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: Electrical Machine II
Course Code: EE501
L-T Scheme: 3-1 **Course Credits: 4**

Introduction:

This course gives electromechanical energy conversion concepts, ideas of alternators and synchronous motors, operation of several special machines. The Topics to be covered (tentatively) include:

- Induction Motor's constructions
- Three phase winding designing
- Concepts of voltage regulation methods
- Features of alternators
- Parallel operation of synchronous generators
- Operating principle of synchronous motors
- Fundamental concepts special machines

Objectives:

The objective of the course is to introduce three phase winding design, in-depth understanding of Electrical Machine, to understand the role of Electrical Machines in real life applications.

Learning Outcomes:

Knowledge:

1. Learning Constructional details, principle of operation, Performance of Induction Motors
2. Design three-phase circuits in electrical machines
3. General features single phase induction motors
4. Working principle of single phase Induction motors
5. Single Phase AC series motor, Compensated & uncompensated motors
6. Learning Constructional details, principle of operation, Performance of Alternator
7. Knowledge of parallel operation of alternators
8. Concepts of Synchronous motor operation

Application:

1. Electric machines, in the form of generators, produce virtually all electric power on Earth.
2. Electric motors are found in applications as diverse as industrial fans, blowers and pumps, machine tools, household appliances.
3. Special machines like synchro, servo motors etc have huge application in position controlling.

Course Contents:

Unit 1: **Single phase induction motor:** Construction, Double revolving field theory, Starting methods, Phasor diagram, Speed — Torque characteristics, Condition of maximum torque, Determination of equivalent circuit parameters, Applications Single Phase AC series motor, Compensated & uncompensated motors

Unit 2: Synchronous machines: Construction, Armature Winding, winding factors, Excitation systems, Armature reaction, Theory for salient pole machine, Two reaction theory, Voltage regulation (EMF,MMF,ZPF), Parallel operation of Alternators, Synchronous machine connected to infinite bus, effect of change of excitation and speed of prime mover, Construction and Starting of Synchronous motor, V- Curve, Damper winding. Hunting

Unit 3: Special Electromechanical Devices: Principle and construction of Reluctance motor, Permanent magnet machines, Brushless D.C machines, Stepper motor, AC servo motors, Principle, Construction and operational characteristics of Induction Generators

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Course Description

Text Books

1. Ashfaq Husain , Electric Machines, Dhanpat Rai & Co

References

1. P.S. Bimbhra ,Electrical Machinery , Khanna Publishers
2. V. K. Meheta , Principles of Electrical Machines, S. Chand

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Course Description

Title of Course: Power System-I
Course Code: EE502
L-T Scheme: 3-1 **Course Credits: 4**

Introduction:

To introduce the students with different types of substation, different type of eathing system, different type of feeder with radial and loop system. Load flow studies by Gauss siedel and Newton rapson method. Design and operation of a transmission line influenced for the determination of voltage drop, line losses and efficiency of transmission, which are generally influenced by line constant R,L,Cof transmission line. Besides that one can acknowledge with voltage regulation of long medium, short transmission line. Different type of fault occur in transmission line. During power transmission, lot of protection were being taken by using protective devices.

Objective: Main objective of this subject is that it will help students to make a perfect design for power transmission purpose by using various transmission equipment with proper orientation and having within safety limit.

Course outcome:-
At the end of the study a perfect design will come out for power system design, by which all equipment will work perfectly so that a system will able to work perfectly without any breakdown. A student can see the test of the function of under voltage relay, over voltage relay, over current relay, whether it is working perfectly or not according to his design. Any kinds of adverse situation arises then whole circuit should be tripped by using the protective circuit equipment.

Course Contents :-

1. Overhead transmission line:-

2. Overhead Line construction:-

3. Insulators:-

4. Corona:

5. Cables:

6. Performance of lines:-

7. Generation of Electric Power:

8. Tariff and Indian Electricity Rule-1956:

Text Book: A text book on Power System Engineering by Soni. Gupta, Bhatnagar & Chakraborty

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Course Description

Title of Course: Control System-I
Course Code: EE503
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.

Text Books

1. Linear Control Systems with MATLAB Applications (11th edition), by B SManke, 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 ControlEngineering (3rdedition), by Katsuhiko Ogata, Prentice HallofIndiaPvt.Ltd.

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Course Description

Title of Course: Advanced OOPs using C++
Course Code: EE504A
L-T-P Scheme: 3-0-0 **Course Credit: 3**

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

Course Description

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.

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Course Description

Title of Course: Computer Organization
Course Code: EE504B
L-T Scheme: 3-1 **Course Credits: 4**

Introduction:

This course examines the basic organization of digital computer and discuss about all the components of it like memory, ALU, Input-Output devices etc. The Topics to be covered (tentatively) include:

- Necessity of digital computer
- Basic working principal of digital computer
- Processing of high level computer language at the hardware level
- Basic concept of microprocessor
- Basic design of ALU and control unit
- Various addressing modes and bus structure
- I/O subsystem
- Concept of pipeline
- Memory unit

Objectives:

The objective of this course is to introduce the organization of a computer and its principal components, viz, ALU, Control, Memory and Input/output. The course will also enable the student to understand the design components of a digital subsystem that required realizing various components such as ALU, Control, etc.

Learning Outcomes:

Upon successful completion of the course, a student will be able to:

1. An ability to understand theory of Digital Design and Computer Organization to provide an insight of how basic computer components are specified.
2. An ability to understand the functions of various hardware components and their building blocks
3. An ability to understand and appreciate Boolean algebraic expressions to digital design
4. An in depth understanding of sequential & Combinational circuits
5. An in depth understanding of realization of different combinational/sequential circuits
6. An in depth understanding of different stages of an instruction execution
7. An in depth understanding of how different hardware components are related and work in coordination
8. An ability to understand computer buses and input/output peripherals
9. An ability to understand memory hierarchy and design of primary memory

Course Contents:

Unit 1: Basic organization of the stored program computer and operation sequence for execution of a program. Role of operating systems and compiler/assembler. Fetch, decode and execute cycle, Concept of operator, operand, registers and storage, Instruction format. Instruction sets and addressing modes. Commonly used number systems. Fixed and floating point representation of numbers.

Unit 2: Overflow and underflow. Design of adders - ripple carry and carry look ahead principles. Design of ALU. Fixed point multiplication -Booth's algorithm. Fixed point division-Restoring and non-restoring algorithms. Floating point - IEEE 754 standard.

Unit 3: Memory unit design with special emphasis on implementation of CPU-memory interfacing. Memory organization, static and dynamic memory, memory hierarchy, associative memory.Cache memory, Virtual memory. Data path design for read/write access.

Unit 4: Design of control unit - hardwired and microprogrammed control. Introduction to instruction pipelining. Introduction to RISC architectures. RISC vs CISC architectures.
I/O operations - Concept of handshaking, Polled I/O, interrupt and DMA.

Text Books

1. M. Morris Mano & Michael D. Ciletti (2013), Digital Design, 5th Edition, PHI.
2. Carl Hamacher, Zvonko Vranesic, Safwat Zaky (2011), Computer Organization, 5th Edition, McGraw-Hill.

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Course Description

Title of Course: Microprocessor & Microcontroller
Course Code: EE504C
L-T Scheme: 3-0 **Course Credits: 3**

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).

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Course Description

Title of Course: Electric Machine-II Lab
Course Code: EE591
L-T-P scheme: 0-0-3 **Course Credit: 2**

Objectives:
1. To introduce the student fundamentals of Electromechanical energy conversion
2. Providing an in-depth understanding of Electrical Machine.
3. To learn the role of Electrical Machines in real life applications.

Learning Outcomes: The students will have a detailed knowledge of the concepts Electrical Machines and their operating principles. Upon the completion of Operating Systems practical course, the student will be able to:

- **Understand** constructional details, principle of operation, Performance of Induction Motors.
- **Understand** general features of alternators.
- **Learn** the concepts of voltage regulation.
- **Learn** the Concepts of Synchronous motor operation

Course Contents:
Exercises that must be done in this course are listed below:
Exercise No. 1: Study the star delta starter of three phase induction motor
Exercise No. 2: Study the characteristics of three phase alternator by OCC & SCC test
Exercise No. 3: Perform slip test and determine X_d & X_q of an alternator.
Exercise No. 4: Perform no load and block rotor test of single phase induction motor.
Exercise No. 5: Study V curve of Synchronous Motor.

Text Book:
Ashfaq Husain, Electric Machines, Dhanpat Rai & Co.

Recommended Systems/Apparatus Requirements:
Laboratory Kits, Multimeters, Connecting wires, Watt Meters.

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Course Description

Title of Course: Power System-I Lab
Course Code: EE592
L-T-P scheme: 0-0-3 **Course Credit: 2**

Objectives:

1. To learn how to handle various electrical equipment to perform experiments of electrical background.
2. To provide an understanding of safety measures necessary to take while nurture electrical equipment of different voltage and current level.
3. To provide a window to investigate and verify various laws, theories, and concepts regarding power system analysis.

Learning Outcomes: The students will have a detailed knowledge of electrical equipment handling and will get to be comfortable with various safety measures and caution which is of outmost importance to be taken while implementing electrical equipments of different voltage and current level practically. The students will also get the opportunity & better understanding of various concepts, laws, & theories applicable regarding power system by investigating and verifying them practically. Upon the completion of Operating Systems practical course, the student will be able to:

- **Understand** and will be able to handle various electrical equipment to perform experiments, and as well as to design practically if required.
- **Use** of different safety precautions for experiment or practical purposes.
- **Analyze** designed circuit to see weather various laws, theories, and concepts regarding power system holds or not.

Course Contents:

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

Exercise No.1: Study of Ferranti Effect experimentally.
Exercise No. 2: Evaluation of ABCD parameters by Short and open circuit test of long transmission line experimentally.
Exercise No. 3: Evaluation of ABCD parameters by Short and open circuit test of medium transmission line experimentally.
Exercise No. 4: Evaluation of ABCD parameters by Short and open circuit test of short transmission line experimentally.
Exercise No. 5: Transformer Oil Testing

Text Book:

1. Electrical Power System, Subir Roy, Prentice Hall

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Course Description

Title of Course: Control System-I Lab
Course Code: EE593
L-T-P scheme: 0-0-3 **Course Credit: 2**

Objectives:

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

Learning Outcomes:

On successful completion of this lab course, the students would beable 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 of2 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: Advanced OOPs using C++ Lab
Course Code: EE594A
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.

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Course Description

Title of Course: Computer Organization Lab
Course Code: EE594B
L-T-P Scheme: 0-0-3 **Course Credits: 2**

Objective:

1. Understand the architecture of a modern computer with its various processing units.

2. To learn and understand IC of basic gates.

3. To provide an efficient understanding of the Hardware, design complete circuit.

Learning Outcomes: The students will have a detailed knowledge of the concept of IC

1. Students can understand the architecture of modern computer.

2. They can analyze the Performance of a computer using performance equation

3. Students can calculate the effective address of an operand by addressing modes

4. They can understand how computer stores positive and negative numbers.

5. Understanding of how a computer performs arithmetic operation of positive and negative numbers.

6. Understanding of how computer stores floating point numbers in IEEE 754 standard.

7. Students can understand how cache mapping occurs in computer and can solve various problems related to this.

8. Secondary storage organization and problem solving

Course Contents:

Unit –I: Basic gates

Study about logic gates and verify their truth tables. XOR (IC 7486), OR (IC 7432),NOT (IC 7404), AND (IC 7408),NAND (IC 7400), etc. Also implementation basic gates using universal gate (NAND).

Unit –II: Half adder, Full Adder

Implement Half and Full Adder using basic gates and check with the following truth table. Half Adder and Full Adder circuits is explained with their truth tables in this article. Design of Full Adder using Half Adder circuit is also shown. Single-bit Full Adder circuit and Multi-bit addition using Full Adder

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Course Description

Unit –III: Half Substractor, Full Substractor.

Implement Half and Full Adder using basic gates and check with the following truth table. Half Subtractor is used for subtracting one single bit binary digit from another single bit binary digit. Full Subtractor, A logic Circuit Which is used for Subtracting Three Single bit Binary digit is known as Full Subtractor

Unit –IV: 4-bit parallel Binary adder and substractor.

The arithmetic addition of two binary digits, together with an input carry from a previous stage. The serial addition method uses only one full-adder circuit and a storage device to hold the generated output carry and sum.

Unit –V: BCD adder

The arithmetic addition of two decimal digits in BCD, together with an input carry from a previous stage. Since each input digit does not exceed 9, the output sum cannot be greater than 19, the 1 in the sum being an input carry.

Unit –VI: 8 to 1 Multiplexer unit (MUX)

It transfer a large number of information units over a smaller number of channels, (usually one channel) under the control of selection signals. Multiplexer means many to one. A multiplexer is a circuit with many inputs but only one output.

Unit –VII: DEMULTIPLEXER

It perform the opposite function of multiplexers.

Unit –VIII: BCD to 7 segment decoder

Using digital kit implement Digital number (0,1,2,3,4,5,6,7,8,9)

Unit –IX: BCD TO EXCESS 3CODE CONVERTOR

The excess-3 code digit is obtained by adding three to the corresponding BCD digit.

Unit –X: FLIP FLOP

S-R Flip Flop, J-K Flip Flop, T Flip Flop, T Flip Flop

Unit –X: Design a composite ALU.

Implement Airthmatic Logic Unit Arithmetic operations are like addition ,substraction, multiplication, and division. Logical operations are like and, or nand, nor ,not operations on bits

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Course Description

Text Book:

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

References:

1. S.Salivahanan & S.Arivazhagan, **"**Digital Circuits and Design", VIKAS publishing house PVT LTD

Recommended Systems/ Software Requrements:

1. Trainer kit

2. IC (Integrated Circuit)

3. Wire/ Probes

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Course Description

Title of Course: Microprocessors & Microcontrollers lab
Course Code: EE594C
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: Group Discussion
Course Code: HU581
L-T –P Scheme: 0-0-3 **Course Credits: 2**

A group discussion aims at a structured but informal exchange of knowledge, ideas, and perceptions among the participants on any issue, topic or sub-topic. Contributions are pooled together and examined in terms of their relevance and validity to the discussion objectives. If planned and organized in a structured way and certain essential conditions are met, it can provide a highly enriching and stimulating experience to the participants. Lets us see, the objectives, different steps involved in it and its limitations.

Objectives of a Group Discussion

- Produce a range of options or solutions, addressing a particular problem or an issue.
- Generate a pile of ideas by examining issues in greater depth, looking at different dimensions of these issues.
- Broaden the outlook of the participants through cross-fertilization and exposure to new and different experiences and ideas and enrich their understanding of the issues under discussion.
- Develop their skills in interpersonal communication and in expressing their views in a clear and succinct manner.
- Effective means of changing attitudes through the influence of peers in the group
- Valuable means of obtaining feedback for the training team on verbal skills, motivation level and personal traits of the participants and characteristics of the group

Steps in organizing a Group Discussion

- Setting up the Groups
- Planning a Group Discussion
- Preparation of Group Reports
- Presentation and Consolidation of Group Reports

Limitations

- If the group is large, not all the members may get the opportunity to participate and contribute to the discussion.
- If the task is not clearly defined, the discussion may lack focus and, as a result, it may be unproductive.
- Difficulties can arise if the leader is unskilled in guiding the discussion and/or not familiar with the topic or the issues.
- Some members may dominate and, in a way, hijack the discussion.

Course Description

- As this is a group task, some members may take it easy and not feel constrained to participate.

Learning outcomes

After studying this course, you should be able to:

- understand the key skills and behaviours required to facilitate a group discussion
- prepare effectively before facilitating a meeting
- consider some of the difficult behaviours that can occur in meetings
- think of some possible strategies for dealing with these.