and write project proposals and SoPs
6. make effective presentations as part of today's workplace demands.	6. 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.
3. Hacking Your Statement of Purpose: A Concise Guide to Writing Your SOP, Milena Young, 2014.
4. 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.
5. Successful Presentations (with DVD): John Hughes & Andrew Mallett. Oxford university Press.

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VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Activity Planner / Calendar for the Academic Year 2019-20

S.No.	Date	Day	Activities
ODD Semesters (I, III, V, VII – Semesters)			
1.	16-08-2019	FRI	2-Day PCB design and Fabrication workshop (III-Sem)
	17-08-2019	SAT	2-Day PCB design and Fabrication workshop (III-Sem)
2.	21-08-2019	WED	Guest Lecture on "Carrere Guidance " (V – Sem)
3.	04-09-2019	WED	Technical Quiz under Professional Bodies for V Semester students
4.	06-09-2019	FRI	Expert lecture on Recent Trends in Image and Video Processing
5.	18-09-2019	WED	Expert Lecture on Electronic Devices under IETE student chapter (III-Sem)
6.	20-09-2019	FRI	1-Day Workshop on VLSI Design (VII-Sem)
7.	26-09-2019	THU	1-Day workshop on IoT Applications (V-Sem)
8.	14-10-2019	MON	Coding contest under IEEE Professional student branch(For all semester students)
9.	25-10-2019	FRI	2-Day workshop on MATLAB Tool Boxes (I & III – Sem. M.E. (CE&SP) Students)
	26-10-2019	SAT	2-Day workshop on MATLAB Tool Boxes (I & III – Sem. M.E. (CE&SP) Students)
10.	01-11-2019	FRI	1-Day workshop on System Design using Vivado Tools (I & III – Sem. M.E. (ES&VLSID) Students)
11.	02-11-2019	SAT	Guest Lecture by Alumni(III-Sem)
12.	03-12-2019	TUE	3-Day Workshop on Recent advancements in Wireless communications &Networking
	04-12-2019	WED	3-Day Workshop on Recent advancements in Wireless communications &Networking
	05-12-2019	THU	3-Day Workshop on Recent advancements in Wireless communications &Networking
13.	06-12-2019	FRI	Faculty Research Paper Presentations
	07-12-2019	SAT	Faculty Research Paper Presentations

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Activity Planner / Calendar for the Academic Year 2019-20

S.No.	Date	Day	Activities
EVEN Semesters (II, IV, VI, VIII – Semesters)		
14.	25-01-2020	SAT	Guest Lecture on SDR & Wireless System Design under IEEE student branch
15.	31-01-2020	FRI	2-day workshop on Hardware Descriptive Language (IV-Sem.)
	01-02-2020	SAT	2-day workshop on Hardware Descriptive Language (IV-Sem.)
16.	15-02-2020	SAT	Robotics Club Activity Under IEEE Student Chapter (IV-Sem.)
17.	17-02-2020	MON	1-Day workshop on DSP Applications (II & IV – Sem. M.E (CE&SP) Students)
18.	18-02-2020	TUE	1-Day workshop on Embedded System Development Tools (II & IV – Sem. M.E (ES&VLSID) Students)
19.	22-02-2020	SAT	1-Day Workshop on DSP Applications (VI-Sem)
20.	21-03-2020	SAT	Guest Lecture on "Career Guidance" for VI Semester students.
21.	28-03-2020	SAT	Expert Lecture on Digital Systems Design Flow (IV-Sem)
22.	04-04-2020	SAT	Guest Lecturer by Alumni (IV-Sem.)
23.	05-05-2020	TUE	One Week (4th to 9th May 2020) FDP on ASIC Design & Verification
24.	05-06-2020	FRI	3-Day International Conference on Recent Trends in Engg. Science & Tech.
	06-06-2020	SAT	3-Day International Conference on Recent Trends in Engg. Science & Tech.
	07-06-2020	SUN	3-Day International Conference on Recent Trends in Engg. Science & Tech.