



Shree Rahul Education Society's (Regd.)

# SHREE L. R. TIWARI DEGREE COLLEGE

(Arts | Commerce | Science) Approved By Government of Maharashtra & Affiliated To University Of Mumbai | Recognized Under Section 2(f) of the UGC Act 1956 | ISO Certified 9001: 2015 | Hindi Linguistic Minority Institution | COLLEGE CODE : 1064

## BACHELOR OF SCIENCE- INFORMATION TECHNOLOGY

### PROGRAM OUTCOMES (PO)

**PO1 Computational Knowledge:** Understand and implement various algorithms methodologies, computing skills and programming knowledge for conceptualising computing models.

**PO2 Formulation of Solutions:** Ability to renovate complex business circumstances and contemporary issues into problems, examine, Explore, understand and propose cohesive solutions using the latest technologies.

**PO3 Problem Investigations:** Ability to identify, critically analyse and formulate complex computing problems using the power of Information and use of technology to solve real-life problems. Moreover, to develop and conduct experiments, interpret data from results and provide well-informed solutions.

**PO4 Emerging technological Usage:** Ability to select modern computing tools, software, problem-solving skills and techniques necessary for innovative software/hardware development.

**PO5 Project Management:** Ability to understand management and computing principles with computing knowledge to manage projects in multidisciplinary environments.

**PO6 Innovation and Entrepreneurship:** Recognize opportunities, entrepreneurship vision and use of innovative ideas to create value and wealth for the betterment of the individual, society and for the nation.

**PO7 Communication Efficacy:** Ability to communicate more effectively with the working team members, project manager and computing community as well as society by being able to comprehend effective documentation and presentations.

**PO8 Professional Ethics:** Ability to apply and commit professional ethics and cyber regulations in a global economic environment. Recognize the need for and develop the ability to engage in continuous learning as a Computing professional.





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## SEMESTER I

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### CO OF SEM I

**COURSE NAME – Programming Principles with C**

**COURSE CODE – USIT101**

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**CO1:** Apply the basic principles of programming.

**CO2:** Develop logic using algorithms and flowchart.

**CO3:** Acquire the information about data types.

**CO4:** Understanding of input and output functions.

**CO5:** Enhance advanced concepts using program.

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### CO OF SEM I

**COURSE NAME - Digital Logic and Applications**

**COURSE CODE – USCT102**

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**CO1:** Apply number conversion techniques in real digital systems

**CO2:** Solve Boolean algebra expressions

**CO3:** Derive and design logic circuits by applying minimization in SOP and POS forms

**CO4:** Design and develop Combinational and Sequential circuits

**CO5:** Understand and develop digital applications.

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### CO OF SEM I

**COURSE NAME - Fundamentals of Database Management Systems**

**COURSE CODE – USIT103**

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**CO1:** Effectively use the fundamental elements of relational database management system

**CO2:** Apply the basic concepts of relational data model, entity-relationship model, relational database design, relational algebra and SQL.

**CO3:** Implement ER-models to represent simple database application scenarios.

**CO4:** Implement the ER-model to relational tables, populate relational database and formulate SQL queries on data.







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**CO5:** Apply basic database storage structures and access techniques: file and page organizations, indexing methods and hashing.

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## CO OF SEM I

**COURSE NAME – Computational Logic and Discrete Structures**

**COURSE CODE – USIT104**

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**CO1:** Use logical notation, Perform logical proofs

**CO2:** Apply recursive functions and solve recurrence relations

**CO3:** Use graphs and trees, Apply basic and advanced principles of counting.

**CO4:** Solve problems on sets and Relations,.

**CO5:** Calculate discrete probabilities.

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## CO OF SEM I

**COURSE NAME - Technical Communication Skills**

**COURSE CODE – USIT105**

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**CO1:** Analyse, synthesize and utilize the process and strategies from delivery to solving communication problems.

**CO2:** Use the communication methodologies at the workplace and learn about the importance of team collaboration.

**CO3:** Implement different technical communication such as presentations and interviews.

**CO4:** Apply the art of written communication in writing reports, proposals.

**CO5:** Apply the functions of graphs, maps, charts.





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## SEMESTER II

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### CO OF SEM II

**COURSE NAME - Object Oriented Programming with C++**

**COURSE CODE – USIT201**

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**CO1:** Understand the concept of OOPs, features of C++ language.

**CO2:** Understand and apply various types of Data Types, Operators, and Conversions while designing the program.

**CO3:** Understand and apply the concepts of Classes & Objects, friend function, constructors & destructors in program design

**CO4** Design & implement various forms of inheritance, String class, calling base class constructors.

**CO5:** Analyse and explore various Stream classes, I/O operations and exception handling.

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### CO OF SEM II

**COURSE NAME - Fundamentals of Microprocessor and Microcontrollers**

**COURSE CODE – USIT202**

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**CO1:** Understand the basic concepts of Micro Computer Systems.

**CO2:** Understand the architecture and hardware aspects of 8085.

**CO3:** Write assembly language programs in 8085.

**CO4:** Design elementary aspects of Micro Controller based systems.

**CO5:** Interfacing peripherals using Microcontroller.

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### CO OF SEM II

**COURSE NAME - Web Applications Development**

**COURSE CODE – USIT203**

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**CO1:** Analyze the working of the Internet.

**CO2:** Gain an insight into designing web pages.

**CO3:** Use different ways of styling web pages using CSS.

**CO4:** Implement basic and complex functionalities of JavaScript in a web page.

**CO5:** Perform various database tasks using PHP.







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## CO OF SEM II

**COURSE NAME - Numerical Methods**

**COURSE CODE – USIT204**

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**CO1:** Implement numerical techniques to find the roots of nonlinear equations and solution of a system of linear equations.

**CO2:** Use the difference operators and the use of interpolation.

**CO3:** Solve numerical differentiation and integration and numerical solutions of ordinary and partial differential equations.

**CO4:** Apply numerical differentiation and integration and numerical solutions of ordinary differential equations

**CO5:** To solve problems on partial differential equations.

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## CO OF SEM II

**COURSE NAME - Green IT**

**COURSE CODE – USIT205**

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**CO1:** Understand and apply the concept of Green IT and problems related to it.

**CO2:** Use different standards for Green IT.

**CO3:** Understand how power usage can be minimized in Technology.

**CO4:** Learn about how the way of work is changing.

**CO5:** Know how information systems can stay Green Information systems.





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## SEMESTER III

### CO OF SEM III

**COURSE NAME – Python Programming**

**COURSE CODE – USIT301**

**CO1:** Aware of the variables, expressions, looping and conditions used in Python programming.

**CO2:** Implement functions, strings, lists, tuples and directories

**CO3:** Create GUI forms and add widgets.

**CO4:** Use MySQL to store data.

**CO5:** Apply the programming skillset learnt here into various domains by having advance programming skillset of Python and usage of libraries.

### CO OF SEM III

**COURSE NAME – Data Structures**

**COURSE CODE – USIT302**

**CO1:** Identify and distinguish data structure classification, data types, and their complexities.

**CO2:** Implement array, linked list, stack and queue.

**CO3:** Implement trees, various hashing techniques and graph for various applications.

**CO4:** Compare various sorting and searching techniques.

**CO5:** Implement various Graph Technology

### CO OF SEM III

**COURSE NAME – Computer Networks**

**COURSE CODE – USIT303**

**CO1:** Identify various data communication standards, topologies and terminologies.

**CO2:** Describe how signals are used to transfer data and communication aspects between nodes.

**CO3:** Configure IP addresses using TCP/IP protocol suite

**CO4:** Use different application layer protocols







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**CO5:** Understand the functioning of networking application.

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## CO OF SEM III

**COURSE NAME – Operating Systems**

**COURSE CODE – USIT304**

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**CO1:** Role of Operating System Computer System.

**CO2:** Use the different types of Operating System and their services.

**CO3:** configure process scheduling algorithms and synchronization techniques to achieve better performance of a computer system.

**CO4:** Apply virtual memory concepts.

**CO5:** Effectively use and manage secondary

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## CO OF SEM III

**COURSE NAME – Applied Mathematics**

**COURSE CODE – USIT305**

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**CO1:** Solve the matrix operations, and identify the linear dependence and independence of vectors. Familiar with the various forms and operations of a complex number.

**CO2:** Learner is able to solve various types of first-order and high-order differential equations using analytic techniques, including separation of variables, Integrating factors, and Homogeneous ODEs.

**CO3:** Find the Laplace transform of a function and the Inverse Laplace transform of a function using definition also solve ordinary differential equations using Laplace transform.

**CO4:** Evaluate the multiple integrals in Cartesian, and Polar coordinates, change the order of the integral, and Apply integration methods to calculate the areas and volumes of solids.

**CO5:** Evaluate the Beta, Gamma, and Differentiation Under integral sign and error functions.





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## SEMESTER IV

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### CO OF SEM IV

**COURSE NAME – Java Programming**

**COURSE CODE – USIT401**

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**CO1:** Learn the architecture of Java

**CO2:** Identify data types, control flow, classes, inheritance, exceptions and event handling

**CO3:** Use object-oriented concepts for problem solving real-life applications

**CO4:** Build GUI programs

**CO5:** Create event driven programs using java.

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### CO OF SEM IV

**COURSE NAME – Introduction to Embedded Systems**

**COURSE CODE – USIT402**

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**CO1:** Differentiate between general purpose and embedded systems

**CO2:** Discuss the characteristics and quality attributes of embedded systems

**CO3:** Use different types of sensors for appropriately

**CO4:** Design and develop embedded systems

**CO5:** impart knowledge in sensors and actuators.

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### CO OF SEM IV

**COURSE NAME – Computer Oriented Statistical Techniques**

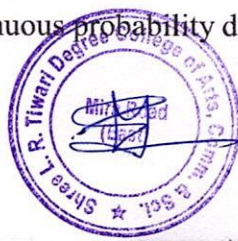
**COURSE CODE – USIT403**

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**CO1:** To calculate and apply measures of central tendencies and measures of dispersion grouped and ungrouped data cases.

**CO2:** To calculate the moments, skewness and kurtosis by various methods.

**CO3:** How to apply discrete and continuous probability distributions to various business problems.







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**CO4:** Perform Test of Hypothesis as well as calculate confidence interval for a population parameter for single sample and two sample cases. Understand the concept of p-values

**CO5:** Apply simple linear regression and correlation model to real life examples.

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## CO OF SEM IV

**COURSE NAME – Software Engineering**

**COURSE CODE – USIT404**

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**CO1:** Understand software engineering

**CO2:** Apply software engineering principles

**CO3:** Discuss various approaches to verification and validation of software including testing, measurements and estimation of software products

**CO4:** Create software using different software development models

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## CO OF SEM IV

**COURSE NAME – Computer Graphics and Animation**

**COURSE CODE – USIT405**

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**CO1.** Understand the basics of computer graphics, different graphics systems and applications of computer graphics

**CO2.** Compare various algorithms for scan conversion and filling of basic objects

**CO3.** Use of geometric transformations on graphics objects and their application in composite form.

**CO4.** Extract scene with different clipping methods and its transformation to graphics display device.

**CO5.** Explore projections and visible surface detection techniques for display of 3D scenes on 2D screens.





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## SEMESTER V

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### CO OF SEM V

**COURSE NAME - Software Project Management**

**COURSE CODE – USIT501**

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**CO1:** Introduction to Software Project Management. Project Evaluation and Programme Management and Planning.

**CO2:** Selection of an Appropriate Project Approach.

**CO3:** Activity Planning, Risk Management, Resource Allocation.

**CO4:** Monitoring and Control, Managing Contracts, Managing People in Software Environments.

**CO5:** Effectively implement the culture of Working in Teams, Software Quality and Project Closeout.

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### CO OF SEM V

**COURSE NAME - Internet of Things**

**COURSE CODE – USIT502**

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**CO1:** Implement design principles for connected devices internet principles.

**CO2:** Use Prototyping, Prototyping Embedded Devices.

**CO3:** Prototyping the Physical Design, Prototyping Online Components.

**CO4:** Apply Techniques for Writing Embedded Code and Business Model.

**CO5:** Describe moving to manufacture and ethics.

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### CO OF SEM V

**COURSE NAME - Advanced Web Programming**

**COURSE CODE – USIT503**

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**CO1:** Apply the knowledge of .NET, the C# Language, Types, Objects, and Namespaces.

**CO2:** Use Web Form Fundamentals, Form Controls.







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**CO3:** Implement Error Handling, Logging, and Tracing, State Management, Styles, Themes, and Master Pages.

**CO4:** Use ADO.NET Fundamentals, Data Binding And The Data Controls.

**CO5:** Apply XML, Security Fundamentals, ASP.NET AJAX

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## CO OF SEM V

**COURSE NAME - Artificial Intelligence**

**COURSE CODE – USIT504**

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**CO1:** Aware of Artificial Intelligence, Intelligent Agents.

**CO2:** Solving Problems by Searching, Beyond Classical Search.

**CO3:** Describe Adversarial Search, Logical Agents.

**CO4:** Aware of First Order Logic and Inference in First Order Logic.

**CO5:** Implement Planning, Knowledge Representation

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## CO OF SEM V

**COURSE NAME - Linux System Administration**

**COURSE CODE – USIT505**

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**CO1:** Use the Red Hat Enterprise Linux, System Administration Tasks, Managing Software.

**CO2** Configuring and Managing Storage, network and permissions.

**CO3:** Securing Server with iptables, cryptography and file sharing.

**CO4:** Configuring DNS and DHCP, Mail server and apache.

**CO5:** Apply Bash Shell Scripting, High-Availability Clustering, Setting Up an Installation Server.

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## CO OF SEM V

**COURSE NAME - Enterprise Java**

**COURSE CODE – USIT506**

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**CO1:** Aware of Java EE, Servlets, Working with Databases (JDBC).

**CO2** Aware of Request Dispatcher, COOKIES, SESSION files and non-blocking.





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**CO3:** Implement Java Server Pages and El Expressions.

**CO4:** Use Enterprise Java beans, JNDI.

**CO5:** Aware of Persistence, Object/Relational Mapping And JPA, Introduction to Hibernate.

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## CO OF SEM V

**COURSE NAME - Next Generation Technologies**

**COURSE CODE – USIT507**

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**CO1:** Compare Big Data, NoSQL, MongoDB

**CO2:** Use the MongoDB Data Model, Using MongoDB Shell, MongoDB Architecture

**CO3:** Aware of MongoDB Storage Engine, MongoDB Use Cases, and MongoDB Limitations

**CO4:** Aware of The End of Disk, SSD and In-Memory Databases, jQuery.

**CO5:** Effectively use JSON Grammar, JSON Values, JSON Tokens, Syntax, JSON vs XML Data.







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## SEMESTER VI

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### CO OF SEM VI

**COURSE NAME- Software Quality Assurance**

**COURSE CODE – USIT601**

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**CO1:** Aware of Quality and Software Quality.

**CO2:** Aware of Fundamentals of testing in detail.

**CO3:** Compare Unit Testing and data flow testing.

**CO4:** Effectively use Software Verification and Validation and V- model.

**CO5:** Implement levels of Testing, Special Tests in detail.

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### CO OF SEM VI

**COURSE NAME - Security in Computing**

**COURSE CODE – USIT602**

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**CO1:** Aware of information Security Overview, Risk Analysis, Secure Design Principles

**CO2:** Aware of the Concepts of Authentication and Authorization: Authentication, Authorization Encryption.

**CO3:** Use Configure network security for server side.

**CO4:** Implement Intrusion Detection and Prevention Systems over VoIP and operating system model.

**CO5:** Effectively use Virtual Machines and Cloud Computing configuration and security.

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### CO OF SEM VI

**COURSE NAME - Business Intelligence**

**COURSE CODE – USIT603**

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**CO1:** Aware of Business intelligence and Decision support systems.

**CO2:** Solve Mathematical models for decision making, Data mining, Data preparation

**CO3:** Aware of Classification and Clustering.





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**CO4:** Effectively Use Business intelligence applications like Marketing models and Logistic and production models.

**CO5:** Aware of Knowledge Management and Artificial Intelligence and Expert Systems

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## CO OF SEM VI

**COURSE NAME - Principles of Geographic Information**

**COURSE CODE – USIT604**

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**CO1:** Aware of GIS (Geographic Information).

**CO2:** Use Data Management and Processing Systems Hardware and Software Trends Geographic Information Systems.

**CO3:** Compare Spatial Referencing and Positioning Spatial Referencing.

**CO4:** Effectively use Spatial Data Analysis Classification of analytical GIS Capabilities Retrieval, classification and measurement

**CO5:** Use Data Visualization GIS and Maps, The Visualization Process Visualization Strategies: Present or explore? The cartographic toolbox.

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## CO OF SEM VI

**COURSE NAME - Enterprise Networking**

**COURSE CODE – USIT605**

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**CO1:** Aware of General Network Design, model.

**CO2:** Configure Enterprise LAN Design and Data Centre Design.

**CO3:** An overview of Wireless LAN Design and WAN design.

**CO4:** Aware and Apply Internet protocol and its security.

**CO5:** Effectively implement Managing Security Like mail security or data security via different network channels.







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## CO OF SEM VI

**COURSE NAME: IT Services Management**

**COURSE CODE – USCS606**

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**CO1:** Aware of IT Service management, principles and its factors.

**CO2:** Apply Service Design Processes, Challenges, Critical Success factors and risks.

**CO3:** Aware of Service Transition Processes, Challenges, Critical Success factors and risks.

**CO4:** Identify Service Operation Processes, Challenges, Critical Success factors and risks.

**CO5:** Effectively use Service Continual Service Improvement (CSI) Principles.

