

Program Specifications of the Under graduate program offered by the department

1. Name of the program: B.Sc(CS)(Bachelor in Computer Science)

2. Program Specifications

School of Studies: Mathematical and Computational science

Department: CSIT

Program: B.Sc.(CS)

Head of the Department: Dr.Pushpalata Pujari

Date of Last Approval in Board of Studies: 06.07.2018

Next revision due: 2021

3. Mode of Study: Full time (Semester system): Class room teaching; experiential learning; Tutorials; experimental laboratory training; Project in final semester.

Back ground and purpose of the course:

B.Sc. Hons. in Computer Science is a three-year undergraduate programme that focuses on the discipline of computer science. B.Sc. Computer Science is the study of principles and fundamentals of computers, where the latest technologies and trends are the most important topics. The course empowers students to deal with the technicalities and issues with authorized knowledge of databases and analytical skills. The programme covers important topics related to computer science such as – Coding, Programming languages, Computer Hardware and Software, Networking, Database Management, Information Technology. The course equips students to work as Software Engineers in renowned IT companies that offer them a decent salary that increases with experience and expertise. It is concerned with understanding, designing, execution and solving issues related to computer systems and applications.

Learning outcome:

The course provides the candidate with knowledge, general competence, technical and analytical skills on an advanced level, needed in industry, consultancy, education, research, or public administration. The programme helps the students in their ability to critically evaluate design paradigms, languages, algorithms, and techniques used to develop complex software systems. They also learn to evaluate and respond to opportunities for developing and exploiting new technologies.

Knowledge gained:

On completion of B.Sc(CS) degree, the graduates will be able to apply the **knowledge** of technical, mathematical, logical and computing fundamentals to various real life applications. This course educates students with computing methods that have their roots in concepts of mathematics and logic. The course imparts knowledge about programming and database requisitions. HTML programming and object-oriented programming are some of the courses taught to students to help them tackle the problems prevailing in the software industry. Students also learn to develop competence in process and product standards.

Skills: The students

- Will be inculcated with Knowledge of programming language (currently in use) or a specific technology in depth.
- Can develop the core set of technical skills that will prepare students for employment or further studies.
- Can identify and solve the most challenging computer science problems, and work towards developing new ideas and creating new knowledge in the field of computer science.
- Will develop experience required to model, analyze, and solve advanced problems in real world (Industrial work).

General competence:

The students

- Will understand the role of Computer in society and has the background to consider ethical problems.
- Will be able to gather, assess, and make use of new information.
- Will have the ability to successfully carry out advanced tasks and projects, both independently and in collaboration with others and also across disciplines.
- Will be an international perspective on her/his discipline.

- Will be able to understand the social context in which knowledge and work of computer science will be used and engage in collaborative work.

SYLLABUS

B.Sc. (Honours) Computer Science (SEMESTER-I)

Course Specific Objectives & Outcomes		
Course Code	Course name	Objectives and Outcomes
SSCICR0101L	COMPUTER SCIENCE (CORE-I): Programming Fundamentals using C/C++	COURSE OBJECTIVES: <ul style="list-style-type: none">• To understand how C++ improves C with object-oriented features.• To learn how to write functions for efficiency and performance.• To learn the syntax and semantics of the C++ programming language.• To learn how to design C++ classes for code reuse. COURSE OUTCOMES: <p>After completion of this course students should able to understand -</p> <ul style="list-style-type: none">• The fundamental programming concepts and methodologies which are essential to building good C/C++ programs.• To practice the fundamental programming methodologies in the C/C++ programming language via laboratory experiences.• To code, document, test, and implement a well-structured, robust computer program using the C/C++ programming language.
SSCICR0101P	COMPUTER SCIENCE LAB (CORE-II): Programming Fundamentals using C/C++ Lab	COURSE OBJECTIVES: <ul style="list-style-type: none">• To understand how C++ improves C with object-oriented features.• To learn how to write functions for efficiency and performance.• To learn the syntax and semantics of the C++ programming language.• To learn how to design C++ classes for code reuse. COURSE OUTCOMES: <p>After completion of this course students should able to</p> <ul style="list-style-type: none">• Practice the fundamental programming methodologies in the C/C++ programming language via laboratory experiences.• To code, document, test, and implement a well-structured, robust computer program using the C/C++ programming language.

SSCICR0102L	COMPUTER SCIENCE (CORE-II): Data Structures	<p>COURSE OBJECTIVES:</p> <ul style="list-style-type: none"> • To impart the basic concepts of data structures and algorithms • To understand concepts about searching and sorting techniques • To Understand basic concepts about stacks, queues, lists, trees and graphs. • To understanding about writing algorithms and step by step approach in solving problems with the help of fundamental data structures <p>COURSE OUTCOMES: After completion of this course students should have-</p> <ul style="list-style-type: none"> • Ability to analyze algorithms and algorithm correctness. • Ability to summarize searching and sorting techniques • Ability to describe stack, queue and linked list operation. • Ability to have knowledge of tree and graphs concepts.
SSCIGE0101L	Generic Elective (GE-1)- Introduction to Programming using C	<p>COURSE OBJECTIVES:</p> <ul style="list-style-type: none"> • The course is designed to provide complete knowledge of C language. • Students will be able to develop logics which will help them to create programs, applications in C. • Also by learning the basic programming constructs they can easily switch over to any other language in future. <p>COURSE OUTCOMES:</p> <ul style="list-style-type: none"> • After the completion of this course, the students will be able to develop applications.
SSCIGE0101P	Generic Elective -1 LAB (GE- IA) : Introduction to Programming using C Lab	<p>COURSE OBJECTIVES:</p> <p>The course aims to provide exposure to problem-solving through programming. It aims to train the student to the basic concepts of the C-programming language. This course involves a lab component which is designed to give the student hands-on experience with the concepts.</p> <p>COURSE OUTCOMES:</p> <p>After the completion of this course, the students will be able to write the program on a computer, edit, compile, debug, correct, recompile and run it.</p>

B.Sc. (Honours) Computer Science (SEMESTER-II)

SSCICR0203L	COMPUTER SCIENCE (CORE-III): Programming in Java	COURSE OBJECTIVES: The course aims to provide exposure <ul style="list-style-type: none">• Programming in the Java programming language,• knowledge of object-oriented paradigm in the Java programming language,• the use of Java in a variety of technologies and on different platforms. COURSE OUTCOMES: On successful completion of this course, student should be able to: <ul style="list-style-type: none">• knowledge of the structure and model of the Java programming language, (knowledge)• use the Java programming language for various programming technologies (understanding)• develop software in the Java programming language, (application)• evaluate user requirements for software functionality required to decide whether the Java programming language can meet user requirements (analysis)
SSCICR0203P	COMPUTER SCIENCE LAB (CORE-III): Programming in Java	COURSE OBJECTIVES: The course aims to provide exposure <ul style="list-style-type: none">• Programming in the Java programming language,• knowledge of object-oriented paradigm in the Java programming language,• the use of Java in a variety of technologies and on different platforms. COURSE OUTCOMES: On successful completion of this course, student should be able to: <ul style="list-style-type: none">• use the Java programming language for various programming technologies (understanding)• develop software in the Java programming language, (application)• evaluate user requirements for software functionality required to decide whether the Java programming language can meet user requirements (analysis)
SSCICR0204L	COMPUTER SCIENCE (CORE-IV): Discrete	COURSE OBJECTIVES: <ul style="list-style-type: none">• To develop logical thinking and its

	Structures Theory	<p>application to computer science.</p> <ul style="list-style-type: none"> • The subject enhances one's ability to reason and ability to present a coherent and mathematically accurate argument. <p>COURSE OUTCOMES: After completing this course satisfactorily, a student will:</p> <ul style="list-style-type: none"> • Be able to construct simple mathematical proofs and possess the ability to verify them. • Have substantial experience to comprehend formal logical arguments. • Be skillful in expressing mathematical properties formally via the formal language of propositional logic and predicate logic. • Be able to specify and manipulate basic mathematical objects such as sets, functions, and relations and will also be able to verify simple mathematical properties that these objects possess.
SSCIGE0202L	Generic Elective (GE-2) Subject – Introduction to Internet Technologies (Theory)	<p>COURSE OBJECTIVES:</p> <ul style="list-style-type: none"> • Define terms related to the Internet. • Describe how the Internet is changing the world. • Understand how computers are connected to the Internet. • Demonstrate the ability to use the World Wide Web. • Understand and apply Internet Etiquette. • Demonstrate an understanding of and the ability to use electronic mail. • Understand the principles of Internet services such as Listserv Mailing Lists, Usenet Newsgroups, and Instant Messaging. • Find information on the Internet. <p>COURSE OUTCOMES: After completing this course satisfactorily, a student will:</p> <ul style="list-style-type: none"> • Analyze a web page and identify its elements and attributes. • Create web pages using XHTML and Cascading Style Sheets. • Build dynamic web pages using JavaScript (Client side programming). • Create XML documents and Schemas.

SSCIGE0202P	<p>Generic Elective (GE-2) Subject – Introduction to Internet Technologies (PRACTICAL)</p>	<p>COURSE OBJECTIVES:</p> <ul style="list-style-type: none"> • Understand how computers are connected to the Internet. • Demonstrate the ability to use the World Wide Web. • To develop an understanding of the Internet in the context of information storage and retrieval models. • To develop an ability to design and implement static and dynamic website. • To develop advanced web publishing and design skills using the Hypertext Markup Language (HTML) <p>COURSE OUTCOMES: After completing this course a student will be able to</p> <ul style="list-style-type: none"> • Analyze a web page and identify its elements and attributes • Understand how Web pages are designed and created. • Demonstrate an ability to create basic Web pages with HTML. • Build dynamic web pages using JavaScript (Client side programming).
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B.Sc. (Honours) Computer Science (SEMESTER-III)

<p>(SSCICR0305)</p>	<p>COMPUTER SCIENCE (C-V): Internet Technologies</p>	<p>COURSE OBJECTIVES :</p> <ul style="list-style-type: none"> • Programming in the Java programming language, • knowledge of object-oriented paradigm in the Java programming language, • knowledge of Java programming using JDBC,JSP and Java Beans <p>COURSE OUTCOMES: After completing this course satisfactorily, a student will:</p> <ul style="list-style-type: none"> • Able to program in Java programming language. • Able to use JDBC • Able to use JSP • And should Java Beans platform.
<p>SSCICR0306L</p>	<p>COMPUTER SCIENCE (C-VI): Database Management Systems Theory</p>	<p>COURSE OBJECTIVES: The objective of the course is to present an introduction to database management systems, with an emphasis on how to organize, maintain and retrieve - efficiently, and effectively - information from a DBMS.</p> <p>COURSE OUTCOMES: Upon successful completion of this course, students should be able to:</p> <ul style="list-style-type: none"> • Describe the fundamental elements of relational database management systems • Explain the basic concepts of relational data model, entity-relationship model, relational database design, relational algebra and SQL. • Design ER-models to represent simple database application scenarios • Convert the ER-model to relational tables, populate relational database and formulate SQL queries on data. • Improve the database design by normalization.
<p>SSCICR0306P</p>	<p>COMPUTER SCIENCE LAB (C-VI): Database Management Systems Theory</p>	<p>COURSE OBJECTIVES:</p> <ul style="list-style-type: none"> • The objective of this course is to expose the students to the fundamentals & basic concepts in relational Data Base Management Systems. • This course discusses architecture of Database Systems with concept of relational

		<p>model & ER model.</p> <ul style="list-style-type: none"> • This course explains techniques for database design, Normalization and database recovery and protection. <p>COURSE OUTCOMES:</p> <ul style="list-style-type: none"> • At the end of this course the students should be able to demonstrate an understanding of the elementary & advanced features of DBMS & RDBMS • Develop a clear understanding of the conceptual frameworks and definitions of specific terms that are integral to the Relational Database Management Systems. • Evaluate options to make informed decisions that meet data storage, processing, and retrieval needs. • Able to design and documents data structures incorporating integrity constraints to satisfy business rules by applying the relational model • Able to build, populate, and document a secure, normalized database that meets business requirements using industry standards and best practices • Able to develop structured query language (SQL) queries to create, read, update, and delete relational database data
SSCICR0307	COMPUTER SCIENCE (C-VII): Computer Networks Theory	<p>COURSE OBJECTIVES:</p> <ul style="list-style-type: none"> • Build an understanding of the fundamental concepts of computer networking. • Familiarize the student with the basic taxonomy and terminology of the computer networking area. • Introduce the student to advanced networking concepts, preparing the student for entry Advanced courses in computer networking. <p>COURSE OUTCOMES: After completing this course the student must demonstrate the knowledge and ability to:</p> <ul style="list-style-type: none"> • Independently understand basic computer network technology. • Understand and explain Data Communications System and its components. • Identify the different types of network topologies and protocols.

		<ul style="list-style-type: none"> Enumerate the layers of the OSI model and TCP/IP. Explain the function(s) of each layer. Identify the different types of network devices and their functions within a network
SSCIGE0303L	Generic Elective -3 (GE-3A) Introduction to Database System	<p>COURSE OBJECTIVES: The objective of the course is to present an introduction to database management systems, with an emphasis on how to organize, maintain and retrieve - efficiently, and effectively - information from a DBMS.</p> <p>COURSE OUTCOMES: Upon successful completion of this course, students should be able to:</p> <ul style="list-style-type: none"> Describe the fundamental elements of relational database management systems Explain the basic concepts of relational data model, entity-relationship model, relational database design, relational algebra and SQL. Design ER-models to represent simple database application scenarios Convert the ER-model to relational tables, populate relational database and formulate SQL queries on data. Improve the database design by normalization.
SSCICR0306P	Generic Elective -3 (GE-3A) LAB: Introduction to Database System	<p>COURSE OBJECTIVES:</p> <ul style="list-style-type: none"> The major objective is to provide a strong formal foundation in database concepts, technology and practice. To give an introduction to systematic database design approaches covering conceptual design, logical design and an overview of physical design <p>COURSE OUTCOMES:</p> <ul style="list-style-type: none"> Understand, appreciate and effectively explain the underlying concepts of database technologies Design and implement a database schema for a given problem-domain Normalize a database Populate and query a database
SSCISC0301(A)	SKILL ENHANCEMENT COURSE (SEC-1) A	COURSE OBJECTIVES:

	<p>HTML and XML programming</p>	<ul style="list-style-type: none"> • The focus in this course is on the World Wide Web as a platform for interactive applications, content publishing and social services. • The development of web-based applications requires knowledge about the underlying technology and the formats and standards the web is based upon. • In this course you will learn about the HTTP communication protocol, the markup languages HTML, XHTML and XML, the CSS and XSLT standards for formatting and transforming web content, interactive graphics and multimedia content on the web, client-side programming using Javascript <p>COURSE OUTCOMES: Upon successful completion of this course, students should be able to</p> <ul style="list-style-type: none"> • History and development of the World Wide Web and associated technologies. • The client-server architecture of the World Wide Web and its communication protocol HTTP/HTTPS. • Formats and languages used in modern web-pages: HTML, XHTML, CSS, XML, XSLT, Javascript, DOM • Programming web pages with Javascript/DOM (client) • Good design, universal design, multi platform web applications
<p>SSCISC0301(B)</p>	<p>Skill Enhancement Course (SEC - 1) B Linux / Unix Programming Syllabus</p>	<p>COURSE OBJECTIVES:</p> <ul style="list-style-type: none"> • This course will prepare students to develop software in and for Linux/UNIX environments. • Topics to be covered include basic operating system concepts, effective command line usage, shell programming, the C language, programming development tools, system programming, network programming (client-server model and sockets), and GUI programming <p>COURSE OUTCOMES: Upon successful completion of this course, students should be able to</p>

		<ul style="list-style-type: none">• Understand the basic set of commands and utilities in Linux/UNIX systems.• To learn to develop software for Linux/UNIX systems.• To learn the C language and get experience programming in C.• To learn the important Linux/UNIX library functions and system calls.• To understand the inner workings of UNIX-like operating systems.• To obtain a foundation for an advanced course in operating systems.
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B.Sc. (Honours) Computer Science (SEMESTER-IV)

Course Code	Course Name	Course Objectives and Course Outcomes
SSCICR0408	Computer System Architecture (CORE-VIII)	COURSE OBJECTIVES: In this course students can understand the internals of a digital computer. This course will provide knowledge of digital logic and circuits, internals regarding program execution, arithmetic operation, I/O interfaces and operations, memory organization etc. within a digital computer. COURSE OUTCOMES: After completion of course student will be aware of components and overall working principles of a digital computer which will help to grasp advance courses and development of software which closely interact with computer hardware.
SSCICR0409L	Software Engineering (CORE-IX)	COURSE OBJECTIVES: In this course students can understand the skills that will enable them to construct software of high quality – software that is reliable, and that is reasonably easy to understand, modify and maintain Outcome: The graduates will be able to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
SSCICR0409P	LAB based on Software Engineering (CORE-IX)	COURSE OBJECTIVES: <ul style="list-style-type: none">• Students will be capable to acquire the generic software development skill through various stages of software life cycle.• Students will also be able to ensure the quality of software through software development. COURSE OUTCOMES: <ul style="list-style-type: none">• After completion of course student will be able to generate test cases for software testing.• Students will be able to handle software development models.
SSCICR0410L	Design and Analysis of Algorithms	COURSE OBJECTIVES:: In this course students will learn paradigms and approaches used to analyze and design algorithms and

	(CORE-X)	<p>to appreciate the impact of algorithm design in practice. They will be able to explain different computational models, order notation and various complexity measures (e.g., running time, disk space) to analyze the complexity/performance of different algorithms and also learn various advanced design and analysis techniques such as greedy algorithms, dynamic programming.</p> <p>COURSE OUTCOMES: After successful completion of this course, student will be able to</p> <ul style="list-style-type: none"> ● Analyze the asymptotic performance of algorithms. ● Write rigorous correctness proofs for algorithms. ● Demonstrate a familiarity with major algorithms and data structures. ● Apply important algorithmic design paradigms and methods of analysis. ● Synthesize efficient algorithms in common engineering design situations.
SSCIGE0404L	Multimedia and Applications	<p>COURSE OBJECTIVES::</p> <ul style="list-style-type: none"> ● To identify a range of concepts, techniques and tools for creating and editing the interactive multimedia applications. ● To identify the current and future issues related to multimedia technology. ● To identify both theoretical and practical aspects in designing multimedia systems surrounding the emergence of multimedia technologies using contemporary hardware and software technologies. <p>COURSE OURCOMES:</p> <p>Upon successful completion of the course students will be able to:</p> <ul style="list-style-type: none"> ● Define multimedia to potential clients. ● Identify and describe the function of the general skill sets in the multimedia industry. ● Identify the basic components of a multimedia project. ● Identify the basic hardware and software requirements for multimedia development and

		<p>playback.</p>
<p>SSCIGE0404P</p>	<p>LAB based on Multimedia and Applications</p>	<p>COURSE COURSE OBJECTIVES:S Students undergoing this course are expected to:</p> <ul style="list-style-type: none"> • Represent data in multimedia applications; examine image data, video data, and audio data in detail. • To provide the foundation knowledge of multimedia computing, e.g. media characteristics, compression standards, multimedia representation, data formats, multimedia technology development. • To provide programming training in multimedia computing, multimedia system design and implementations. <p>COURSE OUTCOMES:</p> <ul style="list-style-type: none"> • Know various multimedia software tools • Design multimedia software that are suitable to Internet applications • Explore issues and technologies for computer and multimedia network communications • program multimedia data and be able to design and implement media applications;
<p>SSCISC0402L</p>	<p>PHP Programming (Skill Enhancement Course)</p>	<p>COURSE OBJECTIVES: The COURSE OBJECTIVES: of this course is to provide the necessary knowledge to design and develop dynamic, database-driven web applications using PHP</p> <p>COURSE OUTCOMES: Upon successful completion students should be able to:</p> <ul style="list-style-type: none"> • Write PHP code to produce outcomes and solve problems. • Display and insert data using PHP. • Test, debug, and deploy web pages containing PHP. • Will be able to apply their knowledge to the creation of dynamic Web applications
<p>SSCISC0402P</p>	<p>LAB based on PHP Programming (Skill Enhancement Course)</p>	<p>COURSE OBJECTIVES:</p> <ul style="list-style-type: none"> • Gain the PHP programming skills needed to successfully build interactive, data-driven sites.

		<ul style="list-style-type: none"> • Test and debug a PHP application to provide the knowledge of basic PHP programming concepts • To provide knowledge of PHP scripting To provide knowledge of database connectivity with PHP <p>COURSE OUTCOMES:</p> <p>After successful completion of this course, students will be able to:</p> <ul style="list-style-type: none"> • Write PHP scripts to handle HTML forms. • Write regular expressions including modifiers, operators, and metacharacters. • Create PHP programs that use various PHP library functions, and that manipulate files and directories. • Analyze and solve various database tasks using the PHP language. • Analyze and solve common Web application tasks by writing PHP programs.
<p>SSCISC0402L</p>	<p>MATLAB (Skill Enhancement Course)</p>	<p>COURSE OBJECTIVES</p> <ul style="list-style-type: none"> • To Impart the Knowledge to the students with MATLAB software. • To provide a working introduction to the MATLAB technical computing environment. • To introduce students the use of a high-level programming language, MATLAB. • To provide a foundation in use of this software's for real time applications. <p>COURSE OUTCOMES:</p> <p>On successful completion of the course, the students should be able to</p> <ul style="list-style-type: none"> • Understand the need for simulation/implementation for the verification of mathematical functions. • Understand the main features of the MATLAB program development environment to enable their usage in the higher learning. • Implement simple mathematical functions/equations in numerical computing environment such as MATLAB. • Interpret and visualize simple mathematical functions and operations thereon using plots/display.

		<ul style="list-style-type: none"> Analyze the program for correctness and determine/estimate/predict the output and verify it under simulation environment using MATLAB tools.
SSCISC0402P	LAB based on MATLAB (Skill Enhancement Course)	<p>COURSE OBJECTIVES:</p> <ul style="list-style-type: none"> To familiarize the student in introducing and exploring MATLAB software. To enable the student on how to approach for solving problems using simulation tools. To prepare the students to use MATLAB in their project works. To provide a foundation in use of this software's for real time applications. <p>COURSE OUTCOMES:</p> <p>Upon successful completion of this course, the student should be able to:</p> <ul style="list-style-type: none"> Understand the main features of the MATLAB development environment Use the MATLAB GUI effectively Design simple algorithms to solve problems Write simple programs in MATLAB to solve scientific and mathematical problems

B.Sc. (Honours) Computer Science (SEMESTER-V)

SSCICR0511	Operating Systems (CORE-XI)	COURSE OBJECTIVES: In this course students will understand operating system architecture and functioning along with in-depth knowledge of internals and working of OS modules like process, management, storage management, file system, security and protection. COURSE OUTCOMES: Upon successful completion of the course students will be able to: <ul style="list-style-type: none">● understand what is an operating system and the role it plays● A high-level understanding of the structure of operating systems, applications, and the relationship between them.● Some knowledge of the services provided by operating systems.● Exposure to some details of major OS concepts.
SSCICR0512	Theory of Computation (CORE-XII)	COURSE OBJECTIVES: In this course students can understand the concepts of Theory of computation in computer science along with the relationship among formal languages, formal grammars and automata. COURSE OUTCOMES: At successful completion of the course, students should: <ul style="list-style-type: none">● Demonstrate advanced knowledge of formal computation and its relationship to languages● Distinguish different computing languages and classify their respective types.● Recognize and comprehend formal reasoning about languages.● Show a competent understanding of the basic concepts of complexity theory.
SSCIDS0501(A)	Information Security (Discipline Specific Elective-I)	COURSE OBJECTIVES: This course focuses on the models, tools, and techniques for enforcement of security With some emphasis on the use of cryptography. COURSE OUTCOMES: Upon the completion of this course, students should be

		able to understand, appreciate, employ, design and implement appropriate security technologies and policies to protect computers and digital information.
SSCIDS0501(B)	Operation Research (Discipline Specific Elective-I)	<p>COURSE OBJECTIVES:</p> <ul style="list-style-type: none"> • The central objective is to do things best under the given circumstances. • Exploring general concept which has great many applications, inventory control, manpower and resource allocation, manufacturing of goods, production process control, risk management, sequencing and scheduling of tasks, telecommunications. <p>COURSE OUTCOMES:</p> <p>After successful completion of this course, students should be able to:</p> <ul style="list-style-type: none"> • Identify and develop operational research models from the verbal description of the real system. Understand the mathematical tools that are needed to solve optimization problems. Use mathematical software to solve the proposed models. • Develop a report that describes the model and the solving technique, analyses the results and propose recommendations in language understandable to the decision-making processes in Management Engineering.
SSCIDS0502 (A)	Image Processing (Discipline Specific Elective-II)	<p>COURSE OBJECTIVES:</p> <ul style="list-style-type: none"> • To study the image fundamentals and mathematical transforms necessary for image processing. • To study the image enhancement techniques • To study image restoration procedures. • To study the image compression procedures. <p>COURSE OUTCOMES</p> <ul style="list-style-type: none"> • Review the fundamental concepts of a digital

		<p>image processing system.</p> <ul style="list-style-type: none"> ● Analyze images in the frequency domain using various transforms. ● Evaluate the techniques for image enhancement and image restoration. ● Categorize various compression techniques. ● Interpret Image compression standards. ● Interpret image segmentation and representation techniques.
SSCIDS0502 (A)	LAB based on Image Processing (Discipline Specific Elective-II)	<p>COURSE OBJECTIVES</p> <ul style="list-style-type: none"> ● Describe and explain basic principles of digital image processing ● To study the image fundamentals and mathematical transforms necessary for image processing. ● To study the image enhancement techniques ● To study image restoration procedures. ● To study the image compression procedures. <p>COURSE OUTCOMES:</p> <ul style="list-style-type: none"> ● After practical and assignments, students will be able to ● Analyze general terminology of digital image processing. ● Examine various types of images, intensity transformations and spatial filtering. ● Develop Fourier transform for image processing in frequency domain. ● Evaluate the methodologies for image segmentation, restoration etc. ● Implement image process and analysis algorithms. ● Apply image processing algorithms in practical applications.
SSCIDS0502(B)	Soft Computing (Discipline Specific Elective –II)	<p>COURSE OBJECTIVES:</p> <p>This course will cover fundamental concepts used in Soft computing. The concepts of Artificial Neural Networks (ANNs) will be covered first, followed by optimization techniques using Genetic Algorithm (GA). Applications of Soft Computing techniques to solve a number of real life problems will be covered to have hands on practices. In summary, this course will provide exposure to theory as well as practical systems</p>

		<p>and software used in soft computing.</p> <p>COURSE OUTCOMES: After completing this course, students will be able to learn:</p> <ul style="list-style-type: none"> ● Artificial neural networks and its applications. ● Solving single-COURSE OBJECTIVES: optimization problems using GAs. ● Applications of Soft computing to solve problems in varieties of application domains.
<p>SSCIDS0502(B)</p>	<p>LAB based on Soft Computing (Discipline Specific Elective II)</p>	<p>COURSE OBJECTIVES:</p> <ul style="list-style-type: none"> ● Develop the skills to gain a basic understanding of neural network theory and fuzzy logic theory and genetic algorithm. ● Introduce students to artificial neural networks and fuzzy theory from an engineering perspective. ● Understand different soft computing tools to solve real life problems. <p>COURSE OUTCOMES: At the end of the course the student should be able to</p> <ul style="list-style-type: none"> ● Learn about soft computing techniques and their applications ● Analyze various neural network architectures ● Understand perceptrons and counter propagation networks. ● Define the fuzzy systems ● Analyze the genetic algorithms and their applications.

B.Sc. (Honours) Computer Science (SEMESTER-VI)

SSCICR0613	Artificial Intelligence (CORE-XIII)	<p>COURSE OBJECTIVES:</p> <p>The basic COURSE OBJECTIVES: of this subject is to enable computers to perform such intellectual tasks as decision making, problem solving, perception, understanding human communication.</p> <p>COURSE OUTCOMES:</p> <p>After the completion of this course students will be able to :</p> <ul style="list-style-type: none">● Understand the computer decision making algorithms.● Identify problems and implement with real world.● Ability to analyze the strengths and weaknesses of AI approaches to knowledge-intensive problem solving.
SSCICR0614	Computer Graphics (CORE-XIV)	<p>COURSE OBJECTIVES:</p> <ul style="list-style-type: none">● To equip students with the fundamental knowledge and basic technical competence in the field of computer graphics.● To emphasize on implementation aspect of Computer Graphics Algorithms.● To prepare the student for advance areas like Image Processing or Computer Vision or Virtual Reality and professional avenues in the field of Computer Graphics. <p>COURSE OUTCOMES:</p> <ul style="list-style-type: none">● Understand the basic concepts of Computer Graphics.● Demonstrate various algorithms for scan conversion and filling of basic objects and their comparative analysis.● Apply geometric transformations, viewing and clipping on graphical objects.● Explore solid model representation techniques

		<p>and projections.</p> <ul style="list-style-type: none"> ● Understand visible surface detection techniques and illumination models.
SSCIDS0603(A)	Big Data Analytics (Discipline Specific Elective-III)	<p>COURSE OBJECTIVES:</p> <p>In this course students can understand the concepts of big data, tools and its architecture and basics of programming used to analyse big data.</p> <p>COURSE OUTCOMES:</p> <p>After the completion of this course students will be able to :</p> <ul style="list-style-type: none"> ● Understand the basics of big Data presentation ● Work with Hadoop tool ● Implement big Data concept ● Analyze big data using R
SSCIDS0603(B)	Data Mining (Discipline Specific Elective-III)	<p>COURSE OBJECTIVES:</p> <ul style="list-style-type: none"> ● To identify the scope and essentiality of Data Warehousing and Mining ● To analyze data, choose relevant models and algorithms for respective applications. ● To study spatial and web data mining. ● To develop research interest towards advances in data mining. <p>COURSE OUTCOMES:</p> <ul style="list-style-type: none"> ● Understand Data Warehouse fundamentals, Data Mining Principles ● Design data warehouse with dimensional modeling and apply OLAP operations ● Identify appropriate data mining algorithms to solve real world problems ● Compare and evaluate different data mining techniques like classification, prediction, clustering and association rule mining ● Benefit the user experiences towards research and innovation.

<p>SSCIDS0604</p>	<p>Project Work (Discipline Specific Elective-IV)</p>	<p>COURSE OBJECTIVES:</p> <ul style="list-style-type: none"> • To prepare students to excel in computer applications to succeed in industry/ technical profession. • To provide students with a solid foundation in mathematical and computing fundamentals and techniques required to solve related problems and also to pursue higher studies and research. • To train students with good computing breadth so as to comprehend, analyze, design and create computing solutions for the real life problems. <p>COURSE OUTCOMES:</p> <p>After successfully completing course student will</p> <ul style="list-style-type: none"> • Discover potential research areas in the field of IT. • Conduct a survey of several available literatures in the preferred field of study. • Compare and contrast the several existing solutions for research challenge. • Demonstrate an ability to work in teams and manage the conduct. • Formulate and propose a plan for creating a solution for the research plan identified. • To report and present the findings of the study conducted in the preferred domain.
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