ESSENTIALS OF INFORMATION TECHNOLOGY		Semester	I/II
Course Code	**BESC104E/204E**	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 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).

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

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 / Manuals:

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 Assessments (CCA):

CCA 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.

Self-study (for Learning Activity, Not for SEE):
File Management, Word Processors, Introduction to Spreadsheets, Introduction to Presentation Applications.
Refer Textbook 2: Chapter-6, Chapter-8, Chapter-9, Chapter-10.

Learning Activity -1: (Marks- 25) Practical Assignment (Individual)

INSTRUCTIONS:

1. Students must demonstrate the solutions to the course instructor and submit the record containing method (steps), program (if applicable), document (if applicable) and results/output.
2. Course instructor must evaluate the student performance as per the rubrics.

Problem Description:

1. Create files of specific types, changing file properties & permissions, search files based on criteria. Creating hierarchy of folders, folder paths, changing folder properties and related operations on folders. File compressions, file backup and cloud-based file management.

2. Create word file with suitable content and performs various operations related to document Revision, Proofreading and references (As listed in the Textbook).

3. Locate the templates available for a word processing application that you have access to. Search the templates for a "Resume." Review the "Resume" template of your choice. Identify all the word processing features used in the "Resume" template. Use the "Resume" template to create your own resume. As you fill out the template, be sure to use the application to check your spelling and grammar. Verify the print layout of your resume. Save the resume and print a copy.

4. Consider the following data: Student First Name, Student Last Name, Student Age, Student Grade, Student School, Telephone Number, Sport (Volleyball, Basketball, Softball, Baseball, Soccer, or Football). Considering the data required in the list above, create a spreadsheet in a spreadsheet application you have access to. Add at least 10 rows of data to your spreadsheet. Once you add all the data to the spreadsheet, what is the average age for all the students? What formula did you use to calculate the average age?

5. Add a chart to the above spreadsheet that illustrates the total number of students for each sport. Which sport has the highest number of students? What formula did you use to count the total number of students for each sport?

6. Use the above spreadsheet to Analyzing and Organizing Data with suitable filters, sorting, conditional formatting and pivot tables.

7. Create a presentation (power point) using a presentation application you have access to that meets the

requirements of marketing of brand-new product. Apply a theme, background, and professional layout for chosen product.

8. Create a Web page with basic HTML elements (tags). Insert lists, images, drop down lists and tables.

9. Create a Personal Website and host it on a free cloud-based Web hosting. Personal Web site should cover your complete biodata and your social activities.

10. Create a relational database model (MS Access or any other) for storing information about courses taken by students. Develop suitable queries to insert data onto tables, update fields, delete rows and query relevant information from the database model.

Rubrics for Learning Activity-1 (Practical Assignment):

Component & CO-PO Mapping	Outstanding (5)	Exceeds Expectations (4)	Meets Expectations (3)	Needs Improvement (2)	Unsatisfactory (1)
Clarity & Simplicity of procedure/ method [CO1-5] [PO9]	procedure/ method is, specific, and well-structured for the intended activity; no ambiguity is present.	procedure/ methods are clear and mostly specific; minor ambiguity is present.	procedure/ methods are somewhat clear but could be more specific; moderate ambiguity.	procedure/ methods are vague and lack clarity; high ambiguity.	procedure/ methods are unclear, incomplete, or irrelevant to the activity.
Appropriate Use of elements/ techniques and design of solution [CO2-5] [PO1, PO3]	Demonstrates precise and creative usage of the features, elements and techniques	Correctly applies the features and elements with minor gaps or missed opportunities.	Uses the features and elements, but with partial understanding or inconsistent usage.	Limited understanding of the features and elements; incorrect or weak usage.	No evidence of correct/relevant features and elements use.
Complete Solution & Comparison of Results/output for various cases. [CO2-4] [PO2, PO4, PO5]	Provides clear and correct solution/results with analysis for multiple cases; comparisons among cases highlight key strengths and weaknesses.	Provides correct solution/results with analysis for multiple cases, though slightly less detailed.	Provides correct solution/results with limited analysis; comparisons are present but shallow.	Provides correct solution/results. Minimal analysis: comparisons are weak or incomplete.	Solution/results are partially correct. No meaningful analysis or comparison.
Creativity, efficiency of Problem-Solving [CO2-4]	Demonstrates outstanding creativity and innovation in developing solution, especially	Demonstrates creativity and some innovation; developed solution is practical.	Shows moderate creativity; developed solution is functional but not innovative.	Minimal creativity; developed solution is repetitive or unimaginative.	No creativity or problem-solving/adequate solution is evident.

[PO3, PO11]	for design tasks.				
Documentation & Analysis [CO1-5] [PO8/PO9/PO11]	Documentation is complete, well-organized, and includes deep reflection on improvements across iterations.	Documentation is complete with some reflection on program refinement.	Documentation is present but lacks detail or depth in reflection.	Incomplete documentation; reflection is minimal.	No documentation or reflection provided as per schedule.