(Annexure H-4)

FACULTY OF COMPUTER SCIENCE & IT

SYLLABUS

of

COMPUTER APPLICATIONS FOR ECONOMISTS

for

Master of Science (Economics) (Semester – I/II)

Under Credit Based Continuous Evaluation Grading System (CBCEGS)

Session: 2024-25

The Heritage Institution

KANYA MAHA VIDYALAYA JALANDHAR (Autonomous)

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATIONS OF THREE YEAR DEGREE PROGRAMME

MASTER OF SCIENCE (ECONOMICS) SEMESTER – I/ II

Credit Based Continuous Evaluation Grading System (CBCEGS)

(Session 2024-25)

MASTER OF SCIENCE (ECONOMICS)										
Course Code	**Course Title**	**Course Type**	**Hours per week**	**Credit**		**Marks**				**Examination Time (in Hours)**
			L-T-P	**L-T-P**	**Total**	**Total**	**Ext.**		**CA**	
							L	**P**		
	OPT-VI (Computer Applications for Economists-I)	E	3-0-2	3-0-1	4	100	50	30	20	3+3

MASTER OF SCIENCE (ECONOMICS)										
Course Code	**Course Title**	**Course Type**	**Hours per week**	**Credit**		**Marks**				**Examination Time (in Hours)**
			L-T-P	**L-T-P**	**Total**	**Total**	**Ext.**		**CA**	
							L	**P**		
	OPT-XIV Computer Applications for Economists-II	E	3-0-2	3-0-1	4	100	50	30	20	3+3

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OPT-VI (Computer Applications for Economists-I)

COURSE OUTCOMES

After passing this course the student will be able to:

CO1: Comprehend about computer hardware, operating system concepts and various system software.

CO2: Comprehend basics of internet and email along with their effective use. Articulate the main concepts, key technologies, strength and limitations of cloud computing.

CO3: Comprehend the working of various programming constructs involved in C programming.

CO4: Design C program and control its sequence using various control statements. Also work with pointers, structures and union.

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OPT-VI (Computer Applications for Economists–I)

Time: 3+3 Hours **Max. Marks: 100**

L-T-P (Credits):3-0-1 **Theory: 50**

Practical: 30

CA: 20

Note: Instructions for the Paper–Setter:

Two questions, each carrying 10 marks, from each of the Units I-IV (i.e. a total of eight questions) are to be set. Candidates are required to attempt five questions, selecting at least one from each unit. The fifth question may be attempted from any unit.

UNIT-I

Introduction to Computer: Computer System Characteristics, Hardware–CPU, Memory, Input, Output and Storage devices, Organization of Secondary Storage Media, Software – System and Application, Types of processing Batch and On-line.

Programming Paradigms and Development Tools: Problem Analysis, Program Constructs (Sequential, Decision, Loop), Algorithms, Flowcharts, Pseudo code, Decision table, Modular Programming, Top-down and Bottom-up Approaches, functional, Procedural object - oriented, and logic programming, Programming Languages–Syntax and Semantics.

Operating System Concepts: Role of an Operating System, Types of operating systems, Batch processing, Multiprogramming, timesharing, realtime, mobile, portable etc., Booting procedure and its types, components and functions of operating system.

UNIT-II

Data Communication and Internet: Introduction to Data Communication, Types of Networks, Transmission Media, Internet and its applications, working knowledge of Search engines and use of electronic mail, Virus, Information level threats, Network level threats, Classification of threats, Hacking Prevention Mechanism: Anti -Viruses, Firewalls, Biometrics Controls for security, cryptography and encryption.

Introduction to Cloud Computing: Overview of distributed computing: Trends of computing, introduction to parallel/distributed computing, Introduction to Cloud Computing including benefits, challenges, and risks, Different types of clouds, Security and Privacy issues in the Cloud.

UNIT-III

Introduction to Program Development: Problem Analysis, Designing a solution.

Overview of C: Brief history of C, Introduction to different versions of C. General Structure of a C program, stages in the development of a C program.

Data Types, Operators and Expressions: Constants and variables, data types, declaring variables, storage classes, different types of expressions and their evaluation, conditional expression, assignment statement, enumerated data type, redefining/creating data types, types casting.

Console Input/Output: Standard input/output devices, unformatted input/output functions (character I/O functions and string I/O functions), formatted input/output functions (*scanf*() function and *printf*() function.

UNIT-IV

Control Statements: Decision making using if, if-else, else if and switch statements, Looping using for, while and do–while statements, transferring program control using break and continue statements.

Arrays and Strings: Introduction to arrays, declaring arrays, initializing arrays, processing of arrays, introduction to strings.

Structures and Unions: Introduction to structures, declaring structures, initializing structures, accessing elements of structure, array of structures, nested structures, passing structures as arguments to a function, introduction to unions.

Suggested Readings:

1. Kernigean, B.W.& Ritchie, P.M.: The C ProgrammingLanguage,PrenticeHall,2000
2. Kaicker,S.: Programming in C, BPB Publications,2003
3. Subramaniam, N.: Introduction to computer; Fundamentals of Computer Science, TataMcGrawHill,2005
4. GurvinderSinghandRachhpalSingh:WindowsBasedComputerSystem,KalyaniPublications,2016
5. P.K.Sinha,PreetiSinha:ComputerFundamentals,BPBPublications2010
6. E.Balagursamy:ProgramminginAnsiC,IndiaHigherEducations,2000
7. YashwantKanetkar:LetUsC,BPBPublications2017

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OPT-XIV Computer Applications for Economists-II

Time: 3+3 Hours **Max. Marks: 100**

L-T-P (Credits):3-0-1 **Theory: 50**

Practical: 30

CA: 20

Note: Instructions for the Paper–Setter:

Two questions, each carrying 10 marks, from each of the Units I-IV (i.e. a total of eight questions) are to be set. Candidates are required to attempt five questions, selecting at least one from each unit. The fifth question may be attempted from any unit.

UNIT-I

Introduction: Concept of data, database, DBMS and data science. Its advantages and applications. Three level architecture of DBMS, data independence, Data models: relational, hierarchical and network. Working knowledge of DDL, DML and DCL. Datafication, Digitalization, Digital transformation.

Relational Database Design: Concepts of functional dependencies, multivalued dependencies, 1NF, 2NF, 3NF and Boyce-CODD normal form. Introduction to SQL, data types, operators and functions. Implementation of queries in SQL: create, insert, delete, modify and alter, constraints in SQL.

UNIT-II

Data Analysis: Sources, acquisition and interpretation of data, primary and secondary data, quantitative and qualitative data, graphical representation of data with histogram, piechart, bar chart, column chart and line chart.

Data Visualization and Report Writing: Characteristics of effective graphical display, ideas and tools for data visualization, different steps in report writing, layout of the research report, types of reports, APA, MLA and Chicago reference styles.

UNIT-III

Introduction to Big Data: Structured and Unstructured data, Data Analytics, Big data management and big data analytics techniques of data management, storage and analysis of data, extraction of relevant

information.

Exploring the Use of Big Data: Use of big data in detecting fraudulent activities in financial transactions, e-commerce and in insurance sector, Use of big data in social networking. Use of big data in retail industry, health care industry and Government sector.

UNIT-IV

Cloud Computing Architecture: Service Models, Deployment Models, Cloud Entities, Cloud Clients, Service Level Agreement (SLA) and Quality of Service (QoS) in Cloud Computing.

Cloud Security: Infrastructure security, data security, identity and access management, privacy management, Security as a Service in cloud, cloud forensics.

Text Books:

1. C.J. Date, "An Introduction of Database System", The Systems Programming Series,6/Ed, Addison–Wesley Publishing Company, Inc., 2016
2. Silberscatz, Korth and Sudarshan, "Database System Concepts", Third Ed., McGraw Hill International Editions, Computer Science Series. McGraw Hill 2013
3. Desai.Bipin C, "An Introduction to Database Systems", West Publishing Company, St.Paul, Minnesota, USA.
4. Michael Minelli, Michele Chambers, Ambiga Dhiraj, "Big Data. Big Analytics", JohnWiley.
5. Cathy O'Neil and Rachel Schutt. Doing Data Science, Straight Talk from The Frontline. O'Reilly, 2017
6. Barrie Sosinsky, Cloud Computing Bible, Wiley India Pvt. Ltd., ISBN–13: 978–8–12–652980–3, NewDelhi,India2016
7. Dr. Saurabh Kumar, Cloud Computing: Insights into New–Era Infrastructure, Wiley India Pvt. Ltd, ISBN–13:978–8–12–652883–7, New Delhi, India, 2011.
8. Fern Halper, Hurwitz, Robin Bloor, Marcia Kaufman, Cloud Computing for Dummies, Wiley India Pvt. Ltd, ISBN–13:978–0–47–059742–2, New Delhi, India, 2011.
9. Cloud Computing: Principles and Paradigms–2013 by Rajkumar Buyya, James Broberg, Andrzej Goscinski.