K. S. INSTITUTE OF TECHNOLOGY, BENGALURU

An Autonomous Institution under VTU, Approved by AICTE

Department of Computer Science and Engineering

FIRST/ SECOND SEMESTER SYLLABUS

Course : Essentials Of Information Technology		Semester	I/II
Course Code	**25BESC104E/25BESC204E**	CIE Marks	50
Teaching Hours/Week (L:T:P:S)	3:0:0:0	SEE Marks	50
Total Hours of Pedagogy	40	Total Marks	100
Credits	3	Exam Hours	3
Examination type (SEE)	**Theory**		

Course Objectives (Course Skill Set)

1. Understand the fundamentals of data storage, manipulation, and computer architecture to represent and process information effectively.
2. Analyse the role of operating systems and algorithms in managing resources, coordinating processes, and solving computational problems.
3. Illustrate the principles of networking, internet protocols, cybersecurity practices, and ethical issues related to information technology.
4. Apply software engineering concepts and database management techniques for efficient design and handling of information systems.
5. Develop basic skills in web development, computer graphics, and IT applications for real-world problem-solving and communication.

Module-1

Data Storage: Bits and Their Storage, Main Memory, Mass Storage, Representing Information as Bit Patterns, The Binary System, Storing Integers, Storing Fractions.

Data Manipulation: Computer Architecture, Machine Language, Program Execution, Arithmetic/Logic Instructions, Communicating with Other Devices.

Textbook 1: Chapter-1 (1.1-1.7), Chapter-2 (2.1-2.5)

Number of Hours: 8

Module-2

Operating Systems: The History of Operating Systems, Operating System Architecture, Coordinating the
Machine's Activities, Handling Competition Among Processes, Security.

Algorithms: The Concept of an Algorithm, Algorithm Representation, Algorithm Discovery.

Textbook 1: Chapter-3, Chapter-5 (5.1-5.3)

Number of Hours: 8

Module-3

Networking and the Internet: Network Fundamentals, The Internet, The World Wide Web, Internet Protocols, Security.

Cybersecurity: Overview—What is Cybersecurity?, Brief History of Cybersecurity Events, The Basic Information Security Model, Cyber Hygiene, Teams in Cybersecurity.

Ethical Issues in Information Technology: Overview, Ownership Rules, Ethics and Online Content.

Textbook 1: Chapter-4
Textbook 2: Chapter-16, Chapter-17

Number of Hours: 8

Module-4

Software Engineering: The Software Engineering Discipline, The Software Life Cycle, Software Engineering Methodologies, Modularity, Tools of the Trade.

Database Systems: Database Fundamentals, The Relational Model.

Textbook 1: Chapter-7 (7.1-7.5), Chapter-9 (9.1-9.2)

Number of Hours: 8

Module-5

Introduction to HTML and Website Development: What is HTML?, Cascading Style Sheets (CSS), Website Design and Storyboarding, Structure of a Website.

Computer Graphics: The Scope of Computer Graphics, Overview of 3D Graphics, Modeling, Rendering.

Textbook 2: Chapter-12.
Textbook 1: Chapter-10 (10.1-10.4)

Number of Hours: 8

Course outcomes (Course Skill Set)

At the end of the course, the student will be able to:

CO1: Illustrate different information representation and manipulation schemes.
CO2: Make use of Information Technology (IT) infrastructure for information exchange.
CO3: Apply basic software engineering concepts for Website and application development.
CO4: Develop queries for quick insert, access and updating of structured information.
CO5: Identify role of cybersecurity and ethics issues in Information Technology (IT).

Suggested Learning Resources: (Text Book/ Reference Book/ Manuals):

Textbooks:

1. J. Glenn Brookshear and Dennis Brylow, Computer Science: An Overview, 12th Edition, Pearson Education Limited, 2017.
2. Roy, Shambhavi; Daniel, Clinton; and Agrawal, Manish, "Fundamentals of Information Technology", Digital Commons at The University of South Florida (2023). https://digitalcommons.usf.edu/dit_tb_eng/19

Reference books :

1. V. Rajaraman, “Introduction to Information Technology”, Third Edition, PHI Learning, 2018.
2. Pelin Aksoy, Information Technology in Theory, First Edition, Cengage.

Web links and Video Lectures (e-Resources):

- Information Technology: https://onlinecourses.swayam2.ac.in/cec20_cs05/preview
- Computer Organization and Architecture: https://nptel.ac.in/courses/106103068
- Introduction To Internet: https://nptel.ac.in/courses/106105084

Teaching-Learning Process (Innovative Delivery Methods):

The following are sample strategies that educators may adopt to enhance the effectiveness of the teaching- learning process and facilitate the achievement of course outcomes.

1. Flipped Classroom
2. Problem-Based Learning (PBL)
3. Case-Based Teaching
4. Simulation and Virtual Labs
5. ICT-Enabled Teaching

Assessment Structure:

The assessment in each course is divided equally between Continuous Internal Evaluation (CIE) and the Semester End Examination (SEE), with each carrying 50% weightage.

- To qualify and become eligible to appear for SEE, in the **CIE**, a student must score at least **40% of 50 marks**, i.e., **20 marks**.
- To pass the **SEE**, a student must score at least **35% of 50 marks**, i.e., **18 marks**.
- Notwithstanding the above, a student is considered to have **passed the course,** provided the combined total of **CIE and SEE is at least 40 out of 100 marks**.

Continuous Comprehensive Evaluation (CCE):

CCE will be conducted for a total of 25 marks. It is recommended to include a maximum of two learning activities aimed at enhancing the holistic development of students. These activities should align with course objectives and promote higher-order thinking and application-based learning.

Learning Activity 1: (Marks 25): Two assignments (for 10 marks and 15 marks) related to practical applications of Information Technology (such as file management, spreadsheets, word processing, presentation tools, database queries, or basic web development), at RBL3, RBL4, or RBL5 levels**.** Assignment reports should include the problem statement, procedure/steps, screenshots of implementation, and output/results**.**

Suggested Learning Activities may include (but are not limited to):

- **Learning Activity -1:** File Management, Word Processors, Introduction to Spreadsheets and Introduction to Presentation Applications.
- **Learning Activity -2:** Open Book Test (preferably at RBL4 and RBL5 levels)
- **Learning Activity -3:** Assignment (at RBL3, RBL4, or RBL5 levels)
- **Learning Activity -4:** Course Project
  Refer Textbook 2: Chapter-6, Chapter-8, Chapter-9, Chapter-10.
- **Learning Activity -5:** Use of MOOCs and Online Platforms