2016-2017
COMPUTER SCIENCE ENGINEERING

ACADEMIC YEAR 2016-2017

S1 CSE (2016 Batch) KTU

MA 101	Calculus	Jisha George
CY 100	Engineering Chemistry	Dr.Salini
BE 100	Engineering Mechanics	Aravind
BE 101-05	Introduction to computing and problem solving	Sibi S
BE 103	Introduction to Sustainable Engineering	Thushara S
ME 100	Basics of Mechanical Engineering	John P George
CY 110	Engineering chemistry Lab	Dr.Salini
CS 110	Computer Science Workshop	Sibi S
ME 110	Mechanical Engineering workshop	V K Soman

COURSE OBJECTIVES AND COURSE OUTCOMES

MA 101 CALCULUS

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To give the definition of an infinite series and explain what is meant by the sequence of partial sums. Relate the convergence or divergence of the series to the sequence of partial sums.	Evaluate the limit of a sequence of numbers (infinite series) and determine whether the series converges.
2	Compute partial derivatives of functions of several variables. Apply the theorem on mixed partial derivatives.	Understand the meaning of partial derivatives and calculate partial derivatives.
3	Use concepts of calculus to the model real-world problems	Compute dot product, cross product, length of vectors. Compute partial derivatives, derivatives of vector-valued functions, gradient functions.
4	Evaluate volumes of bounded solids and areas of bounded regions by using the ideas of double and triple integrals.	To change a double integral to polar co ordinate. Compute (relatively simple) triple integrals
5	Apply the concept of line integral to work and circulation. Know the definition and properties of conservative vector fields and their relationship to gradient fields.	Determine if a vector field is conservative and find a potential function if conservative. Evaluate line integrals in the plane and in space, including line integrals of vector fields.

COURSE OBJECTIVES AND COURSE OUTCOMES

CY100 ENGINEERING CHEMISTRY

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To acquire knowledge about desalination of brackish water and treatment of municipal water.	Develop innovative methods to produce soft water for industrial use and potable water at cheaper cost.
2	To gain the knowledge of conducting polymers, bio-degradable polymers and fibre reinforced plastics.	Substitute metals with conducting polymers and also produce cheaper biodegradable polymers to reduce environmental pollution. Design economically and new methods of synthesis nano materials.
3	To learn significance of green chemistry and green synthesis.	Have the knowledge of converting solar energy into most needy electrical.
4	To understand mechanism of corrosion and preventive methods.	Apply their knowledge for protection of different metals from corrosion.To prevents the monuments from getting corroded.
5.	To have an idea and knowledge about the Chemistry of Fuels.	Recent trends in electrochemical energy storage devices.
6.	To study different types of spectroscopy.	Learn how to use different spectroscopy techniques for analysis purpose of simple molecules.

COURSE OBJECTIVES AND COURSE OUTCOMES

BE100: ENGINEERING MECHANICS

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To apply the principles of mechanics to practical engineering problems.	Understand the fundamental concepts of mechanics.
2	To identify appropriate structural system for studying a given problem and isolate it from its environment.	Students would be able to apply and demonstrate the concepts of resultant and equilibrium of force system.
	To develop simple mathematical model for engineering problems and carry out static analysis.	Students would be able to determine the properties of planes and solids.
4	To develop simple mathematical model for engineering problems and carry out static analysis.	Understand the concepts of moment of inertia.
5		Students would be able to apply fundamental concepts of dynamics to practical problems.
6		Understand the basic elements of vibration.

COURSE OBJECTIVES AND COURSE OUTCOMES

BE 101-05   INTRODUCTION TO COMPUTING AND PROBLEM SOLVING

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes **On completion of course the students will be able to:**
1	Introduce Von-Neumann concept, Understand different types of programming languages, concept of operating systems, compiler, assembler & interpreter,	Able to identify different components of computer hardware.
		Brief overview of different programming languages.
		Aware of basic concepts of OS, compiler, interpreter and assembler
2	Provide an overview of problem solving concepts, study algorithm and flowcharts,documentation, debugging, testing & verification of programs.	Able to analyse and design simple problem solutions.
		Able to document, debug, test and verify a program correctly.
		Able to write algorithm and draw flowcharts of problems
3	Understand important concepts of Python, variables, expressions, logical operators, arithmetic operators, relational operators, control statements	Awareness of python basic data types, expression evaluation
		Able to develop simple Python programs including loops.
		Able to develop programs for multiplication and addition tables, simple menu driven applications
4	Study the basic concepts of functions	Understood the basic concept of modularized programming and benefits.
5	Study the basic concepts of string traversals, comparisons, lists, tuples, dictionaries	Able to develop simple matrix applications, alphabetical sorting of names, sort records

6	Introduce files and exceptions, classes and objects	Awareness about permanent storage and retrieval of data, encapsulation of data, abstraction of data, basic concepts of object oriented programming

COURSE OBJECTIVES AND COURSE OUTCOMES

BE103 INTRODUCTION TO SUSTAINABLE ENGINEERING

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes **On completion of course the students will be able to:**
1	To have an increased awareness among students on issues in areas of sustainability.	Able to appreciate and explain the different types of environmental pollution problems and their sustainable solutions
2	To have an insight into global environmental issues.	To be aware of problem related to global environmental issues
3	To establish a clear understanding of the role and impact of various aspects of engineering and engineering decisions on environmental, societal, and economic problems.	Able to apply the concepts of sustainability in their respective area of specialization
4	To understand the role of engineering in achieving sustainable world	To understand the need of waste disposal and management

COURSE OBJECTIVES AND COURSE OUTCOMES

ME 100: BASICS OF MECHANICAL ENGINEERING

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To expose the students to the thrust areas in Mechanical Engineering and their relevance by covering the fundamental concepts	The student will be able to understand the inter dependence of the thrust areas in Mechanical Engineering and their significance leading to the development of products, processes and systems.
2	This subject covers wide areas of Mechanical Engineering and is intended for exposing the students to the various theoretical and practical aspects of thermal engineering, fluid mechanics and machines, manufacturing and power transmission.	The student can able to understand the inter dependence of the thrust areas in Mechanical Engineering and their significance leading to the development of products and systems.
3		The students can able to understand working of automobiles.
4		Able to understand about various mechanical processes.

COURSE OBJECTIVES AND COURSE OUTCOMES

CY110 ENGINEERING CHEMISTRY LAB

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes On completion of course the students will be able to:
1	To make students familiarize with the practical aspects of volumetric analysis of water samples ad determine the parameters like alkalinity, chlorides and hardness.	To equip the students to apply the knowledge of Chemistry and take up Chemistry related topics as parts of their project works during higher semester of the course.
2	To improve the knowledge of different types of titrations used in volumetric analysis	To impart sound knowledge in the different fields of theoretical chemistry so as to apply it to the problems in engineering field. (b) To develop analytical capabilities of students so that they can characterize, transform and use materials in engineering and apply knowledge gained in solving related engineering problems
3	To make students develop in terms of practical skills required for analytical projects.	To develop abilities and skills that are relevant to the study and practice of Chemistry.
4	To study flash and fire point	To familiarize the students with different application oriented topics like new generation engineering material different instrumental methods etc.
		To enable the students to aquire the knowledge in the concepts of chemistry for

		engineering applications.
4		

COURSE OBJECTIVES AND COURSE OUTCOMES

CS110 COMPUTER SCIENCE WORKSHOP

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To impart the basic concepts of Python programming	Able to develop simple applications like calculator, interest calculations etc.
2	Understand the Python control statements and do programming	Able to develop programs for prime check, palindrome check, Armstrong check
3	Practise usage of functions in programming	Familiarized with modularised programming
4	To make them confident to develop a simple application using files	Able to store and retrieve data records permanently

COURSE OBJECTIVES AND COURSE OUTCOMES

ME 110 MECHANICAL ENGINEERING WORKSHOP

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	Introduction to basic manufacturing process like welding, moulding, fitting, assembling, smithy, carpentry works etc.	Knowledge achieved to explain the various manufacturing process in the basic mechanical engineering workshop sections-smithy, carpentry, assembling, welding etc.
2	Familiarization of basic manufacturing hand tools and equipment like files, hacksaw, spanner chisel hammers, etc.	Identify the various hand tools used in the basic mechanical engineering workshop sections-smithy, carpentry, assembling, welding etc.
3	Familiarization of various measuring devises like vernier height gauge, vernier caliper, micrometer, steel rule etc.	Able to choose different measuring devises according to the work.
4	Demonstration and study of various machine tools like lathe, drilling machine, milling machine etc.	Ability to name and summarise the operations of various machine tools like lathe, milling, drilling and shaping machines.
5	Familiarizing the disassembling and assembling of machine parts.	Knowledge achieved to disassemble and assemble the machine like IC engines.
6		Skill achieved to construct models by using basic mechanical workshop sections like welding, moulding, smithy, carpentry etc.

S3 CSE (2015 Batch) KTU

MA 201	Linear Algebra & Complex Analysis	Sreelekha T R
CS 201	Discrete computational Structures	Anjana Krishnan
CS 203	Switching Theory and Logic Design	Sukesh Babu V S
CS 205	Data Structures	Dhanunath R
CS 207	Electronic Devices & Circuits	Malu
HS 210	Life skills	Col. G G Mathews
CS 231	Data structures Lab	Dhanunath R
CS 233	Electronics circuits Lab	Preetha R

COURSE OBJECTIVES AND COURSE OUTCOMES

MA201 LINEAR ALGEBRA & COMPLEX ANALYSIS

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	Learn to work with vectors in two and three dimensions.	Compute the distance between points, the distance from a point to a line, and the distance from a point to a plane in the three-dimensional coordinate system. Perform algebraic operations with vectors in two and three dimensions, Find the length of a vector, Compute dot and cross product of vectors.
2	An understanding of Fourier Series and Laplace Transform to solve real world problems	Solve first-order linear or separable equations, finding both the general solution and the solution satisfying a specified initial condition.
3	Identify an ordinary differential equation and its order	Sketch and describe regions in space.
4	Verify whether a given function is a solution of a given ordinary differential equation (as well as verifying initial conditions when applicable	Solve constant-coefficient, linear, homogeneous equations of higher order (especially second order) and find the solution satisfying specified initial conditions
5	Solve first order linear differential equations Find solutions of separable differential equations, Model radioactive decay, compound interest,	Determine whether solutions of such an equation are linearly independent. Use the methods of undetermined coefficients and variation of parameters to solve

	and mixing problems using first order equations, Model population dynamics	nonhomogeneous equations equation

COURSE OBJECTIVES AND COURSE OUTCOMES

CS 201 DISCRETE COMPUTATIONAL STRUCTURES

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	Students will learn basic logic and set theory.	1. Students will understand Boolean algebra and truth tables.
		2. Students will understand basic proofs involving sets and functions.
		3. Students will understand types of algorithms and the issue of efficiency of algorithms.
		4. Use set notation, including the notations for subsets, unions, intersections, differences, complements, cross (Cartesian) products, and power sets.
		5.Prove that a proposed statement involving sets is true, or give a counterexample to show that it is false. In particular, be able to prove that a set is empty.
		6. Understand and use the terms cardinality, finite, countably infinite, and uncountably infinite, and determine which of these characteristics is associated with a given set.

2	Students will learn core ideas in combinatorial mathematics	1. Students will understand the ideas of permutations and combinations.
		2. Students will understand the addition and multiplication principles for counting.
		3. Students will understand how to apply combinatorial ideas to practical problems.
3	Explain the fundamental concepts of advanced algebra such as groups and rings and their role in modern mathematics and applied contexts	Demonstrate accurate and efficient use of advanced algebraic techniques
		Demonstrate capacity for mathematical reasoning through analyzing, proving and explaining concepts from advanced algebra
		Apply problem-solving using advanced algebraic techniques applied to diverse situations in physics, engineering and other mathematical contexts
4	At the conclusion of this course, students should have a sound understanding of what mathematics is about, and should have acquired a level of mathematical literacy that would enable them to see its relevance in their own domain of knowledge.	1.Can use, manipulate, and analyze Boolean expressions & functions (CAC a, EAC a)
		2. Can use, manipulate, and analyze propositional & predicate logic statements (CAC a, EAC a)
		3. Can construct and analyze simple finite state automata (CAC a, EAC a)
5	1.Write English sentences for logical expressions and vice-versa. Use standard notations of propositional logic.	Apply standard logical equivalences. Be able to prove that two logical expressions are or are not logically equivalent.
	2. Complete and use truth tables for expressions involving the following logical connectives: negation, conjunction, disjunction, conditional, and biconditional.	Determine if a logical argument is valid or invalid. Apply standard rules of inference including (but not limited to) Modus Ponens, Modus Tollens, Transitivity, and Elimination. Recognize fallacies such as the Converse Error and the

	3.Define and use the terms: proposition (statement), converse, inverse, contrapositive, tautology, and contradiction.	Inverse Error.
6	1. Translate between English sentences and symbols for universally and existentially quantified statements, including statements with multiple quantifiers. 2 Write the negation of a quantified statement involving either one or two quantifiers.	1.Determine if a quantified statement involving either one or two quantifiers is true or false.
		2.Construct induction proofs involving summations, inequalities, and divisibility arguments.

COURSE OBJECTIVES AND OUTCOMES

CS 203 SWITCHING THEORY AND LOGIC DESIGN

Sl No	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To impart an understanding of the basic concepts of Boolean algebra and digital systems	Apply the basic concepts of Boolean algebra for the simplification and implementation of logic functions using suitable gates namely NAND, NOR etc.
2	To impart familiarity with the design and implementation of different types of practically used sequential circuits.	Design simple Combinational Circuits such as Adders, Subtractors, Code Convertors, Decoders, Multiplexers, Magnitude Comparators etc.
3	To provide an introduction to use Hardware Description Language	Design Sequential Circuits such as different types of Counters, Shift Registers, Serial Adders, and Sequence

		Generators.
		Use Hardware Description Language for describing simple logic circuits
		Apply algorithms for addition/subtraction operations on Binary, BCD and Floating Point Numbers.

COURSE OBJECTIVES AND COURSE OUTCOMES

CS 205 DATA STRUCTURE AND ALGORITHMS

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To impart a thorough understanding of linear data structures such as stacks, queues and their applications.	1. compare different programming methodologies and define asymptotic notations to analyze performance of algorithms.
2	2. To impart a thorough understanding of non-linear data structures such as trees, graphs and their applications.	2. use appropriate data structures like arrays, linked list, stacks and queues to solve real world problems efficiently.
3	3. To impart familiarity with various sorting, searching and hashing techniques and their performance comparison.	3. represent and manipulate data using nonlinear data structures like trees and graphs to design algorithms for various applications.

Sl. No.		
4	4. To impart a basic understanding of memory management.	4. illustrate and compare various techniques for searching and sorting.
		5. appreciate different memory management techniques and their significance.
		6. illustrate various hashing techniques.

COURSE OBJECTIVES AND COURSE OUTCOMES

CS 207 ELECTRONIC DEVICES AND CIRCUITS

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To introduce to the students the fundamental concepts of electronic devices and circuits for engineering applications	Explain, illustrate, and design the different electronic circuits using electronic components
2	To develop the skill of analysis and design of various analog circuits using electronic devices	Design circuits using operational amplifiers for various applications

3	To provide comprehensive idea about working principle, operation and applications of electronic circuits	
4	To equip the students with a sound understanding of fundamental concepts of operational amplifiers	
5	To expose to the diversity of operations that operational amplifiers can perform in a wide range of applications	
6	To expose to a variety of electronic circuits/systems using various analog ICs	

COURSE OBJECTIVES AND COURSE OUTCOMES

HS 210 Life Skills

Sl No	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To develop communication competence in prospective engineers, to enable them to convey thoughts and ideas with clarity and focus, to develop writing skills, to equip them to face interviews and Group Discussion	1.Communicate effectively, make effective presentations, write different types of reports, face interviews and Group Discussion
2	To inculcate critical thinking process, to prepare them on problem solving skills, to provide symbolic, verbal and graphical	2. Critically think on a particular problem, solve problems

	interpretations of statements in a problem description	
3	To understand team dynamics and effectiveness	3. Work in groups and teams
4	To create an awareness on Engineering ethics and Human Values, to instill Moral and Social Values, Loyalty and also to learn to appreciate the rights of others	4.Handle Engineering Ethics and Human Values
5	To learn leadership qualities and practise them	5. Become an effective leader

COURSE OBJECTIVES AND COURSE OUTCOMES

CS 231 DATA STRUCTURES LAB

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To implement basic linear and non-linear data structures and their major operations.	Appreciate the importance of structure and abstract data type, and their basic usability in different applications.
2	To implement applications using	Analyze and differentiate different algorithms based on their time complexity.

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		these data structures.
3	To implement algorithms for various sorting techniques.	Implement linear and non-linear data structures using linked lists.
4	Strengthen the ability to the students to identify and apply the suitable data structure for the given real world problem.	Understand and apply various data structure such as stacks, queues, trees, graphs, etc. to solve various computing problems
5	Enables them to gain knowledge in practical applications of data structures.	Implement various kinds of searching and sorting techniques, and decide when to choose which technique.
6	Be capable to identity the appropriate data structure for given problem.	Identify and use a suitable data structure and algorithm to solve a real world problem.

COURSE OBJECTIVES AND COURSE OUTCOMES

CS233 ELECTRONIC CIRCUITS LAB

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To introduce to the students the fundamental concepts of electronic devices and circuits for engineering	Explain, illustrate, and design the different electronic circuits using electronic components

	applications	
2	To develop the skill of analysis and design of various analog circuits using electronic devices	Design circuits using operational amplifiers for various applications
3	To provide comprehensive idea about working principle, operation and applications of electronic circuits	
4	To equip the students with a sound understanding of fundamental concepts of operational amplifiers	
5	To expose to the diversity of operations that operational amplifiers can perform in a wide range of applications	
6	To expose to a variety of electronic circuits/systems using various analog ICs	

S5 CSE (2014 Batch)

13.501	Abstract Algebra,Number Theory and Optimization	Anjana Krishnan
13.502	Linear Algebra and Queuing Theory	Liji
13.503	Operating systems	Freeshma Karunan
13.504	Systems Programming	Vivitha Vijay
13.505	Microprocessors and Interfacing	Shreyas L
13.506	Object Oriented Design and JAVA Programming	Suma S G

13.507	Object Oriented Programming Lab	Neethu Krishna
13.308	Application Software Development Lab	Sibi S

COURSE OBJECTIVES AND COURSE OUTCOMES

13.501 ABSTRACT ALGEBRA, NUMBER THEORY AND OPTIMIZATION

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	Learn to work with vectors in two and three dimensions.	Compute the distance between points, the distance from a point to a line, and the distance from a point to a plane in the three-dimensional coordinate system. Perform algebraic operations with vectors in two and three dimensions, Find the length of a vector, Compute dot and cross product of vectors.

2	An understanding of Fourier Series and Laplace Transform to solve real world problems	Solve first-order linear or separable equations, finding both the general solution and the solution satisfying a specified initial condition.
3	Identify an ordinary differential equation and its order	Sketch and describe regions in space.
4	Verify whether a given function is a solution of a given ordinary differential equation (as well as verifying initial conditions when applicable	Solve constant-coefficient, linear, homogeneous equations of higher order (especially second order) and find the solution satisfying specified initial conditions
5	Solve first order linear differential equations Find solutions of separable differential equations, Model radioactive decay, compound interest, and mixing problems using first order equations, Model population dynamics	Determine whether solutions of such an equation are linearly independent. Use the methods of undetermined coefficients and variation of parameters to solve non homogeneous equations equation

COURSE OBJECTIVES AND COURSE OUTCOMES

13.502: LINEAR ALGEBRA AND QUEUING THEORY

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:

1	To provide students with the ability to understand and conduct computer systems modelling and performance analysis.	To acquire skills in handling situations involving more than one random variable and functions of random variables.
2	To establish the necessary background, the course starts with an introduction to basic probability tools and concepts. It then builds up to more advance topics that are particularly useful in modeling, such as Markov models and queueing theory.	To apply basic probability techniques and models to analyze the performance of computer systems, and, in particular, of networks and queues.
3	To understand probabilistic models are employed in countless applications in all areas of science and engineering.	To have a well – founded knowledge of standard distributions which can describe real life phenomena.
4	To provide necessary mathematical support and confidence to tackle real life problems.	To understand and characterize phenomena which evolve with respect to time in a probabilistic manner.
5		To understand basic characteristic features of a queuing system and acquire skills in analyzing queuing models.
		To use discrete time Markov chains to model computer systems.

COURSE OBJECTIVES AND COURSE OUTCOMES

13.503 OPERATING SYSTEMS

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes

		On completion of course the students will be able to:
1	To provide an understanding of concepts those underlie operating systems.	After successful completion of this course, the student will be able to understand how operating system works in the background
		Makes the user interact with the Machine.

COURSE OBJECTIVES AND COURSE OUTCOMES

13.504 SYSTEM PROGRAMMING

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To impart the basic concepts of system software design.	Able to understand different system software architectures
2	Different assembler design options and assembler implementations.	Design and develop assembler.
3	Basic functions of loaders, linkers and macro processors.	Design and develop loader, linker and macro processor.
4	Overview of text editors and debuggers. General overview of the UNIX operating system	Able to understand the features of UNIX OS.

COURSE OBJECTIVES AND COURSE OUTCOMES FOR

13.505 MICROPROCESSOR AND INTERFACING

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	Study on 8085 microprocessor, its memory and interfacing, analog to	To study instruction sets and know in detail about working of microprocessor, to help them in design of microprocessors.

	digital converters, read and write timing signals	
2	Study on 8086 microprocessor, addressing modes, timing diagrams	To study about instructions, its execution ,develop new real time applications using instruction sets ,to get basic knowledge about the micro processor and to work on improvements in processing speeds.
3	Study on timers, counters, interfaces like keyboard, interrupt controller, dma controller	The program motivates students to develop strong skills in research, analysis and interpretation of complex information

The program prepares students to successfully compete for employment in Electronics, Manufacturing and Teaching industry |

COURSE OBJECTIVES AND COURSE OUTCOMES

13.506 Object Oriented Design and Programming

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To impart the basic concepts of Object	Apply object oriented principles in software

	Oriented Design Techniques.	design process.
2	To give a thorough understanding of Java language.	Implement object oriented principles for reusability.
3	Handling Exceptions in Java. Implementing threads in java. Applet programming.	Assign priorities and resolve run-time errors with Multithreading and Exception Handling techniques.
4	Introduction to GUI classes and event Handling mechanisms. To impart the techniques of creating GUI based applications.	Interpret Event handling techniques for interaction of the user with GUI. Develop client/server applications using socket programming. Analyze JDBC drivers to connect Java applications with relational databases.

COURSE OBJECTIVES AND COURSE OUTCOMES

13.507 OBJECT ORIENTED PROGRAMMING LAB

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	**1. To introduce basic concepts of object oriented design techniques.**	1.apply object oriented principles in software design process.

2	**2. To give a thorough understanding of Java language.**	2. develop programs for real applications using java constructs and libraries.
3	**3. To provide basic exposure to the basics of multithreading, database connectivity etc.**	3.understand and apply various object oriented features like inheritance, data abstraction, encapsulation and polymorphism to solve various computing problems using C++ language.
4	**4. To impart the techniques of creating GUI based applications.**	4. implement Exception Handling in C++.

COURSE OBJECTIVES AND COURSE OUTCOMES

13.508 APPLICATION SOFTWARE DEVELOPMENT LAB

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To introduce basic commands and operations on database	Design and implement a database for a given problem using database design principles
2	To introduce stored programming concepts (PL-SQL)using Cursors and Trigger	Apply stored programming concepts (PL-SQL) using Cursors and Triggers.
3	To familiarize front end tools of database	Use graphical user interface, Event Handling and Database connectivity to develop and deploy applications and applets.
		Develop medium-sized project in a team.

S7 CSE (2013 Batch)

13.701	Computer Graphics	Dhanunath R
13.702	Seminar, Industrial Visit & Project Design	Divya V
13.703	Embedded Systems	Arathy Babu
13.704	Software engineering and project management	Neethu Krishna

13.705.1	Multimedia Systems and Data Compression	Amitha R
13.706.1	Fuzzy Set Theory and Applications	Sreeji C
13.707	Computer Hardware & interfacing Lab	Shreyas L
13.707	Operating Systems and Network Programming Lab	Sreeji C

COURSE OBJECTIVES AND OUTCOMES

13.701 COMPUTER GRAPHICS

Sl No	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To introduce the concepts related to graphic devices.	Capture the knowledge about the working principles of graphic devices in selecting appropriate graphics hardware

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		for various applications.
2	To develop an awareness of the various graphic functions and algorithms	Apply geometric transformations on 2D primitives and use formal mechanisms for displaying views of a picture on an output device.
		Apply geometric transformations on 3D objects and use formal mechanisms for displaying views of a picture on an output device .
		Analyze various basic graphic algorithms, and explore the methods used for detecting visible surfaces in a three dimensional scene
		Explain and differentiate various color, illumination and shading models.
		Develop the skill for graphics programming using OpenGL

COURSE OBJECTIVES AND COURSE OUTCOMES FOR

13.702 SEMINAR INDUSTRIAL VISIT AND PROJECT DESIGN

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:

1	To improve the professional skill and competency of the students	Able to understand the primary things to start a project
2	To understand the hardware and software design of a good product	Able to analyse a problem and design a solution to the problem.
3	To study about a topic in trend, based on the literature survey in leading journals	Able to create a report on a new topic in trend based on the study and literature survey.
4	Provide an opportunity to be inside an industry and aware about the working environment	Understood the working environment of an industry

COURSE OBJECTIVE AND COURSE OUTCOME

13.703 EMBBEDED SYSTEM

Sl no	Course Objective	Course Outcome
		On completion of course the student will be

		able to
1	To impart basic knowledge about embedded system	Discuss various types of embedded system, programming methods for 8051 and peripherals in 8051 microcontroller and its interfacing methods
2	To create awareness on the processes involved in CPU operation	Explained the various steps in embedded system design and working of CPU and it,s related components
3	To explain the various embedded computing platform and basic designs in embedded system	Interpret various steps in the design and operation of embedded system and its network based design
4	To understand basic knowledge about PIC Microcontroller	Explicate various types of embedded system, programming methods for PIC Microcontroller and peripherals in PIC Microcontroller and its interfacing methods

COURSE OBJECTIVES AND COURSE OUTCOMES

13.704 SOFTWARE ENGINEERING AND PROJECT MANAGEMENT

Sl.	Course Objectives	Subject Learning Outcomes or

No.		Course Outcomes
		On completion of course the students will be able to:
1	Apply software testing and quality assurance techniques at the module level, and understand these techniques at the system and organization level. Understand common lifecycle processes including waterfall (linear), incremental approaches (such as Unified process), and agile approaches.	Design and implement both the server and client components of a client-server application, such as a web-based application. Know commonly used architectural patterns, styles, and tactics. Identify their impact upon various quality concerns such as scalability, performance, and reliability.
2	Work collaboratively in a small team environment to develop a moderate-sized software system from conceptualization to completion, including requirements elicitation, system modelling, system design, implementation,	Give examples of the primary project management activities associated with each major software engineering activity including requirements elicitation, analysis and specification; analysis and design; implementation;
3	Work collaboratively in a small team environment to unit and system testing, integration, source code management configuration management, and release management.	Apply the principles and techniques of software engineering in the architectural design, detail design, and implementation of computer games or other entertainment focused software applications.
4	Prepare technical documentations and make presentations on various aspects of a software development project, including the technical aspects as well as the managerial aspects .	Develop a business plan for a start-up software business to be presented to a venture capitalist.

COURSE OBJECTIVES AND COURSE OUTCOMES

13.705.1 MULTIMEDIA SYSTEMS AND DATA COMPRESSION

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To introduce the concepts related to multimedia DBMS.	1. Identify different digital media, and explain the features and architecture of multimedia systems.
2	To create a basic knowledge in compression and decompression of different types of media.	2. Discuss the various applications of multimedia systems.
3	To develop an awareness regarding different types of multimedia systems.	3. Discuss the properties of multimedia DBMS and apply them in data modeling.
		4. Analyze compression techniques for different media like text, image, audio and video and use them in real world applications.
		5. Describe multimedia synchronization and its reference model.
		6. Clearly distinguish the types of multimedia systems.

COURSE OBJECTIVES AND COURSE OUTCOMES FOR

13.706.1 FUZZY SET THEORY AND APPLICATIONS

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To get the concept of uncertainty and imprecision and how to express the values for the uncertainty. To introduce the comparison between classical logic and fuzzy logic and various operations on the classical and fuzzy sets.	Able to do the operations o classical and fuzzy sets. Familiarization of different methods used in both classical and fuzzy for producing similarity relations.
2	To introduce the concept of membership function of fuzzy. To explain different types of fuzzy sets and its features.	Able to assign membership value for fuzzy variables. Able to classify fuzzy sets based on membership functions.
3	To introduce the concept of conversion of classical quantity to fuzzy and vice versa. Also introduced the concept of knowledge representation in natural language. To introduce various methods for representing knowledge.	Ability to convert fuzzy values to crisp by using various methods. Able to draw the knowledge representation graphically. Ability to decompose the knowledge.
4	To introduce different applications of fuzzy logic. Also introduced some real time applications in comparison with classical logic.	Ability to compare classical techniques with fuzzy and can give explanation for stating how fuzzy is applicable in some situations rather than classical concepts.

COURSE OBJECTIVES AND COURSE OUTCOMES

13.707 COMPUTER HARDWARE AND INTERFACING LAB

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	Familiarisation of pc components. Assembling PC	Be familiar with the components of a computer. Detailed knowledge on memory to select type of memory in your PC.. Identify the names, distinguishing features, and units for measuring different kinds of memory. Study on motherboard and its constituent components
2	Interfacing through parallel :Interfacing with pc, Controlling stepper motor through parallel port : base address of parallel port	To familiarize the parallel port, its registers, data transfer through parallel port
3	Interfacing through serial port: base address of serial port	To familiarize the serial port, its registers, data transfer through parallel port
4	8051 Micro controller experiments:- - Familiarization of 8051 trainer kit by executing simple Assembly Language programs such as Multi byte addition, searching, sorting, and code conversion	Generate user application to suit everyday needs. Generate square waveform, saw-tooth waveform and other mixed waveform using 8051

COURSE OBJECTIVES AND COURSE OUTCOMES

13.708 OPERATING SYSTEMS AND NETWORK PROGRAMMING LAB

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To introduce the concept of process, threads, inter process communication. Also introduced the concepts of various methods amiable for inter process communication.	Able to do process creation, do inter process communication by various methods. Also able to implement dining philosophers problem and bankers algorithm.
2	To introduce network concepts and communication between client and server. To introduce various protocols.	Ability to do client server communication using different protocols.

S2 CSE (2016 Batch) KTU

MA 102	Differential Equations	Sincy
BE 102	Design & Engineering	Thushara S
PH 100	Engineering physics	Sreeti Gangadharan
CE 100	Basics of Civil Engineering	Greeshma
CS 100	Basics of computer programming	Divya
BE 110	Engineering graphics	Dileep Kumar C
PH 110	Engineering physics Lab	Sreeti Gangadharan
CE 110	Civil Engineering workshop	Gayathri
CS 120	Computer Programming Lab	Divya

COURSE OBJECTIVES AND COURSE OUTCOMES

MA 102 - DIFFERENTIAL EQUATIONS

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To put it briefly, the point of this class is to take your existing knowledge of calculus and apply it towards the construction and solution of mathematical models in the form of differential equations.	Distinguish between linear, partial and ordinary differential equations. State the basic existence theorem for 1st order ODE's and use the theorem to determine a solution interval
2	Solve non-homogeneous linear equations with constant coefficients using the methods of undetermined coefficients and variation of parameters.	Recognize and solve a non homogeneous differential equation. Find particular solutions to initial value problems.
3	Introduce the Fourier series and its application to the solution of partial differential equation.	Find the Fourier series representation of a function of one variable.
4	To provide the student with the concept and the understanding of basics in Partial Differential Equations.	Knowledge in the Technic, methodology of solving Partial Differential Equations. A basic understanding in the Transforms which are useful in solving engineering problems.
5	This course introduces ideas of wave equation and heat equation which are widely used in the 40 modeling and analysis of a wide range of physical phenomena and has got applications across all branches of engineering.	At the end of the course students will have acquired basic knowledge of differential equations and methods of solving them and their use in analyzing typical mechanical or electrical systems.

COURSE OBJECTIVES AND COURSE OUTCOMES

BE 102 DESIGN AND ENGINEERING COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To excite the student on creative design and its significance	To appreciate different elements involved in design and to apply them when they called for.
2	To make the student aware of the processes involved in design	Aware of product centred and user centred aspects that makes in the design process.
3	To make the student understand the interesting interaction of various segments of humanities, sciences and engineering in the evolution of a design	To be aware of different stages in design process and results of incorporating other fields with engineering stream
4	To get an exposure as to how to engineer a design.	Understand different stages in manufacturing of a designed product

COURSE OBJECTIVES AND COURSE OUTCOMES

PH 100 ENGINEERING PHYSICS

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	Dynamics of mechanical and electrical oscillation using Fourier series and integrals; time and frequency representations for driven damped oscillators, resonance; one-dimensional waves in classical mechanics and electromagnetism; normal modes.	Solve for the solutions and describe the behavior of a damped and driven harmonic oscillator in both time and frequency domains. Damped and Forced Oscillations oscillating system problems.
2	The fundamental principles of photonics that complement the topics in the optics and laser courses and to help students develop problem-solving skills applicable to real-world photonics problems.	Define and explain the propagation of light in conducting and non-conducting media.
3	Introduce basic concepts and principles of acoustics.	Define and explain the physics governing laser behaviour and light matter interaction ting and non-conducting media.
4		Apply wave optics and diffraction theory to a range of problems
5		Explain and calculate the physical effects of acoustic reflections, absorption, scattering, diffusion, diffraction, and propagation losses.
6		Use advanced theoretical, numerical, and experimental techniques to model and analyze acoustical elements in musical instruments,

		the human voice, room acoustics, and audio.

COURSE OBJECTIVES AND COURSE OUTCOMES

CE 100: BASICS OF CIVIL ENGINEERING

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	**This course imparts to the students, the fundamentals of civil engineering and creates awareness on various issues related to our living environment and their remedies**	**At the end of the course, the students will be familiar with the different stages of building construction, various materials used for construction and environmental issues**
2	**To inculcate the essentials of civil engineering field to the students of all branches**	**The students will be able to illustrate the fundamental aspects of civil engineering**
	To provide the students an illustration of the significance of the civil engineering profession satisfying societal needs.	**The students should able to plan a building**
4	**To inculcate the essentials of civil engineering field to the students of all branches**	**Students will be able to explain about surveying for making horizontal and vertical measurements.**
5	**.**	**They will able to illustrate the uses of various building materials and construction of different components of a building.**
6		**The students will be able to illustrate the fundamental aspects of civil engineering**

COURSE OBJECTIVES AND COURSE OUTCOMES

CS100   COMPUTER PROGRAMMING

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	Understand important concepts of C programming, pre-processor directives, data types, operators, input and output, control statements	Awareness about different types of pre-processor directives and structure of C program.
		Able to develop simple C programs for performing calculations like area of rooms, volume of a vessel etc.
		Able to develop programs for multiplication and addition tables, simple menu driven applications
2	Introduce arrays, strings, structure and union, enumerated data types, sorting and searching	Able to develop simple C programs using arrays and structures
		Able to develop programs for sorting and searching simple things
		Able to develop simple matrix applications, alphabetical sorting of names, sort records
3	Provide the concept of pointers and give brief idea about its application storage classes,	Awareness about the need and use of pointers, dynamic memory allocation in programs
4	Study the basic concepts of pointers, dynamic memory allocations, functions, files, command line	Develop C programs that help to store solutions permanently using files, pointers and functions.

		Basic idea about command line programming
programming		

COURSE OBJECTIVES AND COURSE OUTCOMES

BE 110: ENGINEERING GRAPHICS

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes **On completion of course the students will be able to:**
1	Increase ability to communicate with people.	To hand letter will improve.
2	Learn to sketch and take field dimensions.	To perform basic sketching techniques will improve.
3	Learn to take data and transform it into graphic drawings.	To draw orthographic projections and sections.
4	Learn basic Auto Cad skills.	To use architectural and engineering scales will increase.
5	Learn basic engineering drawing formats	To produce engineered drawings will improve
6	Prepare the student for future Engineering positions	To convert sketches to engineered drawings will increase.
		7. Students will become familiar with office practice and standards.
		8. Students will become familiar with Auto Cad two dimensional drawings.
		9. Students will develop good communication skills and team work.

COURSE OBJECTIVES AND COURSE OUTCOMES FOR

PH 110 ENGINEERING PHYSICS LAB

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	Competency in an engineering or science profession via promotion to positions of increasing responsibility, publications, and/or conference presentations.	An ability to apply knowledge of mathematics, science, and engineering.
2	Adaptability to new developments in science and technology by successfully completing or pursuing graduate education in engineering or related fields, or participating in professional development and/or industrial training courses.	An ability to design and conduct experiments, as well as to analyze and interpret data.
3		An ability to identify, formulate, and solve engineering problems
4		Understanding of professional and ethical responsibility
5		The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context

6		A recognition of the need for, and an ability to engage in life-long learning

COURSE OBJECTIVES AND COURSE OUTCOMES

CE110 CIVIL ENGINEERING WORKSHOP

Sl No	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To inculcate the essentials of civil engineering field to the students of all branches.	The ability to practice civil engineering using up-to-date techniques, skills, and tools as a result of life-long learning ability to design and conduct experiments
2	To provide the students an illustration of the significance of the civil engineering profession satisfying societal needs.	An ability to design a system or component to satisfy stated or code requirements of Civil Engineering.
3	To develop awareness about the instruments used in civil engineering field work.	The students will be able to illustrate the fundamental aspects of civil engineering
4	.	The students should able to plan a building

COURSE OBJECTIVES AND COURSE OUTCOMES

CS110 PROGRAMMING LAB

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To impart the basic concepts C programming	Able to develop simple applications like calculator, interest calculations etc.
2	Understand the C programming using array, structure	Able to develop programs for alphabetical sorting of names, sorting of students details based on certain criteria
3	Practise usage of functions in programming	Familiarized with modularised programming
4	To provide the knowledge of pointers, programming using command line arguments, files	Able to store and retrieve data records permanently

S4 CSE (2015 Batch) KTU

MA 202	Probability Distributions, Transforms and Numerical Methods	Ambady V K
CS 202	Computer Organization & Architecture	Sukesh Babu V S
CS 204	Operating systems	Dhanunath R
CS 206	Object Oriented Design and Programming	Suma S G
CS 208	Principles of Database Design	Sreeji C
HS 200	Business Economics	Prof. P J Rajan
CS 232	Free and Open Source Software Lab	Kavya
CS 234	Digital System Lab	Gopika

COURSE OBJECTIVES AND OUTCOMES
MA 202 PROBABILITY DISTRIBUTIONS, TRANSFORMS AND NUMERICAL METHODS

SI No	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	- distinguish between discrete and continuous random variables - explain the difference between population, parameter, sample, and statistic - determine if a given value represents a population parameter or sample statistic - find probabilities associated with a discrete probability distribution - compute the mean and variance of a discrete probability distribution - find probabilities associated with a binomial distribution - find probabilities associated with a normal probability distribution using the standard normal table - determine the standard error for the sample proportion and sample mean - apply the Central Limit Theorem properly to a set of continuous data	- Students completing this course will be able to express a logic sentence in terms of predicates, quantifiers, and logical connectives. - Students completing this course will be able to apply the rules of inference and methods of proof including direct and indirect proof forms, proof by contradiction, and mathematical induction. - Students completing this course will be able to use tree and graph algorithms to solve problems. - Students completing this course will be able to evaluate Boolean functions and simplify expressions using the properties of Boolean algebra.

2	- Use programming operations to calculate solutions - Determine better and more accurate solutions - Perform and evaluate algebraic and trigonometric operations using built-in functions - Assign and manage variables Manipulate vectors and matrices, use matrix indexing, and determine matrix dimensions - Generate linearly spaced vectors - Create and execute a script - Create and evaluate x-y plots and subplots suitable for technical presentation - Create function input validation - Distinguish between the different MATLAB 'data types' - Create and manipulate Structures and Arrays Perform and evaluate relational and logical operations - Load, analyze, and manipulate images - Obtain and utilize user input - Manage and format text output Import and export numeric data using other filetypes (e.g. .csv, .xls, and .txt) - Perform polynomial curve-fitting, general curve fitting, and interpolation - Perform numeric and symbolic differentiation and integration	- Understand the solution types (no-, unique, and infinitely-many solutions) of linear algebra in general - calculate the roots of a function using bi-section, fixed-point iteration, Newton?s methods, and also by searching for sign changes; - calculate the unknowns of a linear equation set using direct solution techniques (Gauss elimination and inverse matrix approach) for the unique-solution case - calculate the unknowns of a linear equation set using iterative solution techniques (Jacobian and Gauss-Seidel Iterative Methods) for the unique-solution case.
3	- Model decision making problems using major modeling formalisms of artificial intelligence and operations research, including propositional logic, constraints, linear programs and Markov processes, - Evaluate the computational performance of search, satisfaction, optimization and learning algorithms. - Apply search, satisfaction, optimization and learning algorithms to real world problems	- Describe at an intuitive level the process of artificial intelligence and operations research: a real-time cycle of problem understanding, formulation, solution and implementation (homework). - Formulate simple reasoning, learning and optimization problems, in terms of the representations and methods presented (homework, quiz).

		• Manipulate the basic mathematical structures underlying these methods, such as system state, search trees, plan spaces, model theory, propositional logic, constraint systems, Markov decision processes, decision trees, linear programs and integer programs
		• Demonstrate the hand execution of basic reasoning and optimization algorithms on simple problems (homework, quiz).
		• Formulate more complex, but still relatively simple problems, and apply implementations of selected algorithms to solve these problems (homework, lab).
		• Evaluate analytically the limitations of these algorithms, and assess tradeoffs between these algorithms (homework, quiz).

COURSE OBJECTIVES AND OUTCOMES

CS202 COMPUTER ORGANIZATION AND ARCHITECTURE

Sl No	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To impart an understanding of the internal organization and operation of computer.	Identify the basic structure and functional units of a digital computer.
2	To introduce the concepts of processor logic design and control logic design.	Analyze the effect of addressing modes on the execution time of a program
		Design processing unit using the concepts of ALU and control logic design
		Identify the pros and cons of different types of control logic design in processors.
		Select appropriate interfacing standards for I/O devices.
		Identify the roles of various functional units of a computer in instruction execution.

COURSE OBJECTIVES AND COURSE OUTCOMES

CS 204 OPERATING SYSTEM

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	1. To impart fundamental understanding of the purpose, structure, functions of operating system.	Students will be able to: 1. identify the significance of operating system in computing devices.
	2. To impart the key design issues of an operating system	2. exemplify the communication between application programs and hardware devices through system calls. .
		3. compare and illustrate various process scheduling algorithms
		4. apply appropriate memory and file management schemes.
		5. illustrate various disk scheduling algorithms.
		6. appreciate the need of access control and protection in an operating system.

COURSE OBJECTIVES AND COURSE OUTCOMES

CS 206 Object Oriented Design and Programming

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To introduce basic concepts of object oriented design techniques.	Apply object oriented principles in software design process.
2	To give a thorough understanding of Java language.	Develop Java programs for real applications using java constructs and libraries.
3	Handling Exceptions in Java	Understand and apply various object oriented features like inheritance, data abstraction, encapsulation and polymorphism to solve various computing problems using Java language. Implementing Exception Handling in java.
4	To provide basic exposure to the basics of multithreading	Implement programs with multithreading in java.
5	Introduction to GUI classes and event Handling mechanisms	Use graphical user interface and Event Handling in java.
6	To impart the techniques of creating	Develop and deploy Applet in java.Implement

	GUI based applications.	Database Connectivity in the GUI program

COURSE OBJECTIVES AND COURSE OUTCOMES

CS 208 DATABASE DESIGN

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To impart the basic understanding of the theory and applications of database management systems. To introduce the concept of ER model. Also to introduce	Ability to draw ER diagrams for databases. Able to search appropriate data from databases using various searching techniques. Able to classify the databases.
2	To introduce the concepts of database languages. To introduce how to create database and how to retrieve data from database using SQL.	Able to algebraic operations on databases.
3	To introduce the queries in SQL to create database, insert values, update values and various operations on database.	Ability to create databases. Able to insert, delete values from databases. Students can able to do various operations on the databases.
4	To introduce the concepts of data dependencies and normalization of databases to reduce the redundancy of data in databases.	Able to normalize the relations of databases, thus avoiding redundancy.
5	To introduce the organization of data in	Able to organize the databases.

Sl No		
6	To introduce the concepts of transactions in real life applications like banking applications. To introduce how to provide security to databases.	Ability to identify the properties of transactions and able to do transactions and can provide security to confidential databases.

a database. Also to introduce the optimization of queries.

COURSE OBJECTIVES AND COURSE OUTCOMES

HS 200: Business Economics

Sl No	Course Objectives	Subject Learning Outcomes or Course Outcomes **On completion of course the students will be able to:**
1	Includes the study of trading, growth, money, income, depression, prices, and monopoly.	1. Apply economic reasoning to the analysis of selected contemporary economic problems
2	Understand fundamental financial concepts of Micro-Economics through exposure to the language, theories and methodologies of economics;	2. Microeconomics course has several common objectives that contribute to a student's learning in a business, finance or economics program.
3	Present factual material concerning the operation of the firm and household as well as the development of rudimentary understanding of economic decision-making	3. Distinguish between a fixed cost and a variable cost
4	To provide the students with an introduction to the basic macroeconomic principles	4. Understand Business Costs and Pricing
5	Recognize the types of real-life business decision problems where use of the models brings added value	5. To make investment decisions with the help of NPV IRR ARR, payback period and PI.

6	Be able to explain the merits and limitations of various statistical techniques	6. Preparation of balance sheet helped to find financial position to understand about capital market and money market.

COURSE OBJECTIVES AND OUTCOMES

CS 232 FREE AND OPEN SOURCE SOFTWARE LAB

Sl No	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	Getting started with Linux basic commands and operations	Identify and apply various Linux commands
2	More awareness about shell script program to show various system configuration and their functions	Develop shell scripts and GUI for specific needs
3	Know about Version control set up and usage using GIT.	Use tools like GIT and SCM tools with no code repository.
4	Installing various software packages. Either the package is yet to be installed or an older version is present.	Perform basic level application deployment, kernel configuration and installation, packet management and installation etc.

COURSE OBJECTIVES AND COURSE OUTCOMES

CS 234.DIGITAL SYSTEMS LAB

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To understand different positional number systems and conversions.	Compare various positional number systems and binary codes
2	To introduce basic postulates of Boolean algebra and show the correlation between Boolean expression	Apply Boolean algebra in logic circuit design
3	To analysis and design various combinational circuits and sequential circuits	Design combinational and sequential circuits
4	To study the fundamentals of HDL	Design and implement digital systems using basic programmable blocks

5	To design and implement synchronous sequential circuits	

S6 CSE (2014 Batch)

13.601	Compiler Design	Sukesh Babu V S
13.602	Principles of Programming Language	Neethu Krishna
13.603	Design and Analysis of Algorithms	Sreeji C
13.604	Computer Networks	Vivitha Vijay
13.605	PC Hardware & Interfacing	Shreyas L
13.606	Signals & systems	Anup Vasavan
13.607	Microprocessor Lab	Kavya
13.608	System Software Lab	Vivitha Vijay

COURSE OBJECTIVES AND OUTCOMES

13.601 COMPILER DESIGN

Sl No	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To introduce the major concept areas of language translation and compiler design	Identify different language translators and explain the concepts and different phases of compilation with compile time error handling. . ..
2	To develop an awareness of the function and complexity of modern compilers	Represent language tokens using regular expressions, context free grammar and finite automata and design lexical analyzer for a language
3	To provide practical, hands on experience in compiler design.	Compare top down with bottom up parsers, and develop appropriate parser to produce parse tree representation of the input
		Explain syntax directed translation schemes for a given context free grammar and generate intermediate code

		Apply optimization techniques to intermediate code and generate machine code for high level language program

COURSE OBJECTIVES AND COURSE OUTCOMES FOR

13.602 PRINCIPLES OF PROGRAMMING LANGUAGES

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	The course is built around an investigation of what programming languages are, and the notion of programs as artefacts. Two key aspects of the study of programming languages are their semantics, and their syntax.	Manipulate and generate lambda-terms, extending a system such as Church numerals; check and assign types to lambda terms.
2	We will survey some of the fundamental principles of the semantics and computational behaviour of programs, including the lambda calculus, types and fixed-points.	Solve simple recursive equations by determining the limit of the Kleene fixpoint construction.

3	Rigorous proofs of properties of programs, such as are needed for safety-critical software, or for program transformations such as are carried out by optimising compilers, require a formal description of the 'meaning' and behaviour of programs	design and extend operational and denotational definitions for basic programming language constructs. prove properties of programs by various formal means, including structural and fixpoint induction.
4	The syntax of programming languages is routinely defined by well-understood means, in terms of formal grammars and their relation to certain classes of automata.	demonstrate correspondences between grammars, languages and automata. use standard parser and lexer generator tools to construct and implement translations such as a very simple compiler.

COURSE OBJECTIVES AND COURSE OUTCOMES

13.603 DESIGN AND ANALYSIS OF ALGORITHMS

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To introduce the important of algorithms and its running time in various applications. Also introduced how to find the time needed for executing an algorithm.	Ability to calculate the running time of algorithms using various methods. Able to a list using different sorting techniques.
2	To introduce different types of height balanced trees.	Able to create height balanced trees and can perform various types of operations on such types of trees.

3	To introduce graph different operations can be applied to graphs.	Ability create trees from graphs. Able to do various operations on graphs.
4	To introduce different techniques for designing algorithms. To introduce different optimization techniques. To introduce the concept of NP-completeness.	Ability to design algorithms for given problems. Able to solve different optimization problems. Able to prove the given problem is under Np or not.

COURSE OBJECTIVES AND COURSE OUTCOMES

13.604 COMPUTER NETWORKS

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes **On completion of course the students will be able to:**
1	Build an understanding of the fundamental concepts of computer networking.	Describe the different aspects of networks, protocols and network design models. Explain the various Data Link layer design issues and Data Link protocols
2	Familiarize the student with the basic taxonomy and terminology of the computer networking area.	Analyze and compare different LAN protocols. Compare and select appropriate routing

		algorithms for a network.
3	Introduce the student to advanced networking concepts, preparing the student for entry Advanced courses in computer networking	Able to understand IP addressing. Able to understand congestion control algorithms. Able to understand IP protocols.
4	Allow the student to gain expertise in some specific areas of networking such as the design and maintenance of individual networks.	Able to understand the functions of network layer, transport layer and application layer in internetworking.

COURSE OBJECTIVES AND COURSE OUTCOMES

13.605 PC HARDWARE AND INTERFACING

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	Study on architecture of 80286,386,486,Pentium	• Developing of assembly level programs and providing the basics of the processors. The course objective is to introduce the basic concepts of microprocessor and to develop in students the assembly language programming skills and real time applications of Microprocessor • Analyze abstract problems and

		apply a combination of hardware and software to address the problem;
2	Components of a computer, Introduction to memory, memory arrangements, memory modules, mother board features	• Be familiar with the components of a computer. Detailed knowledge on memory to select type of memory in your PC.. Identify the names, distinguishing features, and units for measuring different kinds of memory. Study on motherboard and its constituent components
3	Get familiarized with power supply components, mass storage medium and categories	Identify and rectify the hardware issues, do maintenance work. Select storage device of your requirement
4	Study on different i/o ports , types of keyboard, connectors, audio standards	To choose buses as per your requirement ,to select connectors .To trouble shoot keyboard and connectors

COURSE OBJECTIVES AND COURSE OUTCOMES

13.606: SIGNALS AND SYSTEMS

Sl No.	Course Objectives	Course Outcomes
1	Coverage of continuous and discrete-time signals and systems, their properties and representations and methods those are necessary for the analysis of continuous and discrete-time signals and systems.	Student understand continuous-time signals and discrete-time signals
2		Student understand linear time-invariant systems theory and applications

3		Student can perform mathematical and graphical convolution of signals and systems
4	Knowledge of time-domain representation and analysis concepts as they relate to difference equations, impulse response and convolution, etc.	Students can perform analysis to difference equations, impulse response etc
5	Knowledge of frequency-domain representation and analysis concepts using Fourier Analysis tools, Z-transform	Analyze CT and DT systems using Laplace transforms and Z Transforms.
6		Student understand continuous-time and discrete-time Fourier series/transforms
7		Student can sketch the magnitude and phase of signals in transform domains
8		Analyze system properties based on impulse response and Fourier analysis.
	Introduction to the principle, algorithms and applications of modern digital signal processing.	Learn the basic elements of digital signal processing frequency domain sampling, properties of DFT, FFT.
	To study the design of FIR and IIR filters.	Discuss various methods to design IIR and FIR filters like window method, frequency sampling method , impulse invariance, bilinear transformation.

COURSE OBJECTIVES AND COURSE OUTCOMES

13.607 MICROPROCESSOR LAB

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To get concept about 8085 Microprocessor and their instruction set	Develop and execute programs to perform data transfer, arithmetic& logical operations. and code conversions using 8085

		microprocessors and basic arithmetic operations using 8086.
2	To explain and execute arithmetic and logical programs for microprocessor based applications in electrical and electronics engineering.	Generate square wave using 8085 microprocessor and to interface using PPI 8255
3	To know about the basic operating concepts of microprocessors	Make use of 8085 microprocessor for speed and position control of dc motor and stepper motor
4	To generate low level programming like generation of square wave, triangular wave etc	
5	To give awareness about the concept of 8086 Microprocessor	
6	To understand the basic operations that can be run on 8086 microprocessors	

COURSE OBJECTIVES AND COURSE OUTCOMES

13.608 SYSTEM SOFTWARE LAB

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	• To design and implement assembler for a hypothetical machine. • To design Macro processor. • To get an exposure to design and implement various components of	• Understand latest features of translators. • Apply the concept of finite automata to implement components of system software. • Design system software using latest tools.

	system software.	

S8 CSE (2013 Batch)

13.801	Cryptography and Networks Security	Divya V
13.802	Computer System Architecture	Dhanunath R
13.803	Distributed System	Neethu Krishna
13.804.1	Soft Computing	Sreeji C
13.805.4	Mobile Computing	Freeshma Karunan
13.806	Algorithm Design Lab	Sreeji. C
13.807	Project Work and Viva Voce	Divya V

COURSE OBJECTIVES AND COURSE OUTCOMES

13.801   CRYPTOGRAPHY & NETWROK SECURITY

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	Introduce cryptography, key terms, substitution techniques, transposition techniques, rotor machines, symmetric cipher models: DES, AES, IDEA	Able to understand cipher model, substitution and transposition techniques.
		Brief overview of symmetric models
		Understood round structure of DES, AES, IDEA
2	Provide an overview of Asymmetric encryption, RSA, Diffie Hellman key exchange, Elliptic curve cryptography, SHA, MD5, digital signatures	Able to differentiate symmetric and asymmetric encryption techniques.
		Able to encrypt simple messages using RSA, ECC
		Understood the concept of message authentication using SHA,MD5

		Obtained the basic concept and significance of digital signatures
3	Provide an overview of need and possibilities for Network security. Introduce email security protocols PGP, S/MIME, Give a brief idea about IPSec	Awareness about the working of PGP and S/MIME protocols.
		Understood about different protocols that provide network security at IP layer.
4	Introduce the concepts of secure Socket Layer and Transport layer Security- Secure electronic transaction, firewalls.	Understood about different protocols that provide network security at transport layer.
		Understood the process of SET
		Awareness about different firewalls.

COURSE OBJECTIVES AND OUTCOMES

13.802 COMPUTER SYSTEM ARCHITECTURE

Sl No	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To provide an understanding of the different kinds of computer system architectures and their evolution. .	Understand the different classes of computer architecture and select an appropriate architecture for a given application.
2	To provide an insight into the implementation of parallel processing performed in computers	Apply the various scalability analysis techniques.
3	To give a thorough understanding of pipeline design and its various aspects.	Familiarize the concepts of memory hierarchy and interconnection systems.
		Utilize the concept of pipelining to identify its various applications

		Apply collision free scheduling for initiating operations in non linear pipeline design

COURSE OBJECTIVES AND COURSE OUTCOMES

13.803 DISTRIBUTED SYSTEMS

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	The course aims to provide an understanding of the principles on which the Internet and other distributed systems are based; their architecture, algorithms and how they meet the demands of contemporary distributed applications.	• Key concepts and well-known methods will be explained in lectures, classes or online, where syllabus material will be presented and the subject matter will be illustrated with demonstrations and examples;
2	The course covers the building blocks	• Tutorials will focus on problem solving and they will provide practice in the

Sl. No.		
	for a study of distributed systems, and addressing the characteristics and the challenges that must be addressed in their design: scalability, heterogeneity, security and failure handling being the most significant.	application of theory and procedures, allow exploration of concepts with teaching staff and other students, and give feedback on your progress and understanding;
3	This course also covers issues and solutions related to the design and the implementation of distributed applications.	• Computer laboratory sessions provide practices in the application of developing basic distributed applications using RPC;

COURSE OBJECTIVES AND COURSE OUTCOMES

13.804.1 SOFT COMPUTING

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To provide a clear understanding on artificial neural networks.To introduces the architecture of various networks.	Able to implement different logical structures with the help of learning of artificial neural networks.
2	To introduce the concept of fuzzy logic, its properties and operations.	Able to do operations on fuzzy sets. Able to split the knowledge, apply operations on

	Also to introduce the concepts of membership functions of fuzzy logic. To give idea for representation of knowledge in natural language.	antecedents. Able to graphically represent the knowledge.
3	To provide a clear understanding of genetic algorithms and an idea regarding basic operations on genetic algorithms.	Able to do cross over, mutation etc. Able to classify various algorithms.
4	To introduce the concepts of hybrid systems and its applications.	Able to implement hybrid systems in intrnet.

COURSE OBJECTIVES AND COURSE OUTCOMES

13.805.4 MOBILE COMPUTING

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	• To study the relevance and underlining infrastructure of multimedia system.	Clearly differentiate 3-G and 2-G networks

2	• To enable the students to apply contemporary theories of multimedia learning to the development of multimedia products.	Learn the architecture of WAP & WWW.
3		Usage of various standard communication protocols.
4		Understand the services provided by wireless ATM.
5		Implement wireless communication in a mobile network.

COURSE OBJECTIVES AND COURSE OUTCOMES

13.806 ALGORITHM DESIGN LAB

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To introduce different computer graphics techniques. To implement various geometric algorithms. Introduce various algorithms for	Ability to implement geometric algorithms. Ability to draw lines, circles by using different algorithms. Able to do transformations, projections etc.

	drawing line, circle, etc. Introduced the concept of projections, transformations etc. To do all the programs in Open GL, introduce open GL concepts.	
2	To introduce the concept of animations.	Students can do animations for various applications with the help of computer graphics techniques.
3	To introduce the concepts of trees, graphs, different searching methods, optimization problems etc.	Ability to do graph traversal, tree creation, find shortest path, solve different optimization problems.

COURSE OBJECTIVES AND COURSE OUTCOMES

13.807 PROJECT WORK AND VIVA VOCE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To improve the professional skill and competency of the students	Able to develop a product and present it effectively.

2	To encourage the students to develop an application by themselves	Acquired enough confidence to enter into an industry
3	To make them industry ready people by enhancing their technical and softskills.	Improves interpersonal communication skills
2	To assess their overall knowledge about the subjects studied in their carriculam	Able to identify their weaker areas and helps to improve.