PANJAB UNIVERSITY, CHANDIGARH-160014 (INDIA)

(Estd. Under the Panjab University Act VII of 1947—enacted by the Govt. of India)

SYLLABI

FOR

Undergraduate Programme
Multidisciplinary Courses
(Offered by Computer Science & Application)

(SEMESTER SYSTEM)
EXAMINATIONS, 2025-26
(SEMESTER: FIRST TO THIRD)

i.e

First &Third Semester : November/December, 2025
Second Semester : April/May, 2026

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MDC Subjects of
Computer Science and Applications

Paper Title: E-Commerce
Paper Code: CSA-MDC-101/201/301

Th	P	Cr	
3	-	3	Theory External Marks: 75
			Theory Internal Marks: --
Level: L-100			
Time Duration: 3 Hrs.			Number of Theory Hours: 45

Objectives: The objective of this course is to understand the process of electronic commerce and familiarizes students with the technology involved in it.

Learning Outcomes:

After completing the course students will be able to

i) Know about the Basic of E-commerce, its type, EDI, its structure and components
ii) Understand the basic of Web Based E-Commerce, Web Site Development and online promotion tools and techniques.
iii) Gain an insight into electronic payment systems, mobile commerce and various application of e-commerce along with some case studies.

Note :

i. The Question Paper will consist of Four Sections.
ii. Examiner will set total of **NINE** questions comprising **TWO** questions from each Section and
ONE **compulsory question of short answer type covering whole syllabi.**
iii. The students are required to attempt **ONE** question from each Section and the Compulsory question.
iv. All questions carry equal marks unless specified.

UNIT - I

An Overview of E-Commerce:

Definitions: E-commerce, E-business, difference between E-commerce and E-business, Problems with Traditional business systems, Aims of E-commerce, Types of E-commerce: B2B, B2C, C2C, B2G, G2H, G2C, Operational & Strategic benefits of E-commerce, Issues & Challenges in E-commerce.

Electronic Data Interchange (EDI): Definition; Traditional versus EDI enabled system for document exchange; Components of EDI: EDI Standards, EDI Software, Communication Networks; EDI Message Structure; EDI Notification Structure; EDI in India; EDI enabled procurement process; Benefits of EDI: Direct Benefits, Strategic Benefits; EDI Implementation issues; Legal Aspects.

UNIT - II

Web based E-Commerce: Definition; Need for web based business, Steps in setting up business on Internet: Selection & registration of domain name, Website development: Planning a website, Steps for creating a website, Elements of a webpage, web authoring tools, Hosting a website: Website hosting considerations.

Online Promotion tools & techniques: Getting links to your site, banner advertisements & measuring advertisement effectiveness; Web Traffic Analysis: Hits, View pages, Visits and Other web-reporting tools, various measures, What is Search Engine optimization

UNIT - III

Electronic Payment Systems: E-cash: Purchasing & using of e-cash; Electronic Purses their loading with cash and use; E-cheque payment system; Online Third Party Verified Payment System through Credit & Debit Cards; ATM based cash disbursement system; Electronic Bill Payment System; Inter bank clearing system.

UNIT - IV

Mobile Commerce: Definition, Benefits of Mobile Commerce, Issues in Mobile Commerce, Mobile Commerce Framework

Applications of E-Commerce & Case Studies: Applications of e-commerce, Case studies in Retailing, Banking and e-governance; Cyber Crimes: Types, Cyber Forensics, Cyber crimes and IT Act - 2000.

Suggested Readings:

1. Bhasker, Bharat: Electronic Commerce: Framework, Technologies and Applications; Tata McGraw- Hill.
2. Bajaj, Kamlesh& Nag, Debjani: E-Commerce-The Cutting Edge of Business; Tata McGraw Hill.
3. Young, Margaret Levine : The Complete Reference: Internet; Tata McGraw Hill.
4. KalaKota, Ravi &Whinston, Andrew B.: Frontiers of Electronic Commerce; Addison Wesley.
5. Stallings, William: Network Security Essentials: Applications & Standards; Pearson Education.
6. Minoli, Daniel &Minoli, Emma: Web Commerce Technology Handbook; Tata McGraw Hill.
7. Murthy CSV: e-Commerce: Concepts, Models, Strategies; Himalayas Publishing House.
8. Kosiur, David: Understanding E-Commerce; Microsoft Press.

Paper Title: Management Information System
Paper Code: BCA-MDC-102/202/302

Th	Pr	Cr	Theory External Marks: 75
3	-	3	Theory Internal Marks: --

Level: L-100
Time Duration: 3 Hrs. Number of Theory Hours: 45

Objectives:

1. To understand and asses the importance of information and its role in business.
2. To develop data analyzing skills in students to evaluate information and the tools used for information processing.
3. To imbibe theoretical knowledge of MIS in the students and prepare the students technological competitive and make them ready to self-upgrade with the higher technical skill.

Learning Outcomes:

1. Understand the information needs of an organization and a business function.
2. Evaluate effectiveness of decision making process and identify its tools
3. Understand DSS techniques for making effective decisions
4. Design parameters for MIS application, for data analysis uses

Note: Examiner will be required to set nine questions in all. First question will be compulsory, consisting of objective type/short answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory question number one. All questions will carry equal marks.

UNIT-I

Introduction to System and Basic System Concepts, Types of Systems, The Systems Approach, Information System: Definition & Characteristics, Types of information, Role of Information in Decision-Making.

UNIT-II

An overview of Management Information System: Definition & Characteristics, Components of MIS, Frame Work for Understanding MIS: Information requirements & Levels of Management, Simon's Model of decision-Making, Structured Vs Unstructured decisions, Formal vs. Informal Systems.

UNIT-III

Developing Information Systems: Analysis & Design of Information Systems, Implementation & Evaluation, Pitfalls in MIS Development.

UNIT-IV

Functional MIS: A Study of Personnel, Financial and Production MIS, Introduction to EBusiness Systems, E-Commerce- Technologies, Applications, Decision Support SystemsSupport Systems for Planning, Control and Decision- Making.

TEXT AND REFERENCE BOOKS:

1. J. Kanter, "Management/Information Systems", PHI
2. Gordon B. Davis, M. H. Olson, "Management Information Systems- Conceptual Foundations, Structure and Development", McGraw Hill.
3. James A. O'brien, "Management Information Systems", Tata McGraw Hill.
4. Lucas, "Analysis, Design & Implementation", McGraw Hill
5. James A. Senn, " Analysis, Design of Information Systems", Second Edition, McGraw Hill.

Paper Title: Web Development/Designing
Paper Code: CSA-MDC-103/203/303

(Any Semester)

Th	Pr	Cr	
-	**3**	**3**	**Practical External Marks: 65**
			Practical Internal Marks: 10

Level: L-100
Time duration :3 hours Number of Lectures: 90

Course Objectives:

1. Identify the appropriate programming environment for developing dynamic client-side and server-side web applications.
2. Plan, develop, debug, and implement interactive client-side and server-side web applications.
3. Identify the tools needed to create dynamic client-side and server-side web applications.

Learning Outcome:

1. Students are able to develop a dynamic web page by the use of JavaScript and HTML.

Outlines syllabus: Web Development/Designing

Note :

i. The Question Paper will consist of Four Sections.
ii. Examiner will set total of NINE questions comprising TWO questions from each Section and ONE compulsory question of short answer type covering whole syllabi.
iii. The students are required to attempt ONE question from each Section and the Compulsory question.
iv. All questions carry equal marks unless specified.

Unit- I

World Wide Web - Web Browsers - Markup Languages - Style Sheet Technologies - Client-Side, Server Side – HTML – Headings – Links-Images – Lists - Tables - Forms, Frames, Cascading style Sheets

Unit - II

JAVASCRIPT- Introduction - Simple Program, Decision Making.
Equality and Relational Operators - Control Statements - Functions - Programmer Defined Functions, JavaScript Global Functions, Recursion

Unit - III

Arrays- References and Reference Parameters, Passing Arrays to Functions, Multidimensional Array Objects of JavaScript: Window Object - Document Object.

Unit - IV

Forms Object -Text Boxes and Text Areas - Buttons, Radio Buttons, Check Boxes, Select Object, Other Object: Data Object- Math Object- String Object- Arrays- Worked Examples.

Practical Syllabus:

Create Webpages in HTML Links, Images, Lists, Tables, Forms, Frames, Cascading style sheets Creating Webpages in JavaScript, Simple Program, Decision Making, Equality and Relational Operators

- Control Statements-Functions-Programmer Defined Functions, JavaScript Global Functions, Recursion-Arrays

Create web pages in JavaScript-Window Object-Document object-Forms- Object, Text Boxes and Text Areas, Buttons, Radio Buttons, Check Boxes, Select Object, Other Object, Data Object, Math Object, String Object, Arrays, Worked Examples

References:

1. Learning Mike McGrath, JavaScript, Dream, Tech Press, 1st Edition 2006
2. Jennifer Robinson, Learning Web Design, O Reilly, 2018
3. Melani and Kyrnin's "HTML, CSS, JavaScript All in One", Pearson, 2018

Paper Title: Introduction to Information Technology
Paper Code: CSA-MDC-104/204/304

(Any Semester)

Th	P	Cr	
-	3	3	**Practical External Marks: 65**
			Practical Internal Marks: 10
Time duration: 3 hours			Number of Lectures: 90

Objectives:

1. To familiarize the students with the Fundamentals of Information Technology.
2. To assess the implications for the markets and organizational change of advances in information technologies.

Learning Outcomes:

- Knowledge about the basics of Windows Operating System.
- Learning various operations of Windows OS.
- Knowledge of MSword, MS Power Point, MS Excel, MS Access

UNIT I

Introduction: Evolution of Computers, Windows and Unix. Fundamentals of windows, anatomy of windows, Operations on window: Opening, Minimizing, Maximizing, Moving, Resizing, Closing; Windows Explorer, Folders: Creating, deleting, copying, renaming folders, folder properties; Icons, Menu, Taskbar, Control panel, Recycle bin.

UNIT II

Word Processing Package: Basics of Word Processing; Word Processing Basics; Text creation, Manipulation, Finding and replacing, Formatting of text; Printing of word document, Page Layout: Margin setting, Alignments, Adding Borders and shading, Adding Headers and Footers, Setting up Multiple columns, Working with tables, Spell check, Auto Correct, Grammar facility, Mail merge.

UNIT III

Spreadsheet Package: Worksheet Basics, Data Entry in Cells: Entry of numbers, text and formulae, Moving data in a worksheet, Moving around in a worksheet, Selecting Data Range. Using the interface (Toolbars, Menus), Editing Basics, Working with workbooks, Cell referencing: Absolute, Relative and Mixed; Formatting and Calculations: usingAutofill, Working with Formulae, Creating Chart and graphs.

UNIT IV

Presentation Packages: Basics, General Features, Creating a presentation, Different types of slide views, Master Slides and its use, Formatting Slides: slide design, Layout and background; Animation effect, Transition effect, timing effects, Macros.

Database Package: Introduction to Database, Tables, Data Types, Attributes, Records; Overview of MS- ACCESS Creating Database, Creating Tables, Data types, Creating forms and queries.

References Resources:

1. Priti Sinha and P.K. Sinha: Computer Fundamentals, BPB Publications, 2004
2. V. Rajaraman and N. Adabala: Fundamentals of Computers, PHI, 2014
3. R. K. Texali: PC Software made simple, McGraw Hill., 2017

Computer Programming and Problem Solving
Paper Code: CSA-MDC-105/205/305

(Any Semester)

Th	**P**	**Cr**	**Theory External Marks: 65**
3	**-**	**3**	**Theory Internal Marks: 10**

Level: L-100
Time duration: 3 hours Number of Lectures: 90

Course objectives:

- To introduce students to the foundations of computing, programming and problem-solving.
- To develop basic programming skills.

Learning Outcomes:

- Students will be able to break down real-world problems into smaller, manageable components.
- Students will be able to develop an ability to represent problem solutions using algorithms, flowcharts, and pseudocode.
- Students will be able to implement the algorithms using suitable programming languages.
- Students will be able to write, test, and debug simple programs.

Prerequisites: No pre-requisites required, suitable also for those with school level programming skills.

UNIT - I

1. **Introduction to problem solving using computers.**
   Problem solving steps**,** What are programs, Computing based applications of programming, Steps followed in Program Development, Good Programs and Bad Programs, Programming Languages as tools, types of languages (machine level, assembly, high level), programming paradigms (Procedural, Object oriented, Database processing, Scripting)

2. **Introduction to Basic Computing Tools**: Algorithms - definition, characteristics, examples, advantages and limitations**; Flowcharts** - definition, notations, examples, advantages and limitations; **Pseudo codes** - notations, examples, advantages and limitations; **Decision Tables**- definition, advantages, limitations, examples; **comparison** between algorithms, flowchart and pseudo codes.

UNIT - II

3. **Converting pseudo-code to programs**: Compilation process (compilers , interpreters), linking and loading, syntax and semantic errors, testing a program, Good Programming Practices (naming conventions , documentation, indentation), Difference between algorithms and programs

4. **Basic Elements of a Program**: Identifiers, keywords, notion of data types, variables and constants, statements, operators, syntax, program execution environment: Compilation/interpretation, debugging and testing, types of errors, source program, object program

UNIT – III

5. **Sequential and Branching statements:** Sequential statements, Branching: conditional (if, if..else, if..else ladder, nested if), unconditional (goto)

6. **Iterative statements:** what is iteration, iteration body, initialization, termination condition, iteration step, Loop controls: while do, do..while, for.

UNIT – IV

7. **Aspects of loop design**: Avoiding infinite loops, comparison between while do, do while and for loops, Loop control flow statements: break and continue

8. **Functions:** introduction, advantages, defining, declaring and calling a function

Note:
Illustration of basic programming concepts like tokens, data types, identifiers, input/ output statement, arithmetic operations, conditional statements, loops etc. using any programming language such as C, C++, Python.

References:
1. Subhashis Banerjee, S. Arun-Kumar, D. Dubhashi: Introduction to Computer Science.
2. Structure and Interpretation of Computer Programs by Harold Abelson and Gerald Sussman with Julie Sussman, MIT Press, 1985.
3. How to solve it by Computer by R. J. Dromey, Prentice-Hall India EEE Series.

Paper Title: Data Analysis using Excel
Paper Code: CSA-MDC-106/206/306

(Any Semester)

Th	Pr	Cr	
-	3	3	**Practical External Marks: 65**
			Practical Internal Marks: 10

Level: L-100
Time duration: 3 hours **Number of Lectures: 90**

Course objectives:

- Learn to handle data, clean the data to make meaningful dataset without missing value using various excel functions.
- Learn to use excel functions to get statistical and financial results.
- Learn to use intelligent functions in excel like lookups and conditional calculations.
- Learn to visualize data, into the form of Graphs, Pivots and list with subtotals. Explore various types of graphs and chart styles.
- Equip with skills in managing and preparing data for analysis in Excel.
- Employ advanced data analysis techniques such as what-if analysis and macros.

Learning Outcomes:

- Collect data from different sources and organize it to a meaningful tabular format.
- Apply formulas to the data using excel built-in functions.
- Utilize Excel's advanced features for data manipulation and analysis.
- Select graph types and chart styles which will suit the kind of data they analyse.
- Explore the immense possibilities of pivot table and make meaningful reports.
- Utilize Excel's advanced features for data manipulation and analysis.

UNIT I

Introduction to Excel Basics: An Overview of the Screen, Navigation and Basic Spreadsheet Concept, Various Selection Techniques, Data Entry: creating, Editing, Saving, Page Settings. Auto fill, formatting data in the cell, arithmetic operations, basic formulas, working with excel range and tables, Use of cell references in formulas (relative, absolute, and mixed references) and referencing cells outside the worksheet, demonstration of formatting worksheets, applying conditional formatting, Protecting and Un-Protecting worksheets and cells, Shortcut Keys
Basic Functions: arithmetic, string, date & time
Statistical Functions: Counting items in a dataset, Means, Modes and Medians, Finding Values, Ranks and Percentiles, Standard Deviations and Variances, Regression Analysis, Correlation, t-distributions

UNIT II

Financial functions: PMT, FV, NPV, IRR, PV, RATE, NPER, PPMT, XNPV, XIRR
Advanced Excel Functions for Data Analysis: Using formulas for Conditional Analysis – IF, AND and OR functions to evaluate simple and multiple conditions; conditional calculations(SUMIF,COUNTIF, AVERAGEIF); Matching and Lookups(VLOOKUP, HLOOKUP, INDEX, MATCH).

Data Visualization with Excel: Demonstration of creation of a bar chart representing sales data for different months; Customize the appearance of a chart; Use of various types of charts in Excel-column charts, histograms, line charts, pie charts and scatter charts.
Use of spark lines to display trends within a single cell.

UNIT III

Introduction to Pivot Tables and Pivot Charts: Creating a PivotTable using a dataset, Customizing Pivot Tables, Creating a Pivot Chart based on an existing PivotTable, Analyzing Data with PivotTables.
Managing and Analysing Data: Importing data into Excel from an external source, Cleaning Data, Data sorting and filtering, Using Data Validation.
Advanced Data Analysis Techniques: Performing Spread sheet What-If Analysis; Analysing Data Using Goal Seeking and Solver.

UNIT IV

Introducing Data Analysis Toolbar Tools: Using the Descriptive Statistics tool, Creating a histogram, Ranking by percentile, Calculating moving averages, Using the Exponential Smoothing tool, Using Data Analysis t-test tools, Using the Regression and Correlation tools, Implementing the ANOVA data analysis tools.
Excel Macros: Recording and editing macros, Managing recorded macros.

Reference Books

- Excel Data Analysis Modeling and Simulation., Hector, G.(2019), Springer.
- Microsoft Excel data analysis and business modeling ,Winston, W.(2016), Microsoft press.
- Excel 2019 bible, Alexander, M., Kusleika, R., &Walkenbach, J. (2018), John Wiley & Sons.
- Excel data analysis for dummies, Nelson, S.L., & Nelson, E.C. (2014), John Wiley & Sons.
- Data Analysis with Microsoft Excel, Berk, K.N., & Carey, P. (1998),Pacific Grove, CA: Duxbury Press.

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