## Course Outcome (CO) [1st Year Theory Old Syllabus]

| | |
|---|---|
| Department | Basic Science & Humanities (CSE / IT/ ME / ECE/ EE/ CE / AEIE) |
| Course Code | HU 101 |
| Title of Course | English Language and Technical Communication |
| Nature of Course | Compulsory |
| Type of Course | Lecture |
| Contact Hours | 2L + 0T |
| Total Contact Hours | 25 |
| Course Out Come | CO1: Ability to Communicate technical matters<br><br>CO2: Ability to Communicate fluently and confidently on all spheres of everyday matters. |

| | |
|---|---|
| Department | Basic Science & Humanities |
| Course Code | PH-101 |
| Title of Course | Physics-I |
| Nature of Course | Compulsory |
| Type of Course | Lecture |
| Contact Hours | 3L + 1T |
| Total Contact Hours | 42 |
| Course Out Come | **CO1:** Ability to understand the general property of matters and the Oscillation property.<br><br>**CO2:** Ability to know optics property.<br><br>**CO3:** Ability to learn basics of Quantum Physics<br><br>**CO4:** Ability to understand Crystallography and get the idea of crystal structure and understand the property and behaviour of X-Ray. |

| | |
|---|---|
| Department | Basic Science & Humanities |
| Course Code | M-101 |
| Title of Course | Mathematics-I |
| Nature of Course | Compulsory |
| Type of Course | Lecture |
| Contact Hours | 3L + 1T |
| Total Contact Hours | 40 |
| Course Out Come | **CO1:**Ability to explain the Knowledge of Matrix, Eigen value problems.<br><br>**CO2:** Ability to determine the solutions for differential equations which are useful in the Study of Circuit theory and oscillatory systems.<br><br>**CO3:** Ability to understand Calculus of Functions of Several Variables Partial derivatives, Total differential equations for Electro-magnetic theory, Transmission lines and Vibrating membranes.<br><br>**CO4:** Ability to use the convergence and Divergence of infinite series in the study of communication systems. |

| | |
|---|---|
| | **CO5:** Ability to understand Vector Algebra and Vector Calculus. |

| | |
|---|---|
| Department | EE |
| Course Code | **ES101** |
| Title of Course | **Basic Electrical & Electronic Engineering –1 (Group A+Group B)** |
| Nature of Course | Compulsory |
| Type of Course | Theory |
| Contact Hours | 3L+1T |
| Total Contact Hours | 41 |
| Course Out Come | **CO1:** Ability to explain the fundamentals of Physics.<br>**CO2:** Ability to explain the basic knowledge of Electrical and Electronics Engineering.<br>**CO3:** Ability to apply DC network theorem and Kirchhoff's law on different electrical circuits.<br>**CO4:** Ability to determine AC fundamentals like generation of ac voltages, waveforms, average and RMS values, peak factor, form factor, series and parallel resonance circuits.<br>**CO5:** Ability to explain principles of electromagnetism and associated laws.<br>**CO6:** Ability to identify various semiconductors and ability to design and analyse different electrical circuits using different semiconductors. |

| | |
|---|---|
| Department | ME |
| Course Code | **ME101** |
| Title of Course | **Engg. mechanics** |
| Nature of Course | Compulsory |
| Type of Course | Theory |
| Contact Hours | 3L+1T |
| Total Contact Hours | 41 |
| Course Out Come | **CO1:** Understand the vectorial and scalar representation of forces and moments.<br>**CO2:** Analyse the properties of surfaces & solids in relation to moment of inertia. |

| | |
|---|---|
| | **CO3:** Comprehend the effect of Friction on general plane motion. |

**Course Outcome (CO) [1st Year Practical Old Syllabus] Session 2015-16, 2016-17, 2017-18**

| | |
|---|---|
| Department | Basic Science & Humanities |
| Course Code | PH-191 |
| Title of Course | Physics Practical-I |
| Nature of Course | Compulsory |
| Type of Course | Lecture |
| Contact Hours | 3P |
| Total Contact Hours | 30 |
| Course Out Come | **CO1:** Ability to understand the general property of matters like viscosity, Young's Modulus and Modulus of Rigidity<br><br>**CO2:** Ability to know optical property.<br><br>**CO3:** Ability to learn electrical property.<br><br>**CO4:** Ability to understand thermal conductivity |

| | |
|---|---|
| Department | EE |
| Course Code | **ES191** |
| Title of Course | **Basic Electrical &Electronic Engineering– 1(Lab)(Group A+Group B)** |
| Nature of Course | Compulsory |
| Type of Course | Practical |
| Contact Hours | 3P |
| Total Contact Hours | 30 |
| Course Out Come | **CO1:** Ability to perform different experiments of Basic Electrical and Electronics Engineering.<br>**CO2:** Ability to perform different experiments to verify network theorems. |

| | |
|---|---|
| Department | ME |
| Course Code | **ME191** |
| Title of Course | Engg. Drawing & computer graphics |
| Nature of Course | Compulsory |
| Type of Course | Practical |
| Contact Hours | 3P |
| Total Contact Hours | 30 |
| Course Out Come | **CO1:** Use the drawing instruments effectively and able to dimension the given figures.<br>**CO2:** Appreciate the usage of engineering curves in tracing the paths of simple machine components.<br>**CO3:** Able to draw the basic views related to projections of Lines, Planes. |

| | |
|---|---|
| Department | Basic Science & Humanities |

| | |
|---|---|
| Course Code | HU 181 |
| Title of Course | Language Laboratory |
| Nature of Course | Compulsory |
| Type of Course | Practical |
| Contact Hours | 2P |
| Total Contact Hours | 19 |
| Course Out Come | CO1: Ability to develop skills of technical communication in English through Language Lab practice sessions.<br><br>CO2: Ability to Communicate confidently and competently in English in all spheres. |

| | |
|---|---|
| Department | Basic Science & Humanities |
| Course Code | XC181 |
| Title of Course | Extra-Curricular Activities(NSS/NCC/NSO etc) |
| Nature of Course | Compulsory |

| | |
|---|---|
| Type of Course | Practical |
| Contact Hours | 2P |
| Total Contact Hours | 19 |
| Course Out Come | CO1: To enable the students to understand the community in which they works<br><br>CO2: To understand themselves in relation to their community.<br><br>CO3: To identify the needs and problems in the community in the solution of which they can be involved. |

| | |
|---|---|
| Department | IT |
| Course Code | CS201 |
| Title of Course | Basic computation and principles of computer programming |
| Nature of Course | Professional core courses |
| Type of Course | Theory |
| Contact Hours | 3L, 1T |
| Total Contact Hours | 48 |
| Credit | 3 |
| Course Outcomes | CO1: a) Define ,b) explain in detail, and thereafter c) state the necessity/importance of the fundamental concepts of Programming for Problem Solving<br><br>CO2: a) Directly apply the fundamental concepts of Programming to solve (implement) the most elementary/simplest model problems, and thereafter b) Directly combine the fundamental concepts to solve (design and |

| | |
|---|---|
| | implement) elementary model problems on the idealistic components of real-world systems using Programming for Problem Solving.<br><br>CO3: a) Analyze (identify parts, their interconnections and flow of information) the design and implementation of idealistic components of real world systems, and thereafter b) Compute the output of given model subsystems (and also identify errors in the design and implementation of given model subsystems using the concept of Programming for Problem Solving<br><br>CO4: a) Compare and contrast in details between the fundamental concepts of Algorithm and Programming and thereafter b) describe an overview level interconnected map of concepts/terminologies of Programming for Problem Solving.<br><br>CO5: a) Identify and thematically explain where and how the terminologies are utilized in large scale real world systems, and thereafter b) Design the schematics for typical components of large scale known real world systems using the concept of Programming for Problem Solving.<br><br>CO6: a) Identify unsolved but necessary real world problems and thereafter b) generate pragmatic detailed ideas for creation/synthesis of innovative socially necessary products and services to solve such problems in Programming. |

| | |
|---|---|
| Department | Basic Science & Humanities (ECE/ EE/ AEIE/CSE/IT/ME/CE) |
| Course Code | CH 201 |
| Title of Course | Chemistry-1 |
| Nature of Course | Compulsory |
| Type of Course | Lecture |
| Contact Hours | L3 + T1 |
| Total Contact Hours | 42 |
| Course Out Come | CO1: Analyse microscopic chemistry in terms of atomic and molecular orbitals and intermolecular forces.<br><br>CO2: Rationalise bulk properties and processes using thermodynamic considerations. |

| | |
|---|---|
| | CO3: **:** Distinguish the range of the electromagnetic spectrum used for exciting different molecular energy levels in various spectroscopic techniques.<br><br>CO4: Rationalise periodic properties such as ionization potential, electronegativity, oxidation states and electronegativity.<br><br>CO5: List major chemical reactions that are used in the synthesis of molecules. |

| | |
|---|---|
| Department | Basic Science & Humanities |
| Course Code | M 201 |
| Title of Course | Mathematics-II |
| Nature of Course | Compulsory |
| Type of Course | Lecture |
| Contact Hours | 3L + 1T |
| Total Contact Hours | 40 |
| Course Out Come | **CO1:** Ability to learn Ordinary differential equations with higher order and first degree.<br><br>**CO2:** Ability to learn Basics of Graph Theory which are useful in the |

| | |
|---|---|
| | Study of Circuit theory.<br><br>**CO3:** Ability to learn Laplace Transform which is useful in the study of communication systems. |

| | |
|---|---|
| Department | EE |
| Course Code | **ES201** |
| Title of Course | **Basic Electrical &Electronic Engineering-II** |
| Nature of Course | Compulsory |
| Type of Course | Theory |
| Contact Hours | 3L+1T |
| Total Contact Hours | 44 |
| Course Out Come | **CO 1:** Ability to explain electrical properties and simple electrical devices.<br>**CO 2:** Ability to explain construction and mechanism of working of different DC machine, 1-phase transformer and 3-phase induction motor.<br>**CO3:** Ability to understand the basic concepts of 3-phase system and structure of power system.<br>**CO4:** Students must acquire to express binary numbers, convert binary to decimal and vice-versa, draw truth table of various applications, design gates and simple digital circuits using different gates.<br>**CO5:** Ability to distinguish the different gate isolation techniques; explain the V-I characteristics of FETs, OP-AMP etc. |

| | |
|---|---|
| Department | ME |
| Course Code | **ME201** |
| Title of Course | **Basic Electrical &Electronic Engineering-II** |
| Nature of Course | Compulsory |
| Type of Course | Theory |
| Contact Hours | 3L+1T |
| Total Contact Hours | 44 |
| Course Out Come | **CO 1:** Describe basic concepts of **Thermodynamics**. |

| | |
|---|---|
| | **CO2:** Calculate absolute and gage pressure, and absolute temperature.<br>**CO3:** Calculate changes in kinetic, potential, enthalpy and internal energy. |

| | |
|---|---|
| Department | IT |
| Course Code | CS291 |
| Title of Course | Basic computation and principles of computer programming |
| Nature of Course | Professional core courses |
| Type of Course | Practical |
| Contact Hours | 3P |
| Total Contact Hours | 36 |
| Credit | 2 |
| Course Outcomes | CO1: a) Define ,b) explain in detail, and thereafter c) state the necessity/importance of the fundamental concepts of algorithm and correct program.<br><br>CO2: a) Directly apply the fundamental concepts of Programming to solve (implement) the most elementary/simplest model problems, and thereafter b) Directly combine the fundamental concepts to solve (design and implement) elementary model problems on the idealistic components of real-world systems using correct syntax.<br><br>CO3: a) Analyze (identify parts, their interconnections and flow of information) the design and implementation of idealistic components of real world systems, and thereafter b) Compute the output of given model subsystems (and also identify errors in the design and implementation of given model subsystems using the concept of arrays, strings.<br><br>CO4: a) Compare and contrast in details between the fundamental concepts of structures and thereafter b) describe an overview level interconnected map of concepts/terminologies of self-referential structures.<br><br>CO5: a) Identify and thematically explain where and how the terminologies are utilized in large scale real world systems, and thereafter b) Design the |

| | |
|---|---|
| | schematics for typical components of large scale known real world systems using the concept of simple text files.<br><br>CO6: a) Identify unsolved but necessary real world problems and thereafter b) generate pragmatic detailed ideas for creation/synthesis of innovative socially necessary products and services to solve such problems in Programming. |

| | |
|---|---|
| Department | Basic Science & Humanities |
| Course Code | CH-291 |
| Title of Course | Chemistry-1 Lab |
| Nature of Course | Compulsory |
| Type of Course | Practical |
| Contact Hours | P 3 |
| Total Contact Hours | 21 |
| Course Out Come | **CO1**: Ability to apply concept of Solvent Extraction Procedure<br><br>**CO2**: Ability to understand Ph metric and conductometric method of determination for acidity and alkalinity of a solution<br><br>**CO3**: Ability to understand various parameter for the water analysis<br><br>**CO4**: Ability to understand the viscometric method for determination of solution. |

| | |
|---|---|
| Department | EE |
| Course Code | **ES291** |
| Title of Course | **Basic Electrical & Electronic Engineering – II(Lab)** |
| Nature of Course | Compulsory |
| Type of Course | Practical |
| Contact Hours | 3P |
| Total Contact Hours | 30 |
| Course Out Come | **CO1:** Ability to calibrate ammeter and voltmeter and analyse shot circuit and open circuit properties of 1-phase transformer.<br>**CO2:** Ability to explain the different properties of DC machines and |

| | |
|---|---|
| | 3-phase circuit. |

| | |
|---|---|
| Department | ME |
| Course Code | **ME291** |
| Title of Course | **WORKSHOP PRACTICE** |
| Nature of Course | Compulsory |
| Type of Course | Practical |
| Contact Hours | 1L, 3P |
| Total Contact Hours | 48 |
| Course Out Come | **CO1:** To acquire skills in basic engineering practice.<br>**CO2:** To acquire practical skills in the trades. |

| | |
|---|---|
| Department | Basic Science & Humanities |
| Course Code | HU301 |
| Title of Course | Values and ethics in profession |
| Nature of Course | Professional core courses |
| Type of Course | Theory |
| Contact Hours | 3 |
| Total contact hours | 36 |
| Credit | 3 |
| Course Outcomes | CO1: a) Define ,b) explain in detail, and thereafter c) state the necessity/importance of the fundamental concepts of Ethics.<br><br>CO2: Moral principles discussions.<br><br>CO3: Identify and thematically explain professional relationship. |

| | |
|---|---|
| Course Code | PH-301 |

| | |
|---|---|
| Title of Course | Physics-II |
| Nature of Course | Compulsory |
| Type of Course | Lecture |
| Contact Hours | L + T<br>3 + 1 |
| Total Contact Hours | 39 |
| Course Out Come | **CO1**: To elaborate the concept of vector calculus and its applications in engineering problem solving.<br>**CO2** To analyze laws of electricity and their applicability. Ability to know the properties of dielectric and explain different properties of Magnetostatics, Time Varying Field and Electromagnetic theory<br>**CO3:** To be familiarized with Schrödinger wave equation and its applications.<br>**CO4:** To be familiarized with the basic concept of Statistical Mechanics and to understand the applicability of M-B, B-E and F-D statistics. |

| | |
|---|---|
| Department | Basic Science & Humanities (ME/ CE/ CSE/ IT) |
| Course Code | CH-301 |
| Title of Course | Basic Environmental Engineering and Elementary Biology |
| Nature of Course | Compulsory |
| Type of Course | Lecture |
| Contact Hours | L3 |
| Total Contact Hours | 40 |
| Course Out Come | **CO1**: Ability to understand Basic ideas of environment, Ecology.<br>**CO2**: Ability to learn Air, Water, Land, & Noise pollution and control.<br>**CO3**: Ability to gain knowledge about the Environmental Management which includes Environmental impact assessment, Environmental Audit, laws and protection act of India, Different international environmental treaty/agreement/ protocol. |

| | |
|---|---|
| Department | IT |
| Course Code | CS 301 |
| Title of Course | Analog and digital electronics |
| Nature of Course | Compulsory |
| Type of Course | Theory |
| Contact Hours | 3 |
| Total contact hours | 30 |
| Credit | 3 |
| Course Outcomes | CO1: a) Define ,b) explain in detail, and thereafter c) state the necessity/importance of the fundamental concepts of Programming for Problem Solving<br><br>CO2: a) Directly apply the fundamental concepts of Programming to solve (implement) the most elementary/simplest model problems, and thereafter b) Directly combine the fundamental concepts to solve (design and implement) elementary model problems on the idealistic components of real-world systems using Programming for Problem Solving. |

| | |
|---|---|
| | CO3: a) Analyze (identify parts, their interconnections and flow of information) the design and implementation of idealistic components of real world systems, and thereafter b) Compute the output of given model subsystems (and also identify errors in the design and implementation of given model subsystems using the concept of Programming for Problem Solving<br><br>CO4: a) Compare and contrast in details between the fundamental concepts of Algorithm and Programming and thereafter b) describe an overview level interconnected map of concepts/terminologies of Programming for Problem Solving.<br><br>CO5: a) Identify and thematically explain where and how the terminologies are utilized in large scale real world systems, and thereafter b) Design the schematics for typical components of large scale known real world systems using the concept of Programming for Problem Solving.<br><br>CO6: a) Identify unsolved but necessary real world problems and thereafter b) generate pragmatic detailed ideas for creation/synthesis of innovative socially necessary products and services to solve such problems in Programming. |

| | |
|---|---|
| Department | IT |
| Course Code | CS302 |
| Title of Course | Data Structure & Algorithm |
| Nature of Course | Professional core courses |
| Type of Course | Lecture |
| Contact Hours | 3L.1T |
| Total contact hours | 48 |
| Credit | 3 |
| Course Outcomes | CO1: a) Define ,b) explain in detail, and thereafter c) state the necessity/importance of the fundamental concepts of Data Structure & Algorithm.<br><br>CO2: a) Directly apply the fundamental concepts of Data Structure & |

| | |
|---|---|
| | Algorithm to solve (implement) the most elementary/simplest model problems, and thereafter b) Directly combine the fundamental concepts to solve (design and implement) elementary model problems on the idealistic components of real-world systems using different data.<br><br>CO3: a) Analyze (identify parts, their interconnections and flow of information) the design and implementation of idealistic components of real world systems, and thereafter b) Compute the output of given model subsystems (and also identify errors in the design and implementation of given model subsystems using the concept of solving problem.<br><br>CO4: a) Compare and contrast in details between the fundamental concepts of dynamic and static data structures and thereafter b) describe an overview level interconnected map of concepts/terminologies of dynamic and static data structures.<br><br>CO5: a) Identify and thematically explain where and how the terminologies are utilized in large scale real world systems, and thereafter b) Design the schematics for typical components of large scale known real world systems using the concept of principal algorithms for sorting, searching, and hashing.<br><br>CO6: a) Identify unsolved but necessary real world problems and thereafter b) generate pragmatic detailed ideas for creation/synthesis of innovative socially necessary products and services to solve such problems in Data Structure & Algorithm. |

| | |
|---|---|
| Department | Information Technology |
| Course Code | CS303 |
| Title of Course | Computer Organization |
| Nature of Course | Theory |
| Type of Course | Program Core |
| Contact Hours | 3+1=4 |
| Total contact hours | 36 |
| Credit | 4 |
| Course Outcomes | CO1<br><br>a) Define, b) explain in detail, and thereafter c) state the necessity/importance of basic organization of computer, role of operating system and compiler/assembler, instruction cycle, instruction format, addressing modes, commonly used number systems, overflow and underflow, design of adders, design of ALU, design of memory unit, memory organization, design of control unit. |

| | |
|---|---|
| | CO2<br><br>a) Directly apply basic organization of computer, role of operating system and compiler/assembler, instruction cycle, instruction format, addressing modes, commonly used number systems, overflow and underflow, design of adders, design of ALU, design of memory unit, memory organization, design of control unit to solve (implement) the most elementary/simplest model problems, and thereafter b) Directly combine the above concepts to solve (design and implement) elementary model problems on the idealistic components of real-world systems.<br><br>CO3<br><br>a) Analyze (identify parts, their interconnections and flow of information) the design and implementation of idealistic components of real world systems requiring computer organization, and thereafter b) Compute the output of given model subsystems (and also identify errors in the design and implementation of given model subsystems).<br><br>CO4<br><br>a) Compare and contrast in details among basic organization of computer, role of operating system and compiler/assembler, instruction cycle, instruction format, addressing modes, commonly used number systems, overflow and underflow, design of adders, design of ALU, design of memory unit, memory organization, design of control unit, and thereafter b) describe an overview level interconnected map of concepts.<br><br>CO5<br><br>a) Identify and thematically explain where and how basic organization of computer, role of operating system and compiler/assembler, instruction cycle, instruction format, addressing modes, commonly used number systems, overflow and underflow, design of adders, design of ALU, design of memory unit, memory organization, design of control unit are utilized in large scale real world systems with computer organization components , and thereafter b) Design the schematics for typical components of large scale known real world systems with computer organization components.<br><br>CO6<br><br>a) Identify unsolved but necessary real world problems with computer organization components and thereafter b) generate pragmatic detailed ideas for creation/synthesis of innovative socially necessary products and services to solve such problems. |

| | |
|---|---|
| Department | Basic Science & Humanities |
| Course Code | PH- 391 |
| Title of Course | Physics Practical -II |
| Nature of Course | Compulsory |
| Type of Course | Lecture |
| Contact Hours | 3P |
| Total Contact Hours | 36 |
| Course Out Come | **CO1**: Ability to understand Lande g factor of electron, specific charge of electron and energy band gap of semiconductor.<br><br>**CO2**: Ability to study Hall effect of semiconductors and characteristics of solar photovoltaic cell. |

| | |
|---|---|
| Department | IT |
| Course Code | CS391 |
| Title of Course | Analog & digital electronics |
| Nature of Course | Professional core courses |

| | |
|---|---|
| Type of Course | Practical |
| Contact Hours | 3 |
| Total contact hours | 30 |
| Credit | 2 |
| Course Outcomes | CO1: a) Define ,b) explain in detail, and thereafter c) state the necessity/importance of the fundamental concepts of analog and digital electronics.<br><br>CO2: Ripple and Regulation characteristics of full wave rectifier with and without cap.<br><br>CO3: Analyze Ripple factor. |

| | |
|---|---|
| Department | IT |
| Course Code | CS392 |
| Title of Course | Data Structure & Algorithm Lab |
| Nature of Course | Professional core courses |
| Type of Course | Practical |
| Contact Hours | 3 |
| Total contact hours | 36 |
| Credit | 2 |
| Course Outcomes | CO1: a) Define ,b) explain in detail, and thereafter c) state the necessity/importance of the fundamental concepts of Data Structure & Algorithm.<br><br>CO2: a) Directly apply the fundamental concepts of Data Structure & Algorithm to solve (implement) the most elementary/simplest model problems, and thereafter b) Directly combine the fundamental concepts to solve (design and implement) elementary model problems on the idealistic components of real-world systems using different data. |

| | |
|---|---|
| | CO3: a) Analyze (identify parts, their interconnections and flow of information) the design and implementation of idealistic components of real world systems, and thereafter b) Compute the output of given model subsystems (and also identify errors in the design and implementation of given model subsystems using the concept of solving problem.<br><br>CO4: a) Compare and contrast in details between the fundamental concepts of dynamic and static data structures and thereafter b) describe an overview level interconnected map of concepts/terminologies of dynamic and static data structures.<br><br>CO5: a) Identify and thematically explain where and how the terminologies are utilized in large scale real world systems, and thereafter b) Design the schematics for typical components of large scale known real world systems using the concept of principal algorithms for sorting, searching, and hashing.<br><br>CO6: a) Identify unsolved but necessary real world problems and thereafter b) generate pragmatic detailed ideas for creation/synthesis of innovative socially necessary products and services to solve such problems in Data Structure & Algorithm. |

| | |
|---|---|
| Department | Information Technology |
| Course Code | CS 393 |
| Title of Course | Computer Organization Lab |
| Nature of Course | Practical |
| Type of Course | Program Core |
| Contact Hours | 3 |
| Total contact hours | 33 |
| Credit | 2 |
| Course | CO1 |

| | |
|---|---|
| Outcomes | a) Define, b) explain in detail, and thereafter c) state the necessity/importance of IC-chips like Multiplexer , Decoder, Encoder, Comparator, Truth Table verification and clarification from Data-book, design of adder/ Subtractor composite unit, Design of BCD adder, Design of a 'Carry-Look-Ahead' Adder circuit, use of multiplexer unit to design a composite ALU, use of ALU chip for multibit arithmetic operation, implementation read write operation using RAM IC, Cascading two RAM ICs for vertical and horizontal expansion<br><br>CO2<br><br>a) Directly apply IC-chips like Multiplexer , Decoder, Encoder, Comparator, Truth Table verification and clarification from Data-book, design of adder/ Subtractor composite unit, Design of BCD adder, Design of a 'Carry-Look-Ahead' Adder circuit, use of multiplexer unit to design a composite ALU, use of ALU chip for multibit arithmetic operation, implementation read write operation using RAM IC, Cascading two RAM ICs for vertical and horizontal expansion to solve (implement) the most elementary/simplest model problems, and thereafter b) Directly combine the above concepts to solve (design andimplement) elementary model problems on the idealistic components of real-world systems with computer organization components.<br><br>CO3<br><br>a) Analyze (identify parts, their interconnections and flow of information) the design and implementation of idealistic components of real world systems requiring computer organization, and thereafter b) Compute the output of given model subsystems (and also identify errors in the design and implementation of given model subsystems).<br><br>CO4<br><br>a) Compare and contrast in details among IC-chips like Multiplexer , Decoder, Encoder, Comparator, Truth Table verification and clarification from Data-book, design of adder/ Subtractor composite unit, Design of BCD adder, Design of a 'Carry-Look-Ahead' Adder circuit, use of multiplexer unit to design a composite ALU, use of ALU chip for multibit arithmetic operation, implementation read write operation using RAM IC, Cascading two RAM ICs for vertical and horizontal expansion, and thereafter b) describe an overview level interconnected map of concepts.<br><br>CO5<br><br>a) Identify and thematically explain where and how IC-chips like Multiplexer , Decoder, Encoder, Comparator, Truth Table verification and clarification from Data-book, design of adder/ Subtractor composite unit, Design of BCD adder, Design of a 'Carry-Look-Ahead' Adder |

| | |
|---|---|
| | circuit, use of multiplexer unit to design a composite ALU, use of ALU chip for multibit arithmetic operation, implementation read write operation using RAM IC, Cascading two RAM ICs for vertical and horizontal expansion are utilized in large scale real world systems with computer organization components, and thereafter b) Design the schematics for typical components of large scale known real world systems.<br><br>CO6<br><br>a) Identify unsolved but necessary real world problems requiring computer organization and thereafter b) generate pragmatic detailed ideas for creation/synthesis of innovative socially necessary products and services to solve such problems. |

| | |
|---|---|
| Department | Basic Science & Humanities |
| Course Code | M(CS)-401 |
| Title of Course | Numerical Methods |
| Nature of Course | Compulsory |
| Type of Course | Lecture |
| Contact Hours | L + T<br>2 + 1 |
| Total Contact Hours | 28 |
| Course Out Come | **CO1**: Ability to analyse error and to understand numerical computation & Interpolation.<br><br>**CO2**: Ability to learn Numerical integration & solution of linear equations.<br><br>**CO3**: Ability to solve Numerical solution of Algebraic, transcendental equations & ordinary differential equations. |

| | |
|---|---|
| Department | Basic Science & Humanities |
| Course Code | M-401 |
| Title of Course | Mathematics-III |
| Nature of Course | Compulsory |
| Type of Course | Lecture |
| Contact Hours | L + T<br>3 + 1 |
| Total Contact Hours | 48 |
| Course Out Come | CO1: Implement the concept of probability and sampling theory in real life problem solving.<br><br>CO2: Acquire skills for estimating parameters and testing of hypothesis.<br><br>CO3: Understand the basic features of advanced graph theory and algebraic structures. |

| | |
|---|---|
| Department | IT |
| Course Code | CS 401 |
| Title of Course | Communication Engg & Coding theory |
| Nature of Course | Compulsory |
| Type of Course | Theory |
| Contact Hours | 3 |
| Total contact hours | 6 months |
| Credit | 2 |
| Course Outcomes | CO1: Understand the current voltage characteristics of semiconductor devices<br><br>CO2 :Learn about analog transmission.<br><br>CO 3: Evaluate frequency response to understand behavior of Electronics circuits |

| | |
|---|---|
| Department | IT |
| Course Code | CS402 |
| Title of Course | Formal Language & Automata Theory |
| Nature of Course | Professional core courses |
| Type of Course | Theory |
| Contact Hours | 3L,1T |
| Total contact hours | 48 |
| Credit | 3 |
| Course Outcomes | CO1: a) Define ,b) explain in detail, and thereafter c) state the necessity/importance of the fundamental concepts of automata theory.<br><br>CO2: Be able to construct finite state machines and the equivalent regular expressions.<br><br>CO3: Be able to construct pushdown automata and the equivalent context free grammars.<br><br>CO4: Be able to construct Turing machines and Post machines. Be able to |

| | |
|---|---|
| | prove the equivalence of languages described by Turing machines and Post machines |

| | |
|---|---|
| DEPARTMENT | IT |
| COURSE CODE | IT401 |
| TITLE OF COURSE | Object oriented Programming and UML |
| NATURE OF COURSE | Compulsory |
| TYPE OF COURSE | Lecture |
| CONTACT HOURS | 4 |
| TOTAL CONTACT HOURS | 36 |
| COURSE OUTCOMES | CO1: Define, explain in detail and thereafter state the necessity/importance of the fundamental concepts of JVM, java byte-code, classes, functions, data and objects of object oriented paradigm.<br>CO2: Can define, declare and use different kinds of constructors, function overloading, inheritance, abstract classes and methods, interface, package, multi threading, Exception handling, java applet.<br><br>CO3: Can analyse simple problems, identify appropriate components and write program to solve simple problems. Will be able to find output and debug errors.<br>CO4: : Can differentiate and compare between Arrays, String, class, object, Function, Recursion, function overloading, function overriding ,exception, error ,multi threading, multi tasking independently and be able to interconnect these components by appropriate interfaces.<br><br>CO5: Be able to devise a given problem into independent modules and then to solve by integrating the modules by providing appropriate interfaces.<br>CO6: Can Write Java Programs for Unknown real world problems and explain UML. |

| | |
|---|---|
| *Department* | Information Technology |
| *Course Code* | HU 481 |
| *Title of course* | TECHNICAL REPORT WRITING & |

| | |
|---|---|
| | LANGUAGE LAB PRACTICE |
| *Nature of course* | Compulsory |
| *Type of course* | Practical |
| *Contact hours* | 0:3=3 |
| TOTAL CONTACT HOURS | 36 |
| *CREDIT* | 2 |
| *Total contact hours* | 6 MONTHS |
| *Course Outcomes* | CO1: Understand and apply different CONCEPTS IN REPORT WRITING |

| | |
|---|---|
| Department | Basic Science & Humanities |
| Course Code | M(CS)-491 |
| Title of Course | Numerical Methods Lab |
| Nature of Course | Compulsory |
| Type of Course | Lecture |
| Contact Hours | 3P |
| Total Contact Hours | 36 |
| Course Out Come | **CO1**: Ability to understand numerical computation & Interpolation.<br><br>**CO2**: Ability to learn Numerical integration & solution of linear equations.<br><br>**CO3**: Ability to solve Numerical solution of Algebraic, transcendental |

| | |
|---|---|
| | equations & ordinary differential equations. |

| | |
|---|---|
| Department | IT |
| Course Code | CS 491 |
| Title of Course | Communication Engg & Coding theory |
| Nature of Course | Compulsory |
| Type of Course | PRACTICAL |
| Contact Hours | 3+3 |
| Total contact hours | 6 months |
| Credit | 2 |
| Course Outcomes | CO1: Practical experience on modulation.<br><br>CO 2 :Learn about analog transmission.<br><br>CO 3: To be able to apply the knowledge on digital transmission.<br><br>CO 4: To get a basic idea to design a communication system. |

| | |
|---|---|
| Department | IT |
| Course Code | CS492 |
| Title of Course | Software tools |
| Nature of | Professional core courses |

| | |
|---|---|
| Course | |
| Type of Course | Practical |
| Contact Hours | 4+4 |
| Credit | 2 |
| Course Outcomes | CO1: a) Define ,b) explain in detail, and thereafter c) state the necessity/importance of the fundamental concepts of algorithm and correct program.<br><br>CO2: a) Directly apply the fundamental concepts of Programming to solve (implement) the most elementary/simplest model problems, and thereafter b) Directly combine the fundamental concepts to solve (design and implement) elementary model problems on the idealistic components of real-world systems using correct syntax.<br><br>CO3: a) Analyze (identify parts, their interconnections and flow of information) the design and implementation of idealistic components of real world systems, and thereafter b) Compute the output of given model subsystems (and also identify errors in the design and implementation of given model subsystems using the concept of arrays, strings.<br><br>CO4: Use different programming language like python to solve problems. |

| | |
|---|---|
| DEPARTMENT | IT |
| COURSE CODE | IT491 |
| TITLE OF COURSE | Object oriented Programming and UML Lab(IT) |
| NATURE OF COURSE | Compulsory |
| TYPE OF COURSE | Practical |
| CONTACT HOURS | 3 |
| TOTAL CONTACT HOURS | 36 |
| COURSE OUTCOMES | CO1: Define, explain in detail and thereafter state the necessity/importance of the basic control Structures, strings and function for Object Oriented programming. classes,objects, members of a class and the relationships among them needed for a finding the solution to specific problem.<br><br>CO2: Directly apply the concept of constructors, function overloading, reusability using inheritance, interfaces and packages,different exception handling mechanisms and concept of user interface components to design GUI in Java using Applet & AWT along with response to events |

| | |
|---|---|
| | CO3: Can analyse simple problems, identify appropriate components and write program to solve simple problems. Will be able to find output and debug errors.<br>CO4: : Can differentiate and compare between Arrays, String, class, object, Function, Recursion, function overloading, function overriding ,exception, error ,multi threading, multi tasking independently and be able to interconnect these components by appropriate interfaces.<br><br>CO5: Be able to devise a given problem into independent modules and then to solve by integrating the modules by providing appropriate interfaces.<br>CO6: Can Write Java Programs and develop complex Graphical user interfaces for Unknown real world problems using Applet &AWT along with response of events, Java Swing. Draw different UML models. |

---

| | |
|---|---|
| Department | Basic Science & Humanities |
| Course Code | HU 501 |
| Title of Course | Economics for Engineers |
| Nature of Course | Compulsory |
| Type of Course | Lecture |
| Contact Hours | 3L |
| Total Contact Hours | 36 |

| | |
|---|---|
| Course Outcome | **CO1**: Ability to understand Economic Decisions Making and considering that students will learn to find out Engineering Costs & Estimation.<br><br>**CO2**: Ability to learn Cash Flow and also able to calculate Rate of Return Analysis.<br><br>**CO3**: Ability to know Inflation and Price Change, Present Worth Analysis.<br><br>**CO4**: Ability to learn depreciation and able to analysis the requirement of replacement. |

| | |
|---|---|
| Department | Information Technology |
| Course Code | IT501 |
| Title of Course | Design and Analysis of Algorithms |
| Nature of Course | Theory |
| Type of Course | Program Core |
| Contact Hours | 3+1=4 |
| Total contact hours | 36 |
| Credit | 4 |
| Course Outcomes | CO1<br>a) Define, b) explain in detail, and thereafter c) state the necessity/importance of the complexity analysis, algorithm design techniques, lower bound theory, graph traversal, amortized analysis, NP-completeness, approximation algorithms, of the subject design and analysis of algorithms.<br><br>CO2<br>a) Directly apply the complexity analysis, algorithm design techniques, lower bound theory, graph traversal, amortized analysis, NP-completeness, approximation algorithms to solve (implement) the most elementary/simplest model problems, and thereafter b) Directly combine the above fundamental concepts to solve (design and implement) elementary model problems on the idealistic components of real-world systems.<br><br>CO3<br>a) Analyze (identify parts, their interconnections and flow of information) the design and implementation of idealistic components of real world algorithms, and thereafter b) Compute the output of given |

| | |
|---|---|
| | model algorithmic subroutines (and also identify errors in the design and implementation of given model algorithmic subroutines).<br><br>CO4<br>a) Compare and contrast in details between the complexity analysis, algorithm design techniques, lower bound theory, graph traversal, amortized analysis, NP-completeness, approximation algorithms, string matching, network flow, matrix manipulation, disjoint-set manipulation, and thereafter b) describe an overview level interconnected map of concepts/terminologies of design and analysis of algorithms.<br><br>CO5<br>a) Identify and thematically explain where and how the complexity analysis, algorithm design techniques, lower bound theory, graph traversal, amortized analysis, NP-completeness, approximation algorithms, string matching, network flow, matrix manipulation, disjoint-set manipulation, are utilized in large scale real world systems, and thereafter b) Design the schematics for typical components of large scale known real world systems.<br><br>CO6<br>a) Identify unsolved but necessary real world problems having algorithmic component/s and thereafter b) generate pragmatic detailed ideas for creation/synthesis of innovative socially necessary products and services to solve such problems. |

| | |
|---|---|
| Department | IT |
| Course Code | IT 502 |
| Title of Course | Computer Architecture |
| Nature of Course | Compulsory |
| Type of Course | Lecture |
| Contact Hours | 3+1=4 |
| Credit | 3 |
| Course Outcomes | CO1: a) Define, b) explain in detail, and thereafter c) state the necessity/importance of the fundamental logic gates of computer. |

| | |
|---|---|
| | CO2: Directly apply the fundamental concepts of the elements of computer design for programmer.<br><br>CO3: Analyse (identify parts, their interconnections) the design and implementation of idealistic components of real-world systems.<br><br>CO4: Compare and contrast in details between different types of architecture.<br><br>CO5: a) Identify and thematically explain where and how the terminologies are utilized in large scale real world systems and thereafter b) Design the schematics for typical components of large scale known real world systems using the concept of different architecture.<br><br>CO6: a) Identify unsolved but necessary real world problems and thereafter b) generate pragmatic detailed ideas for creation/synthesis of innovative socially necessary products and services to solve such problems for computer architecture. |

| | |
|---|---|
| *Department* | Information Technology |
| *Course Code* | IT 503 |
| *Title of course* | Operating System |
| *Nature of course* | Compulsory |
| *Type of course* | Lecturer |
| *Contact hours* | 3+0=3 |
| *Total contact hours* | 36 |
| *Course Outcomes* | CO1: Understand functional architecture of an operating system<br><br>CO2:Develop algorithms for subsystem components<br><br>CO3:Design device drivers and multi threading libraries for a tiny OS<br><br>CO4:Develop application programs using UNIX system calls<br><br>CO5:Design and solve synchronization problems<br><br>CO6:Understand standard UNIX and FAT file systems |

| | |
|---|---|
| Department | IT |
| Course Code | IT504A |
| Title of Course | Circuit Theory and Networks |
| Nature of Course | Free Elective courses |
| Type of Course | Lecture |
| Contact Hours | 3 |
| *Total contact hours* | 36 |
| Credit | 3 |
| Course Outcomes | CO1: a) Define ,b) explain in detail, and thereafter c) state the necessity/importance of the fundamental concepts of Circuits.<br><br>CO2: Apply concepts of electric network topology.<br><br>CO3: Apply time and frequency concepts of analysis. |

| | |
|---|---|
| Department | IT |
| Course Code | IT504B |
| Title of Course | Data communication |
| Nature of Course | Free Elective courses |
| Type of Course | Lecture |
| Contact Hours | 3 |
| *Total contact hours* | 36 |
| Credit | 3 |
| Course Outcomes | CO1: a) Define ,b) explain in detail, and thereafter c) state the necessity/importance of the fundamental concepts of Circuits.<br><br>CO2: To provide basic knowledge about the various sensors and data acquisition systems applied in Wireless sensor network. |

| | |
|---|---|
| | CO3: Students will be able to calculate time domain and frequency domain parameter for given system. |

| | |
|---|---|
| Department | IT |
| Course Code | IT504C |
| Title of Course | Digital signal processing |
| Nature of Course | Free Elective courses |
| Type of Course | Lecture |
| Contact Hours | 3 |
| *Total contact hours* | 36 |
| Credit | 3 |
| Course Outcomes | CO1: a) Define ,b) explain in detail, and thereafter c) state the necessity/importance of the fundamental concepts of Circuits.<br><br>CO2: To provide basic knowledge about the various sensors and data acquisition systems applied in electronics.<br><br>CO3: Students will be able to calculate time domain and frequency domain parameter for given system. |

| | |
|---|---|
| Department | IT |
| Course Code | IT504D |
| Title of Course | Operation Research |
| Nature of Course | Free Elective courses |
| Type of Course | Lecture |

| | |
|---|---|
| Contact Hours | 3 |
| *Total contact hours* | 36 |
| Credit | 3 |
| Course Outcomes | CO1: a) Define ,b) explain in detail, and thereafter c) state the necessity/importance of the fundamental concepts of LP formulation.<br><br>CO2: a) Directly apply the fundamental concepts of to solve problems on queing theory ,game theory.<br><br>CO3: Analyse network paths. |

| | |
|---|---|
| Department | IT |
| Course Code | IT504E |
| Title of Course | Microprocessors & Microcontrollers |
| Nature of Course | Free Elective courses |
| Type of Course | Lecture |
| Contact Hours | 3 |
| *Total contact hours* | 36 |
| Credit | 3 |
| Course Outcomes | CO1: distinguish and analyze the properties of Microprocessors & Microcontrollers.<br><br>CO2: analyze the data transfer information through serial & parallel ports.<br><br>CO3: train their practical knowledge through laboratory experiments. |

| | |
|---|---|
| DEPARTMENT | INFORMATION TECHNOLOGY |
| COURSE CODE | IT504F |
| TITLE OF COURSE | Programming practices using C++ |
| NATURE OF COURSE | Elective |
| TYPE OF COURSE | Lecture |
| CONTACT HOURS | 3Lecture+1 Tutorial/week |
| TOTAL CONTACT HOURS | 40 |
| COURSE OUTCOMES | CO1: Define, explain in detail and thereafter state the necessity/importance of the fundamental concepts of streams, classes, functions, data and objects of object oriented paradigm .<br><br>CO2: Can define, declare and use dynamic memory management techniques using pointers, constructors, destructors, function overloading, operator overloading, virtual functions and polymorphism, Exception handling, generic programming.<br><br>CO3: Can analyse simple problems, identify appropriate components and write program to solve simple problems. Will be able to find output and debug errors.<br><br>CO4: Can differentiate and compare between Arrays, String, Pointers, Structures, Unions, class, object, Function, Recursion, function overloading, function overriding ,exception, error independently and be able to interconnect these components by appropriate interfaces.<br><br>CO5: Be able to devise a given problem into independent modules and then to solve by integrating the modules by providing appropriate interfaces.<br><br>CO6: Can Write C++ Programs for Unknown real world problems |

| | |
|---|---|
| Department | Information Technology |
| Course Code | IT591 |
| Title of Course | Algorithm Lab |
| Nature of Course | Practical |
| Type of Course | Program Core |
| Contact Hours | 3 |
| Total contact hours | 33 |
| Credit | 2 |
| Course Outcomes | CO1<br>a) Define, b) explain in detail, and thereafter c) state the necessity/importance of the Divide and Conquer, Greedy method, Dynamic programming, Backtracking, branch and bound, graph traversal.<br><br>CO2<br>a) Directly apply the Divide and Conquer, Greedy method, Dynamic programming, Backtracking, branch and bound, graph traversal concepts to solve (implement) the most elementary/simplest model problems, and thereafter b) Directly combine the above concepts to solve (design and implement) elementary model problems/algorithms on the idealistic algorithmic components of real-world systems.<br><br>CO3<br>a) Analyze (identify parts, their interconnections and flow of information) the design and implementation of idealistic algorithmic components of real world systems, and thereafter b) Compute the output of given model subroutines (and also identify errors in the design and implementation of<br>given model subroutines).<br><br>CO4<br>a) Compare and contrast in details between the Divide and Conquer, Greedy method, Dynamic programming, Backtracking, branch and bound, graph traversal, and thereafter |

| | |
|---|---|
| | b) describe an overview level interconnected map of the above concepts/terminologies of the subject.<br><br>CO5<br>a) Identify and thematically explain where and how the Divide and Conquer, Greedy method, Dynamic programming, Backtracking, branch and bound, graph traversal are utilized in large scale real world systems, and thereafter b) Design the schematics for typical components of large scale known real world systems.<br><br>CO6<br><br>a) Identify unsolved but necessary real world problems having algorithmic component/s and thereafter b) generate pragmatic detailed ideas for creation/synthesis of innovative socially necessary products and services to solve such problems. |

| | |
|---|---|
| Department | IT |
| Course Code | IT592 |
| Title of Course | Computer Architecture Lab |
| Nature of Course | Compulsory |
| Type of Course | Practical |
| Contact Hours | 4+4 |
| Credit | 2 |
| Course Outcomes | CO1: a) Define ,b) explain fundamental concepts of VHDL.<br><br>CO2: a) Directly apply the fundamental concepts of VHDL to solve different gates.<br><br>CO3: a) Analyze (the design and implementation of idealistic components of real world systems. |

| | |
|---|---|
| *Department* | Information Technology |
| *Course Code* | IT 593 |
| *Title of course* | Operating System Lab |
| *Nature of course* | Compulsory |
| *Type of course* | Practical |
| *Contact hours* | 0:0:3=3 |
| *Total contact hours* | 6 hours |
| *Credit* | 2 |

| | |
|---|---|
| *Course Outcomes* | CO1: Understand gcc compiler, and Makefiles<br><br>CO2: Understand the high-level structure of the Linux kernel both in concept and source code<br>CO3: Acquire a detailed understanding of one aspect (the scheduler) of the Linux kernel |

| | |
|---|---|
| Department | IT |
| Course Code | IT594A |
| Title of Course | Circuit Theory and Networks lab |
| Nature of Course | Free Elective courses |
| Type of Course | Practical |
| Contact Hours | 3 |
| *Total contact hours* | 36 |
| Credit | 3 |
| Course Outcomes | CO1: To introduce open circuit, short circuit, transmission, hybrid parameters and their interrelationship.<br><br>CO2: Apply concepts of electric network topology in lab.<br><br>CO3: Apply time and frequency concepts of analysis in LAB. |

| | |
|---|---|
| Department | Information Technology |
| Course Code | IT594B |
| Title of Course | Data Communication |
| Nature of Course | Practical |
| Type of Course | Free Elective courses |
| Contact Hours | 3 |
| Total contact hours | 33 |
| Credit | 2 |
| Course Outcomes | CO1<br>a) Define, b) explain in detail, and thereafter c) state the necessity/importance Logic gates and circuits. |

| | |
|---|---|
| | CO2<br>Students will be able to describe functional blocks of data acquisition system.<br><br>CO3: To develop concepts of stability and its assessment criteria |

| | |
|---|---|
| Department | IT |
| Course Code | IT594C |
| Title of Course | Digital signal processing |
| Nature of Course | Free Elective courses |
| Type of Course | Lecture |
| Contact Hours | 3 |
| *Total contact hours* | 36 |
| Credit | 3 |
| Course Outcomes | CO1: a) Define ,b) explain in detail, and thereafter c) state the necessity/importance of the fundamental concepts of Circuits.<br><br>CO2: To provide basic knowledge about the various sensors and data acquisition systems applied in electronics.<br><br>CO3: Students will be able to calculate time domain and frequency domain parameter for given system. |

| | |
|---|---|
| Department | IT |
| | |
| Course Code | IT594D |
| Title of Course | Operation Research |
| Nature of Course | Free Elective courses |
| Type of Course | Practical |
| Contact Hours | 3 |
| *Total contact hours* | 36 |
| Credit | 3 |
| Course Outcomes | CO1: a) Define ,b) explain in detail, and thereafter c) state the necessity/importance of the fundamental concepts of programming. |

| | |
|---|---|
| | CO2: Calculate different methods using programming.<br><br>CO3: Analyse network paths. |

| | |
|---|---|
| Department | IT |
| Course Code | IT594E |
| Title of Course | Microprocessors & Microcontrollers |
| Nature of Course | Free Elective courses |
| Type of Course | Practical |
| Contact Hours | 40 |
| Credit | 3 |
| Course Outcomes | CO1: Distinguish and analyze the properties of Microprocessors & Microcontrollers.<br><br>CO2: Analyze the data transfer information through serial & parallel ports.<br><br>CO3: Train their practical knowledge through laboratory experiments. |

---

| | |
|---|---|
| DEPARTMENT | INFORMATION TECHNOLOGY |
| COURSE CODE | IT504F |
| TITLE OF COURSE | Programming practices using C++ |
| NATURE OF COURSE | Elective |
| TYPE OF COURSE | Practical |
| CONTACT HOURS | 1+1 Tutorial/week |

| | |
|---|---|
| Credit | 2 |
| TOTAL CONTACT HOURS | 40 |
| COURSE OUTCOMES | CO1: Define, explain in detail and thereafter state the necessity/importance of the fundamental concepts of streams, classes, functions, data and objects of object oriented paradigm .<br>CO2: Can define, declare and use dynamic memory management techniques using pointers, constructors, destructors, function overloading, operator overloading, virtual functions and polymorphism, Exception handling, generic programming.<br>CO3: Can analyse simple problems, identify appropriate components and write program to solve simple problems. Will be able to find output and debug errors.<br>CO4: Can differentiate and compare between Arrays, String, Pointers, Structures, Unions, class, object, Function, Recursion, function overloading, function overriding ,exception, error independently and be able to interconnect these components by appropriate interfaces.<br>CO5: Be able to devise a given problem into independent modules and then to solve by integrating the modules by providing appropriate interfaces.<br>CO6: Can Write C++ Programs for Unknown real world problems |

| | |
|---|---|
| Department | Basic Science & Humanities |
| Course Code | HU 601 |
| Title of Course | Principles of Management |
| Nature of Course | Compulsory |
| Type of Course | Lecture |
| Contact Hours | 2L |
| Total Contact Hours | 24 |
| Course Outcome | **CO1**: Ability to know the basic concepts of management, function of management including Planning, Society and People Management.<br><br>**CO2**: Ability to know the Leadership quality; Decision making, Economic, Financial & Quantitative Analysis.<br><br>**CO3**: Ability to understand Customer Management, Operations & Technology Management |

| | |
|---|---|
| *Department* | Information Technology |
| *Course Code* | IT601 |
| *Title of cours* | Database Management Systems |
| *Nature of course* | Regular |
| *Type of course* | Lecture |
| *Contact hours* | 3:0:0=3 |
| *Credit* | 3 |
| *Total contact hours* | 36 |
| *Course Outcomes* | CO1: Understand functional components of the DBMS.<br><br>CO2: Devise queries using Relational Algebra, Relational Calculus and SQL.<br><br>CO3: Design database schema.<br><br>CO4:Develop E-R model<br><br>CO5:Evaluate and optimize queries.<br>CO6: Understand transaction processing, concurrency control and recovery techniques. |

| | |
|---|---|
| *Department* | Information Technology |
| *Course Code* | IT 602 |
| *Title of course* | Computer Networking |
| *Nature of course* | Compulsory |
| *Type of course* | Lecturer |
| *Contact hours* | 3+0=3 |
| *Total contact hours* | 36 |
| *Course Outcomes* | CO1: a) Define, b) explain in detail, and thereafter c) state the necessity/importance of the fundamental concepts of Layers, switching, active components, multiplexing, multiple access, data transmission, Digital, Optical, Satellite and mobile communications<br><br>CO2: Analyze MAC layer protocols and LAN technologies<br><br>CO3: Design applications using internet protocols |

| | |
|---|---|
| | CO4: Implement routing and congestion control algorithms<br><br>CO5: Develop application layer protocols |

| | |
|---|---|
| Department | IT |
| Course Code | IT 603 |
| Title of Course | Software Engineering |
| Nature of Course | Compulsory |
| Type of Course | Lecture |
| Contact Hours | 3 |
| Total Contact Hours | 44 |
| Course Outcomes | CO1: Define Software Engineering and explain in detail and thereafter state the necessity/importance of the fundamental concepts of SDLC, COCOMO Model, Context diagram, DFD, System design, Decision tree, Decision table ,coding & documentation, Structured and Object Oriented programming, Testing ,validation and verification metrics ,software project management and object oriented design in UML.<br><br>CO2: Directly apply the fundamental concepts of Software Engineering to solve (implement) the most elementary/simplest model problems, and thereafter Design & develop the software projects .Directly combine the fundamental concepts to solve (design and implement) elementary model problems on the idealistic components of real-world systems using Software Engineering.<br><br>CO3: Analyze and Identify requirements and prepare models using different SDLC.Compute the output of given model subsystems (and also identify errors in the design and implementation of given model subsystems using the concept of Software Engineering for an organization/institute.<br><br>CO4: Compare and contrast in details between the fundamental concepts of Software Engineering and thereafter describe an overview level interconnected map of concepts/terminologies of Software Engineering.<br><br>CO5: Identify risks, manage the change to assure quality in software projects and explain where and how the Models are utilized in large scale real world systems, and thereafter Design the schematics for typical components of large scale known real world systems using the concept of Software Engineering. |

| | |
|---|---|
| | CO6: Identify unsolved but necessary real world problems of Software Engineering and thereafter demonstrate and evaluate real time projects with respect to software engineering principles. |

| | |
|---|---|
| Department | IT |
| Course Code | IT604A |
| Title of Course | Information theory and coding |
| Nature of Course | Professional core courses |
| Type of Course | Theory |
| Contact Hours | 3 |
| Total contact hours | 6 months |
| Credit | 3 |
| Course Outcomes | CO1: Apply information theory and linear algebra in source coding and channel coding<br><br>CO2: Analyze the performance of error control codes<br><br>CO3: Understand various error control encoding and decoding techniques. |

| | |
|---|---|
| Department | IT |
| Course Code | IT604B |
| Title of Course | Computer Graphics |
| Nature of Course | Professional Elective courses |
| Type of Course | Lecture |
| Contact Hours | 3 |
| Total contact hours | 36 |
| Credit | 3 |

| | |
|---|---|
| Course Outcomes | CO1: a) Define ,b) explain in detail, and thereafter c) state the necessity/importance of the fundamental concepts of Computer Graphics.<br><br>CO2: a) Directly apply the fundamental concepts of Computer Graphics to solve (implement) the most elementary/simplest model problems, and thereafter b) Directly combine the fundamental concepts to solve (design and implement) elementary model problems on the idealistic components of real-world systems using different scan conversion algorithm.<br><br>CO3: a) Analyze (identify parts, their interconnections and flow of information) the design and implementation of idealistic components of real world systems, and thereafter b) Compute the output of given model subsystems (and also identify errors in the design and implementation of given model subsystems using the concept of Computer Graphics.<br><br>CO4: a) Compare and contrast in details between the fundamental concepts of transformation & viewing and thereafter b) describe an overview level interconnected map of concepts/terminologies of Computer Graphics.<br><br>CO5: a) Identify and thematically explain where and how the terminologies are utilized in large scale real world systems, and thereafter b) Design the schematics for typical components of large scale known real world systems using the concept of Transformation & viewing, Curves, Hidden surfaces and Color &shading models.<br><br>CO6: a) Identify unsolved but necessary real world problems and thereafter b) generate pragmatic detailed ideas for creation/synthesis of innovative socially necessary products and services to solve such problems in Computer Graphics. |

| | |
|---|---|
| Department | IT |
| Course Code | IT604C |
| Title of Course | Pattern Recognition |
| Nature of Course | Professional Elective courses |
| Type of Course | Theory |
| Contact Hours | 3 |
| Total contact hours | 6 months |
| Credit | 3 |
| Course Outcomes | CO1: a) Define ,b) explain in detail, and thereafter c) state the necessity/importance of the fundamental concepts of pattern recognition.<br><br>CO2: a) Directly apply the fundamental concepts of pattern recognition to |

| | |
|---|---|
| | solve (implement) the most elementary/simplest model problems.<br><br>CO3: a) Analyze Maximum-Likelihood estimation Gaussian mixture models. |

| | |
|---|---|
| Department | IT |
| Course Code | IT604D |
| Title of Course | ERP |
| Nature of Course | Professional Elective courses |
| Type of Course | Lecture |
| Contact Hours | 3 |
| Total contact hours | 36 |
| Credit | 3 |
| Course Outcomes | CO1: a) Define ,b) explain in detail, and thereafter c) state the necessity/importance of the fundamental concepts of E-Commerce & ERP.<br><br>CO2: a) Directly apply the fundamental concepts of E-Commerce & ERP to solve (implement) the most elementary/simplest model problems, and thereafter b) Directly combine the fundamental concepts to solve (design and implement) elementary model problems on the idealistic components of real-world systems using E-Commerce Technologies.<br><br>CO3: a) Analyze (identify parts, their interconnections and flow of information) the design and implementation of idealistic components of real world systems, and thereafter b) Compute the output of given model subsystems (and also identify errors in the design and implementation of given model subsystems using the concept of E-Commerce Business Models.<br><br>CO4: a) Compare and contrast in details between the fundamental concepts of Four C's, E-Payment, E-Marketing and thereafter b) describe an overview level interconnected map of concepts/terminologies of E-Commerce & ERP.<br><br>CO5: a) Identify and thematically explain where and how the terminologies are utilized in large scale real world systems, and thereafter b) Design the schematics for typical components of large scale known real world systems using the concept of Enterprise Resource Planning(ERP).<br><br>CO6: a) Identify unsolved but necessary real world problems and thereafter b) generate pragmatic detailed ideas for creation/synthesis of innovative |

| | |
|---|---|
| | socially necessary products and services to solve such problems in E-Commerce & ERP. |

| | |
|---|---|
| Department | IT |
| Course Code | IT605A |
| Title of Course | DISCRETE MATHEMATICS |
| Nature of Course | Free Elective courses |
| Type of Course | Theory |
| Contact Hours | 3 |
| Total contact hours | 6 MONTH DURATION |
| Credit | 3 |
| Course Outcomes | CO1: a) Define , explain in detail use mathematically correct terminology and notation .b) Construct correct direct and indirect proofs.<br><br>CO2: Directly apply the fundamental concepts of mathematics to solve (implement) the most elementary/simplest model problems.<br><br>CO3: a) Analyze , b) know Syntax, Semantics, Validity and Satisfiability, Graphs and Trees . |

| | |
|---|---|
| Department | IT |
| Course Code | IT605 B |
| Title of Course | Human Resource Management |

| | |
|---|---|
| Nature of Course | Free Elective courses |
| Type of Course | Theory |
| Contact Hours | 3 |
| Total contact hours | 6 months |
| Credit | 3 |
| Course Outcomes | CO1: a) Define ,b) explain in detail, and thereafter c) state the necessity/importance of the fundamental concepts of Challenges and Opportunities for OB.<br><br>CO2: Historical Background, Fundamental Concepts of OB, Challenges .<br><br>CO3: Group Behaviour: Characteristics of Group, Types of Groups, Stages of Group Development, Group Decision . |

| | |
|---|---|
| *Department* | Information Technology |
| *Course Code* | IT 605C |
| *Title of cours* | Compiler Design |
| *Nature of course* | elective |
| *Type of course* | Lecture |
| *Contact hours* | 3:0:0=3 |
| *Total contact hours* | 36 |
| *Course Outcomes* | CO1: Understand the fundamental and functional architecture of a compiler.<br><br>CO2: Understanding principle flow of execution through different phases (modules).<br><br>CO3: Designing small programs for each independent but correlated module.<br><br>CO4:Designing and solving grammatical problems.<br><br>CO5:Developing a new grammar.<br><br>CO6:Developing a mini sample compiler. |
| | |

| | |
|---|---|
| Department | Information Technology |
| Course Code | IT605D |
| Title of Course | Artificial Intelligence |
| Nature of Course | Theory |
| Type of Course | Elective Free Elective courses |
| Contact Hours | 3 |
| Total contact hours | 45 |
| Credit | 3 |
| Course Outcomes | CO1 |

| | |
|---|---|
| | a) Define, b) explain in detail, and thereafter c) state the necessity/importance of the overview of Artificial Intelligence, intelligent agents, problem solving, search techniques, heuristic search strategies, adversarial search, knowledge and reasoning, predicate logic, representing knowledge using rules, probabilistic reasoning, planning, natural language processing, learning and expert systems.<br><br>CO2<br><br>a) Directly apply intelligent agents, problem solving, search techniques, heuristic search strategies, adversarial search, knowledge and reasoning, predicate logic, representing knowledge using rules, probabilistic reasoning, planning, natural language processing, learning and expert systems to solve (implement) the most elementary/simplest model problems, and thereafter b) Directly combine the above concepts to solve (design and implement) elementary model problems on the idealistic components of real-world systems with AI components.<br><br>CO3<br><br>a) Analyze (identify parts, their interconnections and flow of information) the design and implementation of idealistic components of real world systems with AI components, and thereafter b) Compute the output of given model subsystems (and also identify errors in the design and implementation of given model subsystems).<br><br>CO4<br><br>a) Compare and contrast in details among intelligent agents, problem solving, search techniques, heuristic search strategies, adversarial search, knowledge and reasoning, predicate logic, representing knowledge using rules, probabilistic reasoning, planning, natural language processing, learning and expert systems, and thereafter b) describe an overview level interconnected map of concepts of AI.<br><br>CO5<br><br>a) Identify and thematically explain where and how intelligent agents, problem solving, search techniques, heuristic search strategies, adversarial search, knowledge and reasoning, predicate logic, representing knowledge using rules, probabilistic reasoning, planning, natural language processing, learning and expert systems are utilized in large scale real world systems with AI components, and thereafter b) Design the schematics for typical components of large scale known real world systems with AI components.<br><br>CO6<br>a) Identify unsolved but necessary real world problems with AI components and thereafter b) generate pragmatic detailed ideas for |

| | |
|---|---|
| | creation/synthesis of innovative socially necessary products and services to solve such problems. |

| | |
|---|---|
| *Department* | Information Technology |
| *Course Code* | IT691 |
| *Title of cours* | Database Management Systems Labs |
| *Nature of course* | Regular |
| *Type of course* | Lecture |
| *Contact hours* | 3:0:0=3 |
| Total contact hours | 36 |
| *CREDIT* | 2 |
| *Total contact hours* | 6 MONTHS |
| *Course Outcomes* | CO1: Design and Implement a database schema<br><br>CO2: Devise queries using DDL, DML, DCL and TCL commands.<br><br>CO3: Develop application programs using PL/SQL<br><br>CO4:Design and implement a project using embedded SQL and GUI.<br><br>CO5:Apply modified components for performance tuning in open source software. |

| | |
|---|---|
| *Department* | Information Technology |
| *Course Code* | IT 692 |

| | |
|---|---|
| *Title of course* | Computer Networking Lab |
| *Nature of course* | Compulsory |
| *Type of course* | Practical |
| *Contact hours* | 0:3=3 |
| Total contact hours | 36 |
| *Credit* | 2 |
| *Total contact hours* | 6 MONTHS |
| *Course Outcomes* | CO1: Understand and apply different network commands<br>CO2: Develop programs for client-server applications<br><br>CO3: Perform packet sniffing and analyze packets in network traffic.<br><br>CO4: Implement error detecting and correcting codes |

| | |
|---|---|
| Department | IT |
| Course Code | IT 693 |
| Title of Course | Software Engineering Lab |
| Nature of Course | Compulsory |
| Type of Course | Practical |
| Contact Hours | 3 |
| Total contact hours | 36 |
| CREDIT | 2 |
| Total Contact Hours | 36 |
| Course Outcomes | CO1: Define Software Engineering and explain in detail and thereafter design a project proposal which will be used throughout the lab for performing different experiments using MSProject(Generation of Gnatt and PERT chart from schedule).Prepare Project Management Plan in standard format.<br>.<br>CO2: Able to elicit, analyse and specify software requirements, Plan a software engineering process life cycle, follow diagrams and prepare Software Design Document using CASE tools. Apply the fundamental concepts of Software Project management to solve (implement) the most elementary/simplest model problems.<br><br>CO3: Analyse and translate a specification into a design and Identify requirements and prepare models using different SDLC.Compute the output of given model subsystems (and also identify errors in the design and implementation of given model subsystems using the concept of Software Engineering for an organization/institute.<br><br>CO4: Compare and contrast in details using an appropriate software engineering methodology. Design Test Script/Test Plan for a small component of the proposed Project and thereafter describe an overview level interconnected map of concepts/terminologies.<br><br>CO5: Able to use modern engineering tools for specification, design, implementation, and testing Identify risks, Generate Test Result and perform defect root cause analysis. Manage the change to assure quality in software projects and explain where and how the Models are utilized in large scale real world systems.<br><br>CO6: Identify unsolved but necessary real world problems of Software Engineering and thereafter demonstrate and evaluate real time projects with respect to software engineering principles. |

| | |
|---|---|
| Department | Information Technology |
| Course Code | IT 681 Semester: 6th B.Tech. |
| Title of Course | Seminar |
| Nature of Course | Compulsory |
| Type of Course | Sessional |
| Contact Hours | 3L |
| Total Contact Hours | 40 Credit: 3 |
| CO1 | a) Define, b) explain in detail, and thereafter c) state the necessity/importance of the fundamental concepts of Seminar, Presentation, communication, web surfing, self-learning, teamwork, leadership, body language, learning attitude, recent trends in technology, emerging technologies, social, environmental and industrial aspects of technological developments. |
| CO2 | Can identify and illustrate the working principles of Seminar, Presentation, communication, web surfing, self-learning, teamwork, leadership, body language, learning attitude, recent trends in technology, emerging technologies, social, environmental and industrial aspects of technological developments etc. |
| CO3 | Can analyse the technical aspects of Seminar, Presentation, communication, web surfing, self-learning, teamwork, leadership, body language, learning attitude, recent trends in technology, emerging technologies, social, environmental and industrial aspects of technological developments. |
| CO4 | Can differentiate and compare between Seminar, Presentation, communication, web surfing, self-learning, teamwork, leadership, body language, learning attitude, recent trends in technology, emerging technologies, social, environmental and industrial aspects of technological developments. |
| CO5 | Be able to deliver a seminar on a topic independently, identify/adapt appropriate techniques/ components and then to deliver the seminar by integrating the appropriate techniques. |
| CO6 | Can identify, estimate, design, implement and use appropriate tools, materials, methods, techniques for delivering seminar on real world issues/topics. |

| | |
|---|---|
| Department | IT |
| Course Code | IT 701 |
| Title of Course | Internet Technology |
| Nature of Course | Compulsory |
| Type of Course | Lecture |
| Contact Hours | 3 |
| Total Contact Hours | 34 |
| Course Outcomes | CO1: Define and explain in detail and thereafter state the necessity/importance of the fundamental concepts of WWW, TCP/IP, IP subnetting and addressing, routing protocols,firewall,HTTP,SMTP in Internet Technology.<br><br>CO2: Directly apply the fundamental concepts of Internet Technology to solve (implement) the most elementary/simplest model problems, and thereafter identify and illustrate the working principles of Components, techniques, protocols, and performance metrics in Internet Technology.<br><br>CO3: Analyse the simple internet technology working aspects. Identify appropriate components and plan the desired network design which will leads to troubleshoot errors in Internet Technology.<br><br>CO4: Compare and contrast in details between the fundamental concepts of Internet Technology and thereafter describe an overview level interconnected map of concepts/terminologies of Internet Technology.<br><br>CO5: Be able to devise a given problem into independent modules/layers and identify appropriate Internet Technology Protocols/Components and then to setup the networking system by integrating the modules/ Layers /Protocols by providing appropriate interfaces.<br><br>CO6: Identify unsolved but necessary real world problems of Internet technology and thereafter estimate, design and implement appropriate optical network components/devices/protocols for setting up optical network in an Unknown site / organisation in Internet Technology. |

| | |
|---|---|
| Department | IT |
| Course Code | IT702 |
| Title of Course | Multimedia |
| Nature of Course | Compulsory |
| Type of Course | Lecture |
| Contact Hours | 3 |
| Credit | 3 |
| Course Outcomes | CO1: a) Define ,b) explain in detail, and thereafter c) state the necessity/importance of the fundamental concepts of Multimedia Technology.<br><br>CO2: a) Directly apply the fundamental concepts of Multimedia Technology to solve (implement) the most elementary/simplest model problems, and thereafter b) Directly combine the fundamental concepts to solve (design and implement) elementary model problems on the idealistic components of real-world systems using Text, Audio, Image and Video.<br><br>CO3: a) Analyze (identify parts, their interconnections and flow of information) the design and implementation of idealistic components of real world systems, and thereafter b) Compute the output of given model subsystems (and also identify errors in the design and implementation of given model subsystems using the concept of Multimedia Technology.<br><br>CO4: a) Compare and contrast in details between the fundamental concepts of Text, Audio, Image and Video and thereafter b) describe an overview level interconnected map of concepts/terminologies of Multimedia Technology.<br><br>CO5: a) Identify and thematically explain where and how the terminologies are utilized in large scale real world systems, and thereafter b) Design the schematics for typical components of large scale known real world systems using the concept of Storage and Access Techniques, Multimedia Database, Document Architecture and Content Management Techniques.<br><br>CO6: a) Identify unsolved but necessary real world problems and thereafter b) generate pragmatic detailed ideas for creation/synthesis of innovative socially necessary products and services to solve such problems in Multimedia Technology. |

| | |
|---|---|
| Department | IT |
| Course Code | IT 703 A |
| Title of Course | E-Commerce |
| Nature of Course | Open Elective courses Elective |
| Type of Course | Lecture |
| Contact Hours | 3 |
| Credit | 3 |
| Course Outcomes | CO1: a) Define ,b) explain in detail, and thereafter c) state the necessity/importance of the fundamental concepts of E-Commerce.<br><br>CO2: a) Directly apply the fundamental concepts of E-Commerce & ERP to solve (implement) the most elementary/simplest model problems, and thereafter b) Directly combine the fundamental concepts to solve (design and implement) elementary model problems on the idealistic components of real-world systems using E-Commerce Technologies.<br><br>CO3: a) Analyze (identify parts, their interconnections and flow of information) the design and implementation of idealistic components of real world systems, and thereafter b) Compute the output of given model subsystems (and also identify errors in the design and implementation of given model subsystems using the concept of E-Commerce Business Models.<br><br>CO4: a) Compare and contrast in details between the fundamental concepts of Four C's, E-Payment, E-Marketing and thereafter b) describe an overview level interconnected map of concepts/terminologies of E-Commerce . |

| | |
|---|---|
| Department | IT |
| Course Code | IT703B |
| Title of Course | Soft computing |
| Nature of Course | Compulsory |
| Type of Course | Lecture |
| Contact Hours | 3 |
| Credit | 3 |
| Course Outcomes | CO1: a) Define ,b) explain in detail, and thereafter c) state the necessity/importance of the fundamental concepts of soft computing. |

| | |
|---|---|
| | CO2: Develop the skills to gain a basic understanding of neural network theory and fuzzy logic theory.<br><br>CO3: a) Understand the concepts of fuzzy sets, knowledge representation using fuzzy rules, approximate reasoning, fuzzy inference systems, and fuzzy logic<br><br>CO4: a) Compare and contrast in details between the fundamental concepts of Text, Audio, Image and Video and thereafter b) describe an overview level interconnected map of concepts/terminologies of soft computings.<br><br>CO5: a) Identify and thematically explain where and how the terminologies are utilized in large scale real world systems, and thereafter b) Design the schematics for typical components of large scale known real world systems using the concept of different soft computing Techniques. |

| | |
|---|---|
| Department | Information Technology |
| Course Code | IT 703C. Semester: 6th B.Tech. |
| Title of Course | Image Processing |
| Nature of Course | Elective |
| Type of Course | Lecture |
| Contact Hours | 3L |
| Total Contact Hours | 40 Credit: 3 |
| CO1 | a) Define, b) explain in detail, and thereafter c) state the necessity/importance of the fundamental concepts of Image representation, processing, filtering, segmentation, restoration, projection, feature extraction, ehancements, transformation, smoothing, masking, colouring etc. |
| CO2 | Can identify and illustrate the working principles of image processing methods - Image representation, processing, filtering, segmentation, restoration, projection, feature extraction, ehancements, transformation, performance parameters, smoothing, masking, colouring etc. |
| CO3 | Can analyse the technical aspects of a simple image processing software, identify appropriate computational components/methods and estimate the desired system design parameters. Will be able to find output and debug errors on problems related to Image representation, processing, filtering, segmentation, restoration, projection, feature extraction, ehancements, transformation, performance parameters, smoothing, masking, colouring. |

| | |
|---|---|
| CO4 | Can differentiate and compare between image processing techniques/components independently and be able to apply these techniques/components by appropriate interfaces. |
| CO5 | Be able to devise a given image processing problem into independent modules and identify appropriate techniques/ components and then to develop/implement the system by integrating the modules by providing appropriate interfaces. |
| CO6 | Can identify, estimate, design, implement and use appropriate image processing system for real world image processing needs. |

| | |
|---|---|
| Department | IT |
| Course Code | IT704A |
| Title of Course | DISTRIBUTED OS |
| Nature of Course | Elective |
| Type of Course | THEORY |
| Contact Hours | 3 |
| Total contact hours | 36 |
| Credit | 2 |
| Course Outcomes | CO1:Understand the different Distributed Systems and the challenges involved in Design of the Distributed Systems.<br>CO: Understand how computing power is created and synchronized in Distributed systems<br>CO: Design and Implement Distributed applications using Technologies like RPC, threads.<br>CO4. Learn how to store data in Distributed File System. |

| | |
|---|---|
| Department | IT |
| Course Code | IT704B |
| Title of Course | Cloud Computing |
| Nature of Course | Professional Elective |
| Type of Course | Theory |
| Contact Hours | 3 |
| Credit | 3 |
| Course Outcomes | CO1: Cloud Computing and its Basics |

| | |
|---|---|
| | CO2: Use of Platforms in Cloud Computing Concepts<br><br>CO3: Cloud Infrastructure and Cloud Management<br><br>CO4: Concepts of Services and Applications |

| | |
|---|---|
| Department | IT |
| Course Code | IT704C Elective |
| Title of Course | Data Warehousing and Data Mining |
| Nature of Course | Professional core courses |
| Type of Course | Theory |
| Contact Hours | 3 |
| Total contact hours | 6 months |
| Credit | 3 |
| Course Outcomes | CO1: a) Define ,b) explain in detail, and thereafter c) state the necessity/importance of the fundamental concepts of Data Warehousing; Data Mining .<br><br>CO2: Cluster Analysis – Types of Data in Cluster Analysis, Partitioning methods, Hierarchical Methods; Transactional Patterns and other temporal based frequent patterns .<br><br>CO3: Methodologies for stream data processing and stream data systems. |

| | |
|---|---|
| Department | IT |
| Course Code | IT704D |
| Title of Course | SENSOR NETWORK |
| Nature of Course | Elective |
| Type of Course | THEORY |
| Contact Hours | 4 |
| Total contact | 36 |

| | |
|---|---|
| hours | |
| Credit | 3 |
| Course Outcomes | CO1: To Understand the basic WSN technology and supporting protocols, with emphasis placed on standardization basic sensor systems and provide a survey of sensor technology<br>CO2:Understand the medium access control protocols and address physical layer issues<br>CO3:Learn key routing protocols for sensor networks and main design issues<br>CO4:Learn transport layer protocols for sensor networks, and design requirements |

| | |
|---|---|
| *Department* | Information Technology |
| *Course Code* | IT704E |
| *Title of cours* | Mobile Computing |
| *Nature of course* | Elective |
| *Type of course* | Lecture |
| *Contact hours* | 3:0:0=3 |
| *Total contact hours* | 39 |
| ***Course Outcomes*** | CO1: Understand algorithm/protocols, environments and communication systems in mobile computing.<br><br>CO2: Evaluate the efficiency of mobile IPv4 and IPv6 architectures with agents and proxies.<br><br>CO3: Analyze the performance of MAC protocols used for wired network and wireless networks.<br><br>CO4: Evaluate the performance of TCP protocols in Wireless Networks with mobile nodes.<br><br>CO5: Design and analyze the existing routing protocols for multi-hop wireless networks. |

| | |
|---|---|
| Department | Information Technology |
| Course Code | IT705A. Semester: 7th B.Tech. |
| Title of Course | Bio informatics(BI) |
| Nature of Course | Elective |
| Type of Course | Lecture |
| Contact Hours | 3L |
| Total Contact Hours | 40 Credit: 3 |
| CO1 | a) Define, b) explain in detail, and thereafter c) state the necessity/importance of the fundamental concepts biology. |
| CO2 | knowledge and awareness of the basic principles and concepts of biology, computer science and mathematics |
| CO3 | existing software effectively to extract information from large databases and to use this information in computer modeling. |

| | |
|---|---|
| Department | Information Technology |
| Course Code | IT705B. Semester: 7th B.Tech. |
| Title of Course | Control system |
| Nature of Course | Elective |
| Type of Course | Lecture |
| Contact Hours | 3L |

| | |
|---|---|
| Total Contact Hours | 40 Credit: 3 |
| CO1 | a) Define, b) explain in detail, and thereafter c) state the necessity/importance of the fundamental concepts of System. |
| CO2 | Categorize different types of **system** and identify a set of algebraic equations to represent and model a complicated **system** into a more simplified form. |
| CO3 | Formulate different types of analysis in frequency domain to explain the nature of stability of the **system**. |

| | |
|---|---|
| Department | Information Technology |
| Course Code | IT705C. Semester: 7th B.Tech. |
| Title of Course | Modelling &simulation (M) |
| Nature of Course | Elective |
| Type of Course | Lecture |
| Contact Hours | 3L |
| Total Contact Hours | 40 Credit: 3 |
| CO1 | a) Define, b) explain in detail, and thereafter c) state the necessity/importance of the fundamental concepts of modelling. |
| CO2 | Can identify and illustrate the working principles of networking Components, techniques, protocols used in Digital, Optical, Satellite and mobile communications. |
| CO3 | Can analyse problem. |
| CO4 | Define passivity, and know how to show passivity with the use of energy functions or positive real transfer functions. |
| CO5 | -Describe principles behind use of appropriate model inputs and outputs for aggregation and reuse of models. |

| | |
|---|---|
| Department | Information Technology |

| | |
|---|---|
| Course Code | IT705D. Semester: 7th B.Tech. |
| Title of Course | Micro electronics & VLSI design |
| Nature of Course | Elective |
| Type of Course | Lecture |
| Contact Hours | 3L |
| Total Contact Hours | 40 Credit: 3 |
| CO1 | a) Define, b) explain in detail, and thereafter c) state the necessity/importance of the fundamental concepts of electronics. |
| CO2 | Appreciate capabilities and limitations of current microelectronic (or IC) technologies. analogue and digital microelectronic circuits, and (6) design simple analogue, digital and mixed microelectronic circuits. |
| CO3 | Use modern CAD design tools to design ICs. |
| CO4 | Create IC layouts and understand and use circuit models of IC components. |

| | |
|---|---|
| Department | Information Technology |
| Course Code | IT705E. Semester: 7th B.Tech. |
| Title of Course | Advanced Data Communications and Coding. |

| | |
|---|---|
| Nature of Course | Elective |
| Type of Course | Lecture |
| Contact Hours | 3L |
| Total Contact Hours | 40 Credit: 3 |
| CO1 | a) Define, b) explain in detail, and thereafter c) state the necessity/importance of the fundamental concepts of Layers, switching, active components, multiplexing, multiple access, data transmission, Digital, Optical, Satellite and mobile communications. |
| CO2 | Can identify and illustrate the working principles of networking Components, techniques, protocols used in Digital, Optical, Satellite and mobile communications. |
| CO3 | Can analyse the working aspects of a simple networking system, identify appropriate network components of network design for Digital, Optical, Satellite and mobile communications. Will be able to troubleshoot network errors. |
| CO4 | Can differentiate and compare between networking Components/Protocols independently and be able to explain the interconnection of these Components/Protocols by appropriate interfaces to setup a working Digital, Optical, Satellite and mobile communications. |
| CO5 | Be able to devise a given Digital /Optical/Satellite/mobile communications problem into independent modules/layers and identify appropriate communications Protocols/Components and then to plan the setup of the communications system by integrating the modules/ Layers /Protocols by providing appropriate interfaces. |
| CO6 | Can identify, estimate, design and implement appropriate Digital/Optical/Satellite/Mobile communications components/devices/protocols for setting up optical network in an Unknown site / organisation. |

| | |
|---|---|
| Department | Information Technology |
| Course Code | HU 781 Semester: 7$^{th}$ B.Tech. |
| Title of Course | Group Discussion |
| Nature of Course | Compulsory |
| Type of Course | Sessional |
| Contact Hours | 3L |
| Total Contact Hours | 40 Credit: 3 |

| | |
|---|---|
| CO1 | a) Define, b) explain in detail, and thereafter c) state the necessity/importance of the fundamental concepts of Group Discussion (GD), formal presentation, verbal communication, logical reasoning, decision making, self-learning, teamwork, leadership, body language, learning attitude, group objective, moral, motivation, behaviour, recent trends in technology, emerging technologies, social, environmental and industrial aspects of technological developmental issues. |
| CO2 | Can identify and illustrate the working principles of Group Discussion (GD), formal presentation, verbal communication, logical reasoning, decision making, self-learning, teamwork, leadership, body language, learning attitude, group objective, moral, motivation, behaviour, recent trends in technology, emerging technologies, social, environmental and industrial aspects of technological developmental issues. |
| CO3 | Can analyse the technical aspects of Group Discussion (GD), formal presentation, verbal communication, logical reasoning, decision making, self-learning, teamwork, leadership, body language, learning attitude, group objective, moral, motivation, behaviour, recent trends in technology, emerging technologies, social, environmental and industrial aspects of technological developmental issues. |
| CO4 | Can differentiate and compare between Group Discussion (GD), formal presentation, verbal communication, logical reasoning, decision making, self-learning, teamwork, leadership, body language, learning attitude, group objective, moral, motivation, behaviour, recent trends in technology, emerging technologies, social, environmental and industrial aspects of technological developmental issues. |
| CO5 | Be able to organise and participate a Group Discussion (GD) on recent trends in technology, emerging technologies, social, environmental and industrial aspects of technological developmental issues. |
| CO6 | Can identify, estimate, design, implement and use appropriate tools, materials, methods, techniques for organising or participating a Group Discussion (GD) on real world issues/topics. |

| | |
|---|---|
| Department | IT |
| Course Code | IT 791 |
| Title of Course | Internet Technology Lab |
| Nature of Course | Compulsory |
| Type of Course | Practical |
| Contact Hours | 3 |
| Total | 36 |

| | |
|---|---|
| Contact Hours | |
| CREDIT | 2 |
| Course Outcomes | CO1: Define and explain in detail and thereafter state the necessity/importance of the fundamental concepts of Applet, HTML, JavaScript, Perl, Client Server programming, XML in Internet Technology.<br><br>CO2: Directly apply the fundamental concepts of Applet, HTML, JavaScript, Perl, Client Server programming, XML to create banner, webpage, server/client program, socket program and Hyperlink.<br><br>CO3: Analyse the simple internet technology working aspects. Identify appropriate components and plan the desired network design which will leads to troubleshoot errors in Internet Technology.<br><br>CO4: Compare and contrast in details between the fundamental concepts of Internet Technology and thereafter describe an overview level interconnected map of concepts/terminologies of Internet Technology.<br><br>CO5:Be able to devise a given problem like Web page designing into independent modules/layers and identify appropriate Internet Technology Protocols/Components and then to setup the networking system by integrating the modules/ Layers /Protocols by providing appropriate interfaces.<br><br>CO6: Identify unsolved but necessary real world problems of Internet technology and thereafter estimate, design and implement appropriate optical network components/devices/protocols for setting up optical network in an Unknown site / organisation in Internet Technology. |

| | |
|---|---|
| Department | IT |
| Course Code | IT792 |
| Title of Course | Multimedia Lab |
| Nature of Course | Compulsory |
| Type of Course | Practical |
| Contact Hours | 3+3 |
| Credit | 2 |
| Course Outcomes | CO1: a) Define ,b) explain in detail, and thereafter c) state the necessity/importance of the fundamental concepts of Sound editing, Photo editing, Video editing, Animation Tools.<br><br>CO2: a) Directly apply the fundamental concepts of Multimedia to solve (implement) the most elementary/simplest model problems, and thereafter b) Directly combine the fundamental concepts to solve (design and implement) elementary model problems on the idealistic components of real-world systems using different multimedia tools.<br><br>CO3: a) Analyze (identify parts, their interconnections and flow of information) the design and implementation of idealistic components of real world systems, and thereafter b) Compute the output of given model subsystems (and also identify errors in the design and implementation of given model subsystems using the concept of Multimedia.<br><br>CO4: a) Compare and contrast in details between the fundamental concepts of Text, Audio, Image and Video and thereafter b) describe an overview level interconnected map of concepts/terminologies of Multimedia Technology.<br><br>CO5: a) Identify and thematically explain where and how the terminologies are utilized in large scale real world systems, and thereafter b) Design the schematics for typical components of large scale known real world systems using the concept of Multimedia tools and Web Page design.<br><br>CO6: a) Identify unsolved but necessary real world problems and thereafter b) generate pragmatic detailed ideas for creation/synthesis of innovative socially necessary products and services to solve such problems in Multimedia. |

| | |
|---|---|
| Department | IT |
| Course Code | IT 793 A |
| Title of Course | E-Commerce |
| Nature of Course | Open Elective courses Elective |
| Type of Course | PRACTICAL |
| Contact Hours | 3 |
| Credit | 3 |
| Course Outcomes | CO1: a) Define ,b) explain in detail, and thereafter c) state the necessity/importance of the fundamental concepts of E-Commerce.<br><br>CO2: a) Directly apply the fundamental concepts of E-Commerce & ERP to solve (implement) the most elementary/simplest model problems, and thereafter b) Directly combine the fundamental concepts to solve (design and implement) elementary model problems on the idealistic components of real-world systems using E-Commerce Technologies.<br><br>CO3: a) Analyze (identify parts, their interconnections and flow of information) the design and implementation of idealistic components of real world systems, and thereafter b) Compute the output of given model subsystems (and also identify errors in the design and implementation of given model subsystems using the concept of E-Commerce Business Models.<br><br>CO4: a) Compare and contrast in details between the fundamental concepts of Four C's, E-Payment, E-Marketing and thereafter b) describe an overview level interconnected map of concepts/terminologies of E-Commerce . |

| | |
|---|---|
| Department | Information Technology |

| | |
|---|---|
| Course Code | IT 793B. Semester: 6th B.Tech. |
| Title of Course | Soft computing |
| Nature of Course | Elective |
| Type of Course | PRACTICAL |
| Contact Hours | 3L |
| Total Contact Hours | 40 Credit: 2 |
| CO1 | a) Define, b) explain in detail, and thereafter c) state the necessity/importance of the fundamental concepts of fuzzy logic , ANN etc. |
| CO2 | Programming using the above concept. |

| | |
|---|---|
| Department | Information Technology |
| Course Code | IT 793C. Semester: 6th B.Tech. |
| Title of Course | Image Processing |
| Nature of Course | Elective |
| Type of Course | PRACTICAL |
| Contact Hours | 3L |
| Total Contact Hours | 40 Credit: 2 |
| CO1 | a) Define, b) explain in detail, and thereafter c) state the necessity/importance of the fundamental concepts of Image representation, processing, filtering, segmentation, restoration, projection, feature extraction, ehancements, transformation, smoothing, masking, colouring etc. |
| CO2 | Can identify and illustrate the working principles of image processing methods - Image representation, processing, filtering, segmentation, restoration, projection, feature extraction, ehancements, transformation, performance parameters, smoothing, masking, colouring etc. |
| CO3 | Can analyse the technical aspects of a simple image processing software, identify appropriate computational components/methods and estimate the desired system design parameters. Will be able to find output and debug errors on problems related to Image representation, processing, filtering, segmentation, restoration, projection, feature extraction, ehancements, transformation, performance parameters, smoothing, masking, colouring. |
| CO4 | Can differentiate and compare between image processing techniques/components independently and be able to apply these techniques/components by appropriate interfaces. |

| | |
|---|---|
| CO5 | Be able to devise a given image processing problem into independent modules and identify appropriate techniques/ components and then to develop/implement the system by integrating the modules by providing appropriate interfaces. |
| CO6 | Can identify, estimate, design, implement and use appropriate image processing system for real world image processing needs. |

| | |
|---|---|
| Department | Information Technology |
| Course Code | IT 794 Semester: 7th B.Tech. |
| Title of Course | INDUSTRIAL TRAINNING |
| Nature of Course | Compulsory |
| Type of Course | PRACTICAL |
| Contact Hours | BETWEEN 6 AND 7 SEM BREAK |
| Total Contact Hours | 4 WEEKS Credit: 2 |
| CO1 | a) Define, b) explain in detail, and thereafter c) state the necessity/importance of the fundamental concepts of Group Discussion (GD), formal presentation, verbal communication, logical reasoning, decision making, self-learning, teamwork, leadership, body language, learning attitude, group objective, moral, motivation, behaviour, recent trends in technology, emerging technologies, social, environmental and industrial aspects of technological developmental issues. |
| CO2 | Can identify and illustrate the working principles of Group Discussion (GD), formal presentation, verbal communication, logical reasoning, decision making, self-learning, teamwork, leadership, body language, learning attitude, group objective, moral, motivation, behaviour, recent trends in technology, emerging technologies, social, environmental and industrial aspects of technological developmental issues. |
| CO3 | Can analyse the technical aspects of Group Discussion (GD), formal presentation, verbal communication, logical reasoning, decision making, self-learning, teamwork, leadership, body language, learning attitude, group objective, moral, motivation, behaviour, recent trends in technology, emerging technologies, social, environmental and industrial aspects of technological developmental issues. |
| CO4 | Can differentiate and compare between Group Discussion (GD), formal presentation, verbal communication, logical reasoning, decision making, self-learning, teamwork, leadership, body language, learning attitude, group objective, moral, motivation, behaviour, recent trends in technology, emerging technologies, social, environmental and industrial aspects of technological developmental issues. |
| CO5 | Be able to organise and participate a Group Discussion (GD) on recent trends in technology, emerging technologies, social, environmental and industrial aspects of technological |

| | |
|---|---|
| | developmental issues. |
| CO6 | Can identify, estimate, design, implement and use appropriate tools, materials, methods, techniques for organising or participating a Group Discussion (GD) on real world issues/topics. |

| | |
|---|---|
| *Department* | Information Technology |
| *Course Code* | IT 795 |
| *Title of course* | PROJECT 1 |
| *Nature of course* | Compulsory(all) |
| *Type of course* | Practical |
| *Contact hours* | 0:3=3 |
| *CREDIT* | 2 |
| *Total contact hours* | 6 MONTHS |
| *Course Outcomes* | CO1: Understand and apply different CONCEPTS IN PROJECT |

| | |
|---|---|
| Department | IT |
| Course Code | HU801A |
| Title of Course | ORGANISATIONAL BEHAVIOUR |
| Nature of Course | Elective |
| Type of Course | Theory |
| Contact Hours | 2 |
| Total contact hours | 6 MONTH DURATION |
| Credit | 2 |
| Course Outcomes | CO1: a) Define, b) explain in detail, and thereafter c) state the necessity/importance of the fundamental concepts of Organisational behaviour.<br><br>CO2: Understand the different concepts of cost and different cost estimation techniques.<br><br>CO3: Understand the role and scope of Engineering BEHAVIOUR and the process of economic decision making. |

| | |
|---|---|
| *Department* | Information Technology |
| *Course Code* | HU 801 B |
| *Title of course* | PROJECT management |
| *Nature of course* | Elective |
| *Type of course* | Practical |
| *Contact hours* | 0:2=2 |
| *CREDIT* | 2 |
| *Total contact hours* | 6 MONTHS |
| *Course Outcomes* | CO1: Understand and apply different CONCEPTS IN PROJECT |

| | |
|---|---|
| Department | IT |
| Course Code | IT801A |
| Title of Course | Advanced Computer Architecture |
| Nature of Course | Compulsory |
| Type of Course | Lecture |
| Contact Hours | 3 |
| Credit | 3 |
| *Total contact hours* | 36 |
| Course Outcomes | CO1: a) Define, b) explain in detail, and thereafter c) state the necessity/importance of the fundamental logic gates of computer.<br><br>CO2: a) Directly apply the fundamental concepts of the elements of computer design for programmer.<br><br>CO3: a) Analyse (identify parts, their interconnections) the design and implementation of idealistic components of real-world systems.<br><br>CO4: a) Compare and contrast in details between different types of architecture.<br><br>CO5: a) Identify and thematically explain where and how the terminologies are utilized in large scale real world systems and thereafter b) Design the schematics for typical components of large scale known real world systems using the concept of different architecture.<br><br>CO6: a) Identify unsolved but necessary real world problems and thereafter b) generate pragmatic detailed ideas for creation/synthesis of innovative |

| | |
|---|---|
| | socially necessary products and services to solve such problems for computer architecture. |

| | |
|---|---|
| Department | IT |
| Course Code | IT801B |
| Title of Course | PARALLEL COMPUTING |
| Nature of Course | Compulsory |
| Type of Course | Lecture |
| Contact Hours | 3 |
| *Total contact hours* | 36 |
| Credit | 3 |
| Course Outcomes | CO1: a) Define, b) explain in detail, and thereafter c) state the necessity/importance of the fundamental logic gates of computer.<br><br>CO2: a) Directly apply the fundamental concepts of the elements of computer design for programmer.<br><br>CO3: a) Analyse (identify parts, their interconnections) the design and implementation of idealistic components of real-world systems.<br><br>CO4: a) Compare and contrast in details between different types of architecture.<br><br>CO5: a) Identify and thematically explain where and how the terminologies are utilized in large scale real world systems and thereafter b) Design the schematics for typical components of large scale known real world systems using the concept of different architecture.<br><br>CO6: a) Identify unsolved but necessary real world problems and thereafter b) generate pragmatic detailed ideas for creation/synthesis of innovative socially necessary products and services to solve such problems for computer architecture. |

| | |
|---|---|
| Department | IT |
| Course Code | IT801C |
| Title of | NATURAL LANGUAGE PROCESSING |

| Course | |
|---|---|

| | |
|---|---|
| *Department* | Information Technology |
| *Course Code* | IT801 D |
| *Title of cours* | Cryptography and Network Security |
| *Nature of course* | Elective |
| *Type of course* | Lecture |
| *Contact hours* | 3:0:0=3 |
| *Total contact hours* | 36 |

| | |
|---|---|
| Nature of Course | Compulsory |
| Type of Course | Lecture |
| Contact Hours | 3 |
| *Total contact hours* | 36 |
| Credit | 3 |
| Course Outcomes | CO1: a) Define, b) explain in detail, and thereafter c) state the necessity/importance of the NLP.<br><br>CO2: Understand approaches to syntax and semantics in NLP.<br><br>CO3: Understand approaches to discourse, generation, dialogue and summarization within NLP. Understand current methods for statistical approaches to machine translation. |

| | |
|---|---|
| *Course Outcomes* | CO1: Analyze encryption algorithms.<br><br>CO2: Perform packet sniffing and analyze packets for vulnerabilities.<br><br>CO3: Identify system vulnerabilities of communication protocols.<br><br>CO4:Design firewalls.<br><br>CO5:Develop intrusion detection system |

| | |
|---|---|
| Department | IT |
| Course Code | IT 802A |
| Title of Course | TECHNOLOGY management(HSS) |
| Nature of Course | Professional core courses Elective |
| Type of Course | Theory |
| Contact Hours | 3 |
| Total contact hours | 6 months |
| Credit | 3 |
| Course Outcomes | CO1: Define, explain in detail and thereafter state the necessity/importance of the fundamental concepts of industrial behaviour.<br>CO2: Analyse Critical Path Method (CPM) and Programme Evaluation Review Technique (PERT).<br><br>CO3: Can analyse Materials Management. |

| | |
|---|---|
| *Department* | Information Technology |
| *Course Code* | IT802 B |
| *Title of cours* | Cyber law and Security policy |
| *Nature of course* | Professional elective courses |
| *Type of course* | Lecture |
| *Contact hours* | 3:0:0=3 |
| *Total contact hours* | 36 |
| *Course Outcomes* | CO1: Analyze encryption algorithms.<br><br>CO2: Perform packet sniffing and analyze packets for vulnerabilities.<br><br>CO3: Identify system vulnerabilities of communication protocols.<br><br>CO4:Design firewalls.<br><br>CO5:Develop intrusion detection system |

| | |
|---|---|
| Department | Information Technology |
| Course Code | IT802C Semester: 8th B.Tech. |
| Title of Course | Optical Networking. |
| Nature of Course | Elective |
| Type of Course | Lecture |
| Contact Hours | 3L |
| Total Contact Hours | 40 Credit: 3 |
| CO1 | a) Define, b) explain in detail, and thereafter c) state the necessity/importance of the fundamental concepts of Layers, switching, active components, multiplexing, multiple access, data transmission, buffering, traffic grooming in optical networking |
| CO2 | Can identify and illustrate the working principles of networking Components, techniques, protocols, and performance metrics in optical networking. |
| CO3 | Can analyse the working aspects of a simple optical networking system, identify appropriate network components and plan the desired optical network design. Will be able to troubleshoot network errors. |

| | |
|---|---|
| CO4 | Can differentiate and compare between optical networking Components independently and be able to interconnect these components by appropriate interfaces to setup a working optical network. |
| CO5 | Be able to devise a given networking problem into independent modules/layers and identify appropriate optical networking Protocols/Components and then to setup the networking system by integrating the modules/ Layers /Protocols by providing appropriate interfaces. |
| CO6 | Can identify, estimate, design and implement appropriate optical network components/devices/protocols for setting up optical network in an Unknown site / organisation. |

| | |
|---|---|
| Department | Information Technology |
| Course Code | IT802D |
| Title of Course | Lower power circuit |
| Nature of Course | Theory |
| Type of Course | Elective |
| Contact Hours | 3 |
| Total contact hours | 34 |
| Credit | 3 |
| Course Outcomes | CO1<br><br>a) Define, b) explain in detail, and thereafter c) state the necessity/importance of the overview of Circuit.<br><br>CO2<br><br>a) Directly apply intelligent agents, problem solving, search techniques, heuristic search strategies, adversarial search, knowledge and reasoning, predicate logic, representing knowledge using rules, probabilistic reasoning, planning, natural language processing, learning and expert systems to solve (implement) the most elementary/simplest model problems, and thereafter b) Directly combine the above concepts to solve (design and implement) elementary model problems on the idealistic components of real-world systems with AI components FOR different type of circuit.<br><br>CO3<br><br>a) Analyze (identify parts, their interconnections and flow of information) the design and implementation of idealistic components of real world systems with AI components, and thereafter b) Compute the output of given model subsystems (and also identify errors in the design and implementation of given model subsystems).<br><br>CO4<br><br>a) Compare and contrast in details among intelligent agents, problem solving, search techniques, heuristic search strategies, adversarial |

| | |
|---|---|
| | search, knowledge and reasoning, predicate logic, representing knowledge using rules, probabilistic reasoning, planning, natural language processing, learning and expert systems, and thereafter b) describe an overview level interconnected map of concepts of Robot. |

| | |
|---|---|
| Department | Information Technology |
| Course Code | IT802E |
| Title of Course | Business analysis |
| Nature of Course | Theory |
| Type of Course | Elective |
| Contact Hours | 3 |
| Total contact hours | 34 |
| Credit | 3 |
| Course Outcomes | CO1<br><br>Translate results of business analytic projects into effective courses of action<br><br>CO2<br><br>Exhibit effective collaboration and leadership skills<br><br>CO3<br><br>Identify and describe complex business problems in terms of analytical models. |

| | |
|---|---|
| Department | Information Technology |
| Course Code | IT802F |
| Title of Course | ROBOTICS |
| Nature of Course | Theory |
| Type of Course | Elective |
| Contact Hours | 3 |
| Total contact hours | 34 |
| Credit | 3 |
| Course | CO1 |

| | |
|---|---|
| Outcomes | a) Define, b) explain in detail, and thereafter c) state the necessity/importance of the overview of Artificial Intelligence, intelligent agents, problem solving, search techniques, heuristic search strategies, adversarial search, knowledge and reasoning, predicate logic, representing knowledge using rules, probabilistic reasoning, planning, natural language processing, learning and expert systems.<br><br>CO2<br><br>a) Directly apply intelligent agents, problem solving, search techniques, heuristic search strategies, adversarial search, knowledge and reasoning, predicate logic, representing knowledge using rules, probabilistic reasoning, planning, natural language processing, learning and expert systems to solve (implement) the most elementary/simplest model problems, and thereafter b) Directly combine the above concepts to solve (design and implement) elementary model problems on the idealistic components of real-world systems with AI components FOR ROBOT.<br><br>CO3<br><br>a) Analyze (identify parts, their interconnections and flow of information) the design and implementation of idealistic components of real world systems with AI components, and thereafter b) Compute the output of given model subsystems (and also identify errors in the design and implementation of given model subsystems).<br><br>CO4<br><br>a) Compare and contrast in details among intelligent agents, problem solving, search techniques, heuristic search strategies, adversarial search, knowledge and reasoning, predicate logic, representing knowledge using rules, probabilistic reasoning, planning, natural language processing, learning and expert systems, and thereafter b) describe an overview level interconnected map of concepts of Robot. |

| | |
|---|---|
| Department | IT |
| Course Code | IT891 |
| Title of Course | DESIGN LAB |
| Nature of Course | Professional core courses |
| Type of Course | Practical |

| | |
|---|---|
| Contact Hours | 6 |
| Total contact hours | 6 MONTHS |
| Credit | 4 |
| Course Outcomes | CO1: a) Define ,b) explain in detail, and thereafter c) state the necessity/importance of the fundamental concepts of algorithm and correct program.<br><br>CO2: a) Directly apply the fundamental concepts of Programming to solve (implement) the most elementary/simplest model problems, and thereafter b) Directly combine the fundamental concepts to solve (design and implement) elementary model problems on the idealistic components of real-world systems using correct syntax.<br><br>CO3: a) Analyze (identify parts, their interconnections and flow of information) the design and implementation of idealistic components of real world systems, and thereafter b) Compute the output of given model subsystems (and also identify errors in the design and implementation of given model subsystems using the concept of arrays, strings .<br><br>CO4: a) Compare and contrast in details between the fundamental concepts of structures and thereafter b) describe an overview level interconnected map of concepts/terminologies of self-referential structures.<br><br>CO5: a) Identify and thematically explain where and how the terminologies are utilized in large scale real world systems, and thereafter b) Design the schematics for typical components of large scale known real world systems using the concept of simple text files.<br>CO6: a) Identify unsolved but necessary real world problems and thereafter b) generate pragmatic detailed ideas for creation/synthesis of innovative socially necessary products and services to solve such problems in Programming. |

| | |
|---|---|
| *Department* | Information Technology |
| *Course Code* | IT 892 |
| *Title of course* | PROJECT 2 |
| *Nature of course* | Compulsory |
| *Type of course* | Practical |
| *Contact hours* | 12 |
| *CREDIT* | 3 |
| *Total contact hours* | 6 MONTHS |
| *Course Outcomes* | CO1: Understand and apply different CONCEPTS IN PROJECT |

| | |
|---|---|
| Department | Information Technology |
| Course Code | IT 893 Semester: 7th B.Tech. |
| Title of Course | GRAND VIVA |
| Nature of Course | Compulsory |
| Type of Course | Sessional |
| Contact Hours | 3L |
| Total Contact Hours | 3 Credit: 3 |
| CO1 | a) Define, b) explain in detail, and thereafter c) state the necessity/importance of the fundamental concepts of Group Discussion (GD), formal presentation, verbal communication, logical reasoning, decision making, self-learning, teamwork, leadership, body language, learning attitude, group objective, moral, motivation, behaviour, recent trends in technology, emerging technologies, social, environmental and industrial aspects of technological developmental issues. |
| CO2 | Can identify and illustrate the working principles of ALL SUBJECTS formal presentation, verbal communication, logical reasoning, decision making, self-learning, teamwork, leadership, body language, learning attitude, group objective, moral, motivation, behaviour, recent trends in technology, emerging technologies, social, environmental and industrial aspects of technological developmental issues. |
| CO3 | Can analyse the technical aspects of ALL SUBJECTS formal presentation, verbal communication, logical reasoning, decision making, self-learning, teamwork, leadership, body language, learning attitude, group objective, moral, motivation, behaviour, recent trends in technology, emerging technologies, social, environmental and industrial aspects of technological developmental issues. |
| CO4 | Can differentiate and compare between of ALL SUBJECTS formal presentation, verbal communication, logical reasoning, decision making, self-learning, teamwork, leadership, body language, learning attitude, group objective, moral, motivation, behaviour, recent trends in technology, emerging technologies, social, environmental and industrial aspects of technological developmental issues. |