UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Course Description

Title of Course: Economics for Engineers
Course Code: HU501
L-T Scheme: 3-0 **Course Credits: 3**

Module-I

1. Economic Decisions Making – Overview, Problems, Role, Decision making process.

2.EngineeringCosts&Estimation– Fixed, Variable, Marginal & Average Costs, Sunk Costs ,Opportunity Costs, Recurring And Non recurring Costs, Incremental Costs, Cash Costs vs Book Costs, Life-Cycle Costs; Types Of Estimate, Estimating Models-Per-Unit Model, Segmenting Model, Cost Indexes, Power-Sizing Model, Improvement &Learning Curve, Benefits.

Module-II

3. Cash Flow, Interest and Equivalence: Cash Flow Diagrams, Categories & Computation, Time Value of Money, Debtre payment, Nominal & Effective Interest.

4. Cash Flow & Rate Of Return Analysis–Calculations, Treatment of Salvage Value, Annual Cash Flow Analysis, Analysis Periods; Internal Rate Of Return, Calculating Rate of Return, Incremental Analysis; Best Alternative Choosing An Analysis Method, Future Worth Analysis, Benefit-Cost Ratio Analysis, Sensitivity And Break even Analysis. Economic Analysis In The Public Sector – Quantifying And Valuing Benefits & drawbacks.

Module-III

5.Inflation And Price Change Definition, Effects, Causes, Price Change with Indexes, Types of Index, Composite vs Commodity Indexes, Use of Price Indexes In Engineering Economic Analysis, Cash Flows that inflate at different Rates.

6. Present Worth Analysis: End-Of Year Convention, View point Of Economic Analysis Studies, Borrowed Money View point, Effect Of Inflation & Deflation, Taxes, Economic Criteria, Applying Present Worth Techniques, Multiple Alternatives.

7. Uncertainty In Future Events-Estimates and Their Use in Economic Analysis, Range Of Estimates, Probability, Joint Probability Distributions, Expected Value, Economic Decision Trees, Risk, Risk vs Return, Simulation, Real Options.

Module-IV

8. Depreciation - Basic Aspects, Deterioration & Obsolescence, Depreciation And Expenses, Types Of Property, Depreciation Calculation Fundamentals, Depreciation And Capital Allowance Methods,

Straight-Line Depreciation Declining Balance Depreciation, Common Elements Of Tax Regulations For Depreciation And Capital Allowances.

9. Replacement Analysis- Replacement Analysis Decision Map, Minimum Cost Life of a New Asset, Marginal Cost, Minimum Cost Life Problems.

10. Accounting–Function, Balance Sheet, Income Statement, Financial Ratios Capital Transactions, Cost Accounting, Direct and Indirect Costs, Indirect Cost Allocation.

Books:

1. James L. Riggs, David D. Bedworth, Sabah U. Randhawa: Economics for Engineers 4e, Tata Mc Graw-Hill

2. Donald Newnan, Ted Eschembach, Jerome Lavelle: Engineering Economics Analysis, OUP

3. John A. White, Kenneth E. Case, David B. Pratt: Principle of Engineering Economic Analysis, John Wiley

4. Sulliv anand Wicks: Engineering Economy, Pearson

5. R. Paneer Seelvan: Engineering Economics, PHI

6. Michael RLindeburg : Engineering Economics Analysis, Professional Pub***Readings***

1. JamesL.Riggs,DavidD.Bedworth,SabahU.Randhawa:Economicsfor Engineers 4e,TataMcGraw-Hill

2.DonaldNewnan,TedEschembach,JeromeLavelle:Engineering EconomicsAnalysis,OUP

3.JohnA.White,KennethE.Case,DavidB.Pratt: Principle of Engineering EconomicAnalysis,JohnWiley

4.Sullivanand Wicks:EngineeringEconomy,Pearson

5.R.Paneer Seelvan:Engineering Economics, PHI

6.MichaelRLindeburg :Engineering EconomicsAnalysis,Professional Pub

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Course Description

Title of Course: Analog Communication
Course Code: EC501
L-T Scheme: 3-1 **Course Credits: 4**

Introduction:

This course presents the fundamentals of analog communications. Topics include:

- the analysis of signals and systems
- amplitude modulation and demodulation
- frequency modulation and demodulation
- phase modulation and demodulation
- Super heterodyne receiver
- Noise performance of different AM and FM system

Objectives:

To introduce the concepts of analogue communication systems, and to equip students with various issues related to Analog communication such as modulation, demodulation, transmitters and receivers and noise performance.

Learning Outcomes:

Knowledge:

1. The learner mustbeableto appreciate theneedfor modulationandcalculate theantennasize for differentcarrier frequencies.
2. Fromthefunctionalrepresentationofthemodulatedcarrierwave,thelearnermustbeabletoidentifythetypeof modulation,calculatetheside-band frequencies, identifythemodulating and carrier frequencies,decide thetype of generationmethod tobeadopted.
3. Afterunderstandingthebasicconceptsthelearnermustbeabletocomparebetweenthedifferentdemodulation methods,designan envelope detector, calculate the IF and image frequencies for the super heterodyne receivers given the carrier and modulating frequencies, calculate the oscillator frequency.
4. Fromthefunctionalrepresentationofthemodulatedcarrierwave,thelearnermustbeabletoidentifythetypeof modulation,calculate theside-bandfrequencies, identifythemodulating andcarrier frequencies,decide thetype of generationmethod to beadopted.
5. AppreciatetheimportanceofMultiplexing,findouttheirapplicationareas.
6. ThelearnermustbeabletocalculatetheNoisetemperature and SNR for differentsystems, also comparebetweentheperformance of thedifferentmodulation methodsbycomparingtheir SNR.

Application:

1. The ability to design and analyze basic analog transmitters and receivers
2. The ability to apply computer software for the design and analysis of a simple analog communication system.

Course Contents:

Unit 1: Elements of communication system - Transmitters, Transmission channels &receivers, Concept of modulation, its needs.

Unit 2: Continuous Wave Linear Modulation: a) Amplitude modulation(AM-DSB/TC): Time domain representation of AM signal (expression derived using a single tone message), modulation index, frequency domain (spectral) representations, illustration of the carrier and side band components; transmission bandwidth for AM; Phasor diagram of an AM signal; Calculation of Transmitted power & sideband power & Efficiency ; concept of under, over and critical modulation of AM-DSB-SC b) Other Amplitude Modulations: Double side band suppressed carrier (DSBSC) modulation: time and frequency

domain expressions, bandwidth and transmission power for DSB. Single side band modulation (SSB) both TC & SC and only the basic concept of VSB, Spectra and band-width.

Unit 3: Generation of AM: Concept of Gated, Square law modulators. Generation of DSB-SC: Ring Modulator, Balanced Modulator. Generation of SSB: Filter method, Phase shift method and the Third method.

Unit 4: Demodulation for Linear Modulation: Demodulation of AM signals: Detection of AM by envelope detector, Synchronous detection for AM-SC, Effects of Frequency & Phase mismatch, Corrections, demodulation of SSB with pilot carrier. Principle of Super heterodyne receivers: Super heterodyning principle, intermediate frequency, Local oscillator frequency, image frequency.

Unit 5: Angle Modulation: a) Frequency Modulation (FM) and Phase Modulation (PM): Time and Frequency domain representations, Spectral representation of FM and PM for a single tone message, Bessel's functions and Fourier series.; Phasor diagram.b) Generation of FM & PM: Narrow and Wide-band angle modulation, Basic block diagram representation of generation of FM & PM, Concept of VCO & Reactance modulator. c) Demodulation of FM and PM: Concept of frequency discriminators, Phase Locked Loop

Unit 6: Multiplexing: Frequency Division Multiplexing, Time Division Multiplexing, Stereo – AM and FM: Basic concepts with block diagrams.

Unit 7: Random Signals and Noise in Communication System:i) Noise in Communication systems – Internal & External noise, Noise Temperature, Signal-to-Noise ratio, White noise, thermal noise, Figure of Merit. ii) Noise performance in Analog Communication systems: SNR calculation for DSB/TC, DSB-SC, SSB-TC, SSBSC & FM.

Text Books

1. B.P. Lathi, Zhi Ding, Modern Digital and Analog Communication Systems, 4thed, Oxford Publication.
2. TaubandSchilling, "Principlesof Communication Systems",2nded., Mc-GrawHill.

References

1. P Ramakrishna Rao, Analog Communication, Tata McGraw Hill Education
2. Singh &Sapre—CommunicationSystems:2/e,TMH.
3. V ChandraSekar–Analog Communication- OxfordUniversityPress

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Course Description

Title of Course: Microprocessors & Microcontrollers
Course Code: EC502
L-T Scheme: 3-1 **Course Credits: 4**

Introduction:

This course examines thebasic concepts of digital number system, the evolution of general purpose processor, concept of 8085 and its related programming. The basic concept of 8086 and 8051.The Topics to be covered (tentatively) include:

- Introduction of microcomputer based system
- Architecture of 8085 and its pinout diagram
- Addressing mode and timing diagram of 8085
- Programming concept of 8085
- Serial and parallel data communication
- Architecture of 8086 and its assembly language programming
- Architecture of 8051 and its assembly language programming
- Memory and peripheral interfacing with 8085

Objectives:

In this course, we will study thebasic architecture of 8085, 8086 and 8051.Impart the knowledge about the instruction set of 8085, 8086 and 8051.Understand the basic idea about the data transfer schemes and its applications. This course will develop the simple program skill writing on 8051, 8086 & 8085 environment.After completed the course the students will learn the design of microprocessors/microcontrollers-based systems.

Learning Outcomes:

Knowledge:

Once the student has successfully completed this course, he/she will be able to answer the following questions or perform following activities:

1. Students will be able to understand components of the computers, microprocessors and microcontrollers.
2. Students will be able to use 8085, 8086 and 8051 addressing modes, registers and instruction sets and writing program in assembly.
3. Students will be able to debug their assembly language programs.
4. Students will be able to program parallel input/output ports of 8085.
5. Students will be able to design memory systems, design memory system layout and analyze timing and electrical compatibility of the memory units.
6. Students will be able to use vector interrupt and understand interrupt process.

Application:

1. To develop and implement various microprocessor basedsystem,
2. To develop, implement, and demonstrate the various processor,
3. To design the 8051-based real time circuit,

Course Contents:

Unit 1: **Introduction of microcomputer based system:**

Introduction to Microcomputer based system. History of evolution of Microprocessor and Microcontrollers and their advantages and disadvantages.

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Course Description

Unit 2: Architecture of 8085 and its pinout diagram:
Architecture of 8085 Microprocessor, Pin description of 8085. Address/data bus Demultiplexing, Status Signals and the control signals.

Unit 3: Addressing mode and timing diagram of 8085:
Instruction set of 8085 microprocessors, Addressing modes, Timing diagram of the instructions (a few examples).

Unit 4:Programming concept of 8085:
Arithmetic Operation: 8 bit and 16-bit addition, subtraction, multiplication and division.
Logical operation: shifting, rotating, AND, OR, XOR, NOT operation etc.
Stack operation: PUSH, POP, PSW, swapping, CALL, RET etc.
Interrupt related operation: RIM, SIM, RESTART, etc.
Data transfer operation, Branching operation etc.

Unit 5:Serial and parallel data communication:
BasicconceptofserialI/O,DMA,AsynchronousandsynchronousserialtransmissionusingSID and SODpinsof8085 Microprocessor.

Unit 6:Architecture of 8086 and its assembly language programming:
The 8086 microprocessors- Architecture, addressing modes, Interrupts
Introduction to 8051 Microcontroller –Architecture, Pin Details
Addressing modes, Instruction set, Examples of Simple Assembly Language.

Unit 7:Architecture of 8051 and its assembly language programming:
8051micro controller hardware, input/outputpins, ports,externalmemory,counters and timers,instruction set,addressing modes,serialdata I/O, interrupts.
Assembly language programming of 8051: logical , arithmetic, data transfer, branching operations.

Unit 8:Memory and peripheral interfacing with 8085:
I/O Device Interfacing-I/O Mapped I/O and Memory Mapped I/O, SupportIC chips:8255, 8259, 8237 and 8251: BlockDiagram, Pin Details, Modesof operation, controlword(s) format.

Text Books
1. MICROPROCESSOR architecture, programming and Application with 8085 - R.Gaonkar (Penram international Publishing LTD.)
2. Microcontrollers:Principles&Applications - Ajit Pal, PHI 2011.
3.The8051 microcontroller and Embeddedsystems- Mazidi,MazidiandMcKinley(PEARSON)
4. 8086 Microprocessor –K Ayala (Cengage learning)

References
1. The 8085 Microprocessor, Architecture, Programming and Interfacing- K Uday Kumar, B.S Umashankar (Pearson)
2. The X-86 PC Assembly language, Design and Interfacing - Mazidi, Mazidi and Causey (PEARSON)
3. The 8051 microcontrollers – Uma Rao and AndhePallavi (PEARSON).

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Course Description

Title of Course: Control System
Course Code: EC503
L-T Scheme: 3-0 **Course Credits: 3**

Introduction:

This course examines control system analysis and design concepts in classical and modern state space methods. The Topics to be covered (tentatively) include:

- Fundamentals of control system
- Transfer function representation
- Time response analysis
- Stability analysis in S-domain
- Frequency response analysis
- Stability analysis in frequency domain
- Classical control design techniques
- State space analysis of continuous systems

Objectives:

The Course Educational Objectives are:

1. In recent years, control systems have assumed an increasingly important role in the development and advancement of modern civilization and technology. Practically every aspect of our day-to-day activities is affected by some type of control systems.
2. Control systems are found in abundance in all sectors of industry, such as equality control of manufactured products, automatic assembly line, machine-tool control, space technology and weapon systems, computer control, transportation systems, power systems, robotics, Micro-Electro-Mechanical systems (MEMS), nano-technology and many others.
3. In this subject it is aimed to introduce to the students the principles and application of control systems in everyday life. The basic concepts of block diagram reduction, time domain analysis solutions to time invariant systems and also deals with the different aspects of stability analysis of systems infrequency domain and time domain.
4. Simulation exercises are included in Matlab tool and Simulink tool throughout for practice.

Learning Outcomes:

Knowledge:

Once the student has successfully completed this course, he/she will be able to answer the following questions or perform following activities:

1. Able to understand the basic concepts of linear control system.
2. Able to describe different stability analysis of the system.
3. Able to analyze the classical control design technique.
4. Able to understand the modern state space analysis.

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Course Description

Applications:

1. To develop, implement, and analyze all stability checking methods.
2. To develop and implement different controllers.
3. To develop classical and modern control system approaches.

Course Contents:

Unit 1: INTRODUCTION

Concepts of Control Systems- Open Loop and closed loop control systems and their differences- Different examples of control systems- Classification of control systems, Feed-Back Characteristics, Effects of feedback.

Mathematical models – Differential equations, Impulse Response and transfer functions - Translational and Rotational mechanical systems.

Unit 2: TRANSFER FUNCTION REPRESENTATION

Transfer Function of linear systems, Block diagram representation of systems considering electrical systems as examples -Block diagram algebra –Representation by Signal flow graph - Reduction using mason's gain formula.

Unit 3: TIME RESPONSE ANALYSIS

Standard test signals - Time response of first order systems – Characteristic Equation of Feedback control systems, Transient response of second order systems - Time domain specifications – Steady state response - Steady state errors and error constants.

Unit 4: STABILITY ANALYSIS IN S-DOMAIN

The concept of stability: Routh's stability criterion – limitations of Routh's stability. Root Locus Technique: The root locus concept - construction of root loci-effects of adding poles and zeros to G(s)H(s) on the root loci.

Unit 5: FREQUENCY RESPONSE ANALYSIS

Introduction, Frequency domain specifications-Bode diagrams-Determination of Frequency domain specifications and transfer function from the Bode Diagram-Phase margin and Gain margin-Stability Analysis from Bode Plots.

Unit 6: STABILITY ANALYSIS IN FREQUENCY DOMAIN

Polar Plots, Nyquist Plots, Stability Analysis.

Unit 7: CLASSICAL CONTROL DESIGN TECHNIQUES

Compensation techniques – Lag, Lead, Lead-Lag Controllers design in frequency Domain, PID Controllers.

Unit 8: STATE SPACE ANALYSIS OF CONTINUOUS SYSTEMS

Concepts of state, state variables and state model, derivation of state models from block diagrams, Diagonalization Solving the Time invariant state Equations- State Transition Matrix and it's Properties – Concepts of Controllability and Observability.

Text Books

1. Linear Control Systems with MATLAB Applications (11th edition), by B S Manke, Khanna Publishers. (Unit-1 to Unit-8)

References

1. Control Systems Engineering (2nd edition), by I. J. Nagrath and M. Gopal, New Age International (P) Ltd.
2. Modern Control Engineering (3rd edition), by Katsuhiko Ogata, Prentice Hall ofIndiaPvt.Ltd.

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Course Description

Title of Course: Computer Architecture
Course Code: EC504A
L-T Scheme: 3-1 **Course Credits: 4**

Introduction:

This This course discusses the basic structure of a digital computer and used for understanding theorganization of various units such as control unit, Arithmetic and Logical unit and Memory unit and I/O unit in adigital computer.

Objectives:

1. To have a thorough understanding of the basic structure and operation of a digital computer.
2. To discuss in detail the operation of the arithmetic unit including the algorithms &implementation of fixed point and floating-point addition, subtraction, multiplication &division.
3. To study in detail the different types of control and the concept of pipelining.
4. To study the hierarchical memory system including cache memories and virtual memory.
5. To study the different ways of communicating with I/O devices and standard I/O interfaces.

Learning Outcomes:

This course provides the foundation education in thebasics of a digital computer and makes understanding the organization of various units such as Control unit, Arithmetic and Logical unit, Memory unit and I/O unit in a digital computer.

1. To have a thorough understanding of the basic structure and operation of a digital computer.
2. To discuss in detail the operation of the arithmetic unit including the algorithms &implementation of fixed-point and floating-point addition, subtraction, multiplication &division.
3. To study in detail the different types of control and the concept of pipelining.
4. To study the hierarchical memory system including cache memories and virtual memory.
5. To study the different ways of communicating with I/O devices and standard I/O interfaces.

Course Contents:

Module 1 Computer Organization & Architecture, Basic functional Unit, Computer component structure, Basic operation of computer and components, Harvard & Von Neumann architecture, BUS architecture, Instruction set: Instruction format & types. Instruction sequencing, Addressing modes, RISC & CISC architecture [8L]

*[**Learning Outcome**: Students will come to know about basic of computer organization & architecture]*

Module 2: Memory Organization: Memory system overview, Cache memory organizations, Techniques for reducing cache misses; Hierarchical memory technology: Inclusion, Coherence and locality properties; Virtual memory organization, mapping and management techniques, memory replacement policies [10L]

*[**Learning Outcome**: Students will come to know about basic of computer memory structure & different mapping technique]*

Module 3: CPU Organization: Fundamentals, Processor-memory communication [Clock cycles and Timing Diagram], Instruction cycle, RISC & CISC based architecture. [4L]

*[**Learning Outcome**: Students will come to know about different CPU architecture & Processor-memory communication technique]*

Course Description

Module 4: ALU Design Restoring Division Algorithm**,** Non- Restoring division, Multiplier, Different adders.

Module 5: Pipelining: Basic concepts, instruction and arithmetic pipeline, data hazards, control hazards and structural hazards, techniques for handling hazards, Flynn's classification –SISD, SIMD, MISD, MIMD architectures, Pipeline optimization techniques. [7L]

*[**Learning Outcome**: Students will come to know about pipelining architecture]*

Module 6: Instruction-level parallelism: basic concepts, techniques for increasing ILP, superscalar, super pipelined and VLIW processor architectures, Array and Vector processors. [6L]

Module 7: I/O Sub System Programmed I/O, Interrupt I/O, priority interrupt , Daisy Chaining, DMA.

Module 8: Overview of HDL: VHDL basics programming concept, Structural, dataflow, behavioural& mixed style modeling techniques. [8L]

*[**Learning Outcome**: Students will come to know about VHDL programming techniques]*

[Overall Learning Outcome: This course is a formidable prerequisite for the course Operating System, Embedded System to be offered in the subsequent semester.]

Text Books:

1. Morris Mano, "Computer System Architecture", Third Edition, Prentice-Hall of India, 2000.
2. Paraami, "Computer Architecture", Eighth impression, 2 0 1 1, Oxford Press.
3. P.Pal Chaudhuri, , "Computer organization and design", 2nd Edition., Prentice Hall of India, 2007.

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Course Description

Title of Course: Advanced OOPs using C++
Course Code: EC504B
L-T-P Scheme: 3-0-1 **Course Credit: 4**

Introduction:
The course presents advanced C++ programming including: C++ environment, exception handling, conception of different file handling, template, STL etc.

Objectives:
After completion of the course the students will:

- Be able to program using more advanced C++ features such as composition of objects, operator overloads, dynamic memory allocation, inheritance and polymorphism, file I/O, exception handling, etc.
- Be able to build class template, function template and also they will able to know how STL are works.
- Be able to understand different string operations and different file operations, like text file, binary file.

Learning Outcomes:

- Be able to develop simple computer programs.
- Understand exception handling mechanism.
- Be able to do different file(text, binary) operations.
- Understand template-class template & function template.
- Understand the usage of STL.
- Be able to do different operations on string in C++ programming.

Course Contents:

Module-I: Introduction
Basics of OOP, Features; Structure of C++ program; Class and object; Concept of Constructor& destructor; Abstraction and Encapsulation; Inheritance; Static and dynamic binding; Polymorphism.

Module II: Exception Handling
Exception handling mechanism; throwing, catching, rethrowing mechanism; Multiple catch statement; Nested try-catch block; exception in constructor & destructor; exceptions in operator overloaded functions.

Module III: Template
Class template; Member function inclusion; Class template with different parameter; Function template; Function template with multiple parameters; Overloading of template function; member function template.

Module IV: Console I/O operations
C++ streams; C++ stream classes; Unformatted I/O operations; Formatted I/O operations; Managing output with Manipulators.

Module V: Working with Files

Data File Handling: Need for a data file, Types of data files – Text file and Binary file;
Text File: Basic file operations on text file: Creating/Writing text into file, reading and manipulation of text from an already existing text File (accessing sequentially).
Binary File: Creation of file, Writing data into file, Searching for required data from file, Appending data to a file, Insertion of data in sorted file, Deletion of data from file, Modification of data in a file; opening and closing files; classes for file stream operations; Error handling during file operations; command line arguments.

Module VI: Standard Template Library

Components of STL; Containers, Iterator; Applications of container classes.

Standard Functions Library

C-based I/O functions (fflush, fgetc, ferror, fscanf, fprintf etc.); Time, Date, Localization functions (asctime, clock, ctime, difftime, localtimemktime,strftime etc.); Dynamic memory allocation functions (calloc, malloc, realloc, free).

Module VII: String Manipulation

The String class; Creating String object; Manipulating strings; Relational operations on strings; String comparison characteristics, swapping; Accessing characters in strings.

Text Books:

- Schildt, H., The Complete Reference C++, Tata McGraw Hill Education Pvt. Ltd.
- E.Balagurusamy; Object Oriented programming with C++; Tata McGraw Hill Education Pvt. Ltd.

References:

- Debasish Jana, C++ object oriented programming paradigm, PHI.
- D. Ravichandran, Programming with C++, Tata McGraw Hill Education Pvt. Ltd.
- Y.I. Shah and M.H. Thaker, Programming In C++, ISTE/EXCEL BOOKS.

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Course Description

Title of Course: Analog Communication Lab
Course Code: EC-591
L-T-P scheme: 0-0-3 **Course Credit: 2**

Objectives:
This course provides the basic theory of Analogand principle ofvarious components in Analogcommunication system. Student should be able to design the components with specifications for a given fiberAnalog communication system.

Learning Outcomes:
1: The learner must be able to appreciate the need for modulation and calculate theantennasizefordifferentcarrierfrequencies.Fromthefunctionalrepresentationofthemodulatedcarrierwave, the learner must be able to identify the type of modulation, calculate the side-band frequencies, identify the modulating and carrier frequencies, decidethe type of generation method tobeadopted. Solve problems.

2:Afterunderstandingthebasicconceptsthelearnermustbeabletocomparebetweenthedifferentdemodulationmethods,designanenvelopedetector, FM modulator and demodulator.

3:Fromthefunctionalrepresentationofthemodulatedcarrierwave,thelearnermustbeabletoidentifythetypeofmodulation,calculate theside-bandfrequencies, identifythemodulating and carrierfrequencies; decidethe type of generation method to beadopted.Solveproblems.

course Contents:
Exercises that must be done in this course are listed below:

1. To generate Amplitude Modulated signal and calculate its modulation index for varying amplitude of modulating signal.
2. To generate Amplitude Modulated signal and calculate sideband power, carrier power and efficiency.
3. To generate Amplitude Modulated DSB-SC Wave.
4. To generate Frequency Modulated wave and determine modulation index and bandwidth for different values of amplitude and frequency of modulating signal.
5. To observe the effect of pre-emphasis and de-emphasis on a given input signal.
6. To study Phase Locked Loop and its capture range, Lock range and free running VCO.
7. To design a FM demodulator using PLL.
8. Measurement of selectivity and sensitivity of a superhetrodyne receiver.
9. Time Division Multiplexing and De- Multiplexing
10. Design by Student Minor Project Etc.AM ,FM Transmitters and Receivers, VCO and Audio amplifier

Text Book:
1L.W.CouchIi,"DigitalandAnalogCommunicationSystems",2/e,MacmillanPublishing
2.Blake,ElectronicCommunicationSystems- CengageLearning
3. S Sharma,AnalogCommunication Systems- KatsonBooks

Recommended Kits and Equipment Requirements:
1. AM , FM, TDM,Transmitter and Receiver of am kits
2. DSO, FG, Probes

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Course Description

Title of Course: Microprocessors & Microcontrollers lab
Course Code: EC592
L-T-P scheme: 0-0-3 **Course Credit: 2**

Objectives:
The course is intended to create an appreciation for contemporary concepts in high performance mutli core super scalar architectures and appreciate their implementation in modern multi processors.

Learning Outcomes:
Upon successful completion of the course, a student will have:
1. An ability to define and explain the principles of computer architecture and the interfacing between its Hardware and software components
2. An ability to write assembly programs and understand its machine code equivalent
3. An in-depth understanding of architectural blocks involved in computer arithmetic, both integer and Floating point.
4. An in-depth understanding of the data path inside a processor, its control and handling of exceptions
5. An in depth understanding of pipelining for 32-bit architectures
6. An ability to understand and analyze computer memory hierarchy, at all levels of its organization, and the interaction between caches and main memory
7. An ability to understand multi-processor architectures

Course Contents:
Exercises that must be done in this course are listed below:
Exercise No.1: Introduction to 8085 Microprocessor.
Exercise No.2: a) Addition of 2 - 8 bit numbers
b) Subtraction of 2 - 8 bit numbers
Exercise No.3: a) Addition of 2 - 16 bit numbers
b) Subtraction of 2 – 16 bit numbers
Exercise No.4: a) Multiplication of 2 - 8 numbers
b) Division of 2 - 8 bit numbers
Exercise No.5: a) Ascending order
b) Descending order
Exercise No.6: Factorial of Given Numbers
Exercise No.7: To write an assembly language program to displace Fibanocci Series.

Text Book:

Recommended Systems/Software Requirements:
1. 8085 kit

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Course Description

Title of Course: Control System Lab
Course Code: EC593
L-T-P scheme: 0-0-3 **Course Credit: 2**

Objectives:

1. To provide the students with a hands-on experience on the theoretical concepts through simple experiments.
2. To develop the ability to design and validate their knowledge through open ended experiments.

Learning Outcomes:

On successful completion of this lab course, the students would be able to

1. Demonstrate and analyze the response of Transfer function for various input.
2. Analyze the response of various signal like Impulse Ramp etc.
3. Carry out the root locus of given signal.
4. Analyse different plot and state model.
5. Conduct an open ended experiment in a group of 2 to 3.

Course Contents:

List of Experiments:

1. To obtain a transfer function from given poles and zeroes using MATLAB
2. To obtain zeros and poles from a given transfer function using MATLAB
3. To obtain the step response of a transfer function of the given system using MATLAB
4. To obtain the impulse response of a transfer function of the given system using MATLAB
5. To obtain the ramp response of a transfer function of the given system using MATLAB.
6. To plot the root locus for a given transfer function of the system using MATLAB.
7. To obtain bode plot for a given transfer function of the system using MATLAB.
8. To obtain the transfer function from the state model.
9. To obtain the state model from the given transfer function.
10. To design a lag compensator for a closed loop system.

Text Book:

1) Katsuhiko Ogata, (2002), Modern Control Engineering, Prentice Hall of India Private Ltd., New Delhi.
2) Nagrath I.J. and Gopal M., (2006), Control Systems Engineering, New Age International Publisher, New Delhi.

Recommended Systems/Software Requirements:

SCILAB, MATLAB

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Course Description

Title of Course: Computer Architecture Lab
Course Code: EC594A
L-T-P Scheme: 0-0-3 **Course Credits: 2**

Objective:
To learn the fundamental aspects of computer architecture design and analysis. This lab course provides a comprehensive introduction to understand the underlying of VHDL (VHSIC Hardware Description Language) which is a hardware description language used to describe a logic circuit by function. In particular defined data flow, behaviour or structure. It can also be used as a general purpose parallel programming language i.e. commands, which correspond to logic gates, are executed (computed) in parallel, as soon as a new input arrives. The emphasis of the course will be placed on understanding HDL programming using xilinx to implement different type of circuit.

Learning Outcomes:
Students can understand the functions, structures and history of VHDL programming. Understand the data flow model, behaviaral model, structural model.

Course Contents:

Unit –I: Implement AND NOT ,OR Gate, Implement basic gates using data flow model Behavioral model and Structural model

Unit –II: Implement NAND, NOR ,XOR Gate, Implement Few gates using data flow model Behavioral model and Structural model. Individually find each and every gates out put.

Unit –III: Implement Half Adder and Full Adder, Write the code for the same circuit in different type like data flow, behavioral and structural method.

Unit –IV: Implement Half Subtractor and Full Subtractor, Write the code for the same circuit in different type like data flow, behavioral and structural method.

Unit –V: Implement Flip-Flop, S-R Flip Flop, J-K Flip Flop, D Flip Flop, T Flip Flop

Text Book:

1. “Essential of Computer Architecture”, Douglas E. Corner, Pearson

References:

1. “Computer Organization and Design” David A. Patterson, John L. Hennessy, Elsevier.

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Course Description

Title of Course: Advanced OOPs using C++ Lab
Course Code: EC594B
L-T-P Scheme: 0-0-3 **Course Credit: 2**

Objectives:
The course presents C++ programming including: advanced C++ environment, exception handling, conception of different file handling, template, STL that aims to:

- Be able to code using more advanced C++ features such as class, objects, operator overloads, dynamic memory allocation, inheritance and polymorphism, exception handling, etc.
- Be able to build class template, function template and also they will able to know how practically STL are works.
- Be able to understand practically different string operations and different file operations, like text file, binary file.

Learning Outcomes:

- Be able to develop different types of computer programs using C++.
- Understand exception handling mechanism anddifferent file(text, binary) operations.
- Understand the usage of template: class template & function template and STL.
- Be able to do different operations on string in C++ programming.

Course Contents:
Exercises that must be done in this course are listed below:
Exercise No.1: Introduction, Basics of C++, Inline function, friend function, function and overloading, inheritance
Exercise No. 2: Exception Handing: throwing, catching, rethrowing mechanism; Multiple catch statement
Exercise No. 3: Template: Class template, Function template
Exercise No. 4: Console I/O operations: C++ streams; C++ stream classes; Unformatted I/O operations; Formatted I/O operations; Managing output with Manipulators.
Exercise No. 5: Working with Files: Text File: Basic file operations on text file: Creating/Writing text into file; Binary File: Creation of file, writing data into file, searching.
Exercise No. 6: Standard Template Library: Components of STL; Containers, Iterator; Applications of container classes.
Exercise No. 7: String Manipulation: The String class; Creating String object; Manipulating strings; Relational operations on strings; String comparison characteristics.

Text Books:

- Schildt, H., The Complete Reference C++, Tata McGraw Hill Education Pvt. Ltd.
- E.Balagurusamy; Object Oriented programming with C++; Tata McGraw Hill Education Pvt. Ltd.

References:

- Debasish Jana, C++ object oriented programming paradigm, PHI.
- D. Ravichandran, Programming with C++, Tata McGraw Hill Education Pvt. Ltd.
- Y.I. Shah and M.H. Thaker, Programming In C++, ISTE/EXCEL BOOKS.