

FACULTY OF COMPUTER SCIENCE & IT

SYLLABUS

of

- Master of Science (Computer Science) (Semester I - IV)
- Master of Science (Information and Network Security) (Semester I - IV)
- Post Graduate Diploma in Computer Applications (Semester I-II)
- Bachelor of Computer Applications (Semester I-VI)
- Bachelor of Science (Information Technology) (Semester I-VI)
- Diploma in Computer Applications (Semester I-II)
- Bachelor of Science (Information technology) Additional / Optional paper for Specialization in Data Science (Semester I-VI)

Session: 2021-22



The Heritage Institution

KANYA MAHA VIDYALAYA

JALANDHAR

(Autonomous)

(Annexure A-1)

FACULTY OF COMPUTER SCIENCE & IT

SYLLABUS

of

Master of Science (Computer Science) (Semester I - IV)

(Under Continuous Evaluation System)

Session: 2021-22



The Heritage Institution

**KANYA MAHA VIDYALAYA
JALANDHAR
(Autonomous)**

Program Specific Outcomes
Master of Science (Computer Science)
(Session 2021-22)

After completing this programme, the students will be able to:

PSO1: Showcase their skillset to apply in the field of IT, academics and other competitive examinations. PSO2: Comprehend the implementation logic behind the architecture of computers.

PSO3: Apply skills to provide IT based solutions for real world problems through development of software and websites.

PSO4: Contextualize and analyze the problems in hand to work for an IT based solution.

PSO4: Apply principles and techniques from the selective areas to develop special expertise.

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATIONS OF TWO YEAR DEGREE PROGRAMME

Master of Science (Computer Science)

Session 2021-22

Master of Science (Computer Science) Semester - I							
COURSE CODE	COURSE NAME	COURSE TYPE	Marks				Examination Time (in Hours)
			Total	Ext.		CA	
				L	P		
MCSL-1111	Advanced Data Structures	C	100	80	-	20	3
MCSL-1112	Advanced Computer Architecture	C	100	80	-	20	3
MCSL-1113	Network Security Practices	C	100	80	-	20	3
MCSL-1114	Discrete Structures	C	100	80	-	20	3
MCSL-1115	Artificial Intelligence	C	100	80	-	20	3
MCSP-1116	Lab on Advanced Data Structures	C	100	-	80	20	3
		Total	600				

Note:

C - Compulsory

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATIONS OF TWO YEAR DEGREE PROGRAMME

Master of Science (Computer Science)

Session 2021-22

Master of Science (Computer Science) Semester – II							
COURSE CODE	COURSE NAME	COURSE TYPE	Marks				Examination Time (in Hours)
			Total	Ext.		CA	
				L	P		
MCSL-2111	Theory of Computation	C	100	80	-	20	3
MCSL-2112	Image Processing	C	100	80	-	20	3
MCSL-2113	Advanced Programming Concepts	C	100	80	-	20	3
MCSL-2114	Cloud Computing	C	100	80	-	20	3
MCSL-2115	Distributed Database Systems	C	100	80	-	20	3
MCSP-2116	Lab on Advanced Programming Concepts	C	100	-	80	20	3
		Total	600				

Note:

C - Compulsory

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATIONS OF TWO YEAR DEGREE PROGRAMME

Master of Science (Computer Science)

Session 2021-22

Master of Science (Computer Science) Semester – III							
COURSE CODE	COURSE NAME	COURSE TYPE	Marks				Examination Time (in Hours)
			Total	Ext.		CA	
				L	P		
MCSL-3111	Data Mining and Data Warehousing	C	100	80	-	20	3
MCSL-3112	System Software	C	100	80	-	20	3
MCSL-3113	Advanced Web Technologies	C	100	80	-	20	3
MCSL-3114	Design and Analysis of Algorithms	C	100	80	-	20	3
MCSL-3115	Software Testing	C	100	80	-	20	3
MCSP-3116	Lab on Advanced Web Technologies	C	100	-	80	20	3
	Total		600				

Note:

C - Compulsory

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATIONS OF TWO YEAR DEGREE PROGRAMME

Master of Science (Computer Science)

Session 2021-22

Master of Science (Computer Science) Semester – IV							
COURSE CODE	COURSE NAME	COURSE TYPE	Marks				Examination Time (in Hours)
			Total	Ext.		CA	
				L	P		
MCSL-4111	Advanced Software Engineering	C	100	80	-	20	3
MCSL-4112	Microprocessor and Its Applications	C	100	80	-	20	3
MCSL-4113	Foundation of Statistical Computing	C	100	80	-	20	3
MCSP-4114	Lab on Foundation of Statistical Computing	C	100	-	80	20	3
MCSD-4115	Project Work	C	200	-	160	40	6
	Total		600				

Note:

C - Compulsory

Master of Science (Computer Science) Semester – I

(Session 2021-22)

COURSE CODE: MCSL-1111

ADVANCED DATA STRUCTURES

Course Outcomes:

After passing this course the student will be able to:

CO1: Design, analyze and implement algorithms and check their performances against specified parameters.

CO2: Understand the necessary mathematical abstraction to solve different data structure problems.

CO3: Devise various algorithms for real world problems involving data structures.

Master of Science (Computer Science) Semester – I

(Session 2021-22)
COURSE CODE: MCSL - 1111
ADVANCED DATA STRUCTURES

Examination Time: 3 Hrs.

Max. Marks: 100

Theory: 80

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (16 marks each) are to set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT-I

Review of algorithm analysis, Binary search trees, balanced binary search trees (red-black trees), Btrees, AVL Trees, 2-3 trees, 2-3-4 trees.

UNIT-II

Binary heaps, heap operations, implementation and applications. Priority queue operations, and double-ended, priority queues.

UNIT-III

Binomial heaps, Fibonacci heaps. Data structures for disjoint sets.

Amortized analysis, string matching, and graph algorithms.

UNIT-IV

External data structures - external storage, external files, external sorting searching indexing files, external hashing.

References / Textbooks:

1. Alfred V. Aho, Jeffrey D. Ullman, John E. Hopcroft, Data Structures and Algorithms, Addison Wesley, 1985.
2. Dinesh P. Mehta, Sartaj Sahni, Handbook of Data Structures and Applications, Chapman & Hall/CRC, 2018.

3. Jean-Paul Tremblay, Paul Sorenson, An Introduction to Data Structures with Applications, McGraw Hill Education, 2017.
4. Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein, Introduction to Algorithms, MIT Press, 2009.
5. Peter Brass, Advanced Data Structure, Cambridge University Press, 2008.

Note: The latest editions of the books should be followed.

Master of Science (Computer Science) Semester – I
(Session 2021-22)
COURSE CODE: MCSL-1112
ADVANCED COMPUTER ARCHITECTURE

Course Outcomes:

After passing this course the student will be able to:

CO1: Have broad knowledge of computer architecture and paradigms of computer system.

CO2: Gain knowledge of parallel computing models and parallel computer structures.

CO3: Understand the concepts of pipelining and multiprocessors.

Master of Science (Computer Science) Semester – I
(Session 2021-22)
COURSE CODE: MCSL-1112
ADVANCED COMPUTER ARCHITECTURE

Examination Time: 3 Hrs.

Max. Marks: 100

Theory: 80

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (16 marks each) are to set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts(not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT-I

Paradigms of Computing: Synchronous – Vector/Array, SIMD, Systolic

Asynchronous – MIMD, reduction Paradigm, Hardware taxonomy: Flynn’s classification, Software taxonomy: Kung’s taxonomy, SPMD.

UNIT-II

Parallel Computing Models

Parallelism in Uniprocessor Systems: Trends in parallel processing, Basic Uniprocessor Architecture, Parallel Processing Mechanism.

UNIT-III

Parallel Computer Structures: Pipeline Computers, Array Computers, Multiprocessor Systems

Architectural Classification Schemes: Multiplicity of Instruction-Data Streams, Serial versus Parallel Processing, Parallelism versus Pipelining.

UNIT-IV

Pipelining: An overlapped Parallelism, Principles of Linear Pipelining, Classification of Pipeline Processors, General Pipelines and Reservation Tables.

Principles of Designing Pipelined Processors: Instruction Prefetch and Branch Handling, Data Buffering and Busing Structure, Internal Forwarding and Register tagging, Hazard Detection and Resolution.

References / Textbooks:

1. Kai Hwang, Faye A. Briggs, Computer Architecture and Parallel Processing, McGrawHill International Editions, 1985.
2. John D. Carpinelli, Computer Systems Organization & Architecture, Addison Wesley, 2001.
3. Kai Hwang, Advanced Computer Architecture: Parallelism, Scalability and Programmability, McGraw-Hill, International Edition, 1993.
4. T. J. Fountain, D Sima , Peter Kacsuk, Advanced Computer Architectures: A Design Space Approach, Addison-Wesley, 1997.

Note: The latest editions of the books should be followed.

Master of Science (Computer Science) Semester – I

(Session 2021-22)

COURSE CODE: MCSL-1113

NETWORK SECURITY PRACTICES

Course Outcomes:

After passing course the student will be able to:

CO1: Understand basics of cryptography, network security, services, mechanisms and defining various terms as vulnerability, threat and attack.

CO2: Identify and classify particular examples of attacks, differentiating between Symmetrical and Asymmetrical cryptography.

CO3: Have understanding of data integrity, authentication, digital signatures and hash functions.

CO4: Understand various network security concepts as IPSec, Web security, PGP, Email security.

Master of Science (Computer Science) Semester – I

(Session 2021-22)

COURSE CODE: MCSL-1113

NETWORK SECURITY PRACTICES

Examination Time: 3 Hrs.

Max. Marks: 100

Theory: 80

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (16 marks each) are to set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT -I

Introduction: Overview, Security attacks (Interruption, Interception, Modification and Fabrication) and services (confidentiality, authentication, integrity, non-repudiation, access control and availability), types of attacks, model for network security, CAINA Properties.

Classical and Modern Cryptography Techniques: Conventional encryption model, classical encryption techniques, Simplified DES, Principles of Block ciphers, DES and its strength.

UNIT -II

Classical and Modern Cryptography Techniques: Triple DES, Blowfish, CAST – 128, linear and differential cryptanalysis, steganography.

Confidentiality: Traffic confidentiality and random number generation.

Public Key Encryption Methods: Principles, RSA Algorithm, Diffie– Hellman key exchange, Elliptic curve cryptography.

UNIT -III

Hash functions: Applications of Hash Functions, Two Simple Hash Functions, Requirements and Security, SHA.

Message Authentication Codes: Requirements, Functions, Requirements of Message Authentication codes, Security of MACs, MACs based on HMAC, MACs based on Block Ciphers: DAA and CMAC.

Digital Signatures: Basics, Digital signature standard.

UNIT -IV

Key Management and Distribution: Symmetric Key Distribution using Symmetric Encryption, Symmetric Key Distribution using Asymmetric Encryption, X.509 Certificates, Distribution of Public Keys, PKI.

Other Securities:

Transport Level Security: Web Security Considerations.

Electronic Mail security: Pretty Good Privacy.

IP Security: IP Security Overview and Policy, ESP, Combining security Associations.

References / Textbooks:

1. William Stallings, Cryptography and Network Security: Principles and Practice, Pearson Education, 2017.
 2. William Stallings, Network Security Essentials: Applications and Standards, Pearson Education, 2014.
 3. Atul Kahate, Cryptography and Network Security, Tata McGraw-Hill Publishing Company Limited, 2013.
 4. Bruce Schneier, Applied Cryptography: Protocols, Algorithms and Source Code in C, Wiley Publications, 2007.
 5. V. K. Pachghare, Cryptography and Information Security Paperback, PHI Publications, 2015.
1. Behrouz A. Forouzan, Cryptography & Network Security, McGraw-Hill, 2008.

Note: The latest editions of the books should be followed.

Master of Science (Computer Science) Semester – I

(Session 2021-22)

**COURSE CODE: MCSL - 1114 DISCRETE
STRUCTURES**

Course Outcomes:

After passing course the student will be able to:

CO1: Develop the quantitative and mathematical skills required for continuous success in the field of Computer Science.

CO2: Understand and construct simple mathematical proofs of important principles like Pigeonhole principle, Inclusion-Exclusion Principle.

CO3: Get familiarize with data structures like Graphs and Trees.

CO4: Understand the basic and elementary counting techniques, factorials and recurrence relations.

Master of Science (Computer Science) Semester – I

(Session 2021-22)

**COURSE CODE: MCSL-1114 DISCRETE
STRUCTURES**

Examination Time: 3 Hrs.

Max. Marks: 100

Theory: 80

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (16 marks each) are to set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT-I

Sets and Functions: Sets, Relations, Functions, Pigeonhole principle, Inclusion – Exclusion Principle, Equivalence and Partial orderings, Elementary counting techniques, relation of partial order partitions, binary relations.

UNIT-II

Graph Theory: Definition, Walks, Paths, Directed and Undirected graphs, connected graphs, regular and bipartite graphs, Eulerian chains and cycles. Hamiltonian chains and cycles, planar graphs, Trees and rooted tree, Spanning trees, Chromatic number Connectivity and other graphical parameter application.

UNIT-III

Combinatorial Mathematics: Basic counting principles Permutations and combinations, Recurrence relations, generating Function, Application.

UNIT-IV

Rings and Boolean algebra: Rings Subrings morphism of rings ideals and quotient rings. Euclidean domains Integral domains and fields Boolean Algebra direct product morphisms Application of Boolean algebra in logic circuits and switching functions.

References / Textbooks:

1. Ehrig, H., Mahr, B., Fundamentals of Algebraic Specification I, EATCS Monographs on Theory. Comp. Sc. Vol. 6 spinger, Berlin 1985.
2. Gersting J., Mathematical Structures for Computer Science, W.H. Freeman, New York, 1987.
3. Gibbons, A., Algorithmic Graph theory, Cambridge University Press, 1985.

4. Knuth, D.E., The art of Computer Programming Vol. I: Fundamental Algorithms, Reading, Mas, Adison Wesley 1973.
5. Kolman B., Busby R., Discrete Mathematical Structures for Computer Science, Prentice Hall Englewod Cliffs, 1984.
6. Sahni, S., Concepts in Discrete Mathematics Fridley MN., Camelot Publ. Comp., 1981.
7. Schmidt G., Strohlein T., Relations Graphs Program, EATS Monograph on Theor.Comp.Sc.Vol.29, Berlin Spinger 1993.
8. Wheler W., Universal Algebra for Computer Scientist, EATCS Monographs on Theor.Comp.Sc.Vol.25 Spinger-Verlag, Berlin 1992.

Note: The latest editions of the books should be followed.

Master of Science (Computer Science) Semester – I

(Session 2021-22)

COURSE CODE: MCSL-1115
ARTIFICIAL INTELLIGENCE

Course Outcomes:

After passing course the student will be able to:

CO1: Understand various search strategies used in AI for finding solution to a problem.

CO2: Gain knowledge of propositional and predicate logic.

CO3: Represent planning in AI in different scenarios.

CO4: Understand basics of fuzzy logic, learning in AI and neural network.

Master of Science (Computer Science) Semester I

(Session 2021-22)
COURSE CODE: MCSL-1115
ARTIFICIAL INTELLIGENCE

Examination Time: 3 Hrs.

Max. Marks: 100

Theory: 80

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (16 marks each) are to set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT-I

Introduction- What is intelligence, Foundations of Artificial Intelligence (AI). History of AI Problem Solving- Formulating problems, problem types, states and operators, state space, search strategies.

Uninformed Search Strategies – BFS, DFS, UCS, Depth Limited Search, Iterative Deepening Search, Bi-directional Search. Informed Search Strategies- Best first search, A* algorithm, heuristic functions, Iterative deepening A*(IDA), small memory A*(SMA*).

UNIT-II

Game playing - Perfect decision game, Imperfect decision game, Evaluation function, AlphaBeta Pruning.

Reasoning- Representation, Inference, Propositional Logic, Predicate Logic (First Order Logic), logical reasoning, forward chaining, backward chaining.

UNIT-III

Planning- Basic representation of plans, partial order planning, planning in the blocks world, Hierarchical planning, Conditional planning, representation of resource constraints, measures, temporal constraints.

Uncertainty - Basic probability, Baye's rule, Belief networks, Default reasoning, Fuzzy sets and Fuzzy logic.

UNIT-IV

Inductive Learning - decision trees, rule based learning, current-best-hypothesis search, least commitment search, neural networks, reinforcement learning, genetic algorithms, Other learning methods - Neural Networks, Re-enforcement learning, Genetic algorithms, Communication among agents.

References / Textbooks:

1. Stuart J. Russell, Peter Norvig, Artificial Intelligence: A Modern Approach, Pearson India Education Services Pvt. Ltd., 2015.
2. Kevin Knight, Elaine Rich, B. Nair, Artificial Intelligence, McGraw Hill, 2008.
3. George F. Luger, Artificial Intelligence, Pearson Education, 2001.
4. Nils J. Nilsson, Artificial Intelligence: A New Synthesis, Morgan Kauffman, 2002.

Note: The latest editions of the books should be followed.

Master of Science (Computer Science) Semester I

(Session 2021-22)

COURSE CODE: MCSP - 1116

LAB ON ADVANCED DATA STRUCTURES

Examination Time: 3 Hrs.

Max. Marks: 100

Practical: 80

CA: 20

Programs based on Advanced Data Structures.

(Session 2021-22)

COURSE CODE: MCSL-2111

THEORY OF COMPUTATION

Course Outcomes:

After passing this course the student will be able to:

CO1: Comprehend regular languages and its properties.

CO2: Define production rules for Context Free Grammar (CFG), Convert CFG into Chomsky and Greibach Normal Form.

CO3: Apply Pumping Lemma to find to identify membership of a language.

CO4: Construct computing machines like Finite Automata, Pushdown Automata, Turing machine, etc.

CO5: Comprehend closure properties associated with formal languages.

Master of Science (Computer Science) Semester II

(Session 2021-22)

COURSE CODE: MCSL-2111

THEORY OF COMPUTATION

Examination Time: 3 Hrs.

Max. Marks: 100

Theory: 80

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (16 marks each) are to set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT-I

Chomsky Hierarchy, regular expressions, Operations on Regular Sets, Regular grammars, Linear Grammar, equivalence of Regular Grammars, properties of regular languages, pumping lemma, Closure properties.

UNIT-II

Finite Automata – DFA, transition graphs, non-deterministic FA, equivalence of DFA and NDFA, Minimization of NFA, ϵ -NFA and its conversion into NFA, Mealy and Moore Machines.

Context Free Languages – Leftmost and rightmost derivation, parsing and ambiguity, Chomsky normal form, Greibach Normal form.

UNIT-III

Pushdown Automata – NDPDA, DPDA, context free languages and PDA, comparison of deterministic and non-deterministic versions, closure properties, pumping lemma for CFL

Context Sensitive Languages, Variations, Linear Bounded Automata, Closure Properties, The Kuroda Normal Form, One sided Context Sensitive Grammars.

UNIT-IV

Turing Machines, variations, halting problem, Post Correspondence Problem (PCP)

Properties of LL(k) and LR(k) grammars, Decidability, Recursive and Recursively Enumerable Languages, Closure properties.

References / Textbooks:

1. K.L.P. Mishra and N. Chandrasekaran, “Theory of Computer Science, Third Edition”, PHI Learning Private Limited, 2011.
2. John E. Hopcroft, Rajeev Motwani, Jeffrey D. Ullman, “Introduction to Automata Theory”, Languages and Computation, Pearson Education.
3. M. Sipser, “Introduction to the Theory of Computation”, Second Edition, Cengage Learning.
4. K. V. N. Sunitha , N. Kalyani, “Formal Languages and Automata Theory”, McGrawHill, 2010.
5. Stephen Wolfram, “Theory and Applications of Cellular Automata”, World Scientific, 1986.
6. G.E. Revesz, “Introduction to Formal Languages”, Dover Publications, 1991.
7. M. A. Harrison, “Introduction to Formal Language Theory”, Addison-Wesley, 1978.
8. R.K. Shukla,” Theory of Computation”, Cengage Learning.
9. Peter Linz, An Introduction to Formal Languages and Automata, Third Edition, Narosa Publishers, 1998.

Master of Science (Computer Science) Semester II

(Session 2021-22)

COURSE CODE: MCSL-2112

IMAGE PROCESSING

Course Outcomes:

After passing this course the student will be able to:

CO1: Comprehend fundamental concepts of Digital Image Processing like human visual system model, image signal representation, imaging system specification CO2: Identify basic image processing operations.

CO3: identify current applications in the field of digital image processing.

CO4: Comprehend various color models and color image processing techniques.

Master of Science (Computer Science) Semester – II

(Session 2021-22)

COURSE CODE: MCSL-2112

IMAGE PROCESSING

Examination Time: 3 Hrs.

Max. Marks: 100

Theory: 80

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (16 marks each) are to set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT-I

Background: Introduction to electronic systems for image transmission and storage, computer processing and recognition of pictorial data, overview of practical applications.

UNIT-II

Fundamentals: Mathematical and perceptual preliminaries, human visual system model, image signal representation, imaging system specification building image quality, role of computers, image data formats.

UNIT-III

Image Processing Techniques: Image enhancement, image restoration, image data compression and statistical pattern recognition.

Applications of Image Processing: Picture data archival, machine vision, medical image processing.

UNIT-IV

Techniques of Colour Image Processing: Colour image signal representation, colour system transformations, extension of processing techniques to colour domain.

References / Textbooks:

1. Pratt, W.K. Digital Image Processing, John Wiley, N.Y./1978.

2. Rosenfield, A and Kak, A.C., Picture processing, Academic Press N.Y., 1982.
3. Jain, A.K., Fundamentals of Digital Image Processing, Englewood Cliffs, Prentice Hall, 1989.
4. Chris Soloman, Stuart Gibson, Fundamentals of Digital Image Processing: A Practical Approach using MatLab, John Wiley and Sons, 2007.
5. Gonzalez and Woods, Digital Image Processing, Addison Wesley, 2000.
6. Jayaraman S, Veerakumar T, Esakkirajan S, Digital Image Processing, Tata McGraw Hill Education (2017), 1st Edition

Master of Science (Computer Science) Semester – II
(Session 2021-22)
COURSE CODE: MCSL-2113
ADVANCED PROGRAMMING CONCEPTS

Course Outcomes:

After passing this course the student will be able to:

CO1: Comprehend Advanced Programming Concepts using Java programming.

CO2: Apply OOPs concepts to model real world problems for its simplified implementation.

CO3: Identify the utilization of packages, multithreading and Exception handling.

CO4: Demonstrate the concept of Applets, Swings and Events.

Master of Science (Computer Science) Semester – II
(Session 2021-22)
COURSE CODE: MCSL-2113
ADVANCED PROGRAMMING CONCEPTS

Examination Time: 3 Hrs.

Max. Marks: 100

Theory: 80

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (16 marks each) are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT-I

Introduction to Advanced Programming using Java Fundamentals: Features, Objects Oriented Basis, Java Virtual Machine, Character Set, Operators, Data Types, Control Structures

UNIT-II

Classes, Inheritance, Polymorphism, Packages & Interfaces, Stream IO Classes, Exception, Handling.

UNIT-III

Multithreading: Java Thread model, Thread Priorities, Synchronization, Interthread communication, Suspending, resuming & stopping thread.

Applet: Applet basics, Applet architecture, Applet: Display, Repaint, Parameter Passing.

UNIT-IV

Swings: Window Fundamentals, Working with JFrame Windows, Graphics, Controls, Colour and Fonts.

Events Handling: The Delegation Event Model, Event Classes, Event Listener Interfaces.

References / Textbooks:

1. Herbet Schildt & Naughton, Complete Reference: Java, Tata Mc Graw Hill Education, 5th Edition, 2006.

2. Jane Jawoske, Java Unleashed, SAM5, Tech Media 2006.
3. Java 8 Programming Black Book, D.T. Editorial Services, 2015.
4. E Balagurusamy, Programming with Java – A Primer, McGraw Hill Education, 2017.
5. Kathy Sierra and Bert Bates, Head First Java, O'Reilly Publications, 2nd Edition.
6. Herbert Schildt, Java – A Beginner's Guide, Oracle Press, 7th Edition.

Master of Science (Computer Science) Semester – II

(Session 2021-22)

COURSE CODE: MCSL – 2114

CLOUD COMPUTING

Course Outcomes:

After passing this course the student will be able to:

CO1: Articulate the main concepts, key technologies, strengths and limitations of Cloud computing.

CO2: Identify the architecture and infrastructure of various Cloud services and deployment models.

CO3: Identify various issues related with Cloud computing and approaches corresponding to the solution of these issues.

CO4: Design prevalent solution corresponding to Cloud computing application.

CO5: Identify and apply new ideas and innovations in the field of Cloud computing.

Master of Science (Computer Science) Semester – II

(Session 2021-22)

COURSE CODE: MCSL – 2114

CLOUD COMPUTING

Examination Time: 3 Hrs.

Max. Marks: 100

Theory: 80

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (16 marks each) are to set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT-I

Introduction: Definition, Vision, Reference Model, Benefits, Limitations, Terminology, Open Challenges.

Virtualization: Definition, Type of Virtualization, Benefits, Limitations, Virtualization and Cloud, Virtual Appliance.

UNIT-II

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

UNIT-III

Programming Models in Cloud: Thread Programming, Task Programming and Map-Reduce Programming.

Cloud Security: Infrastructure Security, Data Security, Identity and Access Management, Privacy Management, Security as a Service on Cloud.

UNIT-IV

Advance Topic in Cloud: Energy Efficiency in cloud, Market Oriented Cloud Computing, Big- Data Analytics, Federated Cloud Computing.

Reference / Textbooks:

1. Rajkumar Buyya, Christian Vecchiola and ThamaraiSelvi, Mastering Cloud Computing: Foundation and Application Programming, Tata McGraw Hill, ISBN-13: 978-1-25-902995-0, New Delhi, India, Feb 2013.
2. Tim Mather, Subra Kumaraswamy, ShahedLatif, Cloud Security and Privacy, O'Reilly, ISBN-13: 978-8-18-404815-5.
3. Barrie Sosinsky, Cloud Computing Bible, Wiley India Pvt. Ltd., ISBN-13: 978-8-12-652980-3, New Delhi, India, 2011.
4. 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.
5. 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.

Master of Science (Computer Science) Semester – II

(Session 2021-22)

COURSE CODE: MCSL-2115

DISTRIBUTED DATABASE SYSTEMS

Course Outcomes:

After passing this course the student will be able to:

CO1: Comprehend different kind of distributed databases and involved transparencies.

CO2: Design distributed database by demonstrating the meaning of data fragmentation, various methods of data fragmentation and data allocation strategies.

CO3: Translate global queries into fragment queries by following different equivalence transformation rules for queries.

CO4: Solve query optimization problem.

CO5: Comprehend management of distributed transaction, concurrency control mechanisms and reliability protocols.

CO6: Identify the importance of security in distributed database management system.

Master of Science (Computer Science) Semester – II

(Session 2021-22)

COURSE CODE: MCSL-2115

DISTRIBUTED DATABASE SYSTEMS

Examination Time: 3 Hrs.

Max. Marks: 100

Theory: 80

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (16 marks each) are to set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT-I

Introduction to distributed databases, comparison of distributed and centralized systems, DDBMS, global relations, fragment and physical image, types of schemas, methods of fragmentation of a relation, levels of transparency in a distributed system, integrity constraints.

UNIT-II

Representation of database operation in form of a query, operation in form of a query, operations on a query, unary and binary tree in a query, converting a global query into fragment query, join and union operations involving a query, aggregate functions, and parametric queries.

UNIT-III

Introduction to query optimization, estimation of profiles of algebraic operations, optimization graphs, reduction of relation using semi-join and join operation.

Properties and goals of transaction management, distributed transactions, recovery mechanism in case of transaction failures, log based recovery, check pointing, and communication and site failures in case of a transaction and methods to handle them, serializability and timestamp in distributed databases.

UNIT-IV

Introduction to distributed deadlocks, local and global wait for graphs, deadlock detection using centralized and hierarchical controllers, prevention of deadlocks, 2 and 3 phase locking and commitment protocols, reliability in commitment and locking protocols, reliability and concurrency control, reliability and removal of inconsistency.

Distributed database administration, authorization and protection in distributed databases, distributed database design, heterogeneous database system.

References / Textbooks:

1. Stefano Ceri and Guiseppe Pelagatti, Distributed Databases Principles and Systems, McGraw-Hill International Editions, 2004.
2. David Bell, Jame Grimson, Distributed Database Systems, Addison-Wesley, 1992.
3. M. Tamer Ozsü, Patrick Valduriez, Principles of Distributed Database Systems, Prentice Hall, 2002, 2nd Edition.
4. Ramez Elmasri, Shamkant B. Navathe, 'Fundamentals of Database Systems' Pearson Education, 2005.
5. Silberschatz, Korth, Sudershan, Database System Concept, 4th Ed. McGraw Hill, 2006.
6. Connolly & Begg "Database Systems – A practical approach to Design, Implementation and Management, 3rd Ed. Pearson Education, 2005.

Master of Science (Computer Science) Semester – II
(Session 2021-22)
COURSE CODE: MCSP-2116
LAB ON ADVANCED PROGRAMMING CONCEPTS

Examination Time: 3 Hrs.

Max. Marks: 100

Practical: 80

CA: 20

Implementations based on advanced programming concepts.

Master of Science (Computer Science) Semester – III
(Session 2021-22)
COURSE CODE: MCSL- 3111
DATA MINING AND DATA WAREHOUSING

Course Outcomes:

After passing this course the student will be able to:

CO1: Comprehend the basic concepts of data mining and data warehousing, need of data mining and difference with ML.

CO2: Study and analyze architecture of data warehouse.

CO3: Identify various data mining techniques.

CO4: Have knowledge of various applications, trends and challenges of this field.

Master of Science (Computer Science) Semester – III
(Session 2021-22)
COURSE CODE: MCSL- 3111
DATA MINING AND DATA WAREHOUSING

Examination Time: 3 Hrs.

Max. Marks: 100

Theory: 80

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (16 marks each) are to set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT I

Data Mining: Introduction, Need of Data mining, Data mining Process, difference between DM & ML.

Data Pre-processing: Pre-processing the data, Data cleaning, data integration, data transformation, data reduction.

UNIT II

Data Warehousing: Concepts of Data Warehousing, difference between operational database systems and data warehousing, Need of a separate data warehouse.

From data Warehouse to Data Mining- OLAP and OLAM, Three Tier Data Warehouse Architecture.

UNIT III

Integration of Data Mining with DB/DW systems: DM Implementation Process, Knowledge discovery in database.

Data Mining Techniques: Classification, Clustering, Regression, Association Rules.

Clustering: Applications, Requirements, Clustering Methods.

UNIT IV

Applications, Trends and Challenges: Introduction to DMQL, Applications of Data Mining, Challenges in implementation of data mining, trends in Data Mining. Basic knowledge about useful data mining tools.

References / Textbooks:

1. Jiawei Han, Micheline Kamber, Jian Pei, Data Mining: Concepts and Techniques, Morgan Kaufmann, 2012.
2. Alex Berson, Stephen J. Smith, Data Warehousing, Data Mining and OLAP, Tata McGraw 2008.
3. Silberschatz, Korth, Sudershan, Database System Concepts, McGraw Hill, 2002.
4. Thomas M. Connolly, Carolyn E. Begg, Database Systems: A Practical Approach to Design, Implementation and Management, Addison-Wesley, 2002.
5. Pang-Ning Tan, Michael Steinbach, Vipin Kumar, Introduction to Data Mining, Pearson Addison Wesley, 2006.
6. Prateek Bhatia, Data Mining and Data Warehousing: Principles and Practical Techniques, Cambridge University Press, 2019.

Note: The latest editions of the books should be followed.

Master of Science (Computer Science) Semester – III

(Session 2021-22)

COURSE CODE: MCSL-3112

SYSTEM SOFTWARE

Course Outcomes:

After passing this course the student will be able to:

CO1: Study and analyze various components of system software like translators, loaders, interpreters, compilers, assemblers etc.

CO2: Understand different system software like OS, DBMS, text editors etc.

CO3: Target various applications areas of system software.

Master of Science (Computer Science) Semester – III

(Session 2021-22)

COURSE CODE: MCSL-3112

SYSTEM SOFTWARE

Examination Time: 3 Hrs.

Max. Marks: 100

Theory: 80

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (16 marks each) are to set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT I

Introduction to System Software: Evolution of System Software, components of system software, Translators, loaders, interpreters, compiler, assemblers.

UNIT II

Assemblers: Overview of assembly process, design of one pass and two assemblers.

Macroprocessors: Macro definition and expansion, concatenation of macro parameters, generations of unique labels, conditional macro expansion, Recursive macro expansion.

UNIT III

Compilers: Phases of compilation process, logical analysis, parsing, storage management optimisation. Incremental compilers, cross compilers, P code compilers.

UNIT IV

Loaders and Linkage Editors: Basic loader functions. Relocation, program linking, linkage, editors, dynamic linking bootstrap loaders.

Other System Software: Operating system, DBMS, text editors, Interactive debugging systems.

References / Textbooks:

1. Leland L. Beck, System Software: An introduction to System Programming, Addison Wesley, 1997.
2. D.M. Dhamdhere, Introduction to System Software, Tata McGraw Hill, 1986.

3. D.M. Dhamdhere, System Software and Operating Systems, Tata McGraw Hill Education, 1992.
4. Madrich, Stuart, Operating Systems, McGraw Hill, 1974.
5. Stern Nancy, Assembler Language Programming for IBM and IBM compatible computers, John Wiley, 1991.

Note: The latest editions of the books should be followed.

Master of Science (Computer Science) Semester – III

(Session 2021-22)

COURSE CODE: MCSL-3113

ADVANCED WEB TECHNOLOGIES

Course Outcomes:

After passing this course the student will be able to:

CO1: Understand fundamental concepts and theories of web designing using ASP.NET.

CO2: Study and analyze practical uses of different controls of ASP.NET.

CO3: Establish and study dynamic relationship of the language with standard databases.

CO4: Work on other core issues of website like cookies, caching and dependencies.

Master of Science (Computer Science) Semester – III

(Session 2021-22)

COURSE CODE: MCSL-3113

ADVANCED WEB TECHNOLOGIES

Examination Time: 3 Hrs.

Max. Marks: 100

Theory: 80

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (16 marks each) are to set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT-I

Standard Controls: Display information, Accepting user input, Submitting form data, Displaying images, Using the panel control, Using the hyperlink control.

Validation Controls: Using the required field validator control, using the range validator control using the compare validator control, using the regular expression validator control, Using the custom validator control, Using the validation summary controls.

UNIT-II

Rich Controls: Accepting file uploads, Displaying a calendar, Displaying advertisement, Displaying different page views, Displaying a wizard.

Designing Website with Master Pages: Creating master pages, Modifying master page content, Loading master page dynamically.

SQL Data Source Control: Creating database connections, Executing database commands, Using ASP.NET parameters with the SQL data source controls, Programmatically executing SQL data source commands, Caching database data with the SQL data Source controls.

UNIT-III

List Controls: Dropdown list control, Radio button list controls, list box controls, bulleted list controls, custom list controls.

Grid View Controls: Grid view control fundamentals, Using field with the grid view control, Working with grid view control events extending the grid view control.

UNIT-IV

Building Data Access Components with ADO.NET: Connected the data access, Disconnected data access, Executing a synchronous database commands, Building data base objects with the .NET framework.

Maintaining Application State: Using browser cookies, Using session state, Using profiles.

Caching Application Pages and Data: page output caching, partial page caching, data source caching, data caching, SQL cache dependences.

References / Textbooks:

1. Stephen Walther, ASP.NET 3.5, Pearson Education, 2005.
2. Matthew MacDonald, ASP.NET: The Complete Reference, McGraw-Hill/Osborne, 2002.
3. Imar Spaanjaars, Beginning ASP.NET 3.5, John Wiley & Sons, 2008.
4. Scott Millett, Professional ASP.NET Design Patterns, Wiley, 2010.
5. Glenn Johnson, Programming Microsoft® ADO.NET 2.0 Applications: Advanced Topics, WP Publishers & Distributors Pvt Limited, 2005.

Note: The latest editions of the books should be followed.

Master of Science (Computer Science) Semester – III

(Session 2021-22)

COURSE CODE: MCSL-3114

DESIGN AND ANALYSIS OF ALGORITHMS

Course Outcomes:

After passing this course the student will be able to:

CO1: find an optimal solution to a practical problem.

CO2: understand various algorithm design techniques and their applications.

CO3: analyse and implement solutions to complex problems like placement of queens on chessboard, Knapsack, travelling salesman etc.

Master of Science (Computer Science) Semester – III
(Session 2021-22)
COURSE CODE: MCSL-3114
DESIGN AND ANALYSIS OF ALGORITHMS

Examination Time: 3 Hrs.

Max. Marks: 100

Theory: 80

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (16 marks each) are to set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section

UNIT-I

Introduction: Concept of Algorithm, Algorithm Specification, Performance Analysis (Time and Space Complexities), Asymptotic Notations.

Divide and Conquer: General Method, Binary Search, Finding the Maximum and Minimum, Quick Sort, Selection.

UNIT-II

Greedy Method: General Method, Knapsack Problem, Minimum Cost Spanning Trees (Prim's Algorithm, Kruskal's Algorithm) and Single-Source Shortest Path.

UNIT-III

Dynamic Programming: General Single Method, Multistage Graphs, All Pairs Shortest Paths, Single-Source Shortest Paths, Optimal Binary Search Tress, 0/1 Knapsack and Travelling Salesman Problem.

UNIT-IV

Backtracking: General Method, 4-Queens Problem, Graph Coloring and Hamiltonian Cycles.
Search and Traversal Technique: Techniques for Binary Trees, Techniques for Graphs.

References / Textbooks:

1. V. Aho, J.E. Hopcroft, J.D. Ullman, Design and Analysis of Algorithms, Addison Wesley, 1976.
2. Horowitz, S. Sahni, Fundamentals of Computer Algorithms, Galgotia Publishers, 1984.
3. K. Mehlhorn, Data Structures and Algorithms, Vols. 1 and 2, Springer Verlag, 1984.

4. Purdom, Jr. and C. A. Brown, The Analysis of Algorithms, Holt Rinechart and Winston, 1985.
5. D. E. Kunth, The Art of Computer Programming, Vols. I and 3, Addison Wesley, 1975.
6. Anany Levitin, Introduction to the Design & Analysis of Algorithms, Addison, Wesley, 2002.

Note: The latest editions of the books should be followed.

Master of Science (Computer Science) Semester – III
(Session 2021-22)
COURSE CODE: MCSL-3115

SOFTWARE TESTING

Course Outcome:

After passing this course the student will be able to:

CO1: study fundamental concepts in software testing

CO2: discuss various software testing issues and solutions in software unit test, integration and system testing.

CO3: expose the advanced software testing topics, such as object-oriented software testing methods.

CO4: discuss about the functional and system testing methods.

Master of Science (Computer Science) Semester – III
(Session 2021-22)
COURSE CODE: MCSL-3115
SOFTWARE TESTING

Examination Time: 3 Hrs.

Max. Marks: 100

Theory: 80

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (16 marks each) are to set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT - I

Introduction to Software Testing, The Tester's Role in a Software Development Organization, Origins of Defects, Cost of defects, Fundamentals of Test Process, General Principles of Testing, Test Metrics, Role of Testing in SDLC, Comparing Software and Hardware Testing, Verification and Validation.

UNIT - II

Introduction to Test cases, test case design, types of testing, Structural versus Functional Technique Categories, Static versus Dynamic Testing, Control flow & Data flow testing, Random Testing, Requirements based testing, Black Box Testing, White Box Testing.

UNIT - III

Modeling of Software, Object Oriented Modeling based on UML, Requirements and Specifications with Use Case Diagrams; Object Oriented Testing Issues, OO Testing Methodologies, Analysis and Design Testing, UML Based, Class Testing, Integration Testing.

UNIT - IV

GUI testing, Validation testing, Regression testing, Scenario testing, Advances in Software Testing Methods. Test Organization, Test Planning, Test Strategies, Test Prioritization, Debugging. Software test automation – skill needed for automation – scope of automation.

References / Textbooks:

1. Paul Jorgensen, Software Testing: A Craftsman's Approach, Auerbach Publications, 2013.
2. Rex Black, Erik van Veenendaal, Dorothy Graham, Foundations of Software Testing:

ISTQB Certification, Cengage Publications, 2015.

3. Glenford J. Myers, The Art of Software Testing, Wiley, 2004.
4. Paul Ammann, Jeff Offutt, Introduction to Software Testing, Cambridge University Press, 2016.
5. Srinivasan Desikan, Ramesh Gopalswamy, Software Testing: Principles and Practices, Pearson Publications, 2009.

Note: The latest editions of the books should be followed.

Master of Science (Computer Science) Semester – III

(Session 2021-22)

COURSE CODE: MCSP- 3116

LAB ON ADVANCED WEB TECHNOLOGIES

Examination Time: 3 Hrs.

Max. Marks: 100

Practical: 80

CA: 20

Programming Laboratory on Advanced Web Technologies.

Master of Science (Computer Science) Semester - IV
(Session 2021-22)
COURSE CODE: MCSL-4111
ADVANCED SOFTWARE ENGINEERING

Course Outcomes:

After passing this course the student will be able to:

CO1: Comprehend the process of software project planning and management.

CO2: Demonstrate software Re-use and Re-engineering.

CO3: Exemplify the process of Object Oriented Analysis and Design.

CO4: Comprehend classification and design of Object Oriented Metrics.

Master of Science (Computer Science) Semester IV
(Session 2021-22)
COURSE CODE: MCSL-4111
ADVANCED SOFTWARE ENGINEERING

Examination Time: 3 Hrs.

Max. Marks: 100

Theory: 80

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (16 marks each) are to set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT I

Software Project Management: Fundamentals of Software project planning , Conventional Software Management, Evolution of Software Economics, Improvement of Software Economics, Comparison of old and modern ways of Software Management.

UNIT II

Software Re-engineering: Introduction Re-engineering, Restructuring and Reverse Engineering, Re-engineering existing systems, Data Re-engineering and migration, Software Reuse and Re-engineering.

UNIT III

Object-Oriented (OO) Measurements: Introduction, Why metrics ?, Classification of OO metrics, Study of Design Metrics- method size, method internals, class size, class inheritance, Method inheritance, class intervals and class externals.

UNIT IV

Object-Oriented Analysis and Design: What is Object-Oriented Design?, Object, Abstraction, Collaboration among Objects, Polymorphism, Classes, specifying State, Specifying Behaviour, Class Relationships, Grouping, Hiding.

Software Agents: Definition, Applications, Types and Classes, Multi-Agent systems, characteristics & Properties Agents.

References / Textbooks:

1. Hans-Bernd Kittlaus, Samuel A. Fricker, Software Product Management, Springer (2017), 1st Edition
2. Imran Ghani, Emerging Advancements and Technologies in Software Engineering, Idea Group (2014), 1st Edition
3. Ian Sommerville, Software Engineering, Pearson Education (2017), 10th Edition.
4. K.K. Aggarwal, Software Engineering, New Age (2008), 3rd Edition
5. Booch, Object Oriented Analysis and Design, Pearson Education India (2009), 3rd Edition.
6. John W. Satzinger, Object Oriented Analysis and Design, Cengage Learning (2007), 1st Edition.
7. Roger S. Pressman, Software Engineering: A Practitioner's Approach, Mcgraw Hills 8th Edition.

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Master of Science (Computer Science) Semester IV
(Session 2021-22)
COURSE CODE: MCSL-4112
MICROPROCESSOR AND ITS APPLICATIONS

Course Outcomes:

After passing this course the student will be able to:

CO1: Comprehend architecture of 8086 and 8088 microprocessors.

CO2: Demonstrate the working of 8086/8088 microprocessor for minimum and maximum mode.

CO3: Apply instruction set of 8086 microprocessor to perform basic operations.

CO4: Articulate Memory and I/O interfaces of 8086/8088 microprocessor.

CO5: Comprehend interrupts and its service.

Master of Science (Computer Science) Semester – IV
(Session 2021-22)
COURSE CODE: MCSL-4112
MICROPROCESSOR AND ITS APPLICATIONS

Examination Time: 3 Hrs.

Max. Marks: 100

Theory: 80

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (16 marks each) are to set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT-I

Introduction: Introduction to Microprocessor, General Architecture of Microcomputer System. Microprocessor Units, Input unit, Output unit, Memory unit and auxiliary storage unit.

UNIT-II

Architecture of 8086/8088 Microprocessor: Description of various pins, configuring the 8086/8088 microprocessor for minimum and maximum mode systems, Internal architecture of the 8086/8088 microprocessor, system clock, Bus cycle, Instruction execution sequence.

UNIT-III

Memory Interface of 8086/8088 Microprocessor: Address space and data organization, generating memory addresses hardware organization of memory address space, memory bus status code, memory control signals, read/write bus cycles, program and data storage memory, dynamic RAM system.

UNIT-IV

Input/Output Interface of the 8086/8088 Microprocessor: I/O interface, I/O address space and data transfer, I/O instructions, I/O bus cycles, Output ports, 8255A Programmable Peripheral Interface (PPI), Serial communication interface (USART and UART) – the RS-232 C interface.

Interrupt Interface of 8086/8088 Microprocessor, Types of Interrupt, Interrupt Vector Table (IVT).

References / Textbooks:

1. Walter Triebel: The 8086 Microprocessor – Architecture, Software and Interfacing Techniques, PHI, Delhi.
2. Gangwar Tripathi, Microprocessor & its Applications, EXCEL Books (2010)
3. Douglas V. Hall: Microprocessors and Interfacing – Programming and Hardware, Tata McGraw Hill Publishing Company Ltd., New Delhi.
4. Ramesh Gaonkar, Microprocessor Architecture, Programming and Applications with 8085 6/e, Penram International Publishing (2013), 6th Edition
5. A Nagoorkani, 8086 Microprocessor & its Applications, McGraw Hill Education (2017), 2nd Edition
6. Singh Anokh and A.K. Chhabra, Fundamentals of Microprocessors and its Applications, S. Chand & Company (2010).
7. R. Theagarajan, Microprocessors and its applications, New Age Publishers (1997), 1st Edition

Master of Science (Computer Science) Semester – IV
(Session 2021-22)
COURSE CODE: MCSL-4113
FOUNDATION OF STATISTICAL COMPUTING

Course Outcomes:

After passing this course the student will be able to:

CO1: Comprehend basics of Statistical Computing and role of constructs like control statements, string functions, array, list, etc in R programming.

CO2: Create, operate and manage data frames.

CO3: Apply R programming from a statistical perspective.

CO4: Simulate various descriptive and analytical algorithms using R language.

Master of Science (Computer Science) Semester
(Session 2021-22)
COURSE CODE: MCSL-4113
FOUNDATION OF STATISTICAL COMPUTING

Examination Time: 3 Hrs.

Max. Marks: 100

Theory: 80

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (16 marks each) are to set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT - I

Statistical Computing: Introduction, Role of Programming and Statistical Software. Data Statistics: Sampling, Cumulative statistics, Statistics for Data frames, matrix objects and lists.

Introduction to R: Introduction to R, Help functions in R, Vectors, Common Vector Operations, Using all and any function, subletting of vector. Creating matrices, Matrix operations, Applying Functions to Matrix Rows and Columns, Adding and deleting rows and columns.

UNIT - II

Lists, Creating lists, general list operations, Accessing list components and values, applying functions to lists, recursive lists

Creating Data Frames: Matrix-like operations in frames , Merging Data Frames, Applying functions to Data frames, Factors and Tables , factors and levels , Common functions used with factors , string operations

UNIT - III

Input/ Ouput: scan() , readline() Function, Printing to the Screen Reading and writing CSV and text file. Control statements: Loops, Looping Over Nonvector, Sets, if-else , writing user defined function, scope of the variable, R script file.

UNIT - IV

Graphics in R: Graph Syntax ((title, xlabel, ylabel, pch, lty, col.), Simple graphics (Bar, Multiple Bar, Histogram, Pie, Box-Plot, Scatter plot, qqplot), Low-level and High-Level plot functions. Using Analytical Algorithms (KNN, K-means, Naive Bayes) for Predictive analysis and Modelling.

References / Textbooks:

1. Andrie de Vries and JorisMeys, R Programming for Dummies, Wiley (2016), 2nd Edition.
2. Sandip Rakshit, R Programming for Beginners, McGraw Hill Education (2017), 1st Edition.
3. Sandip Rakshit, Statistics with R Programming, McGraw Hill Education (2018), 1st Edition.
4. Garrett Grolemond, Hands on Programming with R, O'Reilly (2014), 1st Edition
5. Mark Gardener, Beginning R: The Statistical Programming Language, Wiley (2013)
6. Tilman M. Davies, The Book of R: A first Course in Programming and Statistics, No Strach Press (2016), 1st Edition

Master of Science (Computer Science) Semester – IV

(Session 2021-22)

COURSE CODE: MCSP-4114

LAB ON FOUNDATION OF STATISTICAL COMPUTING

Examination Time: 3 Hrs.

Max. Marks: 100

Practical: 80

CA: 20

Lab on Foundation of Statistical Computing.

Master of Science (Computer Science) Semester – IV
(Session 2021-22)

COURSE CODE: MCSD-4115

PROJECT WORK

Course Outcomes:

After passing course the student will be able to:

CO1: Apply the tools and techniques learnt to frame problems and their corresponding solutions.

CO2: Develop skills necessary to structure, manage and execute projects.

CO3: Demonstrate the skills to work as a member and as a leader of cohesive unit.

CO4: Develop presentation skills.

CO5: Perform documentation related to development of the project.

Master of Science (Computer Science) Semester – IV
(Session 2021-22)

COURSE CODE: MCSD-4115

PROJECT WORK

Examination Time: 6 Hrs.

Max. Marks: 200

Theory: 160

CA: 40

1. Candidates have to submit only one hard copy and CD of documentation which shall be kept with the course supervisor/guide in the college only. Further, supervisor/guide OR principal of college shall forward two copies of DVD (Digital Versatile Disk) containing all the documentation files of the students (file name to be saved as Rollno_of_the_student.pdf) to the concerned branch of the University. Covering letter (duly signed by the principal/Head of the college/institute) should contain the following information. Candidate name, Candidate Roll no, Project Title of the student and .pdf file name of his project documentation.
2. The assignment shall be evaluated by a board of three examiner (two (02) External examiners and one (01) internal examiner) as approved by the BOS.
3. The Project is to be submitted as per the common ordinances for P.G. courses under semester system.

(Annexure A-2)

FACULTY OF COMPUTER SCIENCE & IT

SYLLABUS

of

**Master of Science (Information and Network Security)
(Semester I - IV)**

(Under Continuous Evaluation System)

Session: 2021-22



The Heritage Institution
KANYA MAHA VIDYALAYA
JALANDHAR
(Autonomous)

PROGRAMME SPECIFIC OUTCOMES

Master of Science (Information and Network Security)

Students of this Post Graduation will be able to:

PSO1: Highlight the need of security architecture and its relevance to system, services, continuity and reliability.

PSO2: Identify the trade-offs for functionality usability and security and to differentiate between controls to protect system availability and reliability: controls to protect information.

PSO3: Measure the performance of security systems within an enterprise-level information system and to troubleshoot, maintain and update an enterprise-level information security system.

PSO4: Comprehend the role of forensics, cyber incidents, intrusions and investigations in revealing how an attack was carried out and understand how to support investigation.

PSO5: Apply skills gained for evaluation and protection of computer networks and security system.

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATIONS OF TWO YEAR DEGREE PROGRAMME

Master of Science (Information and Network Security)

Session 2021-22

Master of Science (Information and Network Security)Semester - I							
COURSE CODE	COURSE NAME	COURSE TYPE	Marks				Examination Time (in Hours)
			Total	Ext.		CA	
				L	P		
MINL-1111	Computer Networks	C	100	80	-	20	3
MINL-1112	Network Protocols	C	100	80	-	20	3
MINL-1113	Network Operating System	C	100	80	-	20	3
MINL-1114	Information Security and Threats	C	100	80	-	20	3
MINL-1115	Object Oriented Programming	C	100	80	-	20	3
MINP-1116	Lab on NOS and Object Oriented Programming	C	100	-	80	20	3
		Total	600				

Note:

C - Compulsory

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATIONS OF TWO YEAR DEGREE PROGRAMME

Master of Science (Information and Network Security)

Session 2021-22

Master of Science (Information and Network Security) Semester - II							
COURSE CODE	COURSE NAME	COURSE TYPE	Marks				Examination Time (in Hours)
			Total	Ext.		CA	
				L	P		
MINL-2111	Network Planning, Analysis and Performance	C	100	80	-	20	3
MINL-2112	Network Security Practices	C	100	80	-	20	3
MINL-2113	Computer Forensic Fundamentals	C	100	80	-	20	3
MINL-2114	Secure Code Development	C	100	80	-	20	3
MINL-2115	Mobile Application Development and Security	C	100	80	-	20	3
MINP-2116	Lab on Mobile Application Development and Security	C	100	-	80	20	3
			600				

Note:

C - Compulsory

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATIONS OF TWO YEAR DEGREE PROGRAMME

Master of Science (Information and Network Security)

Session 2021-22

Master of Science (Information and Network Security) Semester - III							
COURSE CODE	COURSE NAME	COURSE TYPE	Marks				Examination Time (in Hours)
			Total	Ext.		CA	
				L	P		
MINL-3111	Cyber Incident Handling and Reporting	C	100	80	-	20	3
MINL-3112	Cloud Computing and its Security	C	100	80	-	20	3
MINL-3113	Proactive Security Tools and Technology	C	100	80	-	20	3
MINL-3114	Penetration Testing and Auditing	C	100	80	-	20	3
MINL-3115	Cryptography and Network Security	C	100	80	-	20	3
MINP-3116	Lab on Penetration Testing and Virtualization	C	100	-	80	20	3
			600				

Note:

C - Compulsory

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATIONS OF TWO YEAR DEGREE PROGRAMME

Master of Science (Information and Network Security)

Session 2021-22

Master of Science (Information and Network Security) Semester - IV							
COURSE CODE	COURSE NAME	COURSE TYPE	Marks				Examination Time (in Hours)
			Total	Ext.		CA	
				L	P		
MINL-4111	Intrusion Detection System	C	100	80	-	20	3
MINL-4112	Reverse Engineering and Malware	C	100	80	-	20	3
MINL-4113	Ethical Hacking	C	100	80	-	20	3
MINL-4114	Blockchain for Enterprise Applications	C	100	80	-	20	3
MIND-4115	Major Project / Dissertation	C	200	-	160	40	6
	Total		600				

Note:

C - Compulsory

Master of Science (Information and Network Security) Semester – I

(Session 2021-22)

COURSE CODE: MINL-1111

COMPUTER NETWORKS

Course Outcomes:

CO1: The student will understand the fundamental concepts of computer networking and will be familiarized with the basic taxonomy and terminology of the computer networking area.

CO2: The student will be able to understand the physical and logical as well as the electrical characteristics of digital signals and the basic methods of data transmission.

CO3: To understand the organization of computer networks, factors influencing computer network development and the reasons for having variety of different types of networks.

CO4: To study the basic taxonomy and terminology of the computer networking and enumerate the layers of OSI model and TCP/IP model in order to have a good understanding of various Reference Models and protocols.

Master of Science (Information and Network Security) Semester – I
(Session 2021-22)

COURSE CODE: MINL-1111

COMPUTER NETWORKS

Examination Time: 3 Hrs.

Max. Marks: 100

Theory: 80

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (16 marks each) are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT - I

Introduction: Data Communication, Components, Protocols, Standard Organizations, Applications

Networks Basics & Various Types: Topology, Transmission Mode, Categories of Networks

OSI and TCP/IP Models: OSI Model Layers, Functions of the Layer, TCP/IP Layers and its functions, Comparison of TCP/IP and OSI Models

UNIT – II

Signals, Modulations and Multiplexing: Analog and Digital Signal, Digital to Digital Conversion, Analog to Digital Conversion, Digital to Analog Conversion

Transmission Media: Asynchronous and Synchronous Transmission, Modems, Guided (Twisted pair cable, Coaxial Cable and Optical Fibre) and Unguided Media (Terrestrial Microwave, Satellite and Cellular Telephony, Transmission Disturbance and Performance)

UNIT – III

Detection and Correction of Errors: Error types, Redundancy, Error Detection Methods: VRC, LRC, CRC and Checksum, Error Correction: Single Bit Error Correction, Hamming Code

Data Link Control and Protocols: Line Discipline, Flow Control, Error Control, Asynchronous Protocol, Synchronous Protocol, Character Oriented and Bit Oriented Protocols

UNIT – IV

Quality of Service in Routing & Signaling: Issues, importance, parameters like delay, jitter, end to end service, CoS.

Routing Algorithms: Distance Vector Routing, Link State Routing

Upper OSI Layers: Session Layer, Presentation Layer and Application Layer

References / Textbooks:

1. James F. Kurose and Keith W. Ross, Computer Networking: A Top–Down Approach 2002.
2. Computer Networks Protocols, Standards and Interfaces: Uyless Black, PHI, 2006.
3. Data Communication and Networking, White, Cengage Learning, 2008.
4. Behrouz Forouzan, Data Communications and networking, McGraw Hill, 2007.

Note: The latest editions of the books should be followed.

Master of Science (Information and Network Security) Semester – I
(Session 2021-22)

COURSE CODE: MINL-1112

NETWORK PROTOCOLS

Course Outcomes:

CO1: To get in depth knowledge about various networking protocols, their working, management and operations.

CO2: To understand the layered approach that makes design, implementation and operation of extensive networks possible.

CO3: Classify the routing protocols and analyze how to assign the IP addresses for the given network.

CO4: To understand the TCP/IP suite of protocols and the networked applications supported by it.

Master of Science (Information and Network Security) Semester – I
(Session 2021-22)

COURSE CODE: MINL - 1112

NETWORK PROTOCOLS

Examination Time: 3 Hrs.

Max. Marks: 100

Theory: 80

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (16 marks each) are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT - I

Review of networking Technologies & Internetworking Concepts and Architectural Model: Application level and Network level Interconnection, Properties of the Internet, Internet Architecture, Interconnection through IP Routers

Internet Addresses, Mapping internet addresses to Physical addresses (ARP) & Determining an internet addresses at Startup (RARP): Universal identifiers, three Primary classes of IP addresses, network and Broadcast Addresses, Limited Broadcast, Dotted decimal Notation, weakness in Internet addressing, Loopback addresses.

UNIT - II

Internet Addresses, Mapping internet addresses to Physical addresses (ARP) & Determining an internet addresses at Startup (RARP): Address resolution problem, two types of Physical addresses, resolution through Direct Mapping, Resolution through Dynamic Binding. Address Resolution Cache, ARP to other Protocols. Reverse address resolution protocol, timing RARP transaction, Primary and backup RARP servers.

Internet Protocol Connectionless Data Gram Delivery & Internet Protocol: Routing IP Datagrams: The concepts of unreliable delivery, connectionless delivery system, purpose of the internet protocol. The internet datagram.

UNIT - III

Internet Protocol Connectionless Data Gram Delivery & Internet Protocol: Routing in an internet, direct and indirect delivery, table driven IP routing, next Hop Routing, default routes, host specific routes, The IP routing Algorithm, handling incoming datagrams, Establishing routing tables

Internet Protocol: Error and Control Message (ICMP) & Subnet and Supernet Address Extension:

The internet, control message protocols, Error reporting versus error detection. ICMP message format. Detecting and reporting various network problems through ICMP. Transparent Router, Proxy ARP, subset addressing, implementation of subnets with masks representation, Routing in the presence of subsets, a unified algorithm.

UNIT - IV

User Datagram Protocol (UDP): Format of UDP message UDP pseudo header UDP encapsulation and Protocols layering and the UDP checksum computation. UDP multiplexing, De-multiplexing and

Ports.

Reliable Stream Transport service (TCP): The Transmission control Protocol, ports, Connections and Endpoint, passive and active opens the TCP segment format. TCP implementation issues.

References / Textbooks:

1. Douglas E. Comer, Internetworking with TCP/IP, Pearson Prentice Hall, 2006.
2. Behrouz A. Forouzan, TCP/IP Protocol Suite, McGraw Hill Education, 2010.
3. Douglas E. Comer, David L. Stevens, Internetworking with TCP/IP, Vol. III: ClientServer Programming and Applications, Linux/Posix Sockets Version, Pearson, 2000.
4. W. Richard Stevens, Unix Network Programming, PHI, 1998.
5. William Stallings, SNMP, SNMPv2, SNMPv3, and RMON 1 and 2, Addison-Wesley, 1999.
6. Craig Hunt, TCP/IP Network Administration, O'Reilly & Associates, 2002.

Note: The latest editions of the books should be followed.

Master of Science (Information and Network Security) Semester – I
(Session 2021-22)

COURSE CODE: MINL - 1113

NETWORK OPERATING SYSTEM

Course Outcomes:

A student will be able to do the following:

CO1: Understand the installation, configuration and administration of Network Operating Systems.

CO2: The student will gain and will improve the capabilities in:

- Installing, configuring and administering network operating system
- Remote administration using network operating systems
- Connecting client computers to the network
- Linux working

CO3: This course aims to provide an understanding of the general security concepts of windows and Linux systems, network security tools and implementation of organizational security.

CO4: To learn the fundamentals and gain knowledge of Operating Systems.

**Master of Science (Information and Network Security) Semester – I
(Session 2021-22)**

COURSE CODE: MINL - 1113

NETWORK OPERATING SYSTEM

Examination Time: 3 Hrs.

Max. Marks: 100

Theory: 80

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (16 marks each) are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT - I

Introduction: Introduction to LINUX, Installing LINUX, Partitions, LILO, Installing software packages . Updating with Gnome, updating with KDE, Command line installing.

File Structure: LINUX files, File structure, File & Directory permission, Operations on a file.

UNIT - II

Window 2003 File System, Active Directory, DHCP, IIS, DNS

Administering Linux: Creating a user A/C, modifying a user A/C, Deleting a user A/C, Checking Disk Quotas, System Initialization, System start-up & shutdown, Installing & managing H/W devices.

UNIT - III

Disk Management: Managing Basic & Dynamic Disks, Disk quotas, Disk Fragmentation, Remote Storage, RAID all levels

Administrating window 2003: User group & Computer Accounts, Creating & Managing Users and Groups

Backup & Disaster Recover: Concepts, Creating Backing Plan, Choosing & Managing

Backup Media, Setting backup Options, Scheduling Backup.

UNIT - IV

Backup & Disaster Recover:
Restoring Data using Backup

Jobs, Disaster Recovery Plan, Assessing Threats,

Case & Comparative Studies:

Windows 2003 Server & Linux Server

Troubleshooting:

Troubleshooting LINUX in GRUB mode, Windows 2003 Server.

References / Textbooks:

1. Christopher Negus, Red Hat Linux(10) Bible, Wiley, 2003.
2. Tim Parker, Linux Unleashed, Sams, 2006.
3. Charles Fisher, Red Hat Linux Administration Tools, 2007.
4. Kathy Ivens, Windows Server 2003: The Complete Reference, McGraw-Hill, 2003.
5. William R. Stanek, Microsoft Windows Server 2003 Inside Out, Microsoft Press, 2004.

Note: The latest editions of the books should be followed.

Master of Science (Information and Network Security) Semester – I

(Session 2021-22)

COURSE CODE: MINL - 1114

INFORMATION SECURITY AND THREATS

Course Outcomes:

CO1: To understand the network attacks (denial of service, flooding, sniffing and traffic redirection, inside attacks, etc.) and basic networking defense tools.

CO2: The student will be able to differentiate between organizational security policies and security mechanism and will be able to analyze the security needs of a small enterprise, design a strategic plan to address those security requirements and select the appropriate tools to implement the organizational policies.

CO3: To be able to explain various Information security threat and controls for it.

CO4: The student will be able to explain the mechanism to protect confidentiality and completeness of data.

Master of Science (Information and Network Security) Semester – I

(Session 2021-22)

COURSE CODE: MINL - 1114

INFORMATION SECURITY AND THREATS

Examination Time: 3 Hrs.

Max. Marks: 100

Theory: 80

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (16 marks each) are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT - I

Essential terminology, Hardware, Software, Malware, Defining security, Need for security
Cybercrime vs Computer based crime, Information Security statistics, Three pillars of Security,

UNIT - II

Security myths, Identity of a Web Site, http vs https, Operating System fingerprinting, Hardening operating system, updates, patches, CAN and CVEs, Host based firewall vs Network based firewall, deploying firewall, sniffing network traffic.

UNIT - III

Recognizing Security Threats and attacks, Phishing and its countermeasures, Virus, Trojan Horse,
Worms, Spyware, Adware, Keylogger, Social engineering, Denial of Service, Spamming, Port Scanning, Password cracking, Security measures

UNIT - IV

Creating isolated network presence using virtualization, hosting different operating systems virtually and networking amongst these, Identify website's identity, Finding and understanding CVEs, deploying firewall, Understanding phishing, using NMAP, netcat, using tcp dump and wireshark, generating digital certificates, understanding CAs.

References / Textbooks:

1. Atul Kahate, Cryptography and Network Security, McGraw Hill, 2010.
2. Mark S. Merkow, Jim Breithaupt, Information Security: Principles and Practices, Pearson Prentice Hall, 2006.
3. Michael E Whitman, Herbert J Mattord, Principles of Information Security, Cengage Learning, 2018.
4. Christopher T. Carlson, How to Manage Cybersecurity Risk, Universal-Publishers, 2019.

Note: The latest editions of the books should be followed.

Master of Science (Information and Network Security) Semester – I

(Session 2021-22)

COURSE CODE: MINL-1115

OBJECT ORIENTED PROGRAMMING

Course Outcomes:

CO1: To understand the fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class libraries, variables, conditional and iterative execution, methods, etc.

CO2: To be aware of the important topics and principles of software development and have the ability to write a computer program to solve specified problems in order to test, document and prepare a professional looking package for each business project.

CO3: To be able to use the Java SDK environment to create, debug and run simple Java programs and to model of object oriented programming: abstract data types, encapsulation, inheritance and polymorphism

CO4: To understand how to take the statement of a business problem and from this determine suitable logic for solving the problem; then be able to proceed to code that logic as a program written in Java.

Master of Science (Information and Network Security) Semester – I

(Session 2021-22)

COURSE CODE: MINL-1115

OBJECT ORIENTED PROGRAMMING

Examination Time: 3 Hrs.

Max. Marks: 100

Theory: 80

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (16 marks each) are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT - I

Java Fundamentals: Features, Objects Oriented Basis, Java Virtual Machine, Character Set, Operators, Data Types, Control Structures, Classes, Inheritance, Polymorphism, Packages & Interfaces, Abstract Classes, Stream IO Classes, Exception Handling.

Java I/O: I/O Basics, Streams, reading Console input and writing console output, Print Writer Class, Reading & Writing Files, Byte Streams, Character Streams & Serialization.

UNIT - II

Multithreading: Java Thread model, Thread Priorities, Synchronization, Interthread communication, Suspending, resuming & stopping thread.

Event Handling: The Delegation Event Model, Event Classes, Event Listener Interfaces

UNIT - III

AWT: Window Fundamentals, Working with Frame Windows, Graphics, Color and Fonts.

Swings: Basics of Swing, JButton class, JRadio Button, JText Area class, JCombo Box class JTable class. Layout Managers BorderLayout, Grid Layout, Flow Layout, Card Layout.

UNIT - IV

JDBC: JDBC Drivers, Steps to connect to the database, Connectivity with Oracle, Driver Manager, Connection interface, Statement interface, ResultSet interface, Prepared Statement, ResultSet MetaData, Database MetaData.

References / Textbooks:

1. Patrick Naughton & Herbert Schildt, JAVA 2: The Complete Reference, McGraw-Hill Education, 1999.
2. Mary Campione, Kathy Walrath, Alison Huml, The Java Tutorial Continued: The Rest of the JDK, Addison Wesley, 1998.
3. Bruce Eckel, Thinking in Java, Prentice Hall, 2006.
4. D.T. Editorial Services, Java 8 Programming Black Book, Dreamtech Press, 2015.
5. Cay S. Horstmann, Core Java Vol I & II, Prentice Hall, 2013.

Note: The latest editions of the books should be followed.

Master of Science (Information and Network Security) Semester – I

(Session 2021-22)

COURSE CODE: MINP-1116

LAB ON NOS AND OBJECT ORIENTED PROGRAMMING

Examination Time: 3 Hrs.

Max. Marks: 100

Practical: 80

CA: 20

Lab on NOS: Installation & Configuration of NOS (Windows 2003, Linux) and their Administration.

User account creation, group creation, DHCP settings, Backup & Recovery plan.

Lab on Object Oriented Programming.

Master of Science (Information and Network Security) Semester – II

(Session 2021-22)

**COURSE CODE: MINL-2111
NETWORK PLANNING, ANALYSIS AND PERFORMANCE**

Course Outcomes:

After passing this course the student will be able to:

CO1: Comprehend design of computer and communication network.

CO2: Evaluate network planning, including minimum cost and maximum flow methodologies.

CO3: Analyze network performance through design tools, traffic matrix, etc.

CO4: Comprehend and tune various network design.

CO5: Design hypothetically security measures in Network.

Master of Science (Information and Network Security) Semester – II

(Session 2021-22)

COURSE CODE: MINL-2111

NETWORK PLANNING, ANALYSIS AND PERFORMANCE

Examination Time: 3 Hrs.

Max. Marks: 100

Theory: 80

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (16 marks each) are to set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT - I

Requirements, Planning & Choosing Technology: Business requirements, technical requirement user requirements, traffic sizing characteristics time & delay consideration

Traffic Engineering and Capacity Planning: Throughout calculation traffic characteristics & source models.

UNIT - II

Traffic Engineering and Capacity Planning: Traditional traffic engineering, queued data & packet switched traffic modeling, designing for peaks, delay or latency

Network Performance Modeling and Analysis: creating traffic matrix, design tools, components of design tools, types of design projects

UNIT - III

Technology Comparisons: Generic packet switching networks characteristics, private vs. public networking. Business aspects of packet, frame and cell switching services, High speed LAN protocols comparison, Application performance needs, Throughout, burstiness, response time and delay tolerance, selecting service provider, vendor, service levels, etc.

UNIT - IV

Access Network Design: N/W design layers, Access N/W design, access n/w capacity, Backbone n/w design, Backbone segments, backbone capacity, topologies, Tuning the network, securing the network. Design for network security

References / Textbooks:

1. Piet Van Mieghem, Performance Analysis of Complex Networks and Systems, Cambridge University Press (2014), 2nd Edition.
2. James D McCabe, Network Analysis, Architecture and Design, Morgan Kaufman Series in Networking (2007), 2nd Edition.
3. Youeu Zheng, Shakil Akhtar, Network for Computer Scientists and Engineers, Oxford University Press (2007)
4. Foruzan, Data Communications & Networking, Tata–McGraw Hill (2006).
5. Darren L. Spohn, Co–Authors: Tina L. Brawn and Scott G Rau.

Master of Science (Information and Network Security) Semester – II

(Session 2021-22)

**COURSE CODE: MINL-2112
NETWORK SECURITY PRACTICES**

Course Outcomes:

After passing this course the student will be able to:

CO1: Demonstrate various security attacks like Interruption, Interception, Modification, integrity, non-repudiation, etc.

CO2: Analyze the performance of various Classical and Modern Cryptography Techniques.

CO3: Comprehend security requirements and issues at application layer.

CO4: Demonstrate the key exchange and generation through public key infrastructure.

Master of Science (Information and Network Security) Semester – II

(Session 2021-22)

**COURSE CODE: MINL-2112
NETWORK SECURITY PRACTICES**

Examination Time: 3 Hrs.

Max. Marks: 100

Theory: 80

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (16 marks each) are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT – I

Introduction: Overview, Security attacks (Interruption, Interception, Modification and Fabrication) and services (confidentiality, authentication, integrity, non-repudiation, access control and availability), types of attacks, model for network security.

Classical and Modern Cryptography Techniques: Conventional encryption model, classical encryption techniques.

UNIT - II

Classical and Modern Cryptography Techniques: Simplified DES, Principles of Block ciphers, DES and its strength, Triple DES, Blowfish, CAST – 128, linear and differential cryptanalysis, steganography.

Confidentiality: Traffic confidentiality, key distribution, random number generation

UNIT – III

Public Key Encryption Methods: Principles, RSA Algorithm, Key management, Diffie–Hellman key exchange, Elliptic curve cryptography

Authentication: Requirements, functions, Authentication codes, Hash functions

UNIT – IV

Digital Signatures: Basics, Digital signature standard, Authentication Protocols

Other Security s:

IP Security: overview and architecture, Authentication Header (AH) and Encryption Security Payload (ESP); Electronic Mail security: Pretty Good Privacy (PGP); Web security: overview.

References / Textbooks:

1. Forouzan, Cryptography and Network Security, McGraw Hill Education (2015).
2. William Stallings and Lawrie Brown, Computer Security: Principles and Practice, Pearson Education (2019), 4th Edition
3. Richard Bejtlich, The Practice of Network Security Monitoring, No Starch Press (2013), 1st Edition
4. Atul Kahate, Network Security Practices, McGraw Hill Education (2019), 4th Edition

Master of Science (Information and Network Security) Semester – II

(Session 2021-22)

COURSE CODE: MINL-2113

COMPUTER FORENSIC FUNDAMENTALS

Course Outcomes:

After passing this course the student will be able to:

CO1: Comprehend the role of digital forensics in the field of information assurance and cyber security

CO2: Apply various principles of effective digital forensics investigation techniques.

CO3: Identify housing, hardware and software requirements for Computer Forensics.

CO4: Comprehend processing of evidence and report preparation

Master of Science (Information and Network Security) Semester – II

(Session 2021-22)

COURSE CODE: MINL-2113

COMPUTER FORENSIC FUNDAMENTALS

Examination Time: 3 Hrs.

Max. Marks: 100

Theory: 80

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (16 marks each) are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT – I

Computer Forensics Fundamentals: Introduction to Computer Forensics, Cyberspace and Criminal Behavior, Traditional Problems Associated with Computer Crime.

Web-Based Criminal Activity, Malware: Viruses and Worms, DoS and DDoS Attacks, Botnets and Zombie Armies, Spam, Ransomware. Theft of Information, Data Manipulation, and Web Encroachment.

UNIT- II

Use of Computer Forensics in Law Enforcement, Computer Forensics Assistance to Human Resources, Employment Proceedings.

Computer Forensics: Traditional Problems in Computer Investigations, Disk Structure and Digital Evidence, Developing Computer Forensic Science Capabilities.

UNIT- III

Requirements: Housing, Hardware and software requirements.

Sampling of Forensic Software. Searching and Seizing Computer-Related Evidence, Pre-search Activities, On-scene Activities.

UNIT- IV

Processing of Evidence and Report Preparation: Aspects of Data Analysis, Smart Phones and GPS Forensics, Smart Phones and GPS Forensics.

Report Preparation and Final Documentation.

References / Textbooks:

1. Britz, Computer Forensics and Cyber Crime: An Introduction, Pearson Education India (2011), 2nd Edition
2. Jason Luttgens and Matthew Pepe, Incident Response and Computer Forensics, McGrawHill Education (2014), 3rd Edition
3. Akash Kamal Mishra, Computer Crime Investigation and Computer Forensics, Notion Press (2020), 1st Edition
4. Christopher Steuart, Bill Nelson, Guide to Computer Forensics and Investigations, Cengage (2013), 4th Edition
5. John Vacca, Computer Forensics: Computer Crime Scene Investigation, Laxmi Publications (2015), 1st Edition

Master of Science (Information and Network Security) Semester – II

(Session 2021-22)

COURSE CODE: MINL-2114

SECURE CODE DEVELOPMENT

Course Outcomes:

After passing this course the student will be able to:

CO1: Identify and evaluate various process model used for development of software.

CO2: Identify various attacks like buffer overrun, DOS and various principals concerning security. CO3: Comprehend various securities related techniques and methodologies.

CO4: Apply secure coding practices to maintain the Confidentiality, Integrity and Availability of a data.

Master of Science (Information and Network Security) Semester – II

(Session 2021-22)

COURSE CODE: MINL-2114 SECURE CODE DEVELOPMENT

Examination Time: 3 Hrs.

Max. Marks: 100

Theory: 80

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (16 marks each) are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT - I

Principles and Motivations: Software development process models waterfall, rapid prototyping, incremental development, spiral models, Agile Software Development.

Software Development Methods: Formal, semi-formal and informal methods; Requirements

elicitation, requirements specification; Data, function, and event-based modeling;

UNIT – II

The need for Secure Systems, Proactive Security development process: security issues while writing SRS, Design phase security, Development Phase, Test Phase, Maintenance Phase, SD3

(Secure by design, default and deployment), Security principles, Threat modelling.

UNIT III

Security Techniques, authentication, authorization, Buffer Overrun, Access control, least privilege, Cryptographic Foibles, Protecting Secret Data

Input issues: database, web-specific, internationalization.

UNIT – IV

Socket Security, Securing RPC, Protecting Against Denial of Service Attacks.

Security testing, security code review, secure software installation, writing security documentation.

References / Textbooks:

1. Michael Howard and David LeBlanc, Writing Secure Code, Microsoft Press, (2006).
2. Nithin Haridas, Software Engineering – Security as A Process in the SDLC, Startch Publisher (2007).
3. Pressman, Roger, Software Engineering – A Practitioners Approach, McGraw Hill (2008), 6th Ed.
4. Sommerville, Ian, Software Engineering, Addison–Wesley Publishing Company, (2006), 8th Ed.
5. J.D. Glaser, Secure Code Development for Mobile Apps, Auerbach Publications (2017), 1st Edition

Master of Science (Information and Network Security) Semester – II

(Session 2021-22)

COURSE CODE: MINL-2115

MOBILE APPLICATION DEVELOPMENT AND SECURITY

Course Outcomes:

After passing this course the student will be able to:

CO1: Setup Integrated Development Environment for developing and configuring mobile applications.

CO2: Comprehend and utilize various UI widgets and components for designing User Interface of application.

CO3: Identify various issues involved in developing mobile application.

CO4: Manage view and navigation in mobile application through intents, activities, services, etc.

Master of Science (Information and Network Security) Semester – II

(Session 2021-22)

COURSE CODE: MINL-2115

MOBILE APPLICATION DEVELOPMENT AND SECURITY

Examination Time: 3 Hrs.

Max. Marks: 100

Theory: 80

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (16 marks each) are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT – I

Introduction to Android: Android Introduction, History and Version, Android Architecture, Core Building Blocks, Android Emulator, Install Android, Setup Eclipse, Hello Android example, Android Project Folder Structure, Hide Title Bar, Screen Orientation.

UNIT – II

Android Widgets: UI Widgets, Working with Button, Toast, Custom Toast, Toggle Button, Check Box, Custom Check Box, Radio Button, Dynamic Radio Button, Custom Radio Button, Alert Dialog, Spinner, Auto Complete Text View, List View, Custom List View, Rating Bar, WebView, Seek Bar, Date Picker, Time Picker, Analog and Digital, Progress Bar, Vertical Scroll View, Horizontal Scroll View.

Image Switcher, Image Slider, View Stub, Tab Layout, Tab Layout with Frame Layout, search View, Search View on Toolbar, Edit Text with Text Watcher.

UNIT – III

Activity and Intents: Activity Life Cycle, Implicit Intent, Explicit Intent, Start Activity For Result, Share App Data

Android Fragments, Android Menu: Option Menu, Context Menu, Popup Menu

UNIT – IV

Managing and Accessing Databases: SQLite.

Mobile Issues and Development Strategies: Issues facing Mobile devices, Securing mobile application development

Android Security: Android Securable IPC Mechanism, Android Security Model, Intents, Activities, Services, Android Security tools.

References / Textbooks:

1. Allen, Grant, Nikhil Gopal, and Michael Thomas. Beginning Android 4. Apress, 2012.
2. Horton, John. Android Programming for Beginners. Packt Publishing Ltd, 2015.
3. Hardy, Brian, and Bill Phillips. Android Programming: The Big Nerd Ranch Guide. AddisonWesley Professional, 2013.
4. Himanshu Dwivedi, Chris Clark, David Thiel, Mobile Application Security, Tata McGraw Hill, 1st Edition, 2010.
5. Neil Bergman, Mike Stanfield, Jason, Rouse , Joel Scambray , Sarath Geetha kumar , Swapnil Deshmukh, Scott Matsumoto , John Steven , Mike Price, Hacking Exposed Mobile Security Secrets & Solutions, McGraw-Hill Osborne Media,1st Edition ,2013.
6. <https://developer.android.com>

Master of Science (Information and Network Security) Semester – II

(Session 2021-22)

COURSE CODE: MINP-2116

LAB ON MOBILE APPLICATION DEVELOPMENT AND SECURITY

Examination Time: 3 Hrs.

Max. Marks: 100

Practical: 80

CA: 20

Lab on Mobile Application Development and Security.

Master of Science (Information and Network Security) Semester – III

(Session 2021-22)

COURSE CODE: MINL - 3111

CYBER INCIDENT HANDLING AND REPORTING

Course Outcomes:

CO1: Obtain the basic knowledge on dealing with system security related incidents.

CO2: Gain experience using tools and common processes in performing the analysis of compromised systems.

CO3: Increase knowledge on potential defenses and counter measures against common threats / vulnerabilities.

Master of Science (Information and Network Security) Semester – III

(Session 2021-22)

COURSE CODE: MINL - 3111

CYBER INCIDENT HANDLING AND REPORTING

Examination Time: 3 Hrs.

Max. Marks: 100

Theory: 80

CA: 20

Eight questions of equal marks (16 marks each) are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT - I

Introduction: Concept of Computer security Incident, Types of Incident-denial of service-malicious code, unauthorized access, Inappropriate Usage. Need for incident Response, Policies, Plans and Procedure related to incident Response, Incident reporting organization.

UNIT - II

Incident Detection and Analysis: Profiling, Behaviors, Centralized logging , Event Correlation, Diagnosis matrix , Incident Analysis – Incident Documentation ,incident Prioritization, Incident Response SLA Matrix , Incident Notification.

UNIT - III

Handling denial of Service Incident: DoS attacks, Concept of DDoS, Types of

DDoS- Reflector Attacks, Amplifier Attacks and Floods, Prevention of DDoS-Incident Handling Preparation, Containment Strategy, Handling Unauthorized Access Incidents, Malicious Code Incidents.

UNIT - IV

Incident Handling Tools: Disk Digger, NTFS Walker, LOG Auditing

References / Textbooks:

1. Barbara Guttman, Edward Roback, An Introduction to Computer Security: The NIST Handbook, NIST Special Publication 800-12, 1995.
2. Julie Lucas, Brian Moeller, The Effective Incident Response Team, Addison-Wesley Professional, 2004.
3. Michael E. Whitman, Herbert J. Mattord, Principles of Incident Response and Disaster Recovery, Thomson Course Technology, 2007.
4. E. Eugene Schultz, Russell Shumway, Incident Response: A Strategic Guide to Handling System and Network Security Breaches, New Rider Publishing, 2002.
5. Chris Prosise, Kevin Mandia, Incident Response & Computer Forensics, Tata McGraw-Hill Education, 2003.

Note: The latest editions of the books should be followed.

Master of Science (Information and Network Security) Semester – III

(Session 2021-22)

COURSE CODE: MINL - 3112

CLOUD COMPUTING AND ITS SECURITY

Course Outcomes:

CO1: Analyze the Cloud computing setup and applications using different architectures.

CO2: Design different workflows according to requirements

CO3: Analyze the Virtualization concept

CO4: Access cloud Storage systems and Cloud security, the risks involved, its impact and develop cloud application

Master of Science (Information and Network Security) Semester – III

(Session 2021-22)

COURSE CODE: MINL - 3112

CLOUD COMPUTING AND ITS SECURITY

Examination Time: 3 Hrs.

Max. Marks: 100

Theory: 80

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (16 marks each) are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT - I

Introduction: Cloud Computing, Advantage & Disadvantage, History of Cloud, Cloud Computing Architecture, Cloud Computing Technologies, Cloud Computing vs Grid Computing, working of Cloud, Cloud Computing Applications, Security Risks of Cloud Computing, Essential Characteristics of Cloud Computing, Cloud deployment model.

Cloud Computing: Cloud Service Models, cloud Computing threats,

Cloud Reference Model, The Cloud Cube Model, Security for Cloud Computing.

UNIT - II

Virtualization: What is Virtualization, Data Virtualization, Hardware Virtualization, Software virtualization, Server Virtualization, Storage Virtualization, OS Virtualization, Linux Virtualization, Windows virtualization

Cloud security: Cloud Security challenge, Principal Characteristics of Cloud Computing security, Data center security Recommendations, Encryption and key management in the cloud, identity and access management, trust models for cloud, Cloud forensics, traditional security, business continuity and disaster recovery.

UNIT - III

Cloud Service providers: Cloud Service Provider Companies, Amazon EC2, AWS vs Azure vs GCP. Different Clouds - Mobile Cloud Computing, Fog Computing, Green cloud, Sensor Cloud Computing, IoT cloud.

UNIT - IV

Data security tools and techniques for the cloud: Understanding the cloud architecture, Governance and enterprise risk management, design of customized cloud security measures, application security, targets of cybercrime.

Trustworthy cloud infrastructures, Secure computations, Cloud related regulatory and compliance issues,

References / Textbooks:

1. Jim Smith, Ravi Nair, and Virtual Machines: Versatile Platforms for Systems and Processes, Morgan Kaufmann, 2005.
2. John Rittinghouse and James F. Ransome, Cloud Computing: Implementation, Management, and Security, CRC Press Taylor and Francis Group, 2010.
3. Ronald L. Krutz, Russell Dean Vines, Cloud Security: A Comprehensive Guide to Secure Cloud Computing, John Wiley & Sons, 2010.
4. John R. Vacca, Cloud Computing Security, CRC Press, 2016.

Note: The latest editions of the books should be followed.

**Master of Science (Information and Network Security) Semester – III
(Session 2021-22)**

COURSE CODE: MINL - 3113

PROACTIVE SECURITY TOOLS AND TECHNOLOGY

Course Outcomes:

CO1: Learn about the security policies and strategies

CO2: Gain the knowledge about various tools to be used in the implementation of penetration testing

CO3: Learn various commands used in the implementation of proactive security

Master of Science (Information and Network Security) Semester – III

(Session 2021-22)

COURSE CODE: MINL - 3113

PROACTIVE SECURITY TOOLS AND TECHNOLOGY

Examination Time: 3 Hrs.

Max. Marks: 100

Theory: 80

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (16 marks each) are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT - I

Network Security tool taxonomy: Reconnaissance tools, attack and penetration tools, defensive tools, Security planning, Security Strategies, Security threats.

UNIT - II

High interaction honeypots, Medium interaction honeypots, Low interactions honeypots and Virtual honeypots, Netcat (Sniff army knife), NMAP (Active scanning), Nessus (Penetration testing), TCPDUMP, Wireshark (passive traffic sniffing)

UNIT - III

NSLOOKUP, DIG (DNS information retrieval), Firewalling (iptables), Reverse firewalling, securing honeypots, sebek, Argos, Honeywall, Network traffic visualization.

UNIT - IV

Hybrid systems, client honeypots, Botnets, tracking botnets, analysing malware, Hacking channel jargon and interpretation.

References / Textbooks:

1. Niels Provos, Thorsten Holz, Virtual Honeypots: From Botnet Tracking to Intrusion Detection, Addison-Wesley, 2007.
2. The Honeynet Project, Know Your Enemy: Learning about Security Threats, AddisonWesley Professional, 2004.
3. Mike Schiffman, Building Open Source Network Security Tools: Components and Techniques, Wiley, 2002.
4. Roberta Bragg, Mark Rhodes-Ousley, Keith Strassberg, Network Security: The Complete Reference, McGraw Hill Education, 2017.

Note: The latest editions of the books should be followed.

**Master of Science (Information and Network Security) Semester – III
(Session 2021-22)**

COURSE CODE: MINL - 3114

PENETRATION TESTING AND AUDITING

Course Outcomes:

CO1: Learn about the risk analysis

CO2: Student can achieve the knowledge about the planning and scheduling of penetration testing

CO3: Achieve the knowledge about different platforms of testing

Master of Science (Information and Network Security) Semester – III

(Session 2021-22)

COURSE CODE: MINL - 3114

PENETRATION TESTING AND AUDITING

Examination Time: 3 Hrs.

Max. Marks: 100

Theory: 80

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (16 marks each) are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT – I

Identify Risk, Manage Risk, Risk mitigation, Customers and legal agreements, Penetration testing planning and scheduling, Information gathering.

UNIT – II

External and internal network penetration testing. Router penetration testing, Firewalls penetration testing, Intrusion detection system penetration testing

UNIT – III

Wireless networks penetration testing, Password cracking penetration testing, social engineering penetration testing.

UNIT – IV

Application penetration testing, Policies and controls testing. Penetration testing report and documentation writing

References / Textbooks:

1. T. J. Klevinsky, Scott Laliberte and Ajay Gupta, Hack I.T.: Security Through Penetration Testing, Addison-Wesley, 2002.
2. David Kennedy, Jim O'Gorman, Devon Kearns, Mati Aharoni, Metasploit: The Penetration Tester's Guide, No Starch Press, 2011.
3. Thomas Wilhelm, Professional Penetration Testing: Creating and Learning in a Hacking Lab, Syngress, 2013.
4. William Chuck Easttom II, Penetration Testing Fundamentals: A Hands-On Guide to Reliable Security Audits, Pearson, 2018.

Note: The latest editions of the books should be followed.

Master of Science (Information and Network Security) Semester – III
(Session 2021-22)

COURSE CODE: MINL - 3115

CRYPTOGRAPHY AND NETWORK SECURITY

Course Outcomes:

CO1: Learning of classifying the symmetric encryption techniques

CO2: Illustrate various public key cryptographic techniques

CO3: Evaluate the authentication and hash algorithms CO4: Learn basic concepts of system level security.

Master of Science (Information and Network Security) Semester – III

(Session 2021-22)

COURSE CODE: MINL - 3115

CRYPTOGRAPHY AND NETWORK SECURITY

Examination Time: 3 Hrs.

Max. Marks: 100

Theory: 80

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (16 marks each) are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT - I

Introduction to cryptography, Classical Cryptosystem, Cryptanalysis on Substitution Cipher (Frequency Analysis), Play fair Cipher, Block Cipher. Data Encryption Standard (DES), DES (Contd.), Triple DES, Modes of Operation, Stream Cipher, Pseudorandom Sequence. LFSR based Stream Cipher, Abstract algebra, Number Theory.

UNIT - II

Modular Inverse, Extended Euclid Algorithm, Fermat's Little Theorem, Euler Phi-Function, Euler's theorem, Quadratic Residue, Polynomial Arithmetic. Advanced Encryption Standard (AES),

Introduction to Public Key Cryptosystem, Diffie-Hellman Key Exchange, Knapsack Cryptosystem, RSA Cryptosystem. Primality Testing, Elliptic Curve Cryptosystem, Elliptic Curve over the Reals, Elliptic curve Modulo a Prime.

UNIT - III

Message Authentication, Digital Signature, Key Management, Key Exchange, Hash Function, Universal hashing, Cryptographic hash Function, Secure Hash Algorithm (SHA), Digital Signature Standard (DSS), More on Key Exchange Protocol.

UNIT - IV

Cryptanalysis, Time-Memory Trade-off Attack, Differential Cryptanalysis, Linear Cryptanalysis. Cryptanalysis on Stream Cipher. Internetwork Security, SSL, PGP, Cloud Security, Introduction to Blockchain and Bitcoin.

References / Textbooks:

1. William Stallings, Cryptography and Network Security: Principles and Practice, Prentice Hall, 2003.
2. Behrouz A. Forouzan, Cryptography & Network Security, McGraw Hill Education, 2010.
3. S.Bose, P.Vijayakumar, Cryptography and Network Security, Pearson, 2016.
4. Atul Kahate, Cryptography and Network Security, Tata McGraw-Hill, 2003.
5. Bruce Schneier, Applied Cryptography, John Wiley & Sons, 2015.

Note: The latest editions of the books should be followed.

Master of Science (Information and Network Security) Semester – III

(Session 2021-22)

COURSE CODE: MINP - 3116

LAB ON PENETRATION TESTING AND VIRTUALIZATION

Examination Time: 3 Hrs

Max. Marks: 100

Practical: 80

CA:20

Lab on Penetration Testing and Virtualization.

Master of Science (Information and Network Security) Semester – IV
(Session 2021-22)

COURSE CODE: MINL-4111

INTRUSION DETECTION SYSTEM

Course Outcomes:

After passing this course the student will be able to:

CO1: Comprehend the importance of intrusion detection.

CO2: Identify various Intrusion Detection systems and methodologies associated with them.

CO3: Evaluate the impact of Intrusion Detection Systems.

CO4: Identify the integration of multiple IDS.

Master of Science (Information and Network Security) Semester – IV
(Session 2021-22)

COURSE CODE: MINL-4111

INTRUSION DETECTION SYSTEM

Examination Time: 3 Hrs.

Max. Marks: 100

Theory: 80

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (16 marks each) are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT - I

Introduction and an Overview of Intrusion Detection Systems: Introduction about intrusion detection systems, Purpose and Scope of intrusion detection systems, Need of intrusion detection systems, applications of intrusion detection systems, Firewalls and intrusion detection systems.

UNIT - II

Intrusion Detection Systems and Associated Methodologies: Uses of Intrusion detection technologies, Key Functions of Intrusion detection systems, Common Detection Methodologies, Signature-Based Detection, Anomaly-Based Detection, stateful protocol analysis, Types of Intrusion detection technologies

UNIT - III

Intrusion detection Technologies and Components: Components and Architecture, Typical Components Network Architectures, Security capabilities, Information Gathering Capabilities, Logging Capabilities, Detection Capabilities Prevention Capabilities and its implementation, Deploying IDS.

UNIT - IV

Using and Integrating Multiple Intrusion Detection Systems Technologies The Need for Multiple IDS technologies, Integrating Different IDS Technologies, Direct IDS Integration Indirect IDS Integration, Other Technologies with IDS Capabilities, Network Forensic Analysis Anti-Malware Technologies,

Honeypots

References / Textbooks:

1. Tim Crothers, Implementing Intrusion Detection Systems: A Hands–On Guide for Securing the Network, John Wiley and Sons.
2. Christopher Kruegel, Fedrick Valeur, Intrusion Detection and Correlation: Challenges and Solutions, Springer.
3. Chris Sanders, Intrusion Detection Honeypots: Detection through Deception (2020).

Master of Science (Information and Network Security) Semester – IV
(Session 2021-22)

COURSE CODE: MINL-4112

REVERSE ENGINEERING AND MALWARE

Course Outcomes:

After passing this course the student will be able to: CO1: Comprehend complete taxonomy of malware.

CO2: Comprehend the Reverse Engineering Malware Methodology.

CO3: Examine the presence and impact of malware.

Master of Science (Information and Network Security) Semester – IV

(Session 2021-22)

COURSE CODE: MINL-4112

REVERSE ENGINEERING AND MALWARE

Examination Time: 3 Hrs.

Max. Marks: 100

Theory: 80

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (16 marks each) are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT - I

Malware, Analysis, and Trends, Malware taxonomy and characteristics: Understanding Malware Threats: Malware indicators, Malware Classification, Examining Clam AV Signatures , Creating Custom Clam AV Databases.

UNIT - II

Malware Analysis (MA): Reverse Engineering Malware (REM) Methodology, Introduction to key MA tools and techniques, Behavioral Analysis vs. Code Analysis.

UNIT - III

Resources for Reverse-Engineering Malware (REM): Initial Infection Vectors and Malware Discovery, Sandboxing Executables and Gathering Information From Runtime Analysis, The Portable Executable (PE32) File Format, Identifying Executable Metadata, Executable Packers and Compression, and Obfuscation, Techniques.

UNIT - IV

Utilizing Software Debuggers to Examine Malware, Analyzing Malicious Microsoft Office and Adobe PDF Documents, Analyzing Malicious Browser-based Exploits, Automating the Reverse Engineering Process.

References / Textbooks:

1. Michael Ligh, Steven Adair, Blake Hartstein, and Matthew Richard “Malware Analyst’s Cookbook and DVD: Tools and Techniques for Fighting Malicious Code”, First Edition (2010), Wiley Publications.
2. Ed Skoudis and Lenny Zeltser, “Malware: Fighting Malicious Code” (2003). Prentice Hall Publications.
3. Cameron H. Malin, Eoghan Casey, and James M. Aquilina “Malware Forensics: Investigating and Analyzing Malicious Code” (2008), Syngress Publications.
4. Eldad Eilam, “Reversing: Secrets of Reverse Engineering” (2005), Wiley.
5. Blokdyk, Gerardus, “Reverse Engineering Malware: The Ultimate Step-By-Step Guide” (2018).

Master of Science (Information and Network Security) Semester – IV

(Session 2021-22)

COURSE CODE: MINL-4113

ETHICAL HACKING

Course Outcomes:

After passing this course the student will be able to:

CO1: Articulate the concept of security and phases involved in hacking.

CO2: Comprehend various hacking techniques Sniffing Traffic, DNS and IP Sniffing, HTTPS Sniffing, WLAN Sniffers, etc.

CO3: Comprehend session hijacking along with its types and phases.

Master of Science (Information and Network Security) Semester – IV

(Session 2021-22)

COURSE CODE: MINL-4113

ETHICAL HACKING

Examination Time: 3 Hrs.

Max. Marks: 100

Theory: 80

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (16 marks each) are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT - I

Introduction: Understanding the importance of security, Concept of ethical hacking and essential Terminologies-Threat, Attack, Vulnerabilities, Target of Evaluation, Exploit. Phases involved in hacking

UNIT - II

Foot Printing: Introduction to foot printing, Understanding the information gathering methodology of the hackers, Tools used for the reconnaissance phase.

System Hacking: Aspect of remote password guessing, Role of eavesdropping ,Various methods of password cracking, Keystroke Loggers, Understanding Sniffers ,Comprehending Active and Passive Sniffing, ARP Spoofing and Redirection, DNS and IP Sniffing, HTTPS Sniffing.

UNIT - III

Session Hijacking: Understanding Session Hijacking, Phases involved in Session Hijacking, Types of Session Hijacking, Session Hijacking Tools.

UNIT - IV

Hacking Wireless Networks: IEEE 802.11a and IEEE 802.11b standards, Role of WEP, Cracking WEP Keys, Sniffing Traffic, Wireless DOS attacks, WLAN Scanners, WLAN Sniffers, Hacking Tools, Securing Wireless Networks.

References / Textbooks:

1. Network Security and Ethical Hacking, Rajat Khare, Luniver Press,(2006).
2. Ethical Hacking, Thomas Mathew, OSB Publisher, (2003).
3. Hacking Exposed: Network Security Secrets & Solutions, Stuart McClure, Joel Scambray and George Kurtz, McGraw-Hill, (2005).
4. Ethical Hacking and Network defense, Simpson, Cengage Learning, (2009).

Master of Science (Information and Network Security) Semester – IV
(Session 2021-22)

COURSE CODE: MINL-4114

BLOCKCHAIN FOR ENTERPRISE APPLICATIONS

Course Outcomes:

After passing this course the student will be able to:

CO1: Comprehend elements and working of Blockchain.

CO2: Identify the role of Blockchain in Decentralization.

CO3: Apply payment process in Bitcoin and Ethereum.

Master of Science (Information and Network Security) Semester – IV

(Session 2021-22)

COURSE CODE: MINL-4114

BLOCKCHAIN FOR ENTERPRISE APPLICATIONS

Examination Time: 3 Hrs.

Max. Marks: 100

Theory: 80

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (16 marks each) are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT - I

Blockchain : Introduction, History, Elements of Blockchain, Working of a blockchain, tiers, features, Types, Benefits and Limitations, Consensus.

Decentralization: Use of Blockchain in Decentralization, Methods of Decentralization, Routes, Smart Contracts, Decentralized Organizations, Requirements of Decentralized Application, Platforms for Decentralization, Symmetric Cryptography, Private Key Cryptography

UNIT - II

BitCoin: Introduction, Digital Key and address, Transaction, Blockchain Structure, Mining
Bitcoin Network Wallets, Bitcoin Payments

UNIT - III

Bitcoin Clients and APIs: Bitcoin Installation, Type of Clients, setting up a bitcoin node
Bitcoin Limitations, Development of altcoins, Namecoin, Primecoin, Zcash

UNIT - IV

Ethereum: Introduction, Ethereum network, Components, Development Environment, Alternative

Blockchains – Kadena, Ripple, Stellar, Rootstack, Quorum, BigchainDB

References / Textbooks:

1. Ambadas Tulajadas Choudhari, MR Sharn, Blockchain for Enterprise Applications, Wiley (2020)
2. Tiana Laurence, Blockchain for Dummies, Wiley (2017)
3. Daniel Drescher, Blockchain Basics, Apress (2017), 1st Edition
4. David Shrier, Basic Blockchain: What it is and How it will transform the way we work and live, Robinson Publishers (2020)

**Master of Science (Information and Network Security) Semester – IV
(Session 2021-22)**

COURSE CODE: MIND-4115

MAJOT PROJECT / DISSERTATION

Course Outcomes:

After passing course the student will be able to:

CO1: Apply the tools and techniques learnt to frame problems and their corresponding solutions.

CO2: Develop skills necessary to structure, manage and execute projects.

CO3: Learn to work as a member of a cohesive unit.

CO4: Develop presentation skills.

CO5: Perform documentation related to development of the project.

Master of Science (Information and Network Security) Semester – IV

(Session 2021-22)

COURSE CODE: MIND-4115

MAJOT PROJECT / DISSERTATION

Examination Time: 6 Hrs

Max. Marks: 200

Practical: 160

CA:40

1. Candidates have to submit only one hard copy and CD of documentation which shall be kept with the course supervisor/guide in the college only. Further, supervisor/guide OR principal of college shall forward two copies of DVD (Digital Versatile Disk) containing all the documentation files of the students (file name to be saved as Rollno_of_the_student .pdf) to the concerned branch of the University. Covering letter (duly signed by the principal/Head of the college/institute) should contain the following information. Candidate name, Candidate Roll no, Project Title of the student and .pdf file name of his project documentation.
2. The assignment shall be evaluated by a board of three examiner (two (02) External examiners and one (01) internal examiner) as approved by the BOS.
3. The Project is to be submitted as per the common ordinances for P.G. courses under semester system.

(Annexure B)

FACULTY OF COMPUTER SCIENCE & IT

SYLLABUS FOR

Post Graduate Diploma in Computer Applications

(Semester I-II)

(Under Continuous Evaluation System)

Session: 2021-22



The Heritage Institution

**KANYA MAHA VIDYALAYA
JALANDHAR
(Autonomous)**

Post Graduate Diploma in Computer Applications

(Session 2021-22)

PROGRAMME SPECIFIC OUTCOMES

Upon successful completion of Post Graduate Diploma in Computer Applications course, the students will be able to:

PSO1: Get familiar with computer fundamentals and able to work with office automation software.

PSO2: Perform various DTP (Desktop Publishing) applications like CorelDraw and Photoshop to design banners/logos and also use these skills in photo editing.

PSO3: Comprehend different types of Operating Systems, networking and scripting language concepts.

KANYA MAHA VIDYALAYA, JALANDHAR (AUTONOMOUS)**SCHEME AND CURRICULUM OF EXAMINATIONS OF ONE YEAR POST GRADUATE DIPLOMA
PROGRAMME****Post Graduate Diploma in Computer Applications****Session 2021-22**

Post Graduate Diploma in Computer Applications Semester - I							
COURSE CODE	COURSE NAME	Course Type	Marks				Examination Time (in Hours)
			Total	Ext.		CA	
				L	P		
PCAM– 1111	PC Computing-I (Back Office Operations)	C	100	50	30	20	3+3
PCAM– 1112	PC Computing-II (Professional DTP)	C	100	50	30	20	3+3
PCAM-1113	Fundamentals of Computer and Operating System	C	100	50	30	20	3+3
PCAM-1114	Multimedia Systems	C	100	50	30	20	3+3
	Total		400				

Note:**C - Compulsory**

KANYA MAHA VIDYALAYA, JALANDHAR (AUTONOMOUS)

**SCHEME AND CURRICULUM OF EXAMINATIONS OF ONE YEAR POST GRADUATE DIPLOMA
PROGRAMME**

Post Graduate Diploma in Computer Applications

Session 2021-22

Post Graduate Diploma in Computer Applications Semester - II							
COURSE CODE	COURSE NAME	Course Type	Marks				Examination Time (in Hours)
			Total	Ext.		CA	
				L	P		
PCAM-2111	Network Concepts and Management	C	100	50	30	20	3+3
PCAM-2112	Programming in C	C	100	50	30	20	3+3
PCAM-2113	Introduction to Scripting Languages and Web Designing	C	100	50	30	20	3+3
PCAM-2114	Database Management System	C	100	50	30	20	3+3
	Total		400				

Note:

C - Compulsory

Post Graduate Diploma in Computer Applications Semester – I

Session 2021-22

COURSE CODE: PCAM-1111

PC COMPUTING-I

(BACK OFFICE OPERATIONS)

Course Outcomes:

After passing this course the student will be able to:

CO1: Work on Spreadsheet application for office tasks.

CO2: Create effective presentations, can apply designs to enhance the look of the presentation, print a presentation.

CO3: Understand Word Processor, Create, Edit and Format documents, Work with Tables, Import and Export data between Files, Save, Protect and Print documents.

Post Graduate Diploma in Computer Applications Semester – I

Session 2021-22

COURSE CODE: PCAM-1111

PC COMPUTING-I

(BACK OFFICE OPERATIONS)

Examination Time: (3+3) Hrs.

Max. Marks: 100

Theory: 50

Practical: 30

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (10 marks each) are to be set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT I

Word Processing: Introduction to word processing & its features, parts of window of word processing (Title bar, menu bar, status bar, and ruler), understanding the ribbon, use of office button and quick access toolbar, creation of new documents, opening document, insert a document into another document. Page setup, margins, gutters, font properties, alignment, page breaks, header & footer, deleting, moving, replace, editing text in document, saving a document, spell checker, printing a document.

UNIT II

Word Processing: Creating a table, entering and editing text in tables, changing format of table, height and width of row/column editing, adding and deleting rows/columns. Adding picture, page colors and watermarks, borders, shading, drawing objects.

Presentation: Introduction to presentation, exploring menus, starting a new slide, saving presentation, moving/rearranging slides, printing slides.

UNIT III

Presentation: Applying theme to presentation, views (slide view, slide sorter, notes view, outline view), formatting & enhancing text. Creating a graph, displaying slide show, adding multimedia. Slide transitions, applying Animation, Timing slide display, adding movies & sounds, using a pick look wizards to change format.

UNIT IV

Spreadsheet: Introduction to worksheet/spreadsheet, features, creating a new workbook, different functions on different data in excel, creation of graphs, editing it and formatting, changing chart type to 2D chart or 3D chart, pivot table, creation of worksheet, adding, deleting, moving the text in worksheet, linking different sheets, sorting the data, querying the data, filtering the data (auto and advance filters), What-if analysis, open an already existing workbook, saving workbook, printing a worksheet, closing the workbook & exiting.

References/Textbooks:

1. *Anshuman Sharma, A book of Fundamentals of Information Technology, Lakhanpal Publishers, 5th Edition.*
2. *Prof. Satish Jain, M. Geetha, Kratika, BPB's Office 2010 Course Complete Book, BPB Publications, 2017.*
3. *Joyce Cox, Joan Lambert and Curtis Frye, Microsoft office Professional 2010 Step by Step, Microsoft Press, 2010.*
4. *V. Rajaraman, Neeharika Adabala, Fundamentals of Computers, PHI Learning, 2015.*
5. *P.K. Sinha, Computer Fundamentals, BPB Publications, 2004.*

Note: The latest editions of the books should be followed.

Post Graduate Diploma in Computer Applications Semester – I

Session 2021-22

COURSE CODE: PCAM–1112

PC COMPUTING–II

(PROFESSIONAL DTP)

Course Outcomes:

After passing this course the student will be able to:

CO1: understand the raster and vector graphics, image Resolution, menu and various palettes, concept of path and dimensions.

CO2: use simple graphic design tools and techniques like Masks and Histogram, Acquiring and Importing Images, concept of layer Channels and Path, Filters, Rendering Effects, Transformation, Strokes, Image Modes, Canvas and Images, using Navigator and Photoshop Plugins.

CO3: work on Corel Draw, Vector Graphics, Color Palette and Pasteboard.

Post Graduate Diploma in Computer Applications Semester – I

Session 2021-22

COURSE CODE: PCAM–1112

PC COMPUTING–II

(PROFESSIONAL DTP)

Examination Time: (3+3) Hrs.

Max. Marks: 100

Theory: 50

Practical: 30

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (10 marks each) are to be set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section

UNIT I

Photoshop: Introduction to Graphics, Vector Graphics and Bitmaps, Understanding Image Size and Resolution, Using Menu and Palettes.

Photoshop Tools: Marquee Tool , Move Tool , Lasso Tool (Polygon, Magnetic, Magic Wand Tool), Crop Tool ,Healing Brush Tool ,Patch Tool, Brush Tool, Pencil Tool, Clone Stamp Tool, Pattern Stamp Tool, History Brush Tool, Art History Brush, Eraser Tool (Background, Magic Erases Tool), Gradient Tool , Blur Tool , Smudge tool, Sharpen Tool, Dodge Tool ,Burn tool, Sponge tool Path Selection Tool , Text Type Tool , Pen Tool ,Rectangle Tool , Eyedropper Tool, Hand Tool, Zoom Tool.

UNIT II

Color Modes (Grayscale, RGB, CMYK), Channels and Paths (Creating Paths via Selections, via Pen Tools), Concept of Layers, Creating/ Adding Layers, Duplicating Layer, Deleting Layer, Layers Palette Menu, Quick & Layer Mask and Histogram.

Filters, Transformation (Scaling, Rotating, Skewing, Distorting, Perspective, Flipping, Absolute, Free Transform).

UNIT III

Corel Draw: Exploring CorelDraw, Menu, Ruler Bars, Gridlines and Guidelines

Corel Tools (Pick Tool, Zoom Tool, Pan Tool, Rectangle Tool, Ellipse Tool Polygon Tool, Spiral,

Graph Paper Tool, Shapes Tool, eraser tool, Free hand, Bezier, artistic Media Tool, Pen Tool)

UNIT IV

Grouping/Ungrouping Objects, Locking/Unlocking Objects, Trimming, Welding, Intersection of Objects, Working with text, Fill Tool (Uniform, Fountain, Pattern, Texture, Postscript)

Special Effects (Interactive blend tool, Contour Tool Distortion, Envelope, Extrude, Drop Shadow tool, Transparency Tool), Transformations (Position, Rotate, Scale, Size, Mirror).

References/Textbooks:

1. *Kogent Learning Solutions Inc., CorelDraw X7 in Simple Steps, Dreamtech Press, 2014.*
2. *Steve Caplin, How To Cheat In Photoshop CC: The Art of Creating Realistic Photomontages by Routledge, 2013.*
3. *Lisa DaNae Dayley, Brad Dayley, Adobe Photoshop CC Bible, Wiley, 2013.*
4. *Manohar Singh, Jaspreet Thind, Tejinder Thind, Uminder Kaur, PC Computing II Photoshop 5.5 & Corel Draw 10 Professional DTP, AP Publishers, 2008.*

Note: The latest editions of the books should be followed.

Post Graduate Diploma in Computer Applications Semester – I

Session 2021-22

COURSE CODE: PCAM–1112

PC COMPUTING–II

(PROFESSIONAL DTP)

Examination Time: (3+3) Hrs.

Max. Marks: 100

Theory: 50

Practical: 30

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (10 marks each) are to be set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section

UNIT I

Photoshop: Introduction to Graphics, Vector Graphics and Bitmaps, Understanding Image Size and Resolution, Using Menu and Palettes.

Photoshop Tools: Marquee Tool , Move Tool , Lasso Tool (Polygon, Magnetic, Magic Wand Tool), Crop Tool ,Healing Brush Tool ,Patch Tool, Brush Tool, Pencil Tool, Clone Stamp Tool, Pattern Stamp Tool, History Brush Tool, Art History Brush, Eraser Tool (Background, Magic Erases Tool), Gradient Tool , Blur Tool , Smudge tool, Sharpen Tool, Dodge Tool ,Burn tool, Sponge tool Path Selection Tool , Text Type Tool , Pen Tool ,Rectangle Tool , Eyedropper Tool, Hand Tool, Zoom Tool.

UNIT II

Color Modes (Grayscale, RGB, CMYK), Channels and Paths (Creating Paths via Selections, via Pen Tools), Concept of Layers, Creating/ Adding Layers, Duplicating Layer, Deleting Layer, Layers Palette Menu, Quick & Layer Mask and Histogram.

Filters, Transformation (Scaling, Rotating, Skewing, Distorting, Perspective, Flipping, Absolute, Free Transform).

UNIT III

Corel Draw: Exploring CorelDraw, Menu, Ruler Bars, Gridlines and Guidelines

Corel Tools (Pick Tool, Zoom Tool, Pan Tool, Rectangle Tool, Ellipse Tool Polygon Tool, Spiral,

Graph Paper Tool, Shapes Tool, eraser tool, Free hand, Bezier, artistic Media Tool, Pen Tool)

UNIT IV

Grouping/Ungrouping Objects, Locking/Unlocking Objects, Trimming, Welding, Intersection of Objects, Working with text, Fill Tool (Uniform, Fountain, Pattern, Texture, Postscript)

Special Effects (Interactive blend tool, Contour Tool Distortion, Envelope, Extrude, Drop Shadow tool, Transparency Tool), Transformations (Position, Rotate, Scale, Size, Mirror).

References/Textbooks:

5. *Kogent Learning Solutions Inc., CorelDraw X7 in Simple Steps, Dreamtech Press, 2014.*
6. *Steve Caplin, How To Cheat In Photoshop CC: The Art of Creating Realistic Photomontages by Routledge, 2013.*
7. *Lisa DaNae Dayley, Brad Dayley, Adobe Photoshop CC Bible, Wiley, 2013.*
8. *Manohar Singh, Jaspreet Thind, Tejinder Thind, Uminder Kaur, PC Computing II Photoshop 5.5 & Corel Draw 10 Professional DTP, AP Publishers, 2008.*

Note: The latest editions of the books should be followed.

Post Graduate Diploma in Computer Applications Semester – I

Session 2021-22

COURSE CODE: PCAM-1113

FUNDAMENTALS OF COMPUTER AND OPERATING SYSTEMS

Course Outcomes:

After passing this course the student will be able to:

CO1: understand the basic components and functional units of a computer system.

CO2: create folder, shortcuts and manage files in Windows.

CO3: learn fundamentals of disk operation system, DOS structure and DOS commands.

Post Graduate Diploma in Computer Applications Semester – I

Session 2021-22

COURSE CODE: PCAM-1113

FUNDAMENTALS OF COMPUTER AND OPERATING SYSTEMS

Examination Time: (3+3) Hrs.

Max. Marks: 100

Theory: 50

Practical: 30

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (10 marks each) are to be set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section

UNIT I

Fundamentals of Computer: Introduction to computer, Applications of computer, Components of computers (Input unit, Output Unit, Memory Unit & CPU), Types of software, Translators (compiler, interpreter, assembler), Booting a System.

UNIT II

Input Devices: Keyboards, Mouse, Joystick, Track Ball, Light Pen & Data Scanning devices-scanner, OCR, OMR, MICR, Bar Code Reader, Card Reader)

Output Devices: Monitor, Printers (laser printer, dot matrix printer, ink jet printer)

Memories: Primary Memory (RAM & ROM) & Secondary Memory (Hard Disk, CD, DVD)

UNIT III

Introduction to Windows: Parts of window screen (Desktop, window, icons), start menu, Taskbar settings, application & document window, anatomy of a window (Title bar, minimize, maximize button, control box, scroll bars, scroll buttons, scroll boxes), Window explorer (expansion, collapsing of directory tree, copying, moving, deleting files, folder, creating folders), About desktop icons (recycle bin, my computer, network neighborhood, briefcase), folder, shortcut creation, setting of screen saver, color settings, changing window appearance.

UNIT IV

Disk Operating System: Meaning of operating system, its functions, batch systems, real systems, multi programming, multitasking, single, multi user systems. Define dos, Structure of Ms-Dos (description of booting files, steps to boot the system), hot & cold booting internal command (cls, dir, date, time, vol, ver, copy con, type, ren, del, md, rd, d, path, prompt), external commands edit, attrib, backup, restore, chkdsk, diskcopy, diskcomp, deltree, edit, format.

References/Textbooks:

1. *Anshuman Sharma, Fundamentals of Information Technology, Lakhanpal Publishers, 5th Edition.*
2. *Rachhpal Singh & Gurvinder Singh, PC Software, Kalyani Publisher, 2009.*
3. *Peter Norton, Peter Norton's Computing Fundamentals, McGraw-Hill Technology Education, 2006.*

Note: The latest editions of the books should be followed.

Post Graduate Diploma in Computer Applications Semester – I

Session 2021-22

**COURSE CODE: PCAM–1114
MULTIMEDIA SYSTEMS**

Course Outcomes:

After passing this course the student will be able to:

CO1: Understanding of Technical aspect of multimedia system

CO2: Understand various file format for audio, video and text media

CO3: Develop various multimedia system applicable in real time **CO4:** Design interactive multimedia software

Post Graduate Diploma in Computer Applications Semester – I

Session 2021-22

COURSE CODE: PCAM–1114

MULTIMEDIA SYSTEMS

Examination Time: (3+3) Hrs.

Max. Marks: 100

Theory: 50

Practical: 30

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (10 marks each) are to be set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section

UNIT I

Introduction: Introduction to Multimedia, categorization (linear and non-linear), Elements,

Hypertext, Hypermedia, Importance of Multimedia, Definition of Multimedia System, Characteristics, Features, applications

Different Media: Images (types of images-bitmapped & vectors, File types), Audio (Digitization,

MIDI audio compression, file types), Video (File types), Text, Animation

UNIT II

Components of Multimedia System: Capture Devices, Storage Devices, Computer Systems, Display Devices, Hardware and software requirements.

Multimedia Databases: Introduction, Datatypes, Requirements, Issues and challenges, Application Area, Multimedia over the Network(s).

UNIT III

Integration of Different media using Editing Tool: Introduction to Premiere Pro, working with interface, Importing Media, Organizing Media Essentials of Video Editing, Working with clips and markers, Adding transitions.

UNIT IV

Editing Techniques: Advanced Editing Techniques, Putting Clips in Motion, Multi-Camera Editing, Editing and Mixing Audio, Sound Effects, Video Effects, Color Correction and Grading, Creating Titles, Managing the projects, Exporting Frames, Clips and Sequences.

References/Textbooks:

1. *Ze-Nian Li, Mark S. Drew, Jiangchuan Liu, Fundamentals of Multimedia, Springer, 2014.*
2. *Maxim Jago, Adobe Premiere Pro CC, Classroom in a book, Adobe, 2014.* 3.
https://en.wikipedia.org/wiki/Multimedia_database

Note: The latest editions of the books should be followed.

Post Graduate Diploma in Computer Applications Semester – II

(Session 2021-22)

COURSE CODE: PCAM-2111

NETWORK CONCEPTS AND MANAGEMENT

Course Outcomes:

After passing this course the student will be able to:

CO1: Comprehend issues in design of a network.

CO2: Comprehend working of different networking devices, their application areas and network security.

CO3: Perform actions related to management of account, group policies, administration privileges, etc.

CO4: Comprehend the basics of Linux and UNIX Operating System.

Post Graduate Diploma in Computer Applications Semester – II

(Session 2021-22)

COURSE CODE: PCAM-2111

NETWORK CONCEPTS AND MANAGEMENT

Examination Time: (3+3) Hrs.

Max. Marks: 100

Theory: 50

Practical: 30

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (10 marks each) are to be set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section

UNIT I

Introduction: Basic concepts of Computer Networks, Network Hardware and Software requirement, Network topologies, Types of Networks (LAN, MAN, WAN), OSI Reference Model, TCP/IP Model Comparison and Critiques.

UNIT II

Internetworking Devices: Routers, Bridges, Repeaters, Gateways, Hub Switches, Routing Algorithms (Distance Vector, Link State).

Network Security: Data compression techniques, cryptography, IP addressing schemes

UNIT III

Operating System: What is an Operating System, Types of Operating Systems (Single User Systems, Multi User Systems)

Introduction to Unix: Explain the features of Unix system. Structure of Unix (Kernel, Shell), Unix file system (data blocks, list, superblock, boot block), Types of files (ordinary files, directory, special files), Types of shells, Login & logout of unix session.

UNIT IV

Commands: Simple commands (cat, ls, chmod, mail, who, whoami, cal, pwd, date, ps, mkdir, cd, rmdir, rm, tput clear).

Piping, filters, batch processing, shell programming (Echo, read, case constructs). VI Editor (opening it, inserting, modifying, deleting, saving files).

References/Textbooks:

1. *Behrouz A. Forouzan, Data Communications & Networking, McGraw-Hill Education (2012), 5th ed.*
2. *Andrew S. Tanenbaum, Computer Network, Prentice Hall (2010), 5th ed.*
3. *Abraham Silberschatz, Greg Gagne, Peter B. Galvin, Operating System Concepts, Wiley Publishers (2018), 10th ed.*
4. *Charles Crowley, Operating Systems: A Design Oriented Approach, Tata McGraw Hill (2001), 1st ed.*
5. *Anshuman Sharma, Fundamentals of Operating System, Lakhanpal Publishers (2016), 2nd ed.*

Post Graduate Diploma in Computer Applications Semester – II

(Session 2021-22)

**COURSE CODE: PCAM-2112
PROGRAMMING IN C**

Course Outcomes:

After passing this course the student will be able to:

CO1: Comprehend the working of various programming constructs involved in C Programming.

CO2: Design C program and control its sequence using various control statements.

CO3: Apply programming concepts to provide solution in different problem domains.

CO4: Apply basic level file handling functions.

Post Graduate Diploma in Computer Applications Semester – II

(Session 2021-22)

Course Code: PCAM–2112

PROGRAMMING IN C

Examination Time: (3+3) Hrs.

Max. Marks: 100

Theory: 50

Practical: 30

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (10 marks each) are to be set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section

UNIT I

Fundamentals of C: Introduction of C, Data Types, Operators, their precedence, expressions and their evaluation.

Input/Output Functions: Formatted I/O, Character I/O & String I/O Functions.

UNIT II

Control Structures: Taking decisions using if, if-else, switch constructs and Conditional Operator, Description of break and continue Statements. Performing loops using for, while, dowhile Constructs.

Functions: Library Functions vs User-Defined Functions, Declaring (Prototyping) and defining User-Defined functions.

UNIT III

Functions: Ways of passing parameters to functions, Recursive functions, Storage Classes.

Arrays & String: Introduction to Arrays, Declaring arrays, initializing arrays, processing of arrays, passing arrays arguments to functions, Strings, handling string in C, string functions, arrays of string.

UNIT IV

Pointers: Introduction to Pointers, Declaring pointers, accessing values via pointers.

Structure and Unions: Introduction to structure, declaring variables of structure type, initializing structures. Accessing Structure Elements, Introduction to Union, Declaring a Union, Accessing elements of a type union.

References/Textbooks:

1. *E. Balagurusamy, Programming in ANSI C, Tata McGraw-Hill (2002), 5th ed.*
2. *Stephen G. Kochan, Programming in C, Pearson Education (2015), 4th ed.*
3. *Yashwant Kanetkar, Let us C, BPB Publications (2020), 17th ed.*
4. *R.S. Salari, Application Programming in C, Khanna Book Publishing (2012), 4th ed.*
5. *Anshuman Sharma, Learn programming in C, Lakhanpal Publishers (2016), 7th ed.*

Post Graduate Diploma in Computer Applications Semester – II

(Session 2021-22)

COURSE CODE: PCAM-2113

INTRODUCTION TO SCRIPTING LANGUAGES AND WEB DESIGNING

Course Outcomes:

After passing this course the student will be able to:

CO1: Comprehend basics of web designing, HTML and CSS.

CO2: Apply HTML and CSS to design webpages.

CO3: Comprehend basics of internet, related technologies and threats to the security in internet.

Post Graduate Diploma in Computer Applications Semester – II

(Session 2021-22)

COURSE CODE: PCAM-2113

INTRODUCTION TO SCRIPTING LANGUAGES AND WEB DESIGNING

Examination Time: (3+3) Hrs.

Max. Marks: 100

Theory: 50

Practical: 30

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (10 marks each) are to be set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section

UNIT I

HTML: Structure of HTML, Basic Tags, Image, Hyperlinks, Marquee, Frames, Tables, Lists, Forms, Limitations of HTML.

UNIT II

CSS: Types, Syntax, Colors, Backgrounds, Box Model, Fonts, Alignment, CSS Links.

UNIT III

INTERNET & ITS USE: Types of Internet Connectivity, Telnet, File Transfer Protocol, IRC, Virtual Reality, Web Publishing, Web Hosting. Cyber Crime, Types of Cyber Crimes, Cookies, Virus, Trojan Horse, Worm, Danger of Virus.

UNIT IV

E-MAIL BASICS: Introduction, advantage and disadvantage, structure of an email message, working of e-mail (sending and receiving messages), managing email (creating new folder, deleting messages, forwarding messages, filtering messages).

WWW: Introduction, Working of WWW, Web browsing (opening, viewing, saving and printing a web page and bookmark).

References/Textbooks:

1. *Jeffrey C Jackson, Web Technology- A Computer Science perspective, Pearson Education (2007) 1st ed.*
2. *Chris Bates, Web Programming- Building Internet Applications, Wiley India (2006), 3rd ed.*
3. *Achyut S Godbole and AtulKahate, Web technologies, Tata McGraw Hill (2002), 2nd ed.*
4. *Uttam K Roy, Web Technologies, Oxford University Press (2010), 1st ed.*
5. *Anshuman Sharma, Fundamentals of Internet Applications, Lakhanpal Publishers (2016), 1st ed.*

Post Graduate Diploma in Computer Applications Semester – II

(Session 2021-22)

COURSE CODE: PCAM-2114

DATABASE MANAGEMENT SYSTEM

Course Outcomes:

After the completion of this course, the student will be able to:

CO1: Comprehend various terms like data, database and database models.

CO2: Apply SQL to formulate queries and design basic level of database.

CO3: Comprehend the PL/SQL and relationship with SQL.

Post Graduate Diploma in Computer Applications Semester – II

(Session 2021-22)

COURSE CODE: PCAM-2114

DATABASE MANAGEMENT SYSTEM

Examination Time: (3+3) Hrs.

Max. Marks: 100

Theory: 50

Practical: 30

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (10 marks each) are to be set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section

UNIT I

Basic Concepts: An overview of Database Management, (database, database system, why database). An architecture for a database system (levels of the architecture, mapping, data independence), DBA, Definition of CODD's Rules

Normalization of Data: First, Second and Third Normal form

Database Models: Hierarchical, Network, Relational.

Introduction to Relational database systems

UNIT II

ORACLE 10g: Introduction to Oracle

Data Types: Char, numbers, date long, raw, long raw.

DDL Commands of SQL: Create Tables, Constraints, Alter Table, Drop Table, Rename.

Data Manipulation Language: Insert Into, Update Statement, Delete Statement, Select statement (Select distinct, Select from where, Select from where order by, Select group by clause, Select Group by having clause).

Transaction Control Language: Roll back, Savepoint, Commit.

UNIT III

Built in Functions- Aggregate Functions (Sum, Avg, max, min, count), Character Functions (Lower, Upper, Length, Substr, RPAD, LPAD), Arithmetic Functions (Round, Trunc, Sqrt, Mod, Abs, Sign) Date and Time Functions and Other Miscellaneous Functions (Add-months, Monthbetween, NVL, NVL2, decode) & Conversion Functions (to-char, to-number, to-date).

Join methods & Sub query, Union, Intersection, Minus, Views, Security amongst users.

UNIT IV

PL/SQL: Introduction to PL/SQL, Relationship between SQL & PL/SQL, Advantages, block structure, Variable and Constant declaration, Declaration using attributes %type attribute, control statements.

References/Textbooks:

1. *Silberschatz, Korth & Sudarshan, Database Systems Concepts, McGraw-Hill Inc.(2020), 7th ed.*
2. *C.J. Date, An Introduction of Database System, Addison-Wesley Publishing co.(2003), 8th ed.*
3. *Anshuman Sharma, Fundamentals of DBMS, Lakhanpal Publishers (2016), 4th ed.*
4. *Ivan Bayross, SQL/PL/SQL. The Programming Language of Oracle, BPB Publications(2010), 4th ed.*

(Annexure C-1)

FACULTY OF COMPUTER SCIENCE & IT

SYLLABUS

of

Bachelor of Computer Applications

(Semester I-VI)

(Under Continuous Evaluation System) (12+3 System of Education)

Session: 2021-22



The Heritage Institution

**KANYA MAHA VIDYALAYA
JALANDHAR
(Autonomous)**

PROGRAMME SPECIFIC OUTCOMES

Bachelor of Computer Applications (Session 2021-22)

Program Specific Outcomes

PSO1: Apply skills for development of software and websites for providing efficient solution to IT based problems

PSO2: Comprehend development process in IT industry through ethical, defined and innovative techniques.

PSO3: Achieve leadership role and team player role to be able to work in multidisciplinary areas at various job roles.

PSO4: Identify and demonstrate the implementation of various tools and technologies involved in the field of Information Technology.

PSO5: Demonstrate proficiency in the field of Programming, Web development and IT enabled services.

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATIONS OF THREE YEAR DEGREE PROGRAMME

Bachelor of Computer Applications

Session 2021-22

Bachelor of Computer Applications Semester- I							
Course Code	Course Name	Course Type	Marks				Examination Time (in Hours)
			Total	Ext.		CA	
				L	P		
BCAL-1421 / BCAL-1031/ BCAL-1431	Punjabi (Compulsory) / ¹ Basic Punjabi/ ² Punjab History and Culture (From Earliest Times to C. 320)	C	50	40	-	10	3
BCAL-1102	Communication Skills in English	C	50	40	-	10	3
BCAM-1113	Introduction to Programming – C	C	100	50	30	20	3+3
BCAM-1114	Introduction to Computers and Information Technology	C	100	50	30	20	3+3
BCAL-1335	Applied and Discrete Mathematics	C	100	80	-	20	3
AECD-1161	*Drug Abuse: Problem, Management and Prevention (Compulsory)	AC	50	40	-	10	3
SECF-1492	*Foundation Course	AC	25	20	-	05	1
	Total		400				

Note:

C - Compulsory

AC - Audit Course

¹ Special course in lieu of Punjabi (Compulsory)

² Special course in lieu of Punjabi (Compulsory) for those students who are not domicile of Punjab.

*Marks of these courses will not be added in total marks and only grades will be provided.

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATIONS OF THREE YEAR DEGREE PROGRAMME

Bachelor of Computer Applications

Session 2021-22

Bachelor of Computer Applications Semester- II							
Course Code	Course Name	Course Type	Marks				Examination Time (in Hours)
			Total	Ext.		CA	
				L	P		
BCAL-2421 / BCAL-2031/ BCAL-2431	Punjabi (Compulsory) ¹ Basic Punjabi ² Punjab History and Culture (C.320 to 1000 B.C.)	C	50	40	-	10	3
BCAM-2102	Communication Skills in English	C	50	25	15	10	3 + 3
BCAM-2113	Introduction to Object Oriented Programming-I	C	100	50	30	20	3+3
BCAL-2114	Principles of Digital Electronics	C	100	80	-	20	3
BCAL-2115	Numerical Methods and Statistical Techniques	C	100	80	-	20	3
AECD-2161	*Drug Abuse: Problem, Management and Prevention (Compulsory)	AC	50	40	-	10	3
SECM-2502	*Moral Education	AC	25	20	-	05	1
	Total		400				

Note:

C - Compulsory

AC - Audit Course

¹ Special course in lieu of Punjabi (Compulsory)

² Special course in lieu of Punjabi (Compulsory) for those students who are not domicile of Punjab.

*Marks of these courses will not be added in total marks and only grades will be provided.

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATIONS OF THREE YEAR DEGREE PROGRAMME

Bachelor of Computer Applications

Session 2021-22

Bachelor of Computer Applications Semester- III							
Course Code	Course Name	Course Type	Marks				Examination Time (in Hours)
			Total	Ext.		CA	
				L	P		
BCAL-3111	Computer Architecture	C	75	60	-	15	3
BCAL-3112	Database Management System	C	75	60	-	15	3
BCAL-3113	Computational Problem Solving	C	75	60	-	15	3
BCAP-3114	Lab on Computational Problem Solving	C	50	-	40	10	3
BCAP-3115	Lab on Database Management System	C	25	-	20	5	3
AECE - 3221	* Environmental Studies (Compulsory)	AC	100	60	20	20	3
SECP - 3512	* Personality Development	AC	25	20	-	05	1
	Total		300				

Note:

C - Compulsory

AC - Audit Course

*** Marks of these courses will not be added in total marks and only grades will be provided.**

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATIONS OF THREE YEAR DEGREE PROGRAMME

Bachelor of Computer Applications

Session 2021-22

Bachelor of Computer Applications Semester- IV							
Course Code	Course Name	Course Type	Marks				Examination Time (in Hours)
			Total	Ext.		CA	
				L	P		
BCAL-4111	Data Structures	C	75	60	-	15	3
BCAL-4112	Information Systems	C	75	60	-	15	3
BCAL-4113	Internet Applications	C	75	60	-	15	3
BCAL-4114	Foundation of Data Science	C	75	60	-	15	3
BCAP-4115	Lab on Data Structures	C	50	-	40	10	3
BCAP-4116	Lab on Internet and Web Designing	C	50	-	40	10	3
SECS - 4522	* Social Outreach	AC	25	-	25	-	1
	Total		400				

Note:

C - Compulsory

AC - Audit Course

*** Marks of these courses will not be added in total marks and only grades will be provided.**

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATIONS OF THREE YEAR DEGREE PROGRAMME

Bachelor of Computer Applications

Session 2021-22

Bachelor of Computer Applications Semester - V							
Course Code	Course Name	Course Type	Marks				Examination Time (in Hours)
			Total	Ext.		CA	
				L	P		
BCAL-5111	Computer Networks	C	75	60	-	15	3
BCAL-5112	Web Technologies	C	75	60	-	15	3
BCAL-5113	Operating System	C	75	60	-	15	3
BCAL-5114	Object Oriented Programming -II	C	75	60	-	15	3
BCAP-5115	Lab on Object Oriented Programming- II	C	50	-	40	10	3
BCAP-5116	Lab on Web Technologies	C	50	-	40	10	3
SECJ-5551 /SECI-5541	* Job Readiness Course / Innovation, Entrepreneurship and Creative Thinking	AC	25	20	-	5	1
	Total		400				

Note:

C-Compulsory

AC - Audit Course

*** Marks of these courses will not be added in total marks and only grades will be provided**

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATIONS OF THREE YEAR DEGREE PROGRAMME

Bachelor of Computer Applications

Session 2021-22

Bachelor of Computer Applications Semester - VI							
Course Code	Course Name	Course Type	Marks				Examination Time (in Hours)
			Total	Ext.		CA	
				L	P		
BCAL-6111	Computer Graphics	C	75	60	-	15	3
BCAL-6112	Software Engineering	C	75	60	-	15	3
BCAP-6113	Lab on Computer Graphics	C	50	-	40	10	3
BCAP-6114	Project	C	300	-	240	60	3
	Total		500				

Note:

C-Compulsory

Bachelor of Computer Applications Semester – I
(Session 2021-22)
COURSE CODE: BCAM-1113
INTRODUCTION TO PROGRAMMING – C

Course Outcome:

After passing course the student will be able to:

CO1: Understand formulation of algorithms and flowcharts for problem solution and different programming constructs.

CO2: Have knowledge of execution flow of a C program for programming and maintenance.

CO3: Apply programming concepts to provide solution in different problem domains.

Bachelor of Computer Applications Semester – I
(Session 2021-22)
COURSE CODE: BCAM–1113
INTRODUCTION TO PROGRAMMING – C

Examination Time: 3+3 Hrs

Max. Marks: 100

Theory: 50

Practical: 30

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (10 marks each) are to set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts(not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section

UNIT I

Fundamentals: Character set, Identifiers and Key Words, Data types, Constants, Variables, Expressions, Statements, Symbolic Constants.

Operations and Expressions: Arithmetic operators, Unary operators, Relational Operators, Logical Operators, Assignment and Conditional Operators, Library functions. Data Input and Output statements

UNIT II

Control Statements: Preliminaries, While, Do–while and For statements, Nested loops, If–else, Switch, Break – Continue statements.

Program Structure Storage Class: Storage Classes- Auto, extern, register and static about library functions.

UNIT III

Functions: Brief overview, defining, accessing functions, passing arguments to function, specifying argument data types, function prototypes, recursion.

Arrays: Defining, processing an array, passing arrays to a function, multi–dimensional arrays.

Strings: String declaration, string functions and string manipulation

UNIT IV

Structures & Unions: Defining and processing a structure, user defined data types, structures and pointers, passing structures to functions, self referenced structure, unions.

Pointers: Fundamentals, pointer declaration, passing pointer to a function, pointer and one dimensional arrays, operation on pointers, pointers & multi-dimensional arrays of pointers, passing functions, other functions, more about pointer declarations.

References/Textbooks:

1. E Balagurusamy, Programming in ANSI C, Tata McGraw-Hill, 2002.
2. Byron Gottfried, Schaum's Outline Programming with C, McGraw Hill, 1996.
3. Brian W. Kernighan, Dennis M. Ritchie, The C Programming language, Prentice Hall, 1988.
4. Stephen G. Kochan, Programming in C, Pearson Education, 2015.

Note: The latest editions of the books should be followed.

Bachelor of Computer Applications Semester – I
(Session 2021-22)
COURSE CODE: BCAM-1114
INTRODUCTION TO COMPUTERS AND INFORMATION TECHNOLOGY

Course Outcome:

After passing course the student will be able to:

CO1: Have knowledge of Computer fundamentals, operating system concepts and office automation software.

CO2: Analyze, design and implement solutions to various problems using algorithms, flowcharts, decision tables and pseudo codes.

CO3: Apply office automation software to create professional and academic documents and presentations.

Bachelor of Computer Applications Semester – I
(Session 2021-22)

COURSE CODE: BCAM-1114

INTRODUCTION TO COMPUTERS AND INFORMATION TECHNOLOGY

Examination Time: 3+3 Hrs

Max. Marks: 100

Theory: 50

Practical: 30

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (10 Marks each) are to be set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section

UNIT I

Fundamentals of Computer: Introduction to computer, Applications of computer, Components of computers (Input unit, Output Unit, Memory Unit & CPU).

Software: Application Software, Service software, System software -operating system (Types & Function of OS), Translators (compiler, interpreter, assembler), Booting a System.

UNIT II

Input Devices: Keyboards, Mouse, Joystick, Track Ball, Light Pen and Data Scanning devices (scanner, OCR, OMR, MICR, Bar Code Reader, Card Reader)

Output Devices: Monitor, Printers (laser printer, dot matrix printer, ink jet printer)

Memories: Primary Memory -RAM (Working and Its types), ROM (Types of ROM). Secondary Memory - Hard Disk (Structure of a hard disk, working, concept of tracks, sectors, clusters, cylinders), CD, DVD.

UNIT III

Word Processing: Introduction to Office, word processing & its features, Parts of window of word (Title bar, menu bar, status bar, and ruler), understanding the Ribbon, Use of Office Button and Quick Access Toolbar, Creation of new documents, opening document, insert a document into another document. Page setup, margins, gutters, font properties, Alignment, page breaks, header & footer, deleting, moving, replace, editing text in document, saving a document, spell checker, printing a document. Creating a table, entering and editing, Text in tables. Changing format of table, height, width of row/column. Editing, deleting Rows, columns in table. Adding picture, page colors and Watermarks, Borders, shading, Templates, wizards, drawing objects.

Presentation: Introduction to PowerPoint, Exploring menus, starting a new slide, saving presentation, moving/rearranging slides, printing slides. Applying theme to presentation, Views (slide View, slide sorter, notes view, outline view), Formatting & enhancing text formatting. Displaying slide show, adding multimedia. Slide transitions, applying Animation, Timing slide display, adding movies & sounds.

UNIT IV

Spreadsheet: Introduction to Worksheet/Spreadsheet, Features of excel, Describe the excel Window, Creating a new workbook, different functions on different data in excel, creation of graphs, editing it and formatting, creation of worksheet, adding, deleting, moving the text in worksheet, sorting the data, querying the data, filtering the data (auto and advance filters), To open an already existing workbook, Saving workbook, printing a worksheet, Closing the workbook & exiting.

References/Textbooks:

1. Joyce Cox, Joan Lambert and Curtis Frye, Microsoft office Professional 2010 Step by Step, Microsoft Press, 2010.
2. V. Rajaraman, Neeharika Adabala, Fundamentals of Computers, PHI Learning, 2015.
3. P.K. Sinha, Computer Fundamentals, BPB Publications, 2004.
4. Anshuman Sharma, A book of Fundamentals of Information Technology, Lakhanpal Publishers, 5th Edition.
5. Peter Norton, Peter Norton's Computing Fundamentals, McGraw-Hill Technology Education, 2006.

Note: The latest editions of the books should be followed.

Bachelor of Computer Applications Semester – I
(Session 2021-22)
COURSE CODE: BCAL–1335
APPLIED AND DISCRETE MATHEMATICS

Course Outcome:

Student will be able to:

CO1: Have knowledge of matrices, sets, relations, propositional logic and Boolean algebra.

CO 2: represents world knowledge in symbolic notation through propositional calculus.

CO 3: Apply discrete mathematical concepts to obtain analytical and numerical solutions.

Bachelor of Computer Applications Semester – I
(Session 2021-22)
COURSE CODE: BCAL–1335
APPLIED AND DISCRETE MATHEMATICS

Examination Time: 3 Hrs

Max. Marks: 100
Theory: 80
CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (16 Marks each) are to set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section

UNIT-I

Sets and Relations: Definition of sets, subsets, complement of a set, universal set, intersection and union of sets, De-Morgan's laws, Cartesian products, Equivalent sets, Countable and uncountable sets, minset, Partitions of sets, Relations: Basic definitions, graphs of relations, properties of relations

UNIT-II

Logic and Propositional Calculus: Proposition and Compound Propositions, basic Logical Operations, Propositions and Truth Tables, Tautologies and Contradictions, Logical Equivalence, Duality law, Algebra of propositions, Conditional and Bi conditional Statements, Arguments, Logical Implication, Propositional Functions, Predicates and Quantifiers, Negation of Quantified Statements, Inference theory of the predicates calculus.

UNIT-III

Boolean Algebra: Boolean algebra and its duality, Duality, Boolean Algebra as Lattices, Boolean identities, sub-algebra, Representation Theorem, Sum-of-Products Form for Sets, Sum-of-Products Form for Boolean Algebra, Minimal Boolean Expressions, Prime Implicants, Boolean Functions, Karnaugh Maps.

UNIT IV

Matrices: Introduction of a Matrix, its different kinds, matrix addition and scalar multiplication, multiplication of matrices, transpose etc. Square matrices, inverse and rank of a square matrix, Matrix Inversion method.

References/Textbooks:

- 1.Seymour Lipschutz, Marc Lars Lipson, Discrete Mathematics (Schaum's outlines Series), McGraw-Hill, 1997.
- 2.Bernard Kolman, Robert C. Busby, Discrete Mathematical structures for Computer Science, Prentice-Hall, 1984.
- 3.Alan Doerr, Kenneth Levasseur, Applied Discrete Structures for Computer Science, Galgotia Publications, 1989.
- 4.J.P.Tremblay. and R Manohar, Discrete Mathematical Structures with Applications to Computer Science, McGraw-Hill, 1997.

Note: The latest editions of the books should be followed.

Bachelor of Computer Applications Semester – II
(Session 2021-22)
COURSE CODE: BCAM–2113
INTRODUCTION TO OBJECT ORIENTED PROGRAMMING-I

Course Outcomes:

After the completion of this course, the student will be able to:

CO1: Comprehend the concepts of Object Oriented Programming Paradigm

CO2: Write, compile and debug programs in C++, use different data types, operators and I/O function in a computer program

CO3: Apply OOPs concepts to model real world problems for its simplified implementation.

Bachelor of Computer Applications Semester – II
(Session 2021-22)
COURSE CODE: BCAM-2113
INTRODUCTION TO OBJECT ORIENTED PROGRAMMING- I

Examination Time: 3+3 Hrs

Max. Marks: 100

Theory: 50

Practical:30

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (10 marks each) are to set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section

UNIT -I

Programming Paradigms: Introduction to the object oriented approach towards programming by discussing Traditional, Structured Programming methodology.

Objects & Classes: Object Definition, Instance, Encapsulation, Data Hiding, Abstraction, Inheritance, Messages, Method, Polymorphism, Classes, Candidate & Abstract Classes to be examples of the Design process.

UNIT -II

Object Oriented Programming using C++: Characteristics of OOP, Overview of C++, I/O using cout and cin, Objects and Classes, Member functions and data, private & public, constructor & destructor, Constructor Overloading, Types of Constructors.

UNIT -III

Function Overloading: Function Overloading, Default Arguments, Ambiguity in Function Overloading.

Operator Overloading: Overloading unary and binary operators, Type Conversion using Operator Overloading

UNIT-IV

Inheritance: Concept of inheritance, Base & derived classes, Access Specifiers, Class Hierarchies, Types of Inheritance with examples.

Virtual Functions and Polymorphism: Virtual functions, friend functions, static function, this pointer, polymorphism, Types of Polymorphism with examples, templates, class templates.

References / Textbooks:

1. Herbertt Schildt, C++: The Complete Reference, Tata McGraw-Hill Education India, 4th Edition.

2. Bjarne Stroustrup, The C++ Programming Language, Addison – Wesley Professional (2013), 4th Edition
3. Bjarne Stroustrup, A Tour of C++ (C++ In-Depth Series), Addison – Wesley Professional (2018), 2nd Edition
4. G.S. Baluja, C++ Program Design (w/CD), Khanna Book Publishing Company (2015), 2nd edition.
5. Stanley Lippman, Josee Lajoie, Barbara Moo, C++ Primer, Addison-Wesley Professional (2012), 5th edition.
6. Richard Johnsonbaugh and Martin Kalin, Object Oriented Programming in C++, Pearson Education (1999), 2nd Edition

Bachelor of Computer Applications Semester – II
(Session 2021-22)
COURSE CODE: BCAL–2114
PRINCIPLES OF DIGITAL ELECTRONICS

Course Outcomes:

After the completion of this course, the student will be able to:

CO1: Comprehend and apply the number systems and Boolean Algebra.

CO2: Design advanced and complex electronic circuits.

CO3: Reduce Boolean Expressions and implement them with Logic Gates.

CO4: Demonstrate the internal structure of semiconductor memory

Bachelor of Computer Applications Semester – II
(Session 2021-22)
COURSE CODE: BCAL–2114
PRINCIPLES OF DIGITAL ELECTRONICS

Examination Time: 3 Hrs

Max. Marks: 100

Theory: 80

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (16 marks each) are to set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section

UNIT-I

Number System: Introduction, number conversion system , binary arithmetic, representation of signed binary numbers, 1's and 2's complement, Codes: straight binary code, BCD Code Excess3 Code, Grey Code ASCII, Integer and floating point representation

UNIT- II

Logic Gates and Boolean Algebra: Logic gates, Universal Gates, Boolean algebra and Minimization techniques, canonical forms of Boolean expressions, K-Map

UNIT-III

Combinational Circuits: Adder, Subtractor, Multiplexer, Demultiplexer, Decoder, Encoder
Sequential Circuits: Flip-flops, clocks and timers, registers, counter

UNIT-IV

Semiconductor memories: Introduction, Static and dynamic devices, read only & random access memory chips, PROMS and EPROMS Address selection logic. Read and write control timing diagrams for ICs

References / Textbooks:

1. M. Morris Mao, Digital Design, Pearson Publication (2018), 6th Edition.
2. Ronald J. Tocci, Digital Systems, Pearson (2009), 10th Edition.
3. Morris Mano, Digital Logic and Computer Design, Pearson Education (2004), 1st Edition.
4. V.K. Jain, Arti Agarwal, Digital Electronics, Genius Publications Pvt. Ltd. (2018), 1st Edition

5. K. Meena, Principles of Digital Electronics, Prentice Hall India Learning Private Limited (2009), 1st Edition
6. William H. Gothmann, Digital Electronics: An introduction to Theory and Practice, Prentice Hall India Learning Private Limited (1982), 2nd Edition

Bachelor of Computer Applications Semester – II
(Session 2021-22)
COURSE CODE: BCAL–2115
NUMERICAL METHODS AND STATISTICAL TECHNIQUES

Course Outcomes:

After the completion of this course, the student will be able to:

CO1: Comprehend mechanics of elementary methods and statistical inference techniques for numerical analysis.

CO2: Demonstrate the application of numerical methods on different platform with the use of programming language.

CO3: Apply learned techniques to solve linear and non-linear equations related to real world problems.

Bachelor of Computer Applications Semester – II
(Session 2021-22)
COURSE CODE: BCAL–2115
NUMERICAL METHODS AND STATISTICAL TECHNIQUES

Examination Time: 3 Hrs

Max. Marks: 100

Theory: 80

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (16 marks each) are to set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section

UNIT-I

Introduction: Numerical Methods, Numerical methods versus numerical analysis, Errors and Measures of Errors.

Non-linear Equations: Bisection Method, False Position method and Newton Raphson's Method

Linear Equations: Direct Method - Gauss Elimination Method, Gauss Jordan Method, Iterative method – Gauss Seidal Method.

UNIT-II

Interpolation: Lagrange's method, Newton's Methods: Forward Difference Method, Backward Difference Method Divided Difference Method.

Numerical Integration: Trapezoidal Rule, Simpson's 1/3 method and Simpson's 3/8 Method

UNIT-III Statistical Techniques:

Measure of Central Tendency: Arithmetic mean, Geometric Mean, Harmonic Mean, Median, Mode.

Measures of dispersion: Range, Quartile Deviation, Mean deviation, Standard deviation, Co-efficient of variation.

UNIT –IV

Correlation: Introduction, Karl Pearson's Coefficient of Correlation, Rank Correlation

Regression: Regression line and regression equations, Regression Coefficient

Non Linear Curve Fitting: Fit a polynomial equation, Fit an exponential curve, Geometric Curve, Logarithmic curve

References / Textbooks:

1. Amrinder Pal Singh, Jaspal Singh, Anshuman Sharma, Fundamentals Of Numerical Methods And Statistical Techniques, Lakhanpal Publishers, 4th edition.
2. Kandasamy P.& et Al., Numerical Methods, S. Chand & Company (2006), Reprint Edn. 2006 Edition.
3. B.S. Grewal, Numerical Methods in Engineering & Science, Khanna Publishers (2013), 11th Edition.
4. E. Balagurusamy, Numerical Methods, Tata McGraw Hill Education (2017)
5. H.S.G. Rao, Numerical Methods, IK International Publishing House (2011)
6. S.S. Sastry, Introductory methods of Numerical Analysis, PHI (2012), 5th Edition

Bachelor of Computer Applications Semester – III
(Session 2021-22)
COURSE CODE: BCAL–3111
COMPUTER ARCHITECTURE

Course Outcomes:

After passing course the student will be able to:

CO1: Understand register and its micro-operations, computer instructions and basic design of computer.

CO2: Gain knowledge of various instruction formats and addressing modes.

CO3: Have understanding of memory organization and design.

CO4: Have understanding of I/O organization, Pipeline and vector processing.

Bachelor of Computer Applications Semester – III
(Session 2021-22)
COURSE CODE: BCAL–3111
COMPUTER ARCHITECTURE

Examination Time: 3 Hrs

Max. Marks: 75

Theory: 60

CA: 15

Instructions for Paper Setter -

Eight questions of equal marks(12 Marks each) are to set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT-I

Information Representation: Register Transfer, Various Registers, Implementing Common Bus Using Multiplexers: Logical; Arithmetic & Shift Micro-operations.

Basic Computer Design Instruction Codes, Interfacing various Registers, Computer Instructions, Timing Signals, Instruction Cycle, Design of a Basic Computer.

UNIT-II

CPU Design Stack Organized CPU, Instruction Formats, Addressing Modes, Program Control, Hardwired & Microprogrammed (Wilhe's Design) Control Unit.

UNIT-III

Memory Organization Memory Hierarchy, Designs & Concepts of Main Memory, Auxiliary Memory, Associative Memory, Cache and Virtual Memory.

UNIT-IV

I/O Organization I/O Interface, Modes of Transfer, Program Interrupt, DMA & I/O Processor.

Pipeline & Vector Processing Parallel Processing Pipelining, Parallel & Distributed Computers, SISD, SIMD & MISD, MIMD Machines, Vector Processing.

References/Textbooks:

1. Morris M. Mano, Computer System Architectue, Prentice Hall, 1992.
2. J.P. Hayes, Computer Architecture and Organization, McGraw Hill, 1998.
3. J.L. Hennessy D.A Patterson, and D. Goldberg, Computer Architecture A Quantitative Approach, Pearson Education Asia, 2006.

Note: The latest editions of the books should be followed.

Bachelor of Computer Applications Semester – III
(Session 2021-22)
COURSE CODE:BCAL–3112
DATABASE MANAGEMENT SYSTEM

Course Outcomes:

After passing course the student will be able to:

CO1: Understand data, database and database models.

CO2: Gain knowledge of normalization and transaction control.

CO3: Gain knowledge of core database language-SQL.

CO4: Have a basic understanding of Big-data and NoSQL.

Bachelor of Computer Applications Semester – III
(Session 2021-22)
COURSE CODE:BCAL–3112
DATABASE MANAGEMENT SYSTEM

Examination Time: 3 Hrs

Max. Marks: 75

Theory: 60

CA: 15

Instructions for Paper Setter -

Eight questions of equal marks(12 Marks each) are to set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT-I

Introduction: Introduction to Data, Field, Record, File, Database, Database management system. Structure of database system, Advantages and Disadvantages, levels of database system, Relational model, Hierarchical model, Network model, comparison of models, E-R diagram, different keys used in a relational system, DBA, responsibilities of DBA.

UNIT-II

Codd's Rules, Relational Algebra, Relational Calculus - Domain and Tuple relational calculus, Query Processing and Optimization.

UNIT-III

Introduction to normalization – need and advantages of normalization, 1NF, 2NF, 3NF, BCNF, 4NF and 5NF, Introduction to transaction management – ACID Properties, concurrency control and its management, protection, security, recovery of database.

UNIT-IV

SQL: Introduction to SQL–DDL, DML, DCL, Join methods & sub query, Union Intersection, Minus, Built in Functions, Views, Security amongst users, sequences, Indexing,

Introduction to PL/SQL: Cursors – Implicit and Explicit, Procedures, Functions, Packages, Database Triggers.

Big Data: Introduction to Big Data and Analytics, Introduction to NoSQL.

References/Textbooks:

1. C. J. Date, An Introduction to Database Systems, Pearson Education 2000.

2. H. F. Korth & Silverschatz, A., Database System Concepts, Tata McGraw Hill, 2010.
3. Elmasri & Navathe, Fundamentals of Database Systems, Addison-Wesley, 2011.
4. Hoffer, Prescott, Mcfadden, Modern Database Management, Paperback International, 2012.
5. Martin Gruber, Understanding SQL, BPB Publication, 1994.
6. Shashank Tiwari, Professional NOSQL, Wiley, 2015.

Note: The latest editions of the books should be followed.

Bachelor of Computer Applications Semester – III
(Session 2021-22)
COURSE CODE:BCAL–3113
COMPUTATIONAL PROBLEM SOLVING

Course Outcomes:

After passing course the student will be able to:

CO1: Understand formulation of algorithms and programs for problem solving.

CO2: Gain understanding of various programming constructs like data types, operators, string processing and control structures.

CO3: Have knowledge of object oriented programming paradigm.

CO4: Have understanding of file handling, exception handling and SQLite database connectivity in python.

Bachelor of Computer Applications Semester – III
(Session 2021-22)
COURSE CODE:BCAL–3113
COMPUTATIONAL PROBLEM SOLVING

Examination Time: 3 Hrs

Max. Marks: 75

Theory: 60

CA: 15

Instructions for Paper Setter -

Eight questions of equal marks(12 Marks each) are to set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section

UNIT-I

Introduction to Python: Process of Computational Problem Solving, Python Programming Language

Data and Expressions: Literals, Variables and Identifiers, Operators, Expressions, Statements and Data Types

Control Structures: Boolean Expressions (Conditions), Logical Operators, Selection Control, Nested conditions, Debugging

UNIT-II

Lists: List Structures, Lists (Sequences) in Python, Iterating Over Lists (Sequences) in Python

Dictionaries: Dictionaries and Files, Looping and dictionaries, Advanced text parsing

Iteration: While statement, Definite loops using For, Loop Patterns, Recursive Functions, Recursive Problem Solving, Iteration vs. Recursion

UNIT-III

Functions: Fundamental Concepts, Program Routines, Flow of Execution, Parameters & Arguments

Files: Opening Files, Using Text Files, String Processing, Exception Handling

UNIT-IV

Objects and Their Use: Introduction to Object Oriented Programming

Modular Design: Modules, Top-Down Design, Python Modules

Using Databases and SQL: Database Concepts, SQLite Manager Firefox Add-on, SQL basics summary, basic Data Modeling, Programming with multiple tables.

References/Textbooks:

1. Charles Severance, Python for Informatics, Version 0.0.7.
2. Charles Dierbach, Introduction to Computer Science Using Python: A Computational Problem-Solving Focus, Wiley Publications, 2012.
3. Guttag John V, Introduction To Computation And Programming Using Python, PHI, 2014.
4. Jeeva Jose and Sojan P. Lal, Introduction to Computating & Problem Solving Through Python, Khanna Publishers, 2015.
5. Mark J. Guzdial, Introduction to Computing and Programming in Python, Pearson Education, 2015.
6. Kenneth Lambert, Fundamentals of Python, Course Technology, Cengage Learning, 2015
7. Mark Lutz, Learning Python, O'Reilly Media, 2013

Note: The latest editions of the books should be followed.

Bachelor of Computer Applications Semester – III
(Session 2021-22)
COURSE CODE: BCAP-3114
LAB ON COMPUTATIONAL PROBLEM SOLVING

Examination Time: 3 Hrs

Max. Marks: 50

Practical: 40

CA: 10

Lab based on computational problem solving.

Bachelor of Computer Applications Semester – III
(Session 2021-22)
COURSE CODE: BCAP-3115
LAB ON DATABASE MANAGEMENT SYSTEM

Examination Time: 3 Hrs

Max. Marks: 25

Practical: 20

CA: 5

Lab based on Database Management System .

Bachelor of Computer Applications Semester – IV
(Session 2021-22)

COURSE CODE: BCAL-4111

DATA STRUCTURES

Course Outcomes:

After passing course the student will be able to:

CO1: Comprehend various sorting and searching algorithms.

CO2: Implement the basic data structures and solve problems using fundamental algorithms.

CO3: Analyze complexity of algorithms to determine their efficiency.

CO4: Evaluate and choose adequate data structures to solve real world problems.

Bachelor of Computer Applications Semester – IV
(Session 2021-22)

COURSE CODE: BCAL-4111

DATA STRUCTURES

Examination Time: 3 Hrs

Max. Marks: 75

Theory: 60

CA: 15

Instructions for Paper Setter -

Eight questions of equal marks (12 marks each) are to set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section

UNIT-I

Basic Data Structure: Introduction to elementary Data Organization, Common Operation on Data Structures, Algorithm Complexity, Big O Notation, Time – Space tradeoff between Algorithms.

Arrays: Array Defined, Representing Arrays in Memory, Various Operations on Linear Arrays, Multidimensional Arrays.

UNIT-II

Sorting and Searching: Sorting Algorithms, Bubble Sort, Insertion Sort, Selection Sort, Merge Sort, Searching Algorithms, Linear Search and Binary Search.

Hashing: Hash Functions, Division Method, Mid-Square Method, Folding Method.

Linked Lists: Types of Linked Lists, Representing Linked Lists in Memory, Advantages of using Linked Lists over Arrays, Various Operations on Linked Lists.

UNIT-III

Stacks: Description of STACK structure, Implementation of Stack using Arrays and Linked Lists, Applications of Stacks – Converting Arithmetic expression from infix notation to polish and their subsequent evaluation, Quicksort Technique to sort an array.

Queues: Description of queue structure, Implementation of queue using arrays and linked lists, Description of priorities of queues, Dequeues.

UNIT-IV

Trees: Description of Tree Structure and its Terminology, Binary Trees and Binary Search Trees and their representation in Memory, Heapsort.

Graphs: Description of Graph Structure, Implement Graphs in Memory using Adjacency

Matrix, Path Matrix, graph traversal techniques - DFS, BFS.

References / Textbooks:

1. Seymour Lipschutz, Data Structures with C (Schaum's Outline Series), McGraw Hill Education (2017), 1st Edition
2. Reema Thareja, Data Structures Using C, Oxford Publication (2014), 2nd Edition
3. Sahni Horowitz, Fundamentals of Data Structures in C (2008), 2nd Edition
4. Narasimha Karumanchi, Data Structures and Algorithms made easy, Careermonk Publications (2016), 5th Edition
5. S.K. Srivastava and Deepali Srivastava, Data Structures through C, BPB Publications (2004)
6. Yedidyah Langsam, Augenstein and Tanenbaum, Data Structures using C and C++, Pearson Education India (2015), 2nd Edition

Bachelor of Computer Applications Semester – IV
(Session 2021-22)
COURSE CODE: BCAL-4112
INFORMATION SYSTEMS

Course Outcomes:

After passing course the student will be able to:

CO1: Identify the impact of information in decision making of an organization.

CO2: Comprehend various methods for capturing and accessing information including online access.

CO3: Comprehend various types of Information Systems - TPS, MIS, OAS and DSS.

CO4: Identify the role of Information System in organizations: Accounting Information systems, Inventory control systems and Marketing systems.

Bachelor of Computer Applications Semester – IV
(Session 2021-22)
COURSE CODE: BCAL–4112
INFORMATION SYSTEMS

Examination Time: 3 Hrs

Max. Marks: 75

Theory: 60

CA: 15

Instructions for Paper Setter -

Eight questions of equal marks (12 marks each) are to set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section

UNIT - I

Basic Terminology: Systems, Data, Information, Knowledge, Database and Database Management System.

Capturing of Information, sources of information, online access and capture.

UNIT - II

Types of systems, Introduction to Information system and its types.

Technologies for Information System: Latest trends in Hardware and Software.

Development life cycle of Information system.

UNIT - III

Types of Decisions: Structured, Unstructured and Semi Structured, Decision Support System (DSS), Transaction processing systems (TPS), office Automation systems (OAS).

UNIT - IV

Management Information System (MIS) and Expert System.

Case studies of the Information System: Accounting Information systems, Inventory control systems & Marketing systems.

References / Textbooks:

1. Mohammad Azam, Management Information Systems, Tata McGraw Hill Education (2012).
2. Nagpal D.P., Textbook on Management Information System, S.Chand & Company (2011).
3. R. Kelly, Rainer and Casey G. Cegielski, Introduction to Information Systems, Wiley (2015), 4th Edition
4. C. Laudon Kenneth and P. Laudon Jane, Management Information System, Pearson Education (2018), 15th Edition.
5. Brien, Marakas and Behl, Management Information Systems, McGraw Hill Education (2017), 10th Edition
6. Suman Mann Seema Shokeen, Pooja Singh, Information Systems, Dreamtech Press (2020)

Bachelor of Computer Applications Semester – IV
(Session 2021-22)
COURSE CODE: BCAL-4113
INTERNET APPLICATIONS

Course Outcomes:

After passing course the student will be able to:

CO1: Comprehend basics of internet and its working.

CO2: Apply the concepts for better e-mail management.

CO3: Comprehend different Internet protocols and search engines.

CO4: Apply basic web designing technologies to design webpage.

Bachelor of Computer Applications Semester – IV
(Session 2021-22)
COURSE CODE: BCAL-4113
INTERNET APPLICATIONS

Examination Time: 3 Hrs

Max. Marks: 75

Theory: 60

CA: 15

Instructions for Paper Setter -

Eight questions of equal marks (12 marks each) are to set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section

UNIT-I

Introduction: About Internet and its working, Business use of Internet, services offered by Internet, evaluation of internet, internet service provider (ISP), windows environment for dial up networking (connecting to internet), audio on Internet, Internet addressing (DNS) and IP addresses).

E-Mail Basics: Introduction, Advantage and disadvantage, structure of an e-mail message, working of e-mail (sending and receiving messages), managing e-mail (creating new folder, deleting messages, forwarding messages, filtering messages).

UNIT-II

Internet Protocol: Introduction, file transfer protocol (FTP), Gopher, Telnet, other protocols like HTTP and TCP/IP.

WWW: Introduction, working of WWW, Web browsing (opening, viewing, saving and printing a web page and bookmark).

UNIT-III

Web Designing: HTML – Elements, Attributes, Formatting, Paragraphs, Links, Lists, Tables, Images, Frames, Forms.

CSS – Types, Syntax, Colors, Background, Box model, Fonts, Alignment, CSS Links.

JavaScript – Syntax, Operators, Data-Types, Function, Array.

UNIT-IV

Search Engine: About search engine, component of search engine, working of search engine, difference between search engine and web directory.

Intranet and Extranet: Introduction, application of intranet, business value of intranet, working of intranet, role of extranet, working of extranet, difference between intranet and extranet.

References / Textbooks:

1. Anshuman Sharma, Fundamentals of Internae Applications, Lakhanpal Publications (2016)
2. Ikvinderpal Singh, Internet Applications, Khanna Book Publishing Company (2011), 1st Edition
3. P. Rizwan Ahmed, Internet & its Applications, Margham Publications (2013)
4. Douglas E. Comer, Computer Networks and Internet with Internet Applications, Pearson (2008), 4th Edition
5. Satish Jain/Vineeta Pillai, Wireless Communication & Networking made Simple, BPB Publishers (2007)
6. Laura Lerney, Rafe Colburn, Jennifer Kyrnin, Mastering HTML, CSS & Javascript Web Publishing, BPB Publishers (2016), 1st Edition

Bachelor of Computer Applications Semester – IV
(Session 2021-22)
COURSE CODE: BCAL-4114
FOUNDATION OF DATA SCIENCE

Course Outcomes:

After passing course the student will be able to:

CO1: Comprehend basic concepts of Data Science along with its components and process.

CO2: Analyze different application areas and challenges of data science.

CO3: Interpret various data collection tools.

CO4: Comprehend various types of data analytics.

Bachelor of Computer Applications Semester – IV
(Session 2021-22)
COURSE CODE: BCAL-4114
FOUNDATION OF DATA SCIENCE

Examination Time: 3 Hrs

Max. Marks: 75

Theory: 60

CA: 15

Instructions for Paper Setter -

Eight questions of equal marks (12 marks each) are to set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section

UNIT-I

Introduction: Meaning, Evolution of Data science, Need of Data Science, Components of Data Science, Data Science process. Difference between data science and business intelligence.

UNIT- II

Application Areas and Challenges in Data Science. Job Roles in Data Science.

Domain Data Analysis: Exploratory and Confirmatory data analysis.

UNIT-III

Data Collection and Data Analytics.

Data Collection sources, Data collection methods – Primary data collection methods and Secondary data collection methods.

UNIT-IV

Data Collection Tools – online and offline.

Understanding Data Analytics: Need, Characteristics.

Types: Descriptive, Predictive, Diagnostic, Prescriptive

References / Textbooks:

1. Qurban A Memon, Shakeel Ahmed, Data Science: Theory, Analysis and Applications, CRC Press (2019), 1st edition.

2. Ulrika Jagare, Data Science for Dummies, Wiley (2019)
3. Joel Grus, Data Science from Scratch, O'Reilly (2015), 1st Edition
4. Pulkit Bansal, Data Science Uncovering the Reality, Notion Press (2020), 1st Edition
5. Davy Cielen, Arno D.B.Meysman, Mohamed Ali, Introducing Data Science: Big Data, Machine Learning, Dreamtech Press (2016)
6. Roger Peng, Elizabeth Matsui, The Art of Data Science, Lulu.com (2016)
7. Ramesh Sharda, Dursun Delen and Efraim Turban, Business Intelligence, Analytics and Data Science: A Managerial Perspective, Pearson Education (2019), 4th Edition

Bachelor of Computer Applications Semester – IV
(Session 2021-22)
COURSE CODE: BCAP-4115
LAB ON DATA STRUCTURES

Examination Time: 3 Hrs

Max. Marks: 50

Theory: 40

CA: 10

Lab based on Data Structures .

Bachelor of Computer Applications Semester – IV
(Session 2021-22)
COURSE CODE: BCAP-4116
LAB ON INTERNET AND WEB DESIGNING

Examination Time: 3 Hrs

Max. Marks: 50

Theory: 40

CA: 10

Lab Based on Use of Internet and Web Designing.

Bachelor of Computer Applications Semester – V
(Session 2021-22)

COURSE CODE: BCAL-5111
COMPUTER NETWORKS

Course Outcomes:

After passing course the student will be able to:

- CO1: Describe the functions of each layer in OSI and TCP/IP model. CO2: Understand the types of transmission media with real time applications CO3: Describe the Data Link layer and Network layer design issues.
- CO4: Explain the functions of Transport layer and Application layer protocols.
- CO5: Have a basic knowledge of the use of cryptography and network security.

Bachelor of Computer Applications Semester – V
(Session 2021-22)

COURSE CODE: BCAL-5111
COMPUTER NETWORKS

Examination Time: 3 Hrs

Max. Marks: 75

Theory: 60

CA: 15

Instructions for Paper Setter -

Eight questions of equal marks (12 Marks each) are to set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT – I

Introduction: Basic concepts of Computer Networks, Basic Components of a Network, Network types and topologies. OSI Reference Model, TCP/IP Model, Comparison between TCP/IP and OSI model,

Transmission Media: Coaxial cable, Twisted pair cable, Fiber optics & Satellites.

UNIT – II

Network Devices - Hub, Switch, Repeaters, Bridges, Routers, Gateways.

Introduction to Analog and Digital Transmission: Telephone system, Modems, Types of modems, pulse code modulation. Multiplexing and its types, Circuit Switching, Packet Switching, Message Switching, ISDN service transmission.

UNIT - III

Data Link Layer Design Issues: Framing, Error Control, Flow Control, Error Detection & Correction, Media Access Protocols: ALOHA, CSMA, CSMA/CD, CSMA/CA. IEEE standards 802: Token Bus, Token Ring, FDDI.

Design Issues of Network Layer: Routing, IPv4: Notation, Classful addressing, Header Format, IPv6 addressing.

UNIT – IV

Design issues of Transport Layer: TCP, UDP

Network Security and Privacy: Brief Introduction to Cryptography.

Network Services: File transfer, Access & Management, Electronic Mail, Remote login

References/Textbooks:

1. Tanenbaum , A.S., Computer Networks, Prentice Hall, 2010.
2. Stallings, W., Local Networks: An Introduction: Macmillan Publishing Co, 1990.
3. Stallings W., Data and Computer Communications, Prentice Hall, 2011.
4. Forouzan B., Data Communications and networking, McGraw Hill, 2007.

Note: The latest editions of the books should be followed.

Bachelor of Computer Applications Semester – V
(Session 2021-22)
COURSE CODE: BCAL-5112
WEB TECHNOLOGIES

Course Outcomes:

After passing course the student will be able to:

CO1: Understand the basics of websites and use of different markup languages.

CO2: Gain knowledge of different client side technologies.

CO3: Develop single page application through React.

Bachelor of Computer Applications Semester – V
(Session 2021-22)
COURSE CODE: BCAL-5112
WEB TECHNOLOGIES

Examination Time: 3 Hrs

Max. Marks: 75

Theory: 60

CA: 15

Instructions for Paper Setter -

Eight questions of equal marks (12 Marks each) are to set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT I

Web Essentials – Client/Server Architecture, Web Server, Webpage, Website, Internet, Protocol, OSI model, IP Addresses, Port, HTTP Method, HTTP Response/Request, HTTPS, URL, Browser Architecture, E-mail Protocols, World Wide Web, DNS.

HTML – Basics, Program Structure, Headings, Paragraph, Styling, Formatting, Hyperlink, Image, Table, List, Frame, Block, Entities, Form, Form Elements, Introduction To XHTML.

CSS – Types, Selector, Colors, Background, Box Model, Text, Font, Display, Position, Float, Clear, Rounded Corners.

UNIT - II

JavaScript – Basics, Features, Advantages, Limitations, Types, Basics, Functions, Control Statement, Arrays, JavaScript Objects, Host Objects.

DOM – Introduction, Methods, Accessing HTML and CSS, Events, Event Listener, Nodes and Collection.

BOM – Window, Screen, History, Navigation.

UNIT – III

ES6 – Variables, Arrow functions, Class and Inheritance.

Introduction to React - Render HTML, JSX.

React Components – Web component, Class, Function, Constructor, nested Component.

UNIT IV

Data Handling – Props, Props Validation, State, Fetching Data through API.

Lifecycle of React Components, Form Handling in React, Event Handling in React, React Sass.

References/Textbooks:

1. Jeffery C Jackson, Web Technology- A Computer Science perspective, Pearson Education, 2007.
2. Chris Bates, Web Programming- Building Internet Applications, Wiley India, 2006.
3. Achyut S Godbole and AtulKahate, Web technologies, Tata McGraw Hill, 2002.
4. Uttam K Roy, Web Technologies, Oxford University Press, 2010.
5. Kirupa Chinnathambi, Learning React, Addison-Wesley Professional, 2019.
6. Alex Banks, Eve Porcello, Learning React: Functional Web Development with React and Redux, O'Reilly Media, 2017.

Note: The latest editions of the books should be followed.

Bachelor of Computer Applications Semester – V

(Session 2021-22)

COURSE CODE: BCAL – 5113

OPERATING SYSTEM

Course Outcomes:

After passing course the student will be able to:

CO1: Describe, contrast and compare different types of Operating System.

CO2: Understand the process management policies and CPU scheduling.

CO3: Describe and analyze the memory management and its allocation policies.

CO4: Gain knowledge of operating system concepts that includes virtual memory, mutual exclusion algorithms and deadlock handling.

Bachelor of Computer Applications Semester – V
(Session 2021-22)
COURSE CODE: BCAL-5113
OPERATING SYSTEM

Examination Time: 3 Hrs

Max. Marks: 75

Theory: 60

CA: 15

Instructions for Paper Setter -

Eight questions of equal marks (12 Marks each) are to set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT – I

Introduction: Definition, Batch Processing, Multi programming, Time Sharing Systems, Multitasking, multiprocessing, Parallel Systems, Distributed Systems, Real-time Systems.

Processes: Process Concepts, Process Scheduling, Threads, System Calls.

UNIT - II

CPU–Scheduling: Basic concepts, Scheduling Criteria, Scheduling Algorithms, Algorithm Evaluation: Response Time, Turnaround Time, Waiting Time, Throughput.

Process Synchronization: Critical-section problem, semaphores and its Types (Binary and Counting), Classical problems of synchronization and their solutions.

UNIT – III

Deadlocks: System Model, Deadlock characterization, Methods for handling deadlocks, Deadlocks Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock, Approach to Deadlock handling.

Memory Management: Background, Logical v/s Physical Address Space, Swapping, Continuous Allocation, Paging, Segmentation.

UNIT – IV

Virtual Memory: Background, Page Fault, Demand Paging, Page Replacement, Page Replacement Algorithms, Thrashing.

Secondary Storage Structures: Disk structures, Disk scheduling.

References/Textbooks:

1. Avi Silberschatz, Peter Baer Galvin, Greg Gagne, Operating System Concepts, Wiley, 2013.
2. Charles Crowley, Operating Systems: A Design-Oriented Approach, Tata McGraw Hill, 2001.
3. Deitel, An Introduction to Operating Systems, Second Edition, Addison Wesley, 1990.
4. William Stallings, Operating Systems: Internals and Design Principles, Pearson Education Limited, 2014.

Note: The latest editions of the books should be followed.

Bachelor of Computer Applications Semester – V
(Session 2021-22)
COURSE CODE: BCAL-5114
OBJECT ORIENTED PROGRAMMING-II

Course Outcomes:

After passing this course the student will be able to:

CO1: Understand the basic fundamentals of Object Oriented Programming using Java .

CO2: Gain knowledge of object oriented concepts to model real world problems.

CO3: Have knowledge of packages, multithreading and Exception handling.

CO4: Demonstrate the concept of file handling and Applets.

Bachelor of Computer Applications Semester – V
(Session 2021-22)
COURSE CODE: BCAL-5114
OBJECT ORIENTED PROGRAMMING-II

Examination Time: 3 Hrs

Max. Marks: 75

Theory: 60

CA: 15

Instructions for Paper Setter -

Eight questions of equal marks (12 Marks each) are to set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT-I

Introduction to Object Oriented Programming using Java: Features, Object Orientation Concepts, Java Virtual Machine, Data Types, Operators, Control Structures.

UNIT-II

Introduction to OOPS: Classes & Methods, Constructors, Inheritance & Polymorphism

UNIT-III

Packages & Interfaces, Multithreading in Java, Exception Handling.

UNIT-IV

I/O Stream Classes & File Handling.

Applets: Applet basics, Applet Life Cycle, Applet Display, Repaint, Parameter Passing.

References/Textbooks:

1. Hurbert Schildt, Java The Complete Reference, Tata MacGraw Hill, 2014.
2. Y. Daniel Liang, Introduction to Java Programming, Pearsons Publications, 2015.
3. Jon Duckett, Beginning Web Programming with HTML, XHTML, and CSS, John Wiley & Sons, 2004.
4. Thomas A. Powell, HTML & CSS: The Complete Reference, McGraw-Hill, 2010.

Note: The latest editions of the books should be followed.

Bachelor of Computer Applications Semester – V
(Session 2021-22)
COURSE CODE: BCAP-5115
LAB ON OBJECT ORIENTED PROGRAMMING-II

Examination Time: 3 Hrs

Max. Marks: 50

Practical: 40

CA: 10

Lab Based on Object Oriented Programming .

Bachelor of Computer Applications Semester – V
(Session 2021-22)
COURSE CODE: BCAP-5116
LAB ON WEB TECHNOLOGIES

Examination Time: 3 Hrs

Max. Marks: 50

Practical: 40

CA: 10

Lab Based on Web Technologies.

Bachelor of Computer Applications Semester – VI

(Session 2021-22)

COURSE CODE: BCAL – 6111

COMPUTER GRAPHICS

Course Outcomes:

After passing this course the student will be able to:

CO1: Comprehend the background mechanism involved in display devices like CRT, LCD, LED, etc.

CO2: Comprehend basic concepts involved in drawing basic shapes.

CO3: Implement various algorithms to scan, convert the basic geometrical primitives, transformations, Area filling, clipping, etc.

CO4: Identify the importance of viewing and projections.

Bachelor of Computer Applications Semester – VI
(Session 2021-22)
COURSE CODE: BCAL – 6111

COMPUTER GRAPHICS

Examination Time: 3 Hrs

Max. Marks: 75

Theory: 60

CA: 15

Instructions for Paper Setter -

Eight questions of equal marks (12 marks each) are to set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT – I

Overview of Graphics System: Computer Graphics and their applications.

Display Devices: CRT Monitors (Random Scan and Raster Scan, DVST, Plasma – Panel Display, LED and LCD Monitors, Virtual Reality and Workstation.

UNIT – II

Elementary Drawing: Points and various line drawing Algorithms and their comparisons. Circle Generating Algorithms, Algorithms for Ellipse, Arc and Sector.

UNIT – III

Two Dimensional Transformations: Basic Transformations - Translation, Rotation, Scaling, Reflection and Shearing. Matrix representation of Basic Transformations and Homogenous Coordinates.

Composite Transformations: Windowing and Clipping. Windowing Concepts, Clipping and its Algorithms, Window-to-View Port Transformations.

UNIT - IV

Three Dimensional concepts: 3D Coordinate Systems, 3D Transformations - Translation, Rotation, Scaling, Reflection and Shearing,

Projection: Parallel Projections, Perspective Projection, Vanishing Point, View Confusion and Topological Distortion.

References / Textbooks:

1. Hearn D, Baker P, Computer Graphics, PHI Eastern Economy (2002), 2nd Edition.
2. Zhigang Xiang, Plastock R, Kalley G, Computer Graphics, McGraw Hill Education (2006), 2nd Edition.
3. Rajesh K. Maurya, Computer Graphics with Virtual Reality System, Wiley (2018), 3rd Edition
4. Udit Aggarwal, Computer Graphics, SK Katria and Sons (2013), Reprint 2013 Edition
5. Padeep K. Bhatia, Computer Graphics, Dreamtech Press (2019)
6. Andries Van Dam, Foley, Steven, John, Computer Graphics Principles and Practice, Pearson Education India (2002), 2nd Edition

Bachelor of Computer Applications Semester – VI
(Session 2021-22)
COURSE CODE: BCAL – 6112
SOFTWARE ENGINEERING

Course Outcomes:

After passing course the student will be able to:

- CO1: identify and evaluate various process model used for development of software.
- CO2: Analyze gathered data to form requirement specifications.
- CO3: Design modular and structured design of a system.
- CO4: Identify various documentation involved in different phases of system development.
- CO5: Apply testing techniques on basic building blocks and control structure.
- CO6: Comprehend activities involved in software project management.

Bachelor of Computer Applications Semester – VI
(Session 2021-22)
COURSE CODE: BCAL – 6112
SOFTWARE ENGINEERING

Examination Time: 3 Hrs

Max. Marks: 75

Theory: 60

CA: 15

Instructions for Paper Setter -

Eight questions of equal marks (12 marks each) are to set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT – I

Introduction to Software: Definition, Software characteristics, Software Components, Software Applications.

Introduction to Software Engineering: Definition, Software Engineering Paradigms, Waterfall Model, Prototyping Model, Incremental Model, Spiral Model.

UNIT – II

Requirement, Analysis and Specifications – Problem Analysis, Requirement Gathering Tools (Questionnaire, Interview, Group Discussion, Observation), SRS Document and its Characteristics, Structured Analysis: Data Flow Diagram, Data Dictionaries.

Software Design – Characteristics, Structure Chart, Coupling, Cohesion, Functional Independence.

UNIT – III

Project Management – SPMP Document, Size Estimation (LOC, Function Point), COCOMO (Basic, Intermediate and Complete COCOMO), Effort Estimation, Development Time Estimation, Project Scheduling (Work Breakdown Structure, Activity Network, Critical Path Method, Gantt Chart, PERT Chart), Staffing.

Risk management and Control, software Maintenance and its types, Software Reuse, Software Reliability.

UNIT – IV

Coding– Coding Standards and Guidelines, Code Walkthrough, Code Inspection.

Testing - Test Case Design, Unit Testing, Black Box Testing (Equivalence Class Partitioning, Boundary Value Analysis), White Box Testing (Statement, Branch, Condition, Path Coverage), Cyclomatic Complexity, Integration Testing, System Testing (Alpha, Beta, Acceptance), Validation And Verification, Performance Testing.

References / Textbooks:

1. Roger S. Pressman, Software Engineering, McGraw-Hill series (2014) , 8th Edition.
2. Pankaj Jalote, A concise introduction to Software Engineering, Wiley (2008).
3. Rajib Mall, Fundamentals of Software Engineering, PHI Learning (2018), 5th Revised Edition
4. Kogent Learning Solutions Inc., Software Engineering, Dreamtech Press (2012)
5. Bruce R.Maxim, Roger S. Pressman, Software Engineering: A Practioner's Approach, McGraw Hill Education (2019), Eighth edition
6. David A. Gustafson, Schaum's Outline of Software Engineering, McGraw Hill (2020), 1st Edition

Bachelor of Computer Applications Semester – VI
(Session 2021-22)
COURSE CODE: BCAP - 6113
LAB ON COMPUTER GRAPHICS

Examination Time: 3 Hrs

Max. Marks: 50
Practical: 40
CA: 10

Lab Based on Applications of Computer Graphics .

Bachelor of Computer Applications Semester – VI
(Session 2021-22)
COURSE CODE: BCAP - 6114
PROJECT

Course Outcomes:

After passing this course the student will be able to:

CO1: Apply software engineering paradigms like Process Model, Analysis, Design, Testing, etc.

CO2: Work within defined time and resource constraints while developing real world application.

CO3: Address the Real World Problems and find the required solution.

CO4: Demonstrate an ability to work in teams and manage the conduct of the research study.

CO5: Formulate and propose a plan for creating a solution.

Bachelor of Computer Applications Semester – VI
(Session 2021-22)
COURSE CODE: BCAP - 6114
PROJECT

Examination Time: 3 Hrs

Max. Marks: 300

Practical: 240

CA: 60

General Instructions:

1. A software module based on the work done in the entire course is to be developed.
2. The soft copy of the module shall be submitted to the College/Institute till April 5 of the respective semester.
3. The software module shall be developed in groups, consisting of at most two students in a group.
4. The respective college shall depute guide(s)/supervisor(s) under whose supervision the software module shall be developed. The guide/supervisor shall clarify that the work done is original & authenticated. The certificate found to be incorrect at any stage shall attract the proceedings against all the stakeholders, as per rules.
5. The evaluation of the module shall be done as per the common ordinance of UG/PG w.e.f. 2012–2013 under semester system.

(Annexure C-2)

FACULTY OF COMPUTER SCIENCE & IT

SYLLABUS

of

Bachelor of Science (Information Technology)

(Semester I-VI)

(Under Continuous Evaluation System)

(12+3 System of Education)

Session 2021-22



The Heritage Institution

**KANYA MAHA VIDYALAYA
JALANDHAR
(Autonomous)**

Program Specific Outcomes
Bachelor of Science (Information Technology)
(Session 2021-22)

After completing this program, the students will be able to:

PSO1: Apply skills for development of software and websites for providing efficient solution to IT based problems.

PSO2: Comprehend development process in IT industry through ethical, defined and innovative techniques.

PSO3: Achieve leadership role and team player role to be able to work in multidisciplinary areas at various job roles.

PSO4: Identify and demonstrate the implementation of various tools and technologies involved in the field of Information Technology.

PSO5: Demonstrate proficiency in the field of Programming, Web development and IT enabled services.

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATIONS OF THREE YEAR DEGREE PROGRAMME

Bachelor of Science (Information Technology)

Session 2021-22

Bachelor of Science (Information Technology) Semester – I							
Course Code	Course Name	Course Type	Marks				Examination Time (in Hours)
			Total	Ext.		CA	
				L	P		
BITL-1421 / BITL-1031/ BITL-1431	Punjabi (Compulsory) / ¹ Basic Punjabi/ ² Punjab History and Culture (From Earliest Times to C. 320)	C	50	40	-	10	3
BITL-1102	Communication Skills in English	C	50	40	-	10	3
BITM-1113	Introduction to Programming – C	C	100	50	30	20	3+3
BITM-1114	Fundamentals of Computers	C	100	50	30	20	3+3
BITL-1335	Applied and Discrete Mathematics	C	100	80	-	20	3
AECD-1161	*Drug Abuse: Problem, Management and Prevention (Compulsory)	AC	50	40	-	10	3
SECF-1492	*Foundation Course	AC	25	20	-	05	1

Note:

C - Compulsory

AC - Audit Course

¹ Special course in lieu of Punjabi (Compulsory)

¹ Special course in lieu of Punjabi (Compulsory) for those students who are not domicile of Punjab.

*Marks of these courses will not be added in total marks and only grades will be provided.

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATIONS OF THREE YEAR DEGREE PROGRAMME

Bachelor of Science (Information Technology)

Session 2021-22

Bachelor of Science (Information Technology) Semester – II							
Course Code	Course Name	Course Type	Marks				Examination Time (in Hours)
			Total	Ext.		CA	
				L	P		
BITL-2421 / BITL-2031/ BITL-2431	Punjabi (Compulsory) / ¹ Basic Punjabi/ ² Punjab History and Culture (C. 320 to 1000 B.C.)	C	50	40	-	10	3
BITM-2102	Communication Skills in English	C	50	25	15	10	3+3
BITM-2113	Introduction to Object Oriented Programming-I	C	100	50	30	20	3+3
BITL-2114	Principles of Digital Electronics	C	100	80	-	20	3
BITL-2115	Numerical Methods and Statistical Techniques	C	100	80	-	20	3
AECD-2161	*Drug Abuse: Problem, Management and Prevention (Compulsory)	AC	50	40	-	10	3
SECM-2502	*Moral Education	AC	25	20	-	05	1
	Total		400				

Note:

C - Compulsory

AC - Audit Course

¹ Special course in lieu of Punjabi (Compulsory)

² Special course in lieu of Punjabi (Compulsory) for those students who are not domicile of Punjab.

*Marks of these courses will not be added in total marks and only grades will be provided.

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATIONS OF THREE YEAR DEGREE PROGRAMME

Bachelor of Science (Information Technology)

Session 2021-22

Bachelor of Science (Information Technology) Semester – III							
Course Code	Course Name	Course Type	Marks				Examination Time (in Hours)
			Total	Ext.		CA	
				L	P		
BITL-3111	Computational Problem Solving	C	75	60	-	15	3
BITL-3112	Data Structures	C	75	60	-	15	3
BITL-3113	System Analysis and Design	C	75	60	-	15	3
BITP-3114	Lab on Computational Problem solving	C	50	-	40	10	3
BITP-3115	Lab on Data Structures	C	25	-	20	05	3
AECE - 3221	* Environmental Studies (Compulsory)	AC	100	60	20	20	3
SECP - 3512	*Personality Development	AC	25	20	-	05	1
	Total		300				

Note:

C - Compulsory

AC - Audit Course

*** Marks of these courses will not be added in total marks and only grades will be provided.**

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATIONS OF THREE YEAR DEGREE PROGRAMME

Bachelor of Science (Information Technology)

Session 2021-22

Bachelor of Science (Information Technology) Semester - IV							
Course Code	Course Name	Course Type	Marks				Examination Time (in Hours)
			Total	Ext.		CA	
				L	P		
BITL-4111	Database Management System	C	75	60	-	15	3
BITL-4112	Internet Applications	C	75	60	-	15	3
BITL-4113	Object Oriented Programming- II	C	75	60	-	15	3
BITL-4114	E-Business	C	75	60	-	15	3
BITP-4115	Lab on Database Management System	C	50	-	40	10	3
BITP-4116	Lab on Object Oriented Programming - II	C	50	-	40	10	3
SECS - 4522	*Social Outreach	AC	25	-	20	05	1
	Total		400				

Note:

C - Compulsory

AC - Audit Course

*** Marks of these courses will not be added in total marks and only grades will be provided.**

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATIONS OF THREE YEAR DEGREE PROGRAMME

Bachelor of Science (Information Technology)

Session 2021-22

Bachelor of Science (Information Technology) Semester - V							
Course Code	Course Name	Course Type	Marks				Examination Time (in Hours)
			Total	Ext.		CA	
				L	P		
BITL-5111	Computer Networks	C	100	80	-	20	3
BITL-5112	Web Technologies	C	100	80	-	20	3
BITL-5113	Operating System	C	100	80	-	20	3
BITP-5114	Lab on Web Technologies	C	50	-	40	10	3
BITP-5115	Lab on Operating System	C	50	-	40	10	3
SECJ-5551 /SECI-5541	* Job Readiness Course/ Innovation, Entrepreneurship and Creative Thinking	AC	25	20	-	05	1
	Total		400				

Note:

C – Compulsory

*** Marks of these courses will not be added in total marks and only grades will be provided**

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATIONS OF THREE YEAR DEGREE PROGRAMME

Bachelor of Science (Information Technology)

Session 2021-22

Bachelor of Science (Information Technology) Semester - VI							
Course Code	Course Name	Course Type	Marks				Examination Time (in Hours)
			Total	Ext.		CA	
				L	P		
BITL-6111	Computer Graphics	C	75	60	-	15	3
BITL-6112	Software Engineering	C	75	60	-	15	3
BITP-6113	Lab on Computer Graphics	C	50	-	40	10	3
BITP-6114	Project	C	200	-	160	40	3
	Total		400				

Note:

C - Compulsory

Bachelor of Science (Information Technology) Semester- I

Session 2021-22

COURSE CODE: BITM–1113

INTRODUCTION TO PROGRAMMING - C

Course Outcomes:

After passing course the student will be able to:

CO1: Understand formulation of algorithms and flowcharts for problem solution and different programming constructs.

CO2: Have knowledge of execution flow of a C program for programming and maintenance.

CO3: Apply programming concepts to provide solution in different problem domains.

Bachelor of Science (Information Technology) Semester- I

Session 2021-22

COURSE CODE: BITM-1113

INTRODUCTION TO PROGRAMMING - C

Examination Time: (3+3) Hrs.

Max. Marks: 100

Theory: 50

Practical: 30

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (10 marks each) are to be set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section

UNIT-I

Fundamentals: Character set, Identifiers and Key Words, Data types, Constants, Variables, Expressions, Statements, Symbolic Constants.

Operations and Expressions: Arithmetic operators, Unary operators, Relational Operators, Logical Operators, Assignment and Conditional Operators, Library functions. Data Input and Output statements

UNIT -II

Control Statements: Preliminaries, While, Do-while and for statements, Nested loops, If-else, Switch, Break – Continue statements.

Program Structure Storage Class: Storage Classes- Auto, extern, register and static . about library functions.

UNIT-III

Functions: Brief overview, defining, accessing functions, passing arguments to function, specifying argument data types, function prototypes, recursion.

Arrays: Defining, processing an array, passing arrays to a function, multi-dimensional arrays.

Strings: String declaration, string functions and string manipulation.

UNIT - IV

Structures & Unions: Defining and processing a structure, user defined data types, structures and pointers, passing structures to functions, self referenced structure, unions.

Pointers: Fundamentals, pointer declaration, passing pointer to a function, pointer and one dimensional arrays, operation on pointers, pointers & multi-dimensional arrays of pointers, passing functions, other functions, more about pointer declarations.

References/Textbooks:

1. E Balagurusamy, Programming in ANSI C, Tata McGraw-Hill, 2002.
2. Byron Gottfried, Schaum's Outline Programming with C, McGraw Hill, 1996.
3. Brian W. Kernighan, Dennis M. Ritchie, The C Programming language, Prentice Hall, 1988.
4. Stephen G. Kochan, Programming in C, Pearson Education, 2015.

Note: The latest editions of the books should be followed.

Bachelor of Science (Information Technology) Semester- I

Session 2021-22

COURSE CODE: BITM–1114

FUNDAMENTALS OF COMPUTERS

Course Outcomes:

After passing course the student will be able to:

CO1: Have knowledge of Computer fundamentals, operating system concepts and office automation software.

CO2: Apply office automation software to create professional and academic documents and presentations.

CO3: work on Spreadsheet application for office tasks.

Bachelor of Science (Information Technology) Semester- I

Session 2021-22

COURSE CODE: BITM-1114

FUNDAMENTALS OF COMPUTERS

Examination Time: (3+3) Hrs.

Max. Marks: 100

Theory: 50

Practical: 30

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (10 marks each) are to be set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts(not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT I

Fundamentals of Computer: Introduction to computer, Applications of computer, Components of computers (Input unit, Output Unit, Memory Unit & CPU).

Software: Application Software, Service software, System software -operating system (Types & Function of OS), Translators (compiler, interpreter, assembler), Booting a System.

UNIT II

Input Devices: Keyboards, Mouse, Joystick, Track Ball, Light Pen and Data Scanning devices (scanner, OCR, OMR, MICR, Bar Code Reader, Card Reader)

Output Devices: Monitor, Printers (laser printer, dot matrix printer, ink jet printer)

Memories: Primary Memory -RAM (Working and Its types), ROM (Types of ROM). Secondary Memory - Hard Disk (Structure of a hard disk, working, concept of tracks, sectors, clusters, cylinders), CD, DVD.

UNIT III

Word Processing: Introduction to Office, word processing & its features, Parts of window of word (Title bar, menu bar, status bar, and ruler), understanding the Ribbon, Use of Office Button and Quick Access Toolbar, Creation of new documents, opening document, insert a document into another document. Page setup, margins, gutters, font properties, Alignment, page breaks, header & footer, deleting, moving, replace, editing text in document, saving a document, spell checker, printing a document. Creating a table, entering and editing, Text in tables. Changing format of table, height, width of row/column. Editing, deleting Rows, columns

in table. Adding picture, page colors and Watermarks, Borders, shading, Templates, wizards, drawing objects.

Presentation: Introduction to PowerPoint, Exploring menus, starting a new slide, saving presentation, moving/rearranging slides, printing slides. Applying theme to presentation, Views (slide View, slide sorter, notes view, outline view), Formatting & enhancing text formatting. Displaying slide show, adding multimedia. Slide transitions, applying Animation, Timing slide display, adding movies & sounds.

UNIT IV

Spreadsheet: Introduction to Worksheet/Spreadsheet, Features of excel, Describe the excel Window, Creating a new workbook, different functions on different data in excel, creation of graphs, editing it and formatting, creation of worksheet, adding, deleting, moving the text in worksheet, sorting the data, querying the data, filtering the data (auto and advance filters), To open an already existing workbook, Saving workbook, printing a worksheet, Closing the workbook & exiting.

References/Textbooks:

1. Joyce Cox, Joan Lambert and Curtis Frye, Microsoft office Professional 2010 Step by Step, Microsoft Press, 2010.
2. V. Rajaraman, Neeharika Adabala, Fundamentals of Computers, PHI Learning, 2015.
3. P.K. Sinha, Computer Fundamentals, BPB Publications, 2004.
4. Anshuman Sharma, A book of Fundamentals of Information Technology, Lakhanpal Publishers, 5th Edition.
5. Peter Norton, Peter Norton's Computing Fundamentals, McGraw-Hill Technology Education, 2006.

Note: The latest editions of the books should be followed.

Bachelor of Science (Information Technology) Semester- I

Session 2021-22

COURSE CODE: BITL-1335

APPLIED AND DISCRETE MATHEMATICS

Course Outcomes:

Student will be able to:

CO1: Have knowledge of matrices, sets, relations, propositional logic and Boolean algebra.

CO 2: Represent world knowledge in symbolic notation through propositional calculus.

CO 3: Apply discrete mathematical concepts to obtain analytical and numerical solutions.

Bachelor of Science (Information Technology) Semester- I

Session 2021-22

COURSE CODE: BITL-1335

APPLIED AND DISCRETE MATHEMATICS

Examination Time: 3 Hrs.

Max. Marks: 100

Theory: 80

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (16 marks each) are to be set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts(not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section

UNIT-I

Sets and Relations: Definition of sets, subsets, complement of a set, universal set, intersection and union of sets, De-Morgan's laws, Cartesian products, Equivalent sets, Countable and uncountable sets, minset, Partitions of sets, Relations: Basic definitions, graphs of relations, properties of relations

UNIT-II

Logic and Propositional Calculus: Proposition and Compound Propositions, basic Logical Operations, Propositions and Truth Tables, Tautologies and Contradictions, Logical Equivalence, Duality law, Algebra of propositions, Conditional and Bi conditional Statements, Arguments, Logical Implication, Propositional Functions, Predicates and Quantifiers, Negation of Quantified Statements, Inference theory of the predicates calculus.

UNIT-III

Boolean Algebra: Boolean algebra and its duality, Duality, Boolean Algebra as Lattices, Boolean identities, sub-algebra, Representation Theorem, Sum-of-Products Form for Sets, Sum of-Products Form for Boolean Algebra, Minimal Boolean Expressions, Prime Implicants, Boolean Functions, Karnaugh Maps.

UNIT-IV

Matrices: Introduction of a Matrix, its different kinds, matrix addition and scalar multiplication, multiplication of matrices, transpose etc. Square matrices, inverse and rank of a square matrix, Matrix Inversion method.

References/Textbooks:

1. Seymour Lipschutz, Marc Lars Lipson, Discrete Mathematics (Schaum's outlines Series), McGraw-Hill, 1997.
2. Bernard Kolman, Robert C. Busby, Discrete Mathematical structures for Computer Science, Prentice-Hall, 1984.
3. Alan Doerr, Kenneth Levasseur, Applied Discrete Structures for Computer Science, Galgotia Publications, 1989.
4. J.P.Tremblay. and R Manohar, Discrete Mathematical Structures with Applications to Computer Science, McGraw-Hill, 1997.

Note: The latest editions of the books should be followed.

Bachelor of Science (Information Technology) Semester- II
(Session 2021-22)
COURSE CODE: BITM-2113
INTRODUCTION TO OBJECT ORIENTED PROGRAMMING - I

Course Outcomes:

After the completion of this course, the student will be able to:

CO1: Comprehend the concepts of Object-Oriented Programming Paradigm

CO2: Write, compile and debug programs in C++, use different data types, operators and I/O function in a computer program.

CO3: Apply OOPs concepts to model real world problems for its simplified implementation.

Bachelor of Science (Information Technology) Semester- II
(Session 2021-22)
COURSE CODE: BITM-2113
INTRODUCTION TO OBJECT ORIENTED PROGRAMMING - I

Examination Time: (3+3) Hrs

Max. Marks: 100

Theory:50

Practical: 30

CA:20

Instructions for Paper Setter -

Eight questions of equal marks (50 marks each) are to set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts(not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section

UNIT-I

Programming Paradigms: Introduction to the object oriented approach towards programming by discussing Traditional, Structured Programming methodology.

Objects & Classes: Object Definition, Instance, Encapsulation, Data Hiding, Abstraction, Inheritance, Messages, Method, Polymorphism, Classes, Candidate & Abstract Classes to be examples of the Design process.

UNIT-II

Object Oriented Programming using C++: Characteristics of OOP, Overview of C++, I/O using cout and cin, Objects and Classes, Member functions and data, private & public, constructor & destructor, Constructor Overloading, Types of Constructors.

UNIT-III

Function Overloading: Function Overloading, Default Arguments, Ambiguity in Function Overloading.

Operator Overloading: Overloading unary and binary operators, Type Conversion using Operator Overloading

UNIT -IV

Inheritance: Concept of inheritance, Base & derived classes, Access Specifiers, Class Hierarchies, Types of Inheritance with examples.

Virtual Functions and Polymorphism: Virtual functions, friend functions, static function, this pointer, polymorphism, Types of Polymorphism with examples, templates, class templates.

References / Textbooks:

1. Herbertt Schildt, C++: The Complete Reference, Tata McGraw-Hill Education India, 4th Edition.
2. Bjarne Stroustrup, The C++ Programming Language, Addison – Wesley Professional (2013), 4th Edition
3. Bjarne Stroustrup, A Tour of C++ (C++ In-Depth Series), Addison – Wesley Professional (2018), 2nd Edition
4. G.S. Baluja, C++ Program Design (w/CD), Khanna Book Publishing Company (2015), 2nd edition.
5. Stanley Lippman, Josee Lajoie, Barbara Moo, C++ Primer, Addison-Wesley Professional (2012), 5th edition.
6. Richard Johnsonbaugh and Martin Kalin, Object Oriented Programming in C++, Pearson Education (1999), 2nd Edition

Bachelor of Science (Information Technology) Semester- II
(Session 2021-22)
COURSE CODE: BITL-2114
PRINCIPLES OF DIGITAL ELECTRONICS

Course Outcomes:

After the completion of this course, the student will be able to:

CO1: Comprehend and apply the number systems and Boolean Algebra.

CO2: Design advanced and complex electronic circuits.

CO3: Reduce Boolean Expressions and implement them with Logic Gates.

CO4: Demonstrate the internal structure of semiconductor memory

Bachelor of Science (Information Technology) Semester- II
(Session 2021-22)
COURSE CODE: BITL-2114
PRINCIPLES OF DIGITAL ELECTRONICS

Examination Time: 3 Hrs

Max. Marks: 100

Theory:80

CA:20

Instructions for Paper Setter -

Eight questions of equal marks (16 marks each) are to set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts(not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section

UNIT-I

Number System: Introduction, number conversion system , binary arithmetic, representation of signed binary numbers, 1's and 2's complement, Codes: straight binary code, BCD Code Excess3 Code, Grey Code ASCII, Integer and floating point representation

UNIT-II

Logic Gates and Boolean Algebra: Logic gates, Universal Gates, Boolean algebra and Minimization techniques, canonical forms of Boolean expressions, K-Map

UNIT- III

Combinational Circuits: Adder, Subtractor, Multiplexer, Demultiplexer, Decoder, Encoder
Sequential Circuits: Flip-flops, clocks and timers, registers, counter

UNIT-IV

Semiconductor memories: Introduction, Static and dynamic devices, read only & random access memory chips, PROMS and EPROMS Address selection logic. Read and write control timing diagrams for ICs

References / Textbooks:

1. M. Morris Mao, Digital Design, Pearson Publication (2018), 6th Edition.
2. Ronald J. Tocci, Digital Systems, Pearson (2009), 10th Edition.

3. Morris Mano, Digital Logic and Computer Design, Pearson Education (2004), 1st Edition.
4. V.K. Jain, Arti Agarwal, Digital Electronics, Genius Publications Pvt. Ltd. (2018), 1st Edition
5. K. Meena, Principles of Digital Electronics, Prentice Hall India Learning Private Limited (2009), 1st Edition
6. William H. Gothmann, Digital Electronics: An introduction to Theory and Practice, Prentice Hall India Learning Private Limited (1982), 2nd Edition

Bachelor of Science (Information Technology) Semester- II
(Session 2021-22)
COURSE CODE: BITL-2115
NUMERICAL METHODS AND STATISTICAL TECHNIQUES

Course Outcomes:

After the completion of this course, the student will be able to:

CO1: Comprehend mechanics of elementary methods and statistical inference techniques for numerical analysis.

CO2: Demonstrate the application of numerical methods on different platform with the use of programming language.

CO3: Apply learned techniques to solve linear and non-linear equations related real world problems.

Bachelor of Science (Information Technology) Semester- II
(Session 2021-22)
COURSE CODE: BITL-2115
NUMERICAL METHODS AND STATISTICAL TECHNIQUES

Examination Time: 3 Hrs

Max. Marks: 100

Theory:80

CA:20

Instructions for Paper Setter -

Eight questions of equal marks (16 marks each) are to set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts(not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT-I

Introduction: Numerical Methods, Numerical methods versus numerical analysis, Errors and Measures of Errors.

Non-linear Equations: Bisection Method, False Position method and Newton Raphson's Method

Linear Equations: Direct Method - Gauss Elimination Method, Gauss Jordan Method, Iterative method – Gauss Seidal Method.

UNIT-II

Interpolation: Lagrange's method, Newton's Methods: Forward Difference Method, Backward Difference Method Divided Difference Method.

Numerical Integration: Trapezoidal Rule, Simpson's 1/3 method and Simpson's 3/8 Method

UNIT-III Statistical Techniques:

Measure of Central Tendency: Arithmetic mean, Geometric Mean, Harmonic Mean, Median, Mode.

Measures of dispersion: Range, Quartile Deviation, Mean deviation, Standard deviation, Co-efficient of variation.

UNIT –IV

Correlation: Introduction, Karl Pearson's Coefficient of Correlation, Rank Correlation

Regression: Regression line and regression equations, Regression Coefficient

Curve Fitting: Fit a polynomial equation, Fit an exponential curve, Geometric Curve, Logarithmic curve

References / Textbooks:

1. AmrinderPal Singh, Jaspal Singh, Anshuman Sharma, Fundamentals Of Numerical Methods And Statistical Techniques, Lakhanpal Publishers, 4th edition.
2. Kandasamy P.& et Al., Numerical Methods, S. Chand & Company (2006), Reprint Edn. 2006 Edition.
3. B.S. Grewal, Numericals Methods in Engineering & Science, Khanna Publishers (2013), 11th Edition.
4. E. Balagurusamy, Numerical Methods, Tata McGraw Hill Education (2017)
5. H.S.G. Rao, Numerical Methods, IK International Publishing House (2011)
6. S.S. Sastry, Introductory methods of Numerical Analysis, PHI (2012), 5th Edition

Bachelor of Science (Information Technology) Semester – III

Session 2021-22

COURSE CODE: BITL-3111

COMPUTATIONAL PROBLEM SOLVING

Course Outcomes:

After passing course the student will be able to:

CO1: Understand the formulation of algorithms and programs for problem solving.

CO2: Gain understanding of various programming constructs like data types, operators, string processing and control structures.

CO3: Have knowledge of object oriented programming paradigms.

CO4: Have understanding of file handling, exception handling and SQLite database connectivity in Python.

Bachelor of Science (Information Technology) Semester – III

Session 2021-22

COURSE CODE: BITL–3111

COMPUTATIONAL PROBLEM SOLVING

Examination Time: 3 Hrs.

Max. Marks: 75

Theory: 60

CA: 15

Instructions for Paper Setter -

Eight questions of equal marks (12 marks each) are to be set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT- I

Introduction to Problem solving using Python: Process of Computational Problem Solving, Python Programming Language.

Data and Expressions: Literals, Variables and Identifiers, Operators, Expressions, Statements and Data Types.

Control Structures: Boolean Expressions (Conditions), Logical Operators, Selection Control, Nested conditions, Debugging.

UNIT- II

Lists: List Structures, Lists (Sequences) in Python, Iterating Over Lists (Sequences) in Python.

Iteration: While statement, Definite loops using For, Loop Patterns, Recursive Functions, Recursive Problem Solving, Iteration vs. Recursion.

Dictionaries: Dictionaries and Files, Looping and dictionaries, Advanced text parsing.

UNIT- III

Functions: Fundamental Concepts, Program Routines, Flow of Execution, Parameters & Arguments.

Files: Opening Files, Using Text Files, String Processing, Exception Handling.

UNIT- IV

Objects and Their Use: Introduction to Object Oriented Programming.

Modular Design: Modules, Top-Down Design, Python Modules.

Using Databases and SQL: Database Concepts, SQLite Manager Firefox Add-on, SQL basic summary, Basic Data modeling, Programming with multiple tables.

References/Textbooks:

1. Charles Severance, Python for Informatics, Version 0.0.7.
2. Charles Dierbach, Introduction to Computer Science Using Python: A Computational Problem-Solving Focus, Wiley Publications, 2012.
3. Guttag John V, Introduction To Computation And Programming Using Python, PHI, 2014.
4. Jeeva Jose and Sojan P. Lal, Introduction to Computing & Problem Solving Through Python, Khanna Publishers, 2015.
5. Mark J. Guzdial, Introduction to Computing and Programming in Python, Pearson Education, 2015.
6. Kenneth Lambert, Fundamentals of Python, Course Technology, Cengage Learning, 2015
7. Mark Lutz, Learning Python, O'Reilly Media, 2013

Note: The latest editions of the books should be followed.

Bachelor of Science (Information Technology) Semester – III

Session 2021-22

COURSE CODE: BITL-3112

DATA STRUCTURES

Course Outcomes:

After passing course the student will be able to:

CO1: Get familiarized with basic data structures.

CO2: Analyze algorithms to determine their efficiency.

CO3: Handle operations on various data structures.

CO4: Choose appropriate data structures according to real world problems.

Bachelor of Science (Information Technology) Semester – III

Session 2021-22

COURSE CODE: BITL-3112

DATA STRUCTURES

Examination Time: 3 Hrs.

Max. Marks: 75

Theory: 60

CA: 15

Instructions for Paper Setter -

Eight questions of equal marks (12 marks each) are to be set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT-I

Basic Data Structure: Introduction to elementary Data Organization, Common Operation on Data Structures, Algorithm Complexity, Big O Notation, Time – Space tradeoff between Algorithms.

Arrays: Array Defined, Representing Arrays in Memory, Various Operations on Linear Arrays, Multidimensional Arrays.

UNIT-II

Sorting and Searching: Sorting Algorithms, Bubble Sort, Insertion Sort, Selection Sort, Merge Sort, Searching Algorithms, Linear Search and Binary Search.

Hashing: Hash Functions, Division Method, MidSquare Method, Folding Method.

Linked Lists Types of Linked Lists, Representing Linked Lists in Memory, Advantages of using Linked Lists over Arrays, Various Operations on Linked Lists.

UNIT-III

Stacks: Description of STACK structure, Implementation of Stack using Arrays and Linked Lists, Applications of Stacks – Converting Arithmetic expression from infix notation to polish and their subsequent evaluation, Quicksort Technique to sort an array.

Queues: Description of queue structure, Implementation of queue using arrays and linked lists, Description of priorities of queues, Dequeues.

UNIT-IV

Trees: Description of Tree Structure and its Terminology, Binary Trees and Binary Search Trees and their representation in Memory, Heapsort.

Graphs: Description of Graph Structure, Implement Graphs in Memory using Adjacency Matrix, PathMatrix, graph traversal techniques - DFS, BFS.

References/Textbooks:

1. Seymour Lipschutz, Data Structures, Schaum's Outline Series, McGraw Hill Company, 2013.
2. Aaron M. Tenenbaum, Data Structures using C, Pearson Education, 1990.

Note: The latest editions of the books should be followed.

Bachelor of Science (Information Technology) Semester – III

Session 2021-22

COURSE CODE: BITL-3113

SYSTEM ANALYSIS AND DESIGN

Course Outcomes:

After passing course the student will be able to:

CO1: Gather data to analyze and specify the requirements of a system.

CO2: Design database for storing data and user interface for data input and output,

CO3: Build modular and structured design of a system and in designing a model.

CO4: Identify the quality assurance and documentation tools.

Bachelor of Science (Information Technology) Semester – III

Session 2021-22

**COURSE CODE: BITL-3113
SYSTEM ANALYSIS AND DESIGN**

Examination Time: 3 Hrs.

Max. Marks: 75

Theory: 60

CA: 15

Instructions for Paper Setter -

Eight questions of equal marks (12 marks each) are to be set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT-I

System Planning and Analysis: Introduction to systems development life cycle and role of different stages. Requirement analysis, Problem definition, Feasibility Study and its importance. Information Gathering Tools, Cost Benefit Analysis, Role and Responsibilities of System Analyst.

UNIT-II

System Design: Introduction to Architectural Design, User Interface Design, Data Design, Tools for Structured design and System design considerations.

UNIT-III

System Testing: Introduction to testing and its types, Types of Documentation and Documentation Tools.

UNIT-IV

System Implementation: Quality Assurance, Managing system implementation, Transition to new system.

System Maintenance: Concept of maintenance and its importance, types of maintenance.

References/Textbooks:

1. Marvin R. Gore and John W. Stubbe, Elements of System Analysis, Dubuque, Iowa Wm.C. Brown 1988.

2. Thapliyal M.P., System Analysis and Design, JBD Publisher, 2002.
3. Hoffer, Modern Systems Analysis and Design, George and Valacich, Pearson, 2014.
4. Dorny C. Nelson, Understanding Dynamic System: Approaches to Modelling, Analysis and Design, Pearson, 1993.
5. Perry Edwards, System Analysis and Design, McGraw-Hill, 1993.
6. Elias M. Awad, System Analysis and Design, Galgotia Publications, 1997.
7. James A. Senn, Analysis and Design of Information Systems, McGraw-Hill, 1989.

Note: The latest editions of the books should be followed.

Bachelor of Science (Information Technology) Semester – III

Session 2021-22

COURSE CODE: BITP-3114

LAB ON COMPUTATIONAL PROBLEM SOLVING

Examination Time: 3 Hrs.

Max. Marks: 50

Practical: 40

CA: 10

Lab-I: Lab on computational problem solving.

-
Bachelor of Science (Information Technology) Semester III

Session 2021-22

COURSE CODE: BITP-3115
LAB ON DATA STRUCTURES

Examination Time: 3 Hrs.

Max. Marks: 25

Practical: 20

CA: 05

Lab – II: Lab on Data Structures.

Bachelor of Science (Information Technology) Semester IV
(Session 2021-22)

COURSE CODE: BITL-4111

DATABASE MANAGEMENT SYSTEM

Course Outcomes:

After the completion of this course, the student will be able to:

CO1: Comprehend various terms like data, database and database models.

CO2: Illustrate the concept of database normalization and its various forms.

CO3: Apply SQL to design basic to intermediate level of databases.

CO4: Comprehend the use of Programming Language constructs like function, procedure, packages, etc. in database.

CO5: Acquire knowledge of big data and NoSQL.

Bachelor of Science (Information Technology) Semester IV
(Session 2021-22)

COURSE CODE: BITL-4111

DATABASE MANAGEMENT SYSTEM

Examination Time: 3 Hrs

Max. Marks: 75

Theory: 60

CA: 15

Instructions for Paper Setter -

Eight questions of equal marks (12 marks each) are to set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT-I

Introduction to data, field, record, file, database, database management system. Structure of database system, Advantages and disadvantages, levels of database system, Relational model, Hierarchical model, Network model, comparison of models, E-R diagram, different keys used in a relational system, DBA and responsibilities of DBA.

UNIT-II

Codd's Rules, Relational algebra, Relational calculus – Domain and Tuple relational Calculus, Query Processing and Optimization.

UNIT-III

Introduction to Normalization : Need and advantages of Normalization, 1NF, 2NF, 3NF, BCNF, 4NF and 5NF. Introduction to Transaction management – ACID properties, concurrency control and its management, protection, security, recovery of database.

UNIT-IV

SQL: Introduction to SQL-DDL, DML, DCL, Join methods & sub query, Union Intersection, Minus, Built in Functions, Views, Security amongst users, Sequences, Indexing.

Introduction to PL/SQL: Cursors– Implicit & Explicit, Procedures, Functions & Packages Database Triggers.

Big Data: Introduction to Big Data and Analytics, Introduction to NoSQL.

References / Textbooks:

1. C.J. Date, Introduction to Database System, Pearson Education (2003), 8th Edition
2. Ramez Elmasri and Shamkant Navathe, Fundamentals of Database Systems, Pearson Education (2015), 7th Edition
3. Abraham Silberschatz, Henry F. Korth, S. Sudarshan, Database System Concepts, McGraw Hill Education (2019), 7th Edition
4. P.S. Deshpande, SQL & PL / SQL for Oracle 11g, Dreamtech Press (2011)
5. Mahesh Mali, Database Management System for Engineering, TechKnowledge Publication, 2020
6. Raghu Ramakrishnan and Johannes Gehrke, Database Management System, McGraw Hill Education (2014), 3rd Edition
7. Rajiv Chopra, Database Management Systems, S. Chand Publishers (2016), 5th Edition

**Bachelor of Science (Information Technology) Semester- IV
(Session 2021-22)**

COURSE CODE: BITL-4112

INTERNET APPLICATIONS

Course Outcomes:

After passing course the student will be able to:

CO1: Comprehend basics of internet and its working.

CO2: Apply the concepts for better e-mail management.

CO3: Comprehend different Internet protocols and search engines.

CO4: Apply basic web designing technologies to design webpage.

**Bachelor of Science (Information Technology) Semester
(Session 2021-22)**

COURSE CODE: BITL-4112

INTERNET APPLICATIONS

Examination Time: 3 Hrs

Max. Marks: 75

Theory: 60

CA: 15

Instructions for Paper Setter -

Eight questions of equal marks (12 marks each) are to set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT-I

Introduction : About internet and its working, business use of internet, services effect by internet, evaluation of Internet, Internet Service Provider (ISP) windows environment for dial up networking (connecting to internet), audio on internet, internet addressing (DNS) and IP addresses.

E-Mail Basics: Introduction, advantage and disadvantage, structure of an email message, working of e-mail (sending and receiving messages), managing email (creating new folder, deleting messages, forwarding messages, filtering messages).

UNIT-II

Internet Protocol: Introduction, File Transfer Protocol (FTP), Gopher, Telnet, other protocols like HTTP and TCP/IP.

WWW: Introduction, Working of WWW, Web browsing (opening, viewing, saving and printing a web page and bookmark).

UNIT-III

Web designing: HTML: Elements, Attributes, Formatting, Paragraphs, Links, Lists, Tables, Images, Frames and Forms.

CSS: Types, Syntax, Colors, Backgrounds, Box Model, Fonts, Alignment, CSS Links.

Javascript: Syntax, Operators, Function & Array.

UNIT-IV

Search Engine: About search engine, Components of search engine, working of search engine, difference between search engine and web directory.

Internet and Extranet: Introduction, application of intranet, business value of intranet, working of intranet, role of extranet, working of extranet, difference between intranet and extranet.

References / Textbooks:

1. Anshuman Sharma, Fundamentals of Internae Applications, Lakhanpal Publications (2016)
2. Ikvinderpal Singh, Internet Applications, Khanna Book Publishing Company (2011), 1st Edition
3. P. Rizwan Ahmed, Internet & its Applications, Margham Publications (2013)
4. Douglas E. Comer, Computer Networks and Internet with Internet Applications, Pearson (2008), 4th Edition
5. Satish Jain/Vineeta Pillai, Wireless Communication & Networking made Simple, BPB Publishers (2007)
6. Laura Lerney, Rafe Colburn, Jennifer Kyrnin, Mastering HTML, CSS & Javascript Web Publishing, BPB Publishers (2016), 1st Edition

**Bachelor of Science (Information Technology) Semester
(Session 2021-22)**

COURSE CODE: BITL-4113

OBJECT ORIENTED PROGRAMMING- II

Course Outcomes:

After passing this course the student will be able to:

CO1: Apply OOPs concepts to model real world problems for its simplified implementation.

CO2: Comprehend fundamentals of Java programming.

CO3: Identify the utilization of packages, multithreading and Exception handling.

CO4: Demonstrate the concept of file handling and Applets.

**Bachelor of Science (Information Technology) Semester
(Session 2021-22)**

COURSE CODE: BITL-4113

OBJECT ORIENTED PROGRAMMING- II

Examination Time: 3 Hrs

Max. Marks: 75

Theory: 60

CA: 15

Instructions for Paper Setter -

Eight questions of equal marks (12 marks each) are to set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT-I

Introduction to Java Programming: Features, Object Orientation Concepts, Java Virtual Machine, Data Types, Operators, Control Structures.

UNIT-II

Introduction to OOPS: Classes & Methods, Constructors, and Inheritance and Polymorphism

UNIT-III

Packages & Interfaces, Multithreading in Java, Exception Handling.

UNIT-IV

I/O Stream Classes & File Handling

Applets: Applet basics, Applet Life Cycle, Applet Display, Repaint, Parameter Passing.

References / Textbooks:

1. Herbert Schildt, Java – The Complete Reference, McGraw Hill Education (2017), 10th Edition
2. E Balagurusamy, Programming with Java, McGraw Hill (2019), Sixth Edition
3. Barry A. Burd, Beginning Programming with Java for Dummies (2017), 5th Edition
4. Sachin Malhotra and Saurabh Choudhary, Programming in Java, Oxford University Press (2018) Second edition.
5. R. Nageswara Rao, Core Java: An integrated Approach, Dreamtech Press (2016)

**Bachelor of Science (Information Technology) Semester
(Session 2021-22)**

COURSE CODE: BITL-4114

E-BUSINESS

Course Outcomes:

After passing this course student will be able to:

CO1: Comprehend the basic terms of E-Commerce, its evolution, aims and benefits.

CO2: Acquaint about the steps to be followed for opening a new E-Commerce business, along with its Hardware & Software requirements.

CO3: Identify Electronic Payment systems and various issues involved in relation to secure electronic transactions.

CO4: Discuss BPR and Case Studies of E-Business related applications.

**Bachelor of Science (Information Technology) Semester
(Session 2021-22)**

COURSE CODE: BITL-4114

E-BUSINESS

Examination Time: 3 Hrs

Max. Marks: 75

Theory: 60

CA: 15

Instructions for Paper Setter -

Eight questions of equal marks (12 marks each) are to set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT – I

E – Commerce: Definition, Aims, Benefits, VAN and EDI as Promoters, Types of E – Commerce.

Steps to Start E – Commerce: H/W & S/W Requirements, steps involved in opening your own online business.

UNIT - II

EDI: EDI Vs Traditional Systems, components of EDI system, EDI implementation issues, EDI service providers in India, Paper documents versus Electronic documents.

Concerns for E – Commerce: Legal and regulatory issues, Laws for E – Commerce, ECommerce in India.

UNIT – III

Electronic Payment Systems: Various Methods of Electronic Payments – Google pay, Paytm, Debit and Credit Cards, UPI. Issues that confront in relation to securing electronic transactions. Implementation of digital signatures.

UNIT – IV

Re – Engineering for Change: Business process re – engineering (BPR), Methodology and Planning Methods for change.

Case Studies: To demonstrate usefulness of E – Commerce in various business areas like Banks, Reservations, E – Governance and E-Retailing.

References / Textbooks:

1. Chaffey, E-Business and E-Commerce Managemet: strategy, Implementation and Practice, Pearson Education India (2013), 5th Edition
2. Kenneth C. Laudon and Carol Guercio Traver, E-Commerce, Pearson (2018), 13th Edition
3. S.J. P.t. Joseph, E-Commerce: An Indian Prespective, PHI Learning Pvt. Ltd. (2019), 6th Revised Edition
4. Shruti Mathur, Ecommerce, Pinnacle Learning (2020)
5. David Whiteley, E-Commerce: Strategy, Technologies and Applications, McGraw Hill Education (2017).
6. Nidhi Dhawan, A handbook of E-Commerce, Sun India Publications (2017)

Bachelor of Science (Information Technology) Semester- IV
(Session 2021-22)

COURSE CODE: BITP-4115

LAB ON DATABASE MANAGEMENT SYSTEM

Examination Time: 3 Hrs

Max. Marks: 50
Practical: 40
CA: 10

Lab on Database Management System.

Bachelor of Science (Information Technology) Semester- IV
(Session 2021-22)

COURSE CODE: BITP-4116

LAB ON OBJECT ORIENTED PROGRAMMING- II

Examination Time: 3 Hrs

Max. Marks: 50

Practical: 40

CA: 10

Lab on Object Oriented Programming – II .

Bachelor of Science (Information Technology) Semester – V

Session 2021-22

COURSE CODE: BITL-5111

COMPUTER NETWORKS

Course Outcomes:

After passing course the student will be able to:

CO1: Describe the functions of each layer in OSI and TCP/IP model. CO2: Understand the types of transmission media with real time applications CO3: Describe the Data Link layer and Network layer design issues.

CO4: Explain the functions of Transport layer and Application layer protocols.

CO5: Have a basic knowledge of the use of cryptography and network security.

Bachelor of Science (Information Technology) Semester – V

Session 2021-22

COURSE CODE: BITL-5111

COMPUTER NETWORKS

Examination Time: 3 Hrs.

Max. Marks: 100

Theory: 80

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (16 marks each) are to be set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT – I

Introduction: Basic concepts of Computer Networks, Basic Components of a Network, Network types and topologies.

Models: OSI Reference Model, TCP/IP Model, Comparison between TCP/IP and OSI model

Transmission Media: Coaxial Cable, Twisted Pair Cable, Fiber Optics & Satellites.

UNIT – II

Network Devices: Hub, Switch, Repeaters, Bridges, Routers, Gateways.

Introduction to Analog and Digital Transmission: Telephone system, Modems, Types of modems, pulse code modulation. Multiplexing and its types, Circuit Switching, Packet Switching, Message Switching, ISDN service transmission.

UNIT - III

Data Link Layer Design Issues: Framing, Error Control, Flow Control, Error Detection & Correction, Media Access Protocols: ALOHA, CSMA, CSMA/CD, CSMA/CA. IEEE standards 802: Token Bus, Token Ring, FDDI.

Design Issues of Network Layer: Routing, IPv4: Notation, Classful addressing, Header Format, IPv6 addressing.

UNIT – IV

Design issues of Transport Layer: TCP, UDP

Network Security and Privacy: Brief Introduction to Cryptography.

Network Services: File transfer, Access & Management, Electronic Mail, Remote login.

References/Textbooks:

1. Tanenbaum , A.S., Computer Networks, Prentice Hall, 2010.
2. Stallings, W., Local Networks: An Introduction: Macmillan Publishing Co, 1990.
3. Stallings W., Data and Computer Communications, Prentice Hall, 2011.
4. Forouzan B., Data Communications and networking, McGraw Hill, 2007.

Note: The latest editions of the books should be followed.

Bachelor of Science (Information Technology) Semester – V

Session 2021-22

COURSE CODE: BITL-5112

WEB TECHNOLOGIES

Course Outcomes:

After passing course the student will be able to:

CO1: Understand the basics of websites and use of different markup languages.

CO2: Gain knowledge of different client side technologies.

CO3: Develop single page application through React.

Bachelor of Science (Information Technology) Semester – V

Session 2021-22

COURSE CODE: BITL-5112

WEB TECHNOLOGIES

Examination Time: 3 Hrs.

Max. Marks: 100

Theory: 80

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (16 Marks) are to be set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT I

Web Essentials – Client/Server Architecture, Web Server, Webpage, Website, Internet, Protocol, OSI model, IP Addresses, Port, HTTP Method, HTTP Response/Request, HTTPS, URL, Browser Architecture, E-mail Protocols, World Wide Web, DNS.

HTML – Basics, Program Structure, Headings, Paragraph, Styling, Formatting, Hyperlink, Image, Table, List, Frame, Block, Entities, Form, Form Elements, Introduction To XHTML.

CSS – Types, Selector, Colors, Background, Box Model, Text, Font, Display, Position, Float, Clear, Rounded Corners.

UNIT - II

JavaScript – Basics, Features, Advantages, Limitations, Types, Basics, Functions, Control Statement, Arrays, JavaScript Objects, Host Objects.

DOM – Introduction, Methods, Accessing HTML and CSS, Events, Event Listener, Nodes and Collection.

BOM – Window, Screen, History, Navigation.

UNIT – III ES6 – Variables, Arrow functions, Class

and Inheritance.

Introduction to React - Render HTML, JSX.

React Components – Web component, Class, Function, Constructor, nested Component.

UNIT IV

Data Handling – Props, Props Validation, State, Fetching Data through API.

Lifecycle of React Components, Form Handling in React, Event Handling in React, React Sass.

References/Textbooks:

1. Jeffery C Jackson, Web Technology- A Computer Science perspective, Pearson Education, 2007.
2. Chris Bates, Web Programming- Building Internet Applications, Wiley India, 2006.
3. Achyut S Godbole and AtulKahate, Web technologies, Tata McGraw Hill, 2002.
4. Uttam K Roy, Web Technologies, Oxford University Press, 2010.
5. Kirupa Chinnathambi, Learning React, Addison-Wesley Professional, 2019.
6. Alex Banks, Eve Porcello, Learning React: Functional Web Development with React and Redux, O'Reilly Media, 2017.

Note: The latest editions of the books should be followed.

Bachelor of Science (Information Technology) Semester – V

Session 2021-22

COURSE CODE: BITL-5113

OPERATING SYSTEM

Course Outcomes:

After passing course the student will be able to:

CO1: Describe, contrast and compare different types of Operating System.

CO2: Understand the process management policies and CPU scheduling.

CO3: Describe and analyze the memory management and its allocation policies.

CO4: Gain knowledge of operating system concepts that includes virtual memory, mutual exclusion algorithms and deadlock handling.

Bachelor of Science (Information Technology) Semester – V

Session 2021-22

COURSE CODE: BITL-5113

OPERATING SYSTEM

Examination Time: 3 Hrs.

Max. Marks: 100

Theory: 80

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (16 marks each) are to be set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT – I

Introduction: Definition, Batch Processing, Multi programming, Time Sharing Systems, Multitasking, multiprocessing, Parallel Systems, Distributed Systems, Real-time Systems.

Processes: Process Concepts, Process Scheduling, Threads, System Calls.

UNIT – II

CPU–Scheduling: Basic concepts, Scheduling Criteria, Scheduling Algorithms, Algorithm Evaluation: Response Time, Turnaround Time, Waiting Time, Throughput.

Process Synchronization: Critical-section problem, semaphores and its Types (Binary and Counting), Classical problems of synchronization and their solutions.

UNIT – III

Deadlocks: System Model, Deadlock characterization, Methods for handling deadlocks, Deadlocks Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock, Approach to Deadlock handling.

Memory Management: Background, Logical v/s Physical Address Space, Swapping, Continuous Allocation, Paging, Segmentation.

UNIT – IV

Virtual Memory: Background, Page Fault, Demand Paging, Page Replacement, Page Replacement Algorithms, Thrashing.

Secondary Storage Structures: Disk structures, Disk scheduling.

References/Textbooks:

1. Avi Silberschatz, Peter Baer Galvin, Greg Gagne, Operating System Concepts, Wiley, 2013.

2. Charles Crowley, Operating Systems: A Design-Oriented Approach , Tata McGraw Hill, 2001.
3. Deitel, An Introduction to Operating Systems, Second Edition, Addison Wesley, 1990.
4. William Stallings, Operating Systems: Internals and Design Principles, Pearson Education Limited, 2014.

Note: The latest editions of the books should be followed.

Bachelor of Science (Information Technology) Semester – V

Session 2021-22

COURSE CODE: BITP-5114

LAB ON WEB TECHNOLOGIES

Examination Time: 3 Hrs.

Max. Marks: 50

Practical: 40

CA: 10

Lab on Web Technologies.

Bachelor of Science (Information Technology) Semester – V

Session 2021-22

COURSE CODE: BITP-5115

LAB ON OPERATING SYSTEM

Examination Time: 3 Hrs.

Max. Marks: 50

Practical: 40

CA: 10

Lab on Operating System.

**Bachelor of Science (Information Technology) Semester – VI
(Session 2021-22)**

COURSE CODE: BITL - 6111

COMPUTER GRAPHICS

Course Outcomes:

After passing this course the student will be able to:

CO1: Comprehend the background mechanism involved in display devices like CRT, LCD, LED, etc.

CO2: Comprehend basic concepts involved in drawing basic shapes.

CO3: Implement various algorithms to scan, convert the basic geometrical primitives, transformations, Area filling, clipping, etc.

CO4: Identify the importance of viewing and projections.

Bachelor of Science (Information Technology) Semester – VI
(Session 2021-22)

COURSE CODE: BITL - 6111

COMPUTER GRAPHICS

Examination Time: 3 Hrs

Max. Marks: 75

Theory: 60

CA: 15

Instructions for Paper Setter -

Eight questions of equal marks (12 marks each) are to set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT – I

Overview of Graphics system: Computer Graphics and their applications.

Display Devices: CRT Monitors (Random – Scan and Raster Scan, DVST, Plasma – Panel Display, LED and LCD Monitors, Virtual Reality and Workstation.

UNIT – II

Elementary Drawing: Points and various line drawing Algorithms and their comparisons. Circle generating algorithms, Algorithms for Ellipse, Arc and Sector.

UNIT – III

Two Dimensional Transformations: Basic Transformations - Translation, Rotation, Scaling, Reflection and Shearing. Matrix representation of Basic Transformations and Homogenous Coordinates.

Composite Transformations: Windowing and clipping. Windowing Concepts, Clipping and its Algorithms, Window-to-View Port Transformations.

UNIT - IV

Three Dimensional concepts: 3D Coordinate Systems, 3D Transformations - Translation, Rotation, Scaling, Reflection and Shearing,

Projection: Parallel Projections, Perspective Projection, Vanishing Point, View Confusion and Topological Distortion.

References / Textbooks:

1. Hearn D, Baker P, Computer Graphics, PHI Eastern Economy (2002), 2nd Edition.
2. Zhigang Xiang, Plastock R, Kalley G, Computer Graphics, McGraw Hill Education (2006), 2nd Edition.
3. Rajesh K. Maurya, Computer Graphics with Virtual Reality System, Wiley (2018), 3rd Edition
4. Udit Aggarwal, Computer Graphics, SK Katria and Sons (2013), Reprint 2013 Edition
5. Padeep K. Bhatia, Computer Graphics, Dreamtech Press (2019)
6. Andries Van Dam, Foley, Steven, John, Computer Graphics Principles and Practice, Pearson Education India (2002), 2nd Edition

Bachelor of Science (Information Technology) Semester – VI
(Session 2021-22)

COURSE CODE: BITL - 6112

SOFTWARE ENGINEERING

Course Outcomes:

After passing course the student will be able to:

CO1: Identify and evaluate various process model used for development of software.

CO2: Analyze gathered data to form requirement specifications and design modular and /or structured design of a system.

CO3: Identify documentation involved during different phases of system development.

CO4: Apply testing techniques on basic building blocks and control structure.

CO5: Comprehend activities involved in software project management.

Bachelor of Science (Information Technology) Semester – VI
(Session 2021-22)

COURSE CODE: BITL - 6112
SOFTWARE ENGINEERING

Examination Time: 3 Hrs

Max. Marks: 75

Theory: 60

CA: 15

Instructions for Paper Setter -

Eight questions of equal marks (12 marks each) are to set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT – I

Introduction to Software: Definition, Software characteristics, Software Components, Software Applications.

Introduction to Software Engineering: Definition, Software Engineering Paradigms, Waterfall Model, Prototyping Model, Incremental Model, Spiral Model.

UNIT – II

Requirement, Analysis and Specifications: Problem Analysis, Requirement Gathering Tools (Questionnaire, Interview, Group Discussion, and Observation), SRS Document and its Characteristics, Structured Analysis: Data Flow Diagram, Data Dictionaries.

Software Design: Characteristics, Structure Chart, Coupling, Cohesion, Functional Independence.

UNIT – III

Project Management: SPMP Document, Size Estimation (LOC, Function Point), COCOMO (Basic, Intermediate and Complete COCOMO), Effort Estimation, Development Time Estimation, Project Scheduling (Work Breakdown Structure, Activity Network, Critical Path Method, Gantt Chart, PERT Chart), Staffing.

Risk management and Control, software Maintenance and its types, Software Reuse, Software Reliability.

UNIT – IV

Coding: Coding Standards and Guidelines, Code Walkthrough, Code Inspection.

Testing: Test Case Design, Unit Testing, Black Box Testing (Equivalence Class Partitioning, Boundary Value Analysis), White Box Testing (Statement, Branch, Condition, Path Coverage), Cyclomatic Complexity, Integration Testing, System Testing (Alpha, Beta, Acceptance), Validation And Verification, Performance Testing.

References / Textbooks:

1. Roger S. Pressman, Software Engineering, McGraw-Hill series (2014) , 8th Edition.
2. Pankaj Jalote, A concise introduction to Software Engineering, Wiley (2008).
3. Rajib Mall, Fundamentals of Software Engineering, PHI Learning (2018), 5th Revised Edition
4. Kogent Learning Solutions Inc., Software Engineering, Dreamtech Press (2012)
5. Bruce R. Maxim, Roger S. Pressman, Software Engineering: A Practitioner's Approach, McGraw Hill Education (2019), Eighth edition
6. David A. Gustafson, Schaum's Outline of Software Engineering, McGraw Hill (2020), 1st Edition

Bachelor of Science (Information Technology) Semester – VI
(Session 2021-22)

COURSE CODE: BITP - 6113

LAB ON COMPUTER GRAPHICS

Examination Time: 3 Hrs

Max. Marks: 50

Practical: 40

CA: 10

Lab on Applications of Computer Graphics.

Bachelor of Science (Information Technology) Semester – VI
(Session 2021-22)

COURSE CODE: BITP - 6114

PROJECT

Course Outcomes:

After passing course the student will be able to:

CO1: Apply the tools and techniques learnt to frame problems and their corresponding solutions.

CO2: Develop skills necessary to structure, manage and execute projects.

CO3: Learn to work as a member of a cohesive unit.

CO4: Develop presentation skills.

Bachelor of Science (Information Technology) Semester – VI
(Session 2021-22)

COURSE CODE: BITP - 6114

PROJECT

Examination Time: 3 Hrs

Max. Marks: 200

Practical: 160

CA: 40

General Instructions:

1. A software module based on the work done in the entire course is to be developed.
2. The soft copy of the module shall be submitted to the College/Institute till April 5 of the respective semester.
3. The software module shall be developed in groups, consisting of at most two students in a group.
4. The respective college shall depute guide(s)/supervisor(s) under whose supervision the software module shall be developed. The guide/supervisor shall clarify that the work done is original & authenticated. The certificate found to be incorrect at any stage shall attract the proceedings against all the stakeholders, as per rules.
5. The evaluation of the module shall be done as per the common ordinance of UG/PG w.e.f. 2012–2013 under semester system.

(Annexure D)

FACULTY OF COMPUTER SCIENCE & IT

SYLLABUS FOR

Diploma in Computer Applications

(Semester I-II)

(Under Continuous Evaluation System)

Session: 2021-22



The Heritage Institution

**KANYA MAHA VIDYALAYA
JALANDHAR
(Autonomous)**

PROGRAM SPECIFIC OUTCOMES
Diploma in Computer Applications

Session 2021-22

After completing the Diploma Course in Computer Applications, the Students will be able to:

PO1: Comprehend the fundamentals of computer system and its basic components- Hardware & Software.

PO2: Get familiar with various concepts of computer networks, communication media and use of numerous internet applications efficiently for personal as well as professional purpose.

PO3: Manage all office automation tasks from word processing to making presentations, from handling worksheets to managing databases in an efficient manner.

PO3: Perform DTP (Desktop Publishing) applications to design or edit photos.

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATIONS OF ONE YEAR DIPLOMA PROGRAMME

DIPLOMA IN COMPUTER APPLICATIONS

Session 2021-22

Diploma in Computer Applications Semester – I							
Course Code	Course Name	Course Type	Marks				Examination Time (in Hours)
			Total	Ext.		CA	
				L	P		
DCAM- 1111	Information Technology and Operating System	C	100	50	30	20	3+3
DCAM - 1112	PC Computing–I (Back Office Operations)	C	100	50	30	20	3+3
	Total		200				

Note:

C - Compulsory

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATIONS OF ONE YEAR DIPLOMA PROGRAMME

DIPLOMA IN COMPUTER APPLICATIONS

Session 2021-22

Diploma in Computer Applications Semester - II							
Course Code	Course Name	Course Type	Marks				Examination Time (in Hours)
			Total	Ext.		CA	
				L	P		
DCAM - 2111	Database Management System	C	100	50	30	20	3+3
DCAM -2112	PC Computing–II (Professional DTP)	C	100	50	30	20	3+3
	Total		200				

Note:

C - Compulsory

Diploma in Computer Applications Semester – I
Session 2021-22
COURSE CODE: DCAM–1111
INFORMATION TECHNOLOGY AND OPERATING SYSTEM

Course Outcomes:

After passing this course the student will be able to:

CO1: develop a basic understanding of technologies used in the Internet and effective use of Internet tools including current web-based applications, e-mail, search strategies and basic web authoring.

CO2: learn essential operating system skills including how to use, setup, configure, troubleshoot and maintain a current microcomputer operating system.

CO3: learn about various hardware devices, computer languages, system and application software.

Diploma in Computer Applications Semester – I
Session 2021-22
COURSE CODE: DCAM–1111
INFORMATION TECHNOLOGY AND OPERATING SYSTEM

Examination Time: (3+3) Hrs.

Max. Marks: 100

Theory: 50

Practical: 30

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (10 marks each) are to be set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT I

Fundamentals of Computer: Introduction to computer, Components of computers (Input unit, Output Unit, Memory Unit & CPU), Types of software, Translators (compiler, interpreter, assembler), Programming languages (Machine, assembly, high level languages).

UNIT II

Information Concepts and Processing: Evolution of Information Processing, Data Information

Language, Communication and Network, Client Server Systems, Computer Networks (LAN & WAN)

UNIT III

Internet: Understanding the Internet, WWW, E-mail Basics, Browsing the Web.

Operating System: Introduction to Operating System, Types of Operating System (Single User Systems, Multi User Systems), Booting a System.

UNIT IV

Disk Operating System: Introduction to DOS, Structure of DOS, Internal Command (cls, dir, date, time, vol, ver, copy con, type, ren, del, md, rd, d, path, prompt), External Commands (edit, attrib, backup, restore, chkdsk, diskcopy, dskcomp, deltree, edit, format).

References/Textbooks:

1. Anshuman Sharma, Fundamentals of Information Technology, Lakhanpal Publishers, 5th Edition.
2. Rachhpal Singh & Gurvinder Singh, PC Software, Kalyani Publisher, 2009.
3. Peter Norton, Peter Norton's Computing Fundamentals, McGraw-Hill Technology Education, 2006.

Note: The latest editions of the books should be followed.

Diploma in Computer Applications Semester – I
Session 2021-22
COURSE CODE: DCAM–1112
PC COMPUTING–I (BACK OFFICE OPERATIONS)

Course Outcomes:

After passing this course the student will be able to:

CO1: work on Spreadsheet application for office tasks.

CO2: create effective presentations, can apply designs to enhance the look of the presentation, print a presentation.

CO3: understand Word Processor, Create, Edit and Format documents, Work with Tables, Import and Export data between Files, Save, Protect and Print documents.

Diploma in Computer Applications Semester – I

Session 2021-22

COURSE CODE: DCAM–1112

PC COMPUTING–I

(BACK OFFICE OPERATIONS)

Examination Time: (3+3) Hrs.

Max. Marks: 100

Theory: 50

Practical: 30

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (10 marks each) are to be set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT–I

Introduction to Windows: Parts of window screen (Desktop, window, icons), start menu, Taskbar settings, application & document window, anatomy of a window (Title bar, minimize, maximize button, control box, scroll bars), Window explorer (copying, moving, deleting files, folder, creating folders), About desktop icons (recycle bin, my computer), shortcut creation.

UNIT–II

Word Processing: Introduction to word processing & its features, parts of window of word processing (Title bar, menu bar, status bar, and ruler), understanding the ribbon, use of office button and quick access toolbar, creation of new documents, opening document, insert a document into another document. Page setup, margins, gutters, font properties, alignment, page breaks, header & footer, deleting, moving, replace, editing text in document, saving a document, spell checker, printing a document. Creating a table, entering and editing text in tables, changing format of table, height and width of row/column editing, adding and deleting rows/columns. Adding picture, page colors and watermarks, borders, shading, drawing objects.

UNIT III

Presentation: Introduction to presentation, exploring menus, starting a new slide, saving presentation, moving/rearranging slides, printing slides. Applying theme to presentation, views

(slide view, slide sorter, notes view, outline view), formatting & enhancing text. Creating a graph, displaying slide show, adding multimedia. Slide transitions, applying Animation, Timing slide display, adding movies & sounds, using a pick look wizards to change format.

UNIT IV

Spreadsheet: Introduction to worksheet/spreadsheet, features, creating a new workbook, different functions on different data in excel, creation of graphs, editing it and formatting, changing chart type, creation of worksheet, adding, deleting, moving the text in worksheet, sorting the data, querying the data, filtering the data (auto and advance filters), What-if analysis, open an already existing workbook, saving workbook, printing a worksheet, closing the workbook & exiting.

References/Textbooks:

1. Anshuman Sharma, A book of Fundamentals of Information Technology, Lakhanpal Publishers, 5th Edition.
2. Prof. Satish Jain, M. Geetha, Kratika, BPB's Office 2010 Course Complete Book, BPB Publications, 2017.
3. Joyce Cox, Joan Lambert and Curtis Frye, Microsoft office Professional 2010 Step by Step, Microsoft Press, 2010.
4. V. Rajaraman, Neeharika Adabala, Fundamentals of Computers, PHI Learning, 2015.
5. P.K. Sinha, Computer Fundamentals, BPB Publications, 2004.

Note: The latest editions of the books should be followed.

Diploma in Computer Applications Semester – II

(Session 2021-22)

COURSE CODE: DCAM - 2111

DATABASE MANAGEMENT SYSTEM

Course Outcomes:

After the completion of this course, the student will be able to:

CO1: Comprehend various terms like data, database and database models.

CO2: Apply SQL to formulate queries and design basic level of database.

CO3: Comprehend the use of Programming Language constructs like function, procedure, packages, etc. in database.

Diploma in Computer Applications Semester – II

(Session 2021-22)

COURSE CODE: DCAM-2111 DATABASE MANAGEMENT SYSTEM

Examination Time: (3+3) Hrs.

Max. Marks: 100

Theory: 50

Practical: 30

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (10 marks each) are to be set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT-I

Introduction: Introduction to Database Management System, Components of DBMS, Three-level architecture, Data Mapping.

UNIT-II

Data Models: Hierarchical Model, Network Model and Relational Model.

Normalization of Data: First, Second and Third Normal form Introduction to RDBMS, Types of Keys.

UNIT-III

ORACLE : Introduction to Oracle .

SQL– DDL, DML, DCL, Join methods & Sub query, Union, Intersection, Minus, Built in

Functions, Views, Security amongst users, Sequences, Indexing Object Oriented Features of Oracle 10g

UNIT-IV

PL/SQL: Introduction to PL/SQL, Relationship between SQL & PL/SQL, Advantages, block structure, Valuable and Constant declaration, Declaration using attributes %type attribute, control statements.

References/Textbooks:

1. Silberschatz, Korth & Sudarshan, Database Systems Concepts, McGraw-Hill Inc.(2020),
7th edition.
2. C.J. Date, An Introduction of Database System, Addison-Wesley Publishing co.(2003),
8th edition.
3. Anshuman Sharma, Fundamentals of DBMS, Lakhanpal Publishers (2016), 4th edition.
4. Raghu Ramakrishnan, Johannes Gehrke, Database Management Systems, McGraw Hill Education (2014), 3rd edition.
5. Atul Kahate, Introduction to Database Management Systems, Pearson (2004), 1st edition.
6. Ivan Bayross, SQL/PL/SQL. The Programming Language of Oracle, BPB Publications (2010), 4th edition.

Diploma in Computer Applications Semester – II

(Session 2021-22)

COURSE CODE: DCAM - 2112

PC COMPUTING–II
(Professional DTP)

Course Outcomes:

After passing this course the student will be able to:

CO1: Comprehend the raster and vector graphics, image resolution, menu and various palettes, concept of path and dimensions.

CO2: Apply simple graphic design tools and techniques like masks and histogram, acquiring and importing images.

CO3: Acquire knowledge of layer channels and path, filters, rendering effects, transformation, image modes, canvas and images, using navigator and photoshop plugins.

Diploma in Computer Applications Semester – II

(Session 2021-22)

COURSE CODE: DCAM - 2112

PC COMPUTING–II

(Professional DTP)

Examination Time: (3+3) Hrs.

Max. Marks: 100

Theory: 50

Practical: 30

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (10 marks each) are to be set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted

from any section.

UNIT–I

Photoshop: Introduction to Graphics, Vector Graphics and Bitmaps, Understanding Image Size and Resolution, Using Menu and Palettes.

UNIT II

Photoshop Tools: Marquee Tool , Move Tool , Lasso Tool (Polygon, Magnetic, Magic Wand Tool), Crop Tool ,Healing Brush Tool ,Patch Tool, Brush Tool, Pencil Tool, Clone Stamp Tool, Pattern Stamp Tool, History Brush Tool, Art History Brush, Eraser Tool (Background, Magic Erases Tool), Gradient Tool , Blur Tool , Smudge Tool, Sharpen Tool, Dodge Tool, Burn Tool, Sponge Tool Path Selection Tool , Text Type Tool , Pen Tool ,Rectangle Tool , Eyedropper Tool, Hand Tool, Zoom Tool.

UNIT–III

Modes: Color Modes (Grayscale, RGB, CMYK), Channels and Paths (Creating Paths via Selections, via Pen Tools), Concept of Layers, Creating/ Adding Layers, Duplicating Layer, Deleting Layer, Layers Palette Menu, Quick & Layer Mask and Histogram.

UNIT-IV

Effects: Filters, Transformation (Scaling, Rotating, Skewing, Distorting, Perspective, Flipping, Absolute, Free Transform).

References/Textbooks:

1. Steve Caplin, How To Cheat In Photoshop CC: The Art of Creating Realistic Photomontages by Routledge (2013), 1st edition.
2. Lisa DaNae Dayley, Brad Dayley, Adobe Photoshop CC Bible, Wiley (2013), 1st edition.
3. Manohar Singh, Jaspreet Thind, Tejinder Thind, Uminder Kaur, PC Computing II Photoshop 5.5 & Corel Draw 10 Professional DTP, AP Publishers (2008), 1st edition.
4. Saish Jain, Photoshop CS6 Training Guide, BPB Publications (2014).
5. Natallia Geisen, Photoshop for Beginners: Learn the Basics of Photoshop in Under 10 Hours! (Graphic Design, Photo Editing, Adobe Photoshop, Digital Photography), Createspace Independent Pub (2016).
6. Martin Evening, Adobe Photoshop CS6 for Photographers: A professional image editor's guide to the creative use of Photoshop for the Macintosh and PC, Routledge (2012) 1st edition.

(Annexure E)

FACULTY OF COMPUTER SCIENCE & IT

SYLLABUS

of

Additional / Optional paper for specialization in Data Science

for

Bachelor of Science (Information Technology)

(Semester I-VI)

(Under Continuous Evaluation System)

(12+3 System of Education)

Session: 2021-22



The Heritage Institution
KANYA MAHA VIDYALAYA
JALANDHAR
(Autonomous)

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATIONS OF THREE YEAR DEGREE PROGRAMME

Bachelor of Science (Information Technology)

Session 2021-22

Additional / Optional paper for Specialization in Data Science

Bachelor of Science (Information Technology) Semester – I							
Course Code	Course Name	Course Type	Marks				Examination Time (in Hours)
			Total	Ext.		CA	
				L	P		
BITL-1115	*Computational Data Science	O	75	60	-	15	3
	Total		75				

Bachelor of Science (Information Technology) Semester II							
Course Code	Course Name	Course Type	Marks				Examination Time (in Hours)
			Total	Ext.		CA	
				L	P		
BITL-2116	* Statistical Techniques for Data Science	O	75	60	-	15	3
	Total		75				

Bachelor of Science (Information Technology) Semester – III							
Course Code	Course Name	Course Type	Marks				Examination Time (in Hours)
			Total	Ext.		CA	
				L	P		
BITL-3116	*Data Visualization	O	75	60	-	15	3
	Total		75				

Bachelor of Science (Information Technology) Semester IV							
Course Code	Course Name	Cour se Type	Marks				Examinati on Time (in Hours)
			Total	Ext.		CA	
				L	P		
BITM-4117	* Foundation of Statistical Computing	O	75	40	20	15	3+3
	Total		75				

Bachelor of Science (Information Technology) Semester V							
Course Code	Course Name	Course Type	Marks				Examination Time (in Hours)
			Total	Ext.		CA	
				L	P		
BITL-5116	* Data Mining and Data Warehousing	O	75	60	-	15	3
	Total		75				

Bachelor of Science (Information Technology) Semester VI							
Course Code	Course Name	Course Type	Marks				Examination Time (in Hours)
			Total	Ext.		CA	
				L	P		
BITM-6115	* Data Mining Tool	O	75	30	30	15	3+3
	Total		75				

Note:

O - Optional

*One additional/optional paper will be studied by the candidate if she opts for Specialization in Data Science

Bachelor of Science (Information Technology) Semester I
(Session 2021-22)

COURSE CODE: BITL-1115

COMPUTATIONAL DATA SCIENCE

Course Outcomes:

After the completion of this course, the student will be able to:

CO1: Comprehend terminology associated with data and its processing.

CO2: Comprehend various types of functions.

CO3: Apply Algorithms of polynomial algebra to solve problems.

CO4: Apply various counting principles, permutations and combinations to solve basic set of problems.

Bachelor of Science (Information Technology) Semester- I
(Session 2021-22)

COURSE CODE: BITL-1115
COMPUTATIONAL DATA SCIENCE

Examination Time: 3 Hrs

Max. Marks: 75

Theory: 60

CA: 15

Instructions for Paper Setter -

Eight questions of equal marks (12 marks each) are to set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section

UNIT I

Data Processing: Basic Terminology of Data, Types of Data, Information and Knowledge, Preprocessing the Data, Data cleaning, Data transformation, Data reduction.

Introduction to Data Science, Evolution of Data science, Need of Data Science, Components of Data Science, Data Science process, Application Areas and Challenges in Data Science.

UNIT II

Functions: Functions and their types, Quadratic Functions and Equations, Inverse Function, Logarithmic Functions and Equations.

UNIT III

Algebra of Polynomials: Addition, Subtraction, Multiplication and Division Algorithms

Graphs of Polynomials: X-intercepts, multiplicities, end behavior and turning points, Graphing & Polynomial Creation.

UNIT IV

Basic Principles of Counting and Factorial Concepts: Addition rule of counting, Multiplication rule of counting, Factorials.

Permutation and Combination.

Probability Basics: Definition, Events, Properties of Probability.

References/Textbooks:

1. Patricia Pulliam Phillips, Cathy A. Stawarski, "Data Collection: Planning for and Collecting All Types of Data", Wiley Publisher, First Edition, 2008.
2. Roger Sapsford, Victor Jupp, "Data Collection -and Analysis", Second Edition, Sage Publishing, 2006.
3. Kenneth Rosen, "Discrete Mathematics and Its Applications", Tata McGraw Hill, 7th Edition

Bachelor of Science (Information Technology) Semester II

(Session 2021-22)

COURSE CODE: BITL-2116

STATISTICAL TECHNIQUES FOR DATA SCIENCE

Course Outcomes:

After the completion of this course, the student will be able to:

CO1: Comprehend the key terminology of descriptive statistics and frequency distribution.

CO2: Distinguish between sample and population distributions, identify the basic concepts of hypothesis testing to conduct hypothesis.

CO3: Comprehend the basic Probability terms and their usage.

CO4: Implement statistical techniques using Spreadsheets.

Bachelor of Science (Information Technology) Semester- II
(Session 2021-22)
COURSE CODE: BITL-2116
STATISTICAL TECHNIQUES FOR DATA SCIENCE

Examination Time: 3 Hrs

Max. Marks: 75

Theory: 60

CA: 15

Instructions for Paper Setter -

Eight questions of equal marks (12 mark each) are to set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section

UNIT - I

Introduction to Statistics: Basic terminology, variables: discrete and continuous.

Introduction to descriptive statistics: Types of data, levels of measurement, categorical variables and numerical variables. Introduction to Frequency distribution.

UNIT – II

Introduction to Asymmetry: Moments, Kurtosis and Skewness

Introduction to inferential statistics: Concept of a sample and a population, need of sampling, Hypothesis Testing: Type 1 and type 2 errors.

UNIT - III

Testing of hypothesis: null and alternate hypothesis, confidence intervals. Chi square test and ANOVA - one way and two way.

UNIT - IV

Probability: Meaning, Introduction to Marginal Probability, Conditional Probability and Bayes Theorem.

Data Analysis Tools in Spreadsheets: Regression Analysis, Correlation Analysis, Covariance Analysis, ANOVA Analysis.

References/Textbooks:

1. S.P Gupta, Statistical Methods, Sultan Chand & Sons (2012)
2. B. L. Agarwal, Statistics For Professional Courses, CBS Professional (2011)
3. Anshuman Sharma, Fundamentals of Numerical Methods and Statistical techniques, Lakhanpal Publications (2016)
4. Stephen L.Nelson, Excel Data Analysis for Dummies, Wiley Publications (2013)

Bachelor of Science (Information Technology) Semester- III
(Session 2021-22)

COURSE CODE: BITL-3116
DATA VISUALIZATION

Course Outcomes:

After the completion of this course, the student will be able to:

CO1: Comprehend Importance and applications of data visualization

CO2: Acquaint with data visualization tools

CO2: Interpret large amounts of data to analyze, explain and compare data

CO3: Use Specialized and advanced data visualization tools.

Bachelor of Science (Information Technology) Semester- III
(Session 2021-22)

COURSE CODE: BITL-3116

DATA VISUALIZATION

Examination Time: 3 Hrs

Max. Marks: 75

Theory: 60

CA: 15

Instructions for Paper Setter -

Eight questions of equal marks (12 marks each) are to set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section

UNIT-I

Introduction: Introduction of Data Visualization, Meaning of Data Visualization, Importance of Data Visualization, Data Visualization applications, User psychology of Visualization, UX in Data Visualization.

UNIT-II

Gestalt principles of Data Visualization, Introduction to DIKW hierarchy, Goals of Data Visualization, Basic Visualization tools - Area Plots, Histograms, Bar Charts.

UNIT-III

Data Visualization tools: Introduction, characteristics, types, image and graphical visualization. Specialized Visualization tools: Pie Charts, Box Plots, Scatter Plots, Bubble Plots.

UNIT-IV

Advanced Visualization tools: Need, Application, Visualization of Maps, Storyboards in Visualization. Waffle Charts, Word Clouds, Seaborn and Regression Plots.

References / Textbooks:

1. E. Tufte, The Visual Display of Quantitative Information (2nd Edition), Graphics Press, 2001.
2. Herbert Jones, Data Science: The Ultimate Guide to Data Analytics, Data Mining, Data Warehousing, Data Visualization, Regression Analysis, Database Querying, Big Data for Business and Machine Learning for Beginners Kindle Edition, 2020.
3. E. Tufte, Envisioning Information, Graphics Press, 1990.

4. Andy Kirk, Data Visualisation: A Handbook for Data Driven Design SAGE Publications Ltd; First edition, 2016.
5. Kieran Healy, Data Visualization: A Practical Introduction Kindle Edition, Princeton University Press; First edition, 2018.

Note: The latest editions of the books should be followed.

Bachelor of Science (Information Technology) Semester IV
(Session 2021-22)

COURSE CODE: BITM-4117

FOUNDATION OF STATISTICAL COMPUTING

Course Outcomes:

After passing this course the student will be able to:

CO1: Comprehend basic constructs like control statements, string functions, array, list, etc in R programming.

CO2: Create, operate and manage data frames.

CO3: Apply R programming from a statistical perspective.

CO4: Simulate various descriptive and analytical algorithms using R language.

Bachelor of Science (Information Technology) Semester IV
(Session 2021-22)

COURSE CODE: BITM-4117

FOUNDATION OF STATISTICAL COMPUTING

Examination Time: (3+3) Hrs

Max. Marks: 75

Theory: 40

Practical: 20

CA: 15

Instructions for Paper Setter -

Eight questions of equal marks (8 marks each) are to set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section

UNIT – I

Statistical Computing: Introduction, Role of Programming and Statistical Software. Data **Statistics:** Sampling, Cumulative statistics, Statistics for Data frames, matrix objects and lists. Introduction to R, Help functions in R, Vectors, Common Vector Operations, Using all and any function, subletting of vector. Creating matrices, Matrix operations, Applying Functions to Matrix Rows and Columns, Adding and deleting rows and columns.

UNIT - II

Lists, Creating lists, general list operations, Accessing list components and values, applying functions to lists, recursive lists

Creating Data Frames: Matrix-like operations in frames , Merging Data Frames, Applying functions to Data frames, Factors and Tables , factors and levels , Common functions used with factors , string operations

UNIT - III

Input/ Ouput: scan() , readline() Function, Printing to the Screen Reading and writing CSV and text file. Control statements: Loops, Looping Over Nonvector, Sets, if-else , writing user defined function, scope of the variable, R script file.

UNIT – IV

Graphics in R: Graph Syntax ((title, xlabel, ylabel, pch, lty, col.), Simple graphics (Bar, Multiple Bar, Histogram, Pie, Box-Plot, Scatter plot, qqplot), Low-level and High-Level plot functions. Using Analytical Algorithms (KNN, K-means, Naive Bayes) for Predictive analysis and Modelling.

References / Textbooks:

1. Andrie de Vries and Joris Meys, R Programming for Dummies, Wiley (2016), 2nd Edition.
2. Sandip Rakshit, R Programming for Beginners, McGraw Hill Education (2017), 1st Edition.
3. Sandip Rakshit, Statistics with R Programming, McGraw Hill Education (2018), 1st Edition.
4. Garrett Golemund, Hands on Programming with R, O'Reilly (2014), 1st Edition
5. Mark Gardener, Beginning R: The Statistical Programming Language, Wiley (2013)
6. Tilman M. Davies, The Book of R: A first Course in Programming and Statistics, No Strach Press (2016), 1st Edition

Bachelor of Science (Information Technology) Semester V

(Session 2021-22)

COURSE CODE: BITL-5116

DATA MINING AND DATA WAREHOUSING

Course Outcomes:

After passing this course the student will be able to:

CO1: Comprehend data mining and knowledge discovery, process and applications of data mining.

CO2: Know various data mining techniques used.

CO3: Study and analyze architecture of data warehouse.

CO4: Have knowledge of types of data warehouse, tools and technologies used.

Bachelor of Science (Information Technology) Semester V
(Session 2021-22)
COURSE CODE: BITL-5116
DATA MINING AND DATA WAREHOUSING

Examination Time: 3 Hrs

Max. Marks: 75

Theory: 60

CA: 15

Instructions for Paper Setter -

Eight questions of equal marks (12 marks each) are to set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section

UNIT I

Introduction to Data Mining: Introduction to Data Mining Systems, Knowledge Discovery, Data Mining Process, Applications, Web Search Engines, Trends and Challenges in Data Mining.

UNIT II

Data Mining Techniques: Association, classification, clustering, prediction, sequential patterns and decision tree.

Classification: Distance based algorithms, K-nearest neighbors, Euclidean distance, city block distance, tangent distance, Clustering Algorithms, Cluster Analysis, Partitioning methods, Hierarchical methods, density based methods, Grid based methods

UNIT III

Data Warehousing: Introduction, Evolution, Concepts, Benefits, Problems, Architecture, OLAP.

UNIT IV

Types of Data Warehouses: Host based, single stage, LAN Based, multistage, stationary distributed and virtual data warehouses, Data Warehouse tools and technologies

References / Textbooks:

1. Alex Berson and Stephen J.Smith, “Data Warehousing, Data Mining and OLAP”, Tata McGraw – Hill Edition, 13th Reprint 2008.
2. Jiawei Han and Micheline Kamber, “Data Mining Concepts and Techniques”, 3rd Edition, Elsevier, 2012
3. Parteek Bhatia, “Data Mining and Data Warehousing: Principles and Practical Techniques”, Cambridge University Press (2019).
4. M. Sudheep Elayidom, “Data Mining and Warehousing”, 1st Edition, CL India
5. Khushboo Saxena, Sandeep, Dr. Akash Saxena, “Data Mining and Warehousing”, BPB Publications (2014)

Bachelor of Science (Information Technology) Semester VI

(Session 2021-22)

COURSE CODE: BITM-6115

DATA MINING TOOL

Course Outcomes:

After passing this course the student will be able to:

CO1: Comprehend the concept of data set and confusion matrix

CO2: Describe data pre-processing tasks and association rule mining on data sets

CO3: Apply learned techniques to perform classification on data sets

CO4: Apply learned techniques to perform clustering of data sets

Bachelor of Science (Information Technology) Semester VI
(Session 2021-22)
COURSE CODE: BITM-6115
DATA MINING TOOL

Examination Time: (3+3) Hrs

Max. Marks: 75

Theory: 30

Practical: 30

CA: 15

Instructions for Paper Setter -

Eight questions of equal marks (6 marks each) are to set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT I

Beginning with Weka: About Weka, Installing Weka, Explore machine learning tool “Weka”
A. Explore Weka Data Mining/Machine Learning Toolkit Downloading and/or installation of WEKA data mining toolkit, Understanding the features of WEKA toolkit such as Explorer, Preparing the dataset, understanding the ARFF format, working with a Data set in Weka, Plot Histogram, Learn confusion Matrix, Precision and recall in machine learning

UNIT II

Perform data processing tasks and demonstrate performing association rule mining on data sets: Explore various options available in Weka for preprocessing data and supply unsupervised filters like discretization, Resample filter, Load various data sets into Weka and run Apriori algorithm with different support and confidence values. Study the rules generated.

UNIT III

Demonstrate performing classification on data sets: Load each data set into Weka and run 1d3, J48 classification algorithm. Study the classifier output. Compute entropy values, Kappa statistic. Load each data set into Weka and perform Naïve-bayes classification and K-nearest Neighbor classification. Interpret the results obtained. Plot RoC Curves.

UNIT IV

Demonstrate performing clustering of data sets: Load each data set into Weka and run simple K-means clustering algorithm with different values of k (number of desired clusters). Study the clusters formed. Observe the sum of squared errors and centroids, and derive insights.

Explore other clustering techniques available in Weka. Explore visualization features of Weka to visualize the clusters.

References / Textbooks:

1. Ian H, Eibe Frank , Mark A. Hall, Christopher J. Pal, Data Mining: Practical Machine Learning Tools and Techniques, Morgan Kaufmann Series in Data Management Systems, Third Edition.
2. Jiawei Han and Micheline Kamber, “Data Mining Concepts and Techniques”, 3rd Edition, Elsevier, 2012
3. Parteek Bhatia, “Data Mining and Data Warehousing: Principles and Practical Techniques”, Cambridge University Press, 2019.
4. Bostjan Kaluza, Instant Weka How-to, PACKT Publishing , First Edition- 2013.

FACULTY OF COMPUTER SCIENCE & IT

SYLLABUS

of

- Bachelor of Arts / Bachelor of Science (Computer Science) / Bachelor of Science (Economics) (Semester I-VI)
- Bachelor of Arts / Bachelor of Science (Economics) Computer Applications (Vocational) (Semester I-VI)
- Bachelor of Science (Honours) Agriculture Semester IV – Agri Informatics
- Bachelor of Commerce (Honours) Semester I (Workshop on Office Package)
- Bachelor of Business Administration Semester I (Computer Applications for Business – I)
- Bachelor of Commerce (Pass) Semester I (Computer Fundamentals)
- Bachelor of Science (Fashion Designing) Semester I (Basics of Computer)
- Bachelor of Science (Honours) Physics Semester III (Python Programming)
- Bachelor of Science (Home Science) Semester I (Computer Basics) & Semester II (Computer Applications for Home Scientists)
- Bachelor of Science (Honours) Mathematics Semester II (Computer Fundamentals and Introduction to C), Semester III (Python Programming) & Semester IV (Foundation of Statistical Computing)
- Master of Commerce Semester IV (E-Commerce)
- Master of Science (Chemistry) Semester I (Computer for Chemists)
- Master of Science (Zoology) Semester I (Computer Programming & Data Processing)
- Master of Arts (Economics) Semester II (Computer Applications for Economists)

Session: 2021-22



The Heritage Institution

**KANYA MAHA VIDYALAYA
JALANDHAR
(Autonomous)**

(Annexure F-1)

FACULTY OF COMPUTER SCIENCE & IT

SYLLABUS

of

**Bachelor of Arts / Bachelor of Science (Computer Science) /
Bachelor of Science (Economics)
(Semester I-VI)**

**(Under Continuous Evaluation System)
(12+3 System of Education)**

Session: 2021-22



The Heritage Institution
KANYA MAHA VIDYALAYA
JALANDHAR
(Autonomous)

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATIONS OF THREE YEAR DEGREE PROGRAMME

Bachelor of Arts / Bachelor of Science (Computer Science) / Bachelor of Science (Economics)

Session 2021-22

Bachelor of Arts / Bachelor of Science (Computer Science) /Bachelor of Science (Economics) Semester I								
Course Name	Program Name	Course Code	Course Type	Marks				Examinati on time (in Hours)
				Total	Ext.		CA	
					L	P		
Computer Science (Computer Fundamentals and PC Software)	Bachelor of Arts Semester I/	BARM-1134	E	100	50	30	20	3+3
	Bachelor of Science (Computer Science) Semester I /	BCSM-1134	C					
	Bachelor of Science (Economics) Semester I	BECM-1134	E					

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATIONS OF THREE YEAR DEGREE PROGRAMME

Bachelor of Arts / Bachelor of Science (Computer Science) / Bachelor of Science (Economics)

Session 2021-22

Bachelor of Arts / Bachelor of Science (Computer Science) / Bachelor of Science (Economics) Semester II								
Course Name	Program Name	Course Code	Course Type	Marks				Examination time (in Hours)
				Total	Ext.		CA	
					L	P		
Computer Science (Programming in C)	Bachelor of Arts Semester II /							
	Bachelor of Science (Computer Science) Semester II/	BARM-2134	E					
		BCSM-2134	C	100	50	30	20	3+3
	Bachelor of Science (Economics) Semester II	BECM-2134	E					

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATIONS OF THREE YEAR DEGREE PROGRAMME

Bachelor of Arts / Bachelor of Science (Computer Science) / Bachelor of Science (Economics)

Session 2021-22

Bachelor of Arts / Bachelor of Science (Computer Science) / Bachelor of Science (Economics) Semester - III								
Course Name	Program Name	Course Code	Course Type	Marks				Examination time (in Hours)
				Total	Ext.		CA	
					L	P		
Computer Science (Computer Oriented Numerical and Statistical Methods)	Bachelor of Arts - Semester III/ Bachelor of Science (Computer Science)-Semester III Bachelor of Science (Economics)-Semester III	BARM-3134 BCSM-3134 BECM-3134	E C E	100	50	30	20	3+3

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATIONS OF THREE YEAR DEGREE PROGRAMME

Bachelor of Arts / Bachelor of Science (Computer Science) / Bachelor of Science (Economics)

Session 2021-22

Bachelor of Arts / Bachelor of Science (Computer Science) / Bachelor of Science (Economics)Semester - IV								
Course Name	Program Name	Course Code	Course Type	Marks				Examination time (in Hours)
				Total	Ext.		CA	
					L	P		
Computer Science (Data Structures)	Bachelor of Arts - Semester IV/	BARM-4134	E	100	50	30	20	3+3
	Bachelor of Science- Semester IV/		C					
	Bachelor of Science (Economics)- Semester IV	BESM-4134	E					

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATIONS OF THREE YEAR DEGREE PROGRAMME

Bachelor of Arts / Bachelor of Science (Computer Science) / Bachelor of Science (Economics)

Session 2021-22

Bachelor of Arts / Bachelor of Science (Computer Science) / Bachelor of Science (Economics)Semester - V								
Course Name	Program Name	Course Code	Course Type	Marks				Examination time (in Hours)
				Total	Ext.		CA	
					L	P		
Computer Science (Database Management System)	Bachelor of Arts-Semester V/ Bachelor of Science Semester V/ Bachelor of Science (Economics)-Semester V	BARM-5134 BCSM-5134 BECM-5134	E C E	100	50	30	20	3+3

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATIONS OF THREE YEAR DEGREE PROGRAMME

Bachelor of Arts / Bachelor of Science (Computer Science) / Bachelor of Science (Economics)

Session 2021-22

Bachelor of Arts / Bachelor of Science (Computer Science) / Bachelor of Science (Economics)Semester - VI								
Course Name	Program Name	Course Code	Course Type	Marks				Examination time (in Hours)
				Total	Ext.		CA	
					L	P		
Computer Science (Information Technology)	Bachelor of Arts-Semester VI/	BARM-6134	E	100	50	30	20	3+3
	Bachelor of Science-Semester VI/	BCSM-6134	C					
	Bachelor of Science (Economics)-Semester VI	BECM-6134	E					

**Bachelor of Arts / Bachelor of Science (Computer Science) /
Bachelor of Science (Economics) Semester- I**

Session 2021-22

Course Code: BARM-1134

BCSM-1134

BECM-1134

**COMPUTER SCIENCE
(COMPUTER FUNDAMENTALS AND PC SOFTWARE)**

Course Outcomes:

After passing this course the student will be able to:

CO1: have knowledge of Computer components - hardware, software and memory.

CO2: use computer system for general tasks at user level, including operative systems and programming environments.

CO3: gain knowledge on office automation software and recognize when to use a particular office program to create professional and academic documents.

**Bachelor of Arts / Bachelor of Science (Computer Science) /
Bachelor of Science (Economics) Semester- I**

Session 2021-22

Course Code: BARM-1134
BCSM-1134
BECM-1134

**COMPUTER SCIENCE
(COMPUTER FUNDAMENTALS AND PC SOFTWARE)
(THEORY)**

Examination Time: (3+3) Hrs.

Max. Marks: 100

Theory: 50

Practical: 30

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (10 marks each) are to be set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT I

Fundamentals of Computer: Introduction to computer, Applications of computer, Components of computers (Input unit, Output Unit, Memory Unit & CPU), type of Software, Translators (compiler, interpreter, assembler), Booting a System.

UNIT II

Input and Output Devices: Keyboards, Mouse, Joystick, Track Ball, Light Pen and Data Scanning devices (scanner, OCR, OMR, MICR, Bar Code Reader, Card Reader), Monitor, Printers (laser printer, dot matrix printer, ink jet printer).

Memories: Primary Memory-RAM and ROM. **Secondary Memory-** Hard Disk, CD, DVD.

Introduction to Windows based operating system and Desktop icons.

UNIT III

Word Processing: Introduction to word, Parts of window of word (Title bar, menu bar, status bar, and ruler), understanding the Ribbon, Use of Office Button and Quick Access Toolbar,

Creation of new documents, opening document, insert a document into another document. Page setup, margins, gutters, font properties, Alignment, page breaks, header & footer, deleting, moving, replace, editing text in document, saving a document, spell checker, printing a document. Creating a table, entering and editing, Text in tables. Changing format of table, height, width of row/column. Editing, deleting Rows, columns in table. Adding picture, page colors and Watermarks, Borders and shading, Templates, wizards, Mail Merge.

UNIT IV

PowerPoint Presentation: Introduction to PowerPoint, exploring menus, starting a new slide, saving presentation, moving/rearranging slides, printing slides. Applying theme to presentation, Views (slide View, slide sorter, notes view, outline view), Formatting & enhancing text formatting. Creating a graph, displaying slide show, adding multimedia. Slide transitions, applying Animation, Timing slide display, adding movies & sounds. Using a pick look Wizards to change format.

References/Textbooks:

1. Anshuman Sharma, A book of Fundamentals of Information Technology, Lakhanpal Publishers, 5th Edition.
2. Prof. Satish Jain, M. Geetha, Kratika, BPB's Office 2010 Course Complete Book, BPB Publications, 2017.
3. Joyce Cox, Joan Lambert and Curtis Frye, Microsoft office Professional 2010 Step by Step, Microsoft Press, 2010.
4. V. Rajaraman, Neeharika Adabala, Fundamentals of Computers, PHI Learning, 2015.
5. P.K. Sinha, Computer Fundamentals, BPB Publications, 2004.

Note: The latest editions of the books should be followed.

**Bachelor of Arts / Bachelor of Science (Computer Science) /
Bachelor of Science (Economics) Semester- I**

Session 2021-22

**COMPUTER SCIENCE
(COMPUTER FUNDAMENTALS AND PC SOFTWARE)
(PRACTICAL)**

Examination Time: (3+3) Hrs.

Max. Marks: 100

Theory: 50

Practical: 30

CA: 20

Practical on PC Software - Office.

**Bachelor of Arts / Bachelor of Science (Computer Science) /
Bachelor of Science (Economics) Semester- II
(Session 2021-22)**

Course Code: BARM-2134
BCSM-2134
BECM-2134

**COMPUTER SCIENCE
(PROGRAMMING IN C)**

Course Outcomes:

After passing this course the student will be able to:

CO1: Comprehend different programming constructs involved in C programming.

CO2: Design symbolic representation of a problem and its solution through tools like algorithms, flowcharts, etc.

CO3: Design and control the execution of a program.

CO4: Apply programming concepts to provide solution for problems associated with different problem domains.

CO5: Identify storage classes associated with variables.

**Bachelor of Arts / Bachelor of Science (Computer Science) /
Bachelor of Science (Economics) Semester- II
(Session 2021-22)**

Course Code: BARM-2134
BCSM-2134
BECM-2134

**COMPUTER SCIENCE
(PROGRAMMING IN C) (THEORY)**

Examination Time: (3+3) Hrs.

Max. Marks: 100

Theory: 50

Practical: 30

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (10 marks each) are to be set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT-I

Data Representation, Introduction to Number Systems and Character Codes, Flow Charts, Problem Analysis, decision tables, pseudo codes and, algorithms.

UNIT-II Programming Using C:

Basics of C: Introduction to C, Applications and Advantages of C, Tokens, Types of Errors

Data Types: Basic & Derived Data Types, User Defined Data Types, Declaring and initializing variables.

Operators and Expressions: Types of operators (Unary, Binary, Ternary), Precedence and Associativity

Data I/O Functions: Types of I/O function, Formatted & Unformatted console I/O Functions

UNIT-III

Control Statements: Jumping, Branching and Looping-Entry controlled and exit controlled, Advantages/Disadvantages of loops, difference between for, while and do-while.

Arrays: Types of Arrays, One Dimensional and Two-Dimensional Arrays.

Strings: Introduction to Strings and String functions, array of strings.

UNIT-IV

Functions: User Defined & Library Function, Function (Prototype, Declaration, Definition), Methods of passing arguments, local and global functions, Recursion.

Storage Classes: Introduction to various storage classes, scope and lifetime of a variable, Storage class specifiers (auto, register, static, extern), advantages and disadvantages.

Structure and Union: Introduction to structure and union, pointers with structure.

References/Textbooks:

1. E. Balagurusamy, Programming in ANSI C, Tata McGraw-Hill (2002), 5th edition.
2. Stephen G. Kochan, Programming in C, Pearson Education (2015), 4th edition.
3. Rachhpal Singh K.S. Kahlon, Gurvinder Singh, Programming in C, Kalyani Publishers (2011).
4. Yashwant Kanetkar, Let us C, BPB Publications (2020), 17th edition.
5. R.S. Salari, Application Programming in C, Khanna Book Publishing (2012), 4th edition.
6. Anshuman Sharma, Learn programming in C, Lakhanpal Publishers (2016), 7th edition.

Bachelor of Arts / Bachelor of Science (Computer Science) /

Bachelor of Science (Economics) Semester- II

(Session 2021-22)

Course Code: BARM-2134

BCSM-2134

BECM-2134

COMPUTER SCIENCE

(PROGRAMMING IN C)

(PRACTICAL)

Examination Time: (3+3) Hrs.

Max. Marks: 100

Theory: 50

Practical: 30

CA: 20

Practical on Programming in C.

Bachelor of Arts / Bachelor of Science (Computer Science) /

Bachelor of Science (Economics) Semester- III

Session 2021-22

Course Code: BARM-3134

BCSM-3134

BECM-3134

COMPUTER SCIENCE

(COMPUTER ORIENTED NUMERICAL AND STATISTICAL METHODS)

Course Outcomes:

After passing this course the student will be able to:

CO1: Understand numerical methods, nonlinear equations, interpolation methods and Simultaneous Solution of Equations.

CO2: Learn about Interpolation and Curve Fitting and Numerical differentiation.

CO3: Learn Correlation, Regression, Bivariate and Multivariate distribution and Interpretation of Trend Analysis.

Bachelor of Arts / Bachelor of Science (Computer Science) /

Bachelor of Science (Economics) Semester- III

Session 2021-22

Course Code: BARM-3134

BCSM-3134

BECM-3134

COMPUTER SCIENCE

(COMPUTER ORIENTED NUMERICAL AND STATISTICAL METHODS)

(THEORY)

Examination Time: (3+3) Hrs.

Max. Marks: 100

Theory: 50

Practical: 30

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (10 marks each) are to be set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section. The students can use Non-programmable/ scientific & Non-storage type calculator.

Unit –I

Introduction: Numerical methods, Numerical methods versus numerical analysis, Errors and Measures of Errors. Bisection method, false position method and Newton Raphson method.

Simultaneous Solution of Equations: Gauss Elimination Method, Gauss Jordan method, Gauss Siedel Method.

Unit -II

Interpolation: Interpolation and Curve Fitting, Lagrangian Polynomials, Newtons Methods: Forward Difference Method, Backward Difference Method and Divided Difference Method.

Numerical Integration: Trapezoidal Rule, Simpson's 1/3 Rule Simpson's 3/8 Rule.

Unit -III

Measure of Central Tendency: Preparing frequency distribution table, Mean Arithmetic, Mean Geometric, Mean Harmonic, Mean, Median and Mode.

Measure of dispersion: Range, Mean deviation, Standard deviation, co-efficient of variation, Moments, Skewness, Kurtosis.

Unit –IV

Correlation: Meaning, Bivariate Distribution, Multivariate distribution, Karl Pearson method, Rank correlation.

Regression: Meaning, Linear Regression.

References/ Textbooks:

1. B.S. Grewal, Numerical Methods in Engineering & Science: With Programs in C, C++ & MATLAB, Khanna Publisher, 2014.
2. V. Rajaraman, Computer Oriented Numerical Methods, Prentice Hall of India Private Ltd., 2009.

Note: The latest editions of the books should be followed.

Bachelor of Arts / Bachelor of Science (Computer Science) /

Bachelor of Science (Economics) Semester- IV

(Session 2021-22)

Course Code: BARM-4134

BCSM-4134

BECM-4134

COMPUTER SCIENCE

(DATA STRUCTURES)

Course Outcomes:

After passing course the student will be able to:

CO1: Comprehend basic operations on data structures and acquainting with Arrays, Linked Lists, Stacks, Queues, Graphs and Trees.

CO2: Comprehend various sorting and searching algorithms.

CO3: Implement basic data structures and solve problems using fundamental algorithms.

CO4: Analyze complexity of algorithms to determine their efficiency.

**Bachelor of Arts / Bachelor of Science (Computer Science) /
Bachelor of Science (Economics) Semester- IV**

(Session 2021-22)

Course Code: BARM-4134

BCSM-4134

BECM-4134

COMPUTER SCIENCE

(DATA STRUCTURES)

(THEORY)

Examination Time: (3+3) Hrs.

Max. Marks: 100

Theory: 50

Practical: 30

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (10 marks each) are to be set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section. The students can use Non-programmable/ scientific & Non-storage type calculator.

UNIT-I

Data Structures: Introduction to elementary data organization, Common Operation on Data Structures, Algorithm Complexity, Big O Notation, Time-Space Tradeoff between Algorithms.

Arrays: Array defining, representing arrays in memory, various operations on linear arrays, MultiDimensional arrays.

UNIT-II

Linked Lists: Types of Linked Lists, representing linked list in memory, advantages of using linked lists over arrays, various operations of linked lists.

Stacks: Description of stack structure, Implementation of stack, using arrays and linked lists, application of stack-converting, arithmetic expression from infix notation to polish notation and their subsequent evaluation, quicksort technique.

UNIT-III

Queues: Description of queue structure, Implementation of queue using arrays and linked lists, description or priorities of queues, dequeues.

Sorting and Searching: Sorting Algorithms, bubble sort, selection sort, insertion sort, quick sort, merge sort, heap sort, searching Algorithms, linear search and binary search.

UNIT-IV

Trees: Description of Tree Structure and its Terminology, Binary Trees and Binary Search Trees and their representation in Memory, Heapsort.

Graphs: Description of Graph Structure, Implement Graphs in Memory using Adjacency Matrix, Path Matrix, graph traversal techniques - DFS, BFS.

References / Textbooks:

1. Seymour Lipschutz, Data Structures with C (Schaum's Outline Series), McGraw Hill Education (2017), 1st Edition
2. Reema Thareja, Data Structures Using C, Oxford Publication (2014), 2nd Edition
3. Sahni Horowitz, Fundamentals of Data Structures in C (2008), 2nd Edition
4. Narasimha Karumanchi, Data Structures and Algorithms made easy, Careermonk Publications (2016), 5th Edition
5. S.K. Srivastava and Deepali Srivastava, Data Structures through C, BPB Publications (2004)
6. Yedidyah Langsam, Augenstein and Tanenbaum, Data Structures using C and C++, Pearson Education India (2015), 2nd Edition

**Bachelor of Arts / Bachelor of Science (Computer Science) /
Bachelor of Science (Economics) Semester- IV**

(Session 2021-22)

Course Code: BARM-4134

BCSM-4134

BECM-4134

**COMPUTER SCIENCE
(DATA STRUCTURES) (PRACTICAL)**

Examination Time: (3+3) Hrs.

Max. Marks: 100

Theory: 50

Practical: 30

CA: 20

Practical on Data Structures .

**Bachelor of Arts / Bachelor of Science (Computer Science) /
Bachelor of Science (Economics) - Semester–V**

Session 2021-22

COURSE CODE: BARM-5134
BCSM-5134
BECM-5134

**COMPUTER SCIENCE
(DATA BASE MANAGEMENT SYSTEM)**

Course Outcomes:

After passing course the student will be able to:

CO1: Understand data, database and database models.

CO2: Gain knowledge of normalization and transaction control.

CO3: Gain knowledge of core database language-SQL.

CO4: Have a basic understanding of concepts of PL/SQL.

**Bachelor of Arts / Bachelor of Science (Computer Science) /
Bachelor of Science (Economics) Semester- V**

Session 2021-22

COURSE CODE: BARM-5134

BCSM-5134

BECM-5134

**COMPUTER SCIENCE
(DATABASE MANAGEMENT SYSTEM)
(THEORY)**

Examination Time: (3+3) Hrs.

Max. Marks: 100

Theory: 50

Practical: 30

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (10 marks each) are to be set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section. The students can use only Non-programmable & Non-storage type calculator

UNIT-I

DBMS: Introduction to database management system, Components of DBMS, Three Level Database System Architecture, ER. Diagrams. Data Models, Hierarchical Model, Network Model and Relational Model, Relational Databases, Relational Algebra and Calculus.

UNIT-II

Normalisation: Introduction, Normal Forms: 1NF, 2NF, 3NF, BCNF, 4NF, 5NF.

Database Security: Protection, Integrity.

Recovery: Introduction, Recovery Techniques: Log Based Recovery and Shadow Paging.

Concurrency Control: Introduction, Concurrency control with locking methods, Two Phase locking, Precedence graph, Concurrency control based on timestamp ordering, Concurrency control based on optimistic scheduling.

UNIT-III

SQL * PLUS: Introduction to Oracle , Features of Oracle .

SQL Statements: DDL, DML, DCL,TCL, constraints, Join methods & Sub query, Union, Intersection, Built in Functions, View, and Security amongst users, Sequences, indexing object

UNIT-IV

PL/SQL: Introduction to PL/SQL. Cursors – Implicit & Explicit. Procedures, Functions & Packages, Database Triggers.

References/Textbooks:

1. C. J. Date, An Introduction to Database Systems, Pearson Education 2000.
2. F. Korth & Silverschatz, A., Database System Concepts, Tata McGraw Hill, 2010.
3. Elmasri & Navathe, Fundamentals of Database Systems, Addison-Wesley, 2011.
4. B.C.Desai, An Introduction to Database Management System, Galgotia Publication, 1991.
5. Ivan Bayross, SQL, PL/SQL - The Programming Language of Oracle, BPB Publications, 2010.
6. Gurvinder Singh, Parteek Bhatia, Simplified Approach to DBMS, Kalyani Publishers, 2016.
7. Anshuman Sharma, Fundamentals of DBMS, Lakhanpal Publications, 4th Edition.

Note: The latest editions of the books should be followed.

**Bachelor of Arts / Bachelor of Science (Computer Science) /
Bachelor of Science (Economics) Semester- V**

Session 2021-22

COURSE CODE: BARM-5134

BCSM-5134

BECM-5134

COMPUTER SCIENCE

(DATA BASE MANAGEMENT SYSTEM)

(PRACTICAL)

Examination Time: (3+3) Hrs.

Max. Marks: 100

Theory: 50

Practical: 30

CA: 20

Lab on database management system.

**Bachelor of Arts / Bachelor of Science (Computer Science) /
Bachelor of Science (Economics) Semester- VI**

(Session 2021-22)

COURSE CODE: BARM-6134

BCSM-6134

BECM-6134

**COMPUTER SCIENCE
(INFORMATION TECHNOLOGY)**

Course Outcomes:

After passing course the student will be able to:

CO1: Identify usage of various communication media.

CO2: Acquaint with Internet basics, system development process and tools .

CO3: Acquaint the usage of various information systems.

CO4: Comprehend digital marketing concepts and content.

CO5: Create and manage YouTube channel and blog.

**Bachelor of Arts / Bachelor of Science (Computer Science) /
Bachelor of Science (Economics) Semester- VI**

(Session 2021-22)

COURSE CODE: BARM-6134

BCSM-6134

BECM-6134

COMPUTER SCIENCE

(INFORMATION TECHNOLOGY)

(Theory)

Examination Time: (3+3) Hrs.

Max. Marks: 100

Theory: 50

Practical: 30

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (10 marks each) are to be set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section. The students can use only Non-programmable & Non-storage type calculator

UNIT-I

Data and Network Communication: Communication media: Twisted pair, Coaxial, Fiber optics, Wireless (Line of Sight and Satellite), Network Advantages, Types and Topologies,

Communication using Network protocol/Network Interface card (NP/NIC), Transmission & Communication protocol/protocol (TCP/IP)

Internet: Internet basics, its uses and applications. System Development Process and System development Tools.

UNIT-II

Information Technology: Introduction to IT and its components, Information systems, Components of Computer based information systems. Types of Information systems- TPS, MIS, DSS, EIS.

UNIT-III

Introduction to Digital Marketing: Digital Strategy and Planning, Website marketing tools, Digital content – website, blogs, email, webinars, videos, podcasts, e-zines, PPC advertising.

Social Media and Social Bookmarking: Facebook, Twitter, Pinterest, Instagram,

Search Engine Marketing: Meaning, Working and Search Engine Optimization,

UNIT-IV

YouTube Studio: Navigating studio, Uploading videos, Edit Video settings, Analytics, Copyright and Monetization.

Blog Writing: Blog Domain, choice of CMS, Register a domain or subdomain with a website host.

References/Textbooks:

1. Peter Norton, Introduction to Computers, McGraw Hill (2017), 7th edition.
2. Patrick, G.Mckeown, Living with the Computers, Harcourt College Pub (1990) 3rd edition.
3. Hussain & Hussain, Computer: Technology, Applications & Social Implications, PHI Learning (2006)
4. Behrouz A. Forouzan, Data Communications & Networking, McGraw-Hill Education (2012), 5th edition.
5. Andrew S. Tanenbaum, Computer Network, Prentice Hall (2010), 5th edition.
6. Abraham Silberschatz, Greg Gagne, Peter B. Galvin, Operating System Concepts, Wiley Publishers (2018), 10th edition.
7. Yashavant Kanetkar, Unix Shell Programming, BPB Publications (2003), 1st edition.

**Bachelor of Arts / Bachelor of Science (Computer Science) /
Bachelor of Science (Economics) Semester- VI**

Session 2021-22

COURSE CODE: BARM-6134

BCSM-6134

BECM-6134

**COMPUTER SCIENCE
(INFORMATION TECHNOLOGY)
(PRACTICAL)**

Examination Time: (3+3) Hrs.

Max. Marks: 100

Theory: 50

Practical: 30

CA: 20

Lab on Information Technology.

(Annexure F-2)

FACULTY OF COMPUTER SCIENCE & IT

SYLLABUS

Of

Bachelor of Arts /Bachelor of Science (Economics)

COMPUTER APPLICATIONS (VOCATIONAL)

(Semester I- VI)

(Under Continuous Evaluation System)

(12+3 System of Education)

Session: 2021-22



The Heritage Institution

KANYA MAHA VIDYALAYA, JALANDHAR
(Autonomous)

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATIONS OF THREE YEAR DEGREE PROGRAMME

Bachelor of Arts / Bachelor of Science (Economics)

COMPUTER APPLICATIONS (VOCATIONAL)

Session 2021-22

Bachelor of Arts / Bachelor of Science(Economics) Semester-I								
Course Name	Program Name	Course Code	Course Type	Marks				Examination time (in Hours)
				Total	Ext.		CA	
					L	P		
Computer Applications (Vocational) (Computer Fundamentals and PC Software)	Bachelor of Arts Sem- I	BARM-1124	E	100	50	30	20	3+3
	Bachelor of Science (Economics)- Sem I	BECM-1124	E					

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATIONS OF THREE YEAR DEGREE PROGRAMME

Bachelor of Arts / Bachelor of Science (Economics)

COMPUTER APPLICATIONS (VOCATIONAL)

Session 2021-22

Bachelor of Arts / Bachelor of Science(Economics) Semester-II								
Course Name	Program Name	Course Code	Course Type	Marks				Examination time (in Hours)
				Total	Ext.		CA	
					L	P		
Computer Applications (Vocational) (Programming in C)	Bachelor of Arts Sem II	BARM-2124	E	100	50	30	20	3+3
	Bachelor of Science (Economics)- Sem II	BECM-2124	E					

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATIONS OF THREE YEAR DEGREE PROGRAMME

Bachelor of Arts / Bachelor of Science (Economics)

COMPUTER APPLICATIONS (VOCATIONAL)

Session 2021-22

Bachelor of Arts / Bachelor of Science (Economics) Semester III								
Course Name	Program Name	Course Code	Course Type	Marks				Examination time (in Hours)
				Total	Ext.		CA	
					L	P		
Computer Applications (Vocational) (Operating System)	Bachelor of Arts- Semester III	BARM-3124	E	100	50	30	20	3+3
	Bachelor of Science (Economics)- Semester III	BECM-3124	E					

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATIONS OF THREE YEAR DEGREE PROGRAMME

Bachelor of Arts / Bachelor of Science (Economics)

COMPUTER APPLICATIONS (VOCATIONAL)

Session 2021-22

Bachelor of Arts / Bachelor of Science (Economics) Semester IV								
Course Name	Program Name	Course Code	Course Type	Marks				Examination time (in Hours)
				Total	Ext.		CA	
					L	P		
Computer Applications (Vocational)	Bachelor of Arts-Semester IV	BARM-4124	E	100	50	30	20	3+3
	Bachelor of Science(Economics)-Semester IV	BECM-4124	E					
(Relational Database Management Systems)								

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATIONS OF THREE YEAR DEGREE PROGRAMME

Bachelor of Arts / Bachelor of Science (Economics)

COMPUTER APPLICATIONS (VOCATIONAL)

Session 2021-22

Bachelor of Arts / Bachelor of Science (Economics) Semester V								
Course Name	Program Name	Course Code	Course Type	Marks				Examination time (in Hours)
				Total	Ext.		CA	
					L	P		
Computer Applications (Vocational) (Internet and Web Designing)	Bachelor of Arts- Semester V Bachelor of Science (Economics)- Semester V	BARM-5124 BECM-5124	E E	100	50	30	20	3+3

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATIONS OF THREE YEAR DEGREE PROGRAMME

Bachelor of Arts / Bachelor of Science (Economics)

COMPUTER APPLICATIONS (VOCATIONAL)

Session 2021-22

Bachelor of Arts / Bachelor of Science (Economics) Semester VI								
Course Name	Program Name	Course Code	Course Type	Marks				Examination time (in Hours)
				Total	Ext.		CA	
					L	P		
Computer Applications (Vocational)	Bachelor of Arts- Semester VI	BARM-6124	E	100	50	30	20	3+3
(Business Data Processing)	Bachelor of Science (Economics)- Semester VI	BECEM-6124	E					

Bachelor of Arts / Bachelor of Science(Economics) Semester I

Session 2021-22

COURSE CODE: BARM-1124

BECEM-1124

**COMPUTER APPLICATIONS (VOCATIONAL)
(COMPUTER FUNDAMENTALS AND PC SOFTWARE)**

Course Outcomes:

After passing this course the student will be able to:

CO1: gain knowledge about various components and applications of computers.

CO2: understand the functionalities of hardware and software parts of the computer system.

CO3: make use of computer as per the need of data manipulation.

CO4: use and configure essential office applications including word processing, spreadsheets etc.

Bachelor of Arts / Bachelor of Science (Economics) Semester I

Session 2021-22

COURSE CODE: BARM-1124

BECM-1124

**COMPUTER APPLICATIONS (VOCATIONAL)
(COMPUTER FUNDAMENTALS AND PC SOFTWARE)
(THEORY)**

Examination Time: (3+3) Hrs.

Max. Marks: 100

Theory: 50

Practical: 30

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (10 marks each) are to be set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT I

Fundamentals of Computer: Introduction to computer, Applications of computer, Components of computers (Input unit, Output Unit, Memory Unit & CPU), type of Software, Translators (compiler, interpreter, assembler), Booting a System.

UNIT II

Input and Output Devices: Keyboards, Mouse, Joystick, Track Ball, Light Pen and Data Scanning devices (scanner, OCR, OMR, MICR, Bar Code Reader, Card Reader), Monitor, Printers (laser printer, dot matrix printer, ink jet printer).

Memories: Primary Memory-RAM and ROM. **Secondary Memory** - Hard Disk, CD, DVD.

Introduction to Windows based operating system and Desktop icons.

UNIT III

Word Processing: Introduction to word, Parts of window of word (Title bar, menu bar, status bar, and ruler), Understanding the Ribbon, Use of Office Button and Quick Access Toolbar, Creation of new documents, opening document, insert a document into another document. Page setup, margins, gutters, font properties, Alignment, page breaks, header & footer, deleting, moving, replace, editing text in document, saving a document, spell checker, printing a document. Creating a table, entering and editing, Text in tables. Changing format of table, height, width of row/column. Editing, deleting Rows, columns in table. Adding picture, page colors and Watermarks, Borders and shading, Templates, wizards, Mail Merge.

UNIT IV

PowerPoint: Introduction to PowerPoint, Exploring menus, starting a new slide, saving presentation, moving/rearranging slides, printing slides. Applying theme to presentation, Views (slide View, slide sorter, notes view, outline view), Formatting & enhancing text formatting. Creating a graph, displaying slide show, adding multimedia. Slide transitions, applying Animation, Timing slide display, adding movies & sounds. Using a pick look Wizards to change format.

References/Textbooks:

1. Anshuman Sharma, A book of Fundamentals of Information Technology, Lakhanpal Publishers, 5th Edition.
2. Prof. Satish Jain, M. Geetha, Kratika, BPB's Office 2010 Course Complete Book, BPB Publications, 2017.
3. Joyce Cox, Joan Lambert and Curtis Frye, Microsoft office Professional 2010 Step by Step, Microsoft Press, 2010.
4. V. Rajaraman, Neeharika Adabala, Fundamentals of Computers, PHI Learning, 2015.
5. P.K. Sinha, Computer Fundamentals, BPB Publications, 2004.

Note: The latest editions of the books should be followed.

Bachelor of Arts / Bachelor of Science (Economics) Semester I

Session 2021-22

COURSE CODE: BARM-1124

BECM-1124

**COMPUTER APPLICATIONS (VOCATIONAL)
(COMPUTER FUNDAMENTALS AND PC SOFTWARE)
(PRACTICAL)**

Examination Time: (3+3) Hrs.

Practical based on PC Software - Office.

Bachelor of Arts / Bachelor of Science (Economics) Semester II

(Session 2021-22)

COURSE CODE: BARM-2124

BECM-2124

**COMPUTER APPLICATIONS (VOCATIONAL)
(PROGRAMMING IN C)**

Course Outcomes:

After passing this course the student will be able to:

CO1: Comprehend different programming constructs involved in C programming.

CO2: Design symbolic representation of a problem and its solution through tools like algorithms, flowcharts, etc.

CO3: Design and control the execution of a program.

CO4: Apply programming concepts to provide solution for problems associated with different problem domains.

CO5: Identify storage classes associated with variables.

Bachelor of Arts / Bachelor of Science (Economics) Semester II

(Session 2021-22)

COURSE CODE: BARM-2124

BECM-2124

**COMPUTER APPLICATIONS (VOCATIONAL)
(PROGRAMMING IN C)
(THEORY)**

Examination Time: (3+3) Hrs.

Max. Marks: 100

Theory: 50

Practical: 30

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (10 marks each) are to be set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT-I

Data Representation, Flow Charts, Problem Analysis, Decision tables, Pseudo codes and Algorithms.

Programming Using C:

Basics of C: Introduction to C, Applications and Advantages of C, Tokens, Types of Errors

Data Types: Basic and Derived Data Types, User Defined Data Types, Declaring and initializing variables.

UNIT-II

Operators and expressions: Types of operators (Unary, Binary, Ternary), Precedence and Associativity

Data I/O Functions: Types of I/O function, Formatted & Unformatted console I/O Functions

Control Statements: Jumping, Branching and Looping–Entry controlled and exit controlled, Advantages/Disadvantages of loops, difference between for, while and do–while.

UNIT-III

Arrays: Types of Arrays, Advantages/Disadvantages of arrays. Insertion, Deletion, Searching and sorting operations on array

Strings: Introduction to Strings and String functions, array of strings.

Functions: User Defined and Library Function, Function (Prototype, Declaration, Definition), Methods of passing arguments, local and global functions, Recursion.

UNIT-IV

Storage classes: Introduction to various storage classes, scope and lifetime of a variable, Storage class specifiers (auto, register, static, extern), advantages and disadvantages.

Pointers: Introduction, Advantages/Uses of pointers, Limitations of pointers, Difference between void pointer and Null pointer, Pointer arithmetic, operators not allowed on pointers, Types of Pointer, Passing Pointers to function, concept of pointer to pointer.

Structure and Union: Introduction to structure and union, pointers with structure.

References/Textbooks:

1. E. Balagurusamy, Programming in ANSI C, Tata McGraw-Hill (2002), 5th edition.
2. Stephen G. Kochan, Programming in C, Pearson Education (2015), 4th edition.
3. Rachhpal Singh K.S. Kahlon, Gurvinder Singh, Programming in C, Kalyani Publishers (2011).
4. Yashwant Kanetkar, Let us C, BPB Publications (2020), 17th edition.
5. R.S. Salari, Application Programming in C, Khanna Book Publishing (2012), 4th edition.
6. Anshuman Sharma, Learn programming in C, Lakhanpal Publishers (2016), 7th edition.

Bachelor of Arts / Bachelor of Science (Economics) Semester II
(Session 2021-22)

COURSE CODE: BARM-2124
BECM-2124

COMPUTER APPLICATIONS (VOCATIONAL)
(PROGRAMMING IN C)
(PRACTICAL)

Examination Time: (3+3) Hrs.

Lab based on Programming in C.

Bachelor of Arts / Bachelor of Science (Economics) Semester III

Session 2021-22

COURSE CODE: BARM-3124

BECM-3124

**COMPUTER APPLICATIONS (VOCATIONAL)
(OPERATING SYSTEM)**

Course Outcomes:

After passing this course the student will be able to:

CO1: Understand the basic knowledge of operating system, its types and functions.

CO2: Have knowledge of CPU scheduling and deadlocks.

CO3: Gain knowledge about Linux commands.

Bachelor of Arts / Bachelor of Science (Economics) Semester III

Session 2021-22

COURSE CODE: BARM-3124

BECM-3124

**COMPUTER APPLICATIONS (VOCATIONAL)
(OPERATING SYSTEM) (THEORY)**

Examination Time: (3+3) Hrs.

Max. Marks: 100

Theory: 50

Practical: 30

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (10 marks each) are to be set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT-I

Introduction to Operating System, Types of Operating systems: Multiuser, Multitasking and Multiprogramming, Functions of Operating System, Booting a System, Language Processors:

Compiler, Assembler, Interpreter, Linker and Loader.

UNIT-II

CPU Scheduling: First come First serve, Shortest Job First, Priority, Round Robin Scheduling. Memory Management : Logical address space and physical address space, schemes. File Management, I/O Device Management, Data Management and Security.

UNIT-III

Deadlocks: System Model, Deadlock characterization, Methods for handling deadlocks, Deadlocks Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock, Approach to Deadlock handling.

UNIT-IV

Linux: Introduction, History, **Linux Commands:** lias, cat, cd, chmod, chown, curl, df, echo, exit, find, free, whoami, grep ,cal, who, pwd etc.

References/Textbooks:

1. Avi Silberschatz, Peter Baer Galvin, Greg Gagne, Operating System Concepts, Wiley, 2013.
2. Charles Crowley, Operating Systems: A Design-Oriented Approach, Tata McGraw Hill, 2001.
3. Deitel, An Introduction to Operating Systems, Second Edition, Addison Wesley, 1990.
4. William Stallings, Operating Systems: Internals and Design Principles, Pearson Education Limited, 2014.
5. Anshuman Sharma, Fundamentals of Operating System, Lakhanpal Publishers, 2nd Edition.

Note: The latest editions of the books should be followed.

Bachelor of Arts / Bachelor of Science (Economics) Semester III

Session 2021-22

COURSE CODE: BARM-3124

BECM-3124

**COMPUTER APPLICATIONS (VOCATIONAL)
(OPERATING SYSTEM) (PRACTICAL)**

Practical based on Operating System.

Bachelor of Arts / Bachelor of Science (Economics) Semester IV

(Session 2021-22)

COURSE CODE: BARM-4124

BECM-4124

**COMPUTER APPLICATIONS (VOCATIONAL)
(RELATIONAL DATA BASE MANAGEMENT SYSTEMS)**

Course Outcomes:

After passing this course the student will be able to:

CO1: Illustrate the concept of database normalization and its various forms.

CO2: Apply SQL to design basic to intermediate level of databases.

CO3: Identify the importance of security in database management system.

CO4: Comprehend the concept of PL/SQL and its relationship with SQL.

Bachelor of Arts / Bachelor of Science (Economics) Semester IV

(Session 2021-22)

COURSE CODE: BARM-4124

BECM-4124

**COMPUTER APPLICATIONS (VOCATIONAL)
(RELATIONAL DATA BASE MANAGEMENT SYSTEMS)**

(THEORY)

Examination Time: (3+3) Hrs.

Max. Marks: 100

Theory: 50

Practical: 30

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (10 marks each) are to be set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT-I

Basic Concepts: An overview of Database Management, (database, database system, why database). An architecture for a database system (levels of the architecture, mapping, data independence), DBA, Definition of CODD's Rules.

Normalization of Data: First, Second and Third Normal form, **Database Models:** Hierarchical, Network, Relational, Introduction to Relational database systems .

UNIT II

ORACLE : Introduction to Oracle ,**Data Types:** Char, numbers, date long, raw, long raw.

DDL Commands of SQL: Create Tables, Constraints, Alter Table, Drop Table, Rename.

Data Manipulation Language: Insert Into, Update Statement, Delete Statement, Select statement (Select distinct, Select from where, Select from where order by, Select group by clause, Select Group by having clause).

Transaction Control Language: Roll back, Savepoint, Commit.

UNIT III

Built in Functions- Aggregate Functions (Sum, Avg, max, min, count), Character Functions (Lower, Upper, Length, Substr, RPAD, LPAD), Arithmetic Functions (Round, Trunc, Sqrt, Mod, Abs, Sign) Date and Time Functions and Other Miscellaneous Functions (Add-months, Month-between, NVL, NVL2, decode) & Conversion Functions (to-char, to-number, to-date).

Join methods and Sub query, Union, Intersection, Minus, Views, Security amongst users.

UNIT IV

PL/SQL: Introduction to PL/SQL, Relationship between SQL & PL/SQL, Advantages, block structure, Variable and Constant declaration, Declaration using attributes %type attribute, control statements.

References/Textbooks:

1. Silberschatz, Korth & Sudarshan, Database Systems Concepts, McGraw-Hill Inc.(2020), 7th edition.
2. C.J. Date, An Introduction of Database System, Addison-Wesley Publishing co. (2003), 8th edition.
3. Anshuman Sharma, Fundamentals of DBMS, Lakhanpal Publishers (2016), 4th edition.
4. Ivan Bayross, SQL/PL/SQL. The Programming Language of Oracle, BPB Publications(2010), 4th edition.
5. Ramez Elmasri and Shamkant Navathe, Fundamentals of Database Systems, Pearson Education (2015), 7th edition.
6. P.S. Gill, Database Management Systems, Dreamtech Press (2019), 2th edition.

Bachelor of Arts / Bachelor of Science(Economics) Semester IV

(Session 2021-22)

COURSE CODE: BARM-4124

BECM-4124

**COMPUTER APPLICATIONS (VOCATIONAL)
(RELATIONAL DATA BASE MANAGEMENT SYSTEMS)**

(PRACTICAL)

Examination Time: (3+3) Hrs.

Max. Marks: 100

Theory: 50

Practical: 30

CA: 20

Practical on Relational Data Base Management System .

Bachelor of Arts / Bachelor of Science(Economics) Semester V

Session 2021-22

COURSE CODE: BARM-5124

BECM-5124

**COMPUTER APPLICATIONS (VOCATIONAL)
(INTERNET AND WEB DESIGNING)**

Course Outcomes:

After passing course the student will be able to:

CO1: Understand Internet basics and it's working.

CO2: Gain knowledge of email service on different mail servers.

CO3: Understand different Internet protocols and search engines.

CO4: Have knowledge of basic web designing using markup languages.

Bachelor of Arts / Bachelor of Science (Economics) Semester V
Session 2021-22

COURSE CODE: BARM-5124
BECM-5124

COMPUTER APPLICATIONS (VOCATIONAL)
(INTERNET AND WEB DESIGNING)
(THEORY)

Examination Time: (3+3) Hrs.

Max. Marks: 100

Theory: 50

Practical: 30

CA: 20

Instructions for the Paper Setters:–

Eight questions of equal marks (10 marks each) are to be set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT – I

Internet: Introduction, its evolution, working, IP Address, DNS and its classification, working of DNS, Internet Services, ISP, Types of internet connection, Internet Security, Advantages, Disadvantages and Uses of Internet.

Search Engines: Introduction, its working, searching using google, web directory, Meta search engines.

UNIT – II

E-Mail: Introduction, its working, E-mail protocols: SMTP, POP, IMAP, Structure of E-mail, Operations on E-mail, Address Book, Signature, File attachment, MIME, Web based E-mail, Spams, Advantages and limitations of E-mail

Browsers: Introduction, Features of Internet Explorer and Google Chrome.

UNIT – III

HTTP: HTTP Protocol and its structure. **WWW:** Introduction and its working **TCP/IP Protocols:** PPP, SLIP.

FTP: Introduction, its working, FTP Commands, FTP Session, Advantages and Disadvantages of FTP.

UNIT – IV

HTML and Web Designing: Introduction, Structure and creation of HTML document, Formatting Text, Lists, Font element, Advantages and Disadvantages of HTML, Hyperlinks, Images, Tables, Frames, Forms.

References/Textbooks:

1. Keith Sutherland, Understanding the Internet: A Clear Guide to Internet Technologies, Butterworth-Heinemann, 2000.
2. S. K. Bansal, Internet Technologies, APH Publishing Corporation, 2002.
3. Forouzan B., Data Communications and networking, McGraw Hill, 2007.

Note: The latest editions of the books should be followed.

Bachelor of Arts / Bachelor of Science(Economics) Semester V

Session 2021-22

COURSE CODE: BARM-5124

BECM-5124

**COMPUTER APPLICATIONS (VOCATIONAL)
(INTERNET AND WEB DESIGNING)
(PRACTICAL)**

Examination Time: (3+3) Hrs.

Practical on Internet and Web Designing.

**Bachelor of Arts / Bachelor of Science (Economics) Semester VI
(Session 2021-22)**

COURSE CODE: BARM-6124
BECM-6124

**COMPUTER APPLICATIONS (VOCATIONAL)
(BUSINESS DATA PROCESSING)**

Course Outcomes:

After passing course the student will be able to:

CO1: Identify the impact of data and information on working of various organizations.

CO2: Comprehend different types of Data Processing Methods.

CO3: Apply function and formulas in spreadsheets for data processing.

CO4: Apply some data analytics tools.

Bachelor of Arts / Bachelor of Science(Economics) Semester VI

(Session 2021-22)

COURSE CODE: BARM-6124

BECM-6124

**COMPUTER APPLICATIONS (VOCATIONAL)
(BUSINESS DATA PROCESSING)**

Examination Time: (3+3) Hrs.

Max. Marks: 100

Theory: 50

Practical: 30

CA: 20

Instructions for the Paper Setters:–

Eight questions of equal marks (10 marks each) are to be set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT–I

Introduction to Data Processing, Need of Computers in Business.

Characteristics of Business Organization and Use of computers in various work areas of business like: Payroll System, Inventory Control, Online Reservation, Computer in Banks and Computer Application in Educational Institutions.

UNIT–II

Data Processing Methods: Batch Processing, Online Systems, Time Sharing, Real Time Systems and Distributed Processing.

File Organization: Types of Files (Master, Transaction, Work, Backup, Audit Files), File Organization (Serial, Sequential, Indexed Sequential, Direct Access Files).

UNIT–III

Spreadsheets : Introduction, Worksheet, Data Entry, Editing, Cell Addressing Range,

Copying and Moving Cell Content, Inserting and Deleting Rows and Column, Column Formats, Printing, Creating, displaying charts, Create, manage, and format pivot tables and pivot charts. Printing the Worksheet.

UNIT-IV

Working with functions - Date and time function, Statistical function, Mathematical and Trigonometric functions, Text function, Logical functions, other computations , using data analytics tools and what if analysis- data sort, fill, query, filter etc.

References/Textbooks:

1. Murdick & Ross, Introduction to Management Information Systems, Prentice Hall (1977).
2. Muneesh Kumar, Business Information Systems, Vikas Publishing (1998), 1st edition.
3. Silberschatz, Korth & Sudarshan, Database Systems Concepts, McGraw-Hill Inc.(2020), 7th edition.
4. Anshuman Sharma, Fundamentals of DBMS, Lakhanpal Publishers (2016), 4th edition.
5. Rachhpal Singh, Gurvinder Singh, Windows based computer courses, Kalyani Publishers (2011).
6. Peter Norton, Introduction to Computers, McGraw Hill Education (2017), 7th edition.

Bachelor of Arts / Bachelor of Science(Economics) Semester VI

Session 2021-22

COURSE CODE: BARM-6124

BECM-6124

**COMPUTER APPLICATIONS (VOCATIONAL)
(BUSINESS DATA PROCESSING)**

Examination Time: (3+3) Hrs.

Practical on business data processing.

(Annexure G-1)

FACULTY OF COMPUTER SCIENCE & IT

**SYLLABUS of
COMPUTER
for**

**Bachelor of Science (Honours) Agriculture
Semester- IV
(Under Continuous Evaluation System)**

Session: 2021-22



**The Heritage Institution
KANYA MAHA VIDYALAYA
JALANDHAR
(Autonomous)**

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATIONS OF THREE YEAR DEGREE PROGRAMME

BACHELOR OF SCIENCE (HONOURS) AGRICULTURE SEMESTER IV

(Session: 2021-22)

BACHELOR OF SCIENCE (HONOURS) AGRICULTURE SEMESTER IV								
Course Name	Program Name	Course Code	Course Type	Marks				Examination time (in Hours)
				Total	Ext.		CA	
					L	P		
Agri-Informatics	Bachelor of Science (Honours) Agriculture Semester IV	BACM-4128	C	50	25	15	10	3+3

Bachelor of Science (Honours) Agriculture Semester-IV

(Session: 2021-22)

Course Code: BACM-4128

AGRI-INFORMATICS

COURSE OUTCOMES:

After passing this course student will be able to:

CO1: Comprehend about Computer system applications and various operating systems.

CO2: Work with varied applications like word processing, databases and use of these in Agriculture.

CO3: Practice E-Agriculture and exploitation of ICT tools in Agriculture.

CO4: Comprehend computer models for agricultural production .

Bachelor of Science (Honours) Agriculture Semester-IV

(Session: 2021-22)

Course Code: BACM-4128

AGRI-INFORMATICS

(THEORY)

Examination Time: (3+3) Hrs.

Max. Marks: 50

Theory: 25

Practical: 15

CA: 10

Instructions for Paper Setter - Eight questions of equal marks (05 marks each) are to be set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT – I

Introduction to Computers, Operating Systems, definition and types, Applications of MS-Office for document creation & Editing, Data presentation, interpretation and graph creation, statistical analysis, mathematical expressions, Database, concepts and types, uses of DBMS in Agriculture.

UNIT – II

World Wide Web (WWW): Concepts and components. Introduction to computer programming languages, concepts and standard input/output operations, e-Agriculture, concepts and applications, Use of ICT in Agriculture. Computer Models for understanding plant processes.

UNIT – III

IT application for computation of water and nutrient requirement of crops, Computer-controlled devices (automated systems) for Agri-input management, Smartphone Apps in Agriculture for farm advises, market price, postharvest management etc, Geospatial technology for generating valuable agri-information.

UNIT – IV

Decision support systems, concepts, components and applications in Agriculture. Agriculture Expert System, Soil Information Systems etc for supporting Farm decisions. Preparation of contingent crop-planning using IT tools.

References/Textbooks:

1. G. Vanitha, Agro-Informatics Book, New India Publishing Agency (2011).
2. <http://www.agrimoon.com/>
3. <http://www.agriinfo.in/> eagri.org
4. <http://www.agriglance.com/>
5. <http://agritech.tnau.ac.in/>

Bachelor of Science (Honours) Agriculture Semester-IV

(Session: 2021-22)

COURSE CODE: BACM-4128

**AGRI-INFORMATICS
(PRACTICAL)**

COURSE OUTCOMES:

After passing this course student will be able to:

CO1: Comprehend computer and its various components and different operating

CO2: Apply Word processing, Presentation and Spreadsheet software

CO3: Acquaint about World Wide Web as well as programming languages.

CO4: Comprehend the crop simulation models and computation of water and nutrient requirements of crop I.T. tools.

Bachelor of Science (Honours) Agriculture Semester-IV

(Session: 2021-22)

COURSE CODE: BACM-4128

AGRI-INFORMATICS

(PRACTICAL)

Examination Time: (3+3) Hrs.

Max. Marks: 50

Theory: 25

Practical: 15

CA: 10

Instructions for Practical Examiner: Question paper is to be set on the spot jointly by the Internal and External Examiners. Two copies of the same should be submitted for the record to COE Office, Kanya Maha Vidyalaya, Jalandhar.

LIST OF EXPERIMENTS

- 1 Study of Computer Components, accessories, practice of important DOS Commands.
- 2 Introduction of different operating systems such as windows, Unix/ Linux, Creating, Files & Folders, File Management.
- 3 Use of MS-WORD and MS Power-point for creating, editing and presenting a scientific Document.
- 4 Use of MS-EXCEL - Creating a spreadsheet, use of statistical tools, writing expressions, creating graphs, analysis of scientific data.
- 5 Use of MS-ACCESS: Creating Database, preparing queries and reports, demonstration of Agri-information system.
- 6 Introduction to World Wide Web (WWW). Introduction of programming languages.
- 7 Hands on Crop Simulation Models (CSM) such as DSSAT/Crop-Info/CropSyst/Wofost; Computation of water and nutrient requirements of crop using CSM and IT tools.
- 8 Hands on Decision Support System.
- 9 Preparation of contingent crop planning.

References/Textbooks:

1. G. Vanitha, Agro-Informatics Book, New India Publishing Agency (2011).
2. <http://www.agrimoon.com/>
3. <http://www.agriinfo.in/> eagri.org
4. <http://www.agriglance.com/>
5. <http://agritech.tnau.ac.in/>

(Annexure G-2)

FACULTY OF COMPUTER SCIENCE & IT

SYLLABUS

of

WORKSHOP ON OFFICE PACKAGE

for

Bachelor of Commerce (Hons.) (Semester – I)

(Under Continuous Evaluation System)

(12+3 System of Education)

Session: 2021-22



The Heritage Institution

**KANYA MAHA VIDYALAYA
JALANDHAR
(Autonomous)**

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATIONS OF THREE YEAR DEGREE PROGRAMME

Bachelor of Commerce (Honours)

(Session 2021-22)

Bachelor of Commerce (Hons.) Semester I								
Course Name	Program Name	Course Code	Course Type	Marks				Examination time (in Hours)
				Total	Ext.		CA	
					L	P		
Workshop on Office Package	Bachelor of Commerce (Hons.) Semester – I	BCOP-1127	C	50	-	40	10	3

Bachelor of Commerce (Hons.) Semester-I
(Session 2021-22)
COURSE CODE: BCOP-1127
WORKSHOP ON OFFICE PACKAGE

Course Outcomes:

After passing course the student will be able to:

CO1: gain knowledge about office tools like word processing, spreadsheets, etc.

CO2: understand word processing software to create professional and academic documents.

CO3: create effective presentations useful for corporate tasks.

CO4: use spreadsheet application for data organization and manipulation.

Bachelor of Commerce (Hons.) Semester-I
(Session 2021-22)
COURSE CODE: BCOP-1127
WORKSHOP ON OFFICE PACKAGE

Max. Marks: 50

Practical: 40

CA: 10

Examination Time: 3 Hrs

Instructions for the Paper Setter:

- Paper will be set on the spot by the examiner

UNIT-I

Word Processing:

- Shortcuts for navigation, insertion, deletion, and selection
- Formatting fonts with bolding, bullets and numbers
- Creative use of cut, copy and paste
- Format painter
- Tables
- Graphics, Smart Art, watermarks, hyperlinks, print screen function and Word art □
Page numbering
- Borders and shading
- Headers/footers
- Shortcut features like AutoCorrect, quick sections, find and replace
- Page breaks, drop caps
- Spelling, grammar, thesaurus

UNIT-II

Spreadsheets:

- Navigation and keyboard shortcuts
- Text, number and date shortcuts
- Add columns, rows (Autosum, auto-calculate)
- Manual math formulas (average, count, etc.)
- Use “cell references” with formulas
- Copy formulas (fill handle)
- Cut, copy, paste spreadsheets, range, and formulas
- Delete/insert rows and columns
- AutoCorrect

- Print options (orientation, margins, gridlines, header/footer)

UNIT-III

- Create charts to illustrate your spreadsheets; revise and format charts
- Create, sort and filter lists
- Apply formatting options, including conditional formatting

Presentations:

- Slide content: planning, opening slides, sequencing
- Bullet/number slides(variations, sequencing, layout)
- Graphics, shapes(alternatives to bullets; use color to influence mood; use images to reinforce messages)
- Smart art(effective use of diagrams)

UNIT-IV

- Photos and internet photos(formatting options)
- Copy/paste shortcuts(from other programs; linking)
- Create/import org charts, graphs and tables
- Hyperlinks to others programs and the internet
- Insert media clips, movies, sounds
- Views: Slide sorter, Outline, Notes as editing and presentation tools
- Presenting: transitions, animation, hiding slides, pausing and highlighting
- Automatic presentations (narrations, timing)
- Presentation methods to connect with individuals and groups

References/Textbooks:

1. Anshuman Sharma, A book of Fundamentals of Information Technology, Lakhanpal Publishers, 5th Edition.
2. Prof. Satish Jain, M. Geetha, Kratika, BPB's Office 2010 Course Complete Book, BPB Publications, 2017.
3. Joyce Cox, Joan Lambert and Curtis Frye, Microsoft office Professional 2010 Step by Step, Microsoft Press, 2010.
4. P.K. Sinha, Computer Fundamentals, BPB Publications, 2004.
5. Ebooks at OpenOffice.org
6. R. Gabriel Gurley, A Conceptual Guide to OpenOffice.org3, 2nd Edition.

Note: The latest editions of the books should be followed.

(Annexure G-3)

FACULTY OF COMPUTER SCIENCE & IT

SYLLABUS

COMPUTER RELATED COURSE

of

Bachelor of Business Administration (Semester – I) **(Under Continuous Evaluation System)**

Session: 2021-22



The Heritage Institution

KANYA MAHA VIDYALAYA
JALANDHAR
(Autonomous)

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATIONS OF THREE YEAR DEGREE

Bachelor of Business Administration

(Session 2021-22)

Bachelor of Business Administration Semester I								
Course Name	Program Name	Course Code	Course Type	Marks				Examination time (in Hours)
				Total	Ext.		CA	
					L	P		
COMPUTER APPLICATIONS FOR BUSINESS- I	Bachelor of Business Administration Semester – I	BBRM-1126	C	50	25	15	10	3+3

Bachelor of Business Administration Semester II								
Course Name	Program Name	Course Code	Course Type	Marks				Examination time (in Hours)
				Total	Ext.		CA	
					L	P		
COMPUTER BASED ACCOUNTING SYSTEM	Bachelor of Business Administration Semester – II	BBRL- 2126	C	50	40	-	10	3

Bachelor of Business Administration (Semester – I)
(Session 2021-22)
COURSE CODE: BBRM-1126
COMPUTER APPLICATIONS FOR BUSINESS- I

COURSE OUTCOMES

After passing this course the student will be able to:

CO1: understand the basic knowledge of computer, its components, Input / Output devices of computer.

CO2: use operating system with the proper knowledge of functionality of operating system.

CO3: learn Word processing software to create, edit and format documents.

CO4: gain knowledge on spreadsheet software as how to calculate, organize, edit and present numerical data and apply formulae on it.

Bachelor of Business Administration (Semester – I)

(Session 2021-22)

COURSE CODE: BBRM-1126

COMPUTER APPLICATIONS FOR BUSINESS- I

Examination Time: 3+3 Hours

Max. Marks: 50

Theory:25

Practical: 15

CA:10

Instructions for Paper Setter -

Eight questions of equal marks are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT- I

Computer Fundamentals: Definition of computer, Components of a computer system, Brief history of evolution of computers and generation of computers.

Internal and External Memory Storage: RAM, ROM, PROM, EPROM. Commonly used

Input / Output/Memory storage devices: Punched Card, VDU, CRT. Difference between Hardware & Software. Types of software system. Software & Application software,

Interpreter.

UNIT-II

Operating System: Definition, Types of operating on the Basis of processing. Introduction to various types of operating system such as windows & DOS Overview and Anatomy of windows, Working with files and folder in windows. Basic Commands of Internal & External commands in DOS.

UNIT-III

Word Processor: Overview, Creating, Saving, Opening, Importing, Exporting and Inserting files. Formatting pages, paragraphs and sections. Indents and outdates. Creating lists and numbering .Heading Styles, Fonts and size editing, positioning& viewing text. Finding and replacing text, inserting page breaks, page numbers, book marks, symbols & dates. Using tabs and tables Header, Footer & Printings.

UNIT-IV

Spreadsheet: Worksheet overview. Entering information. Worksheet. Opening and saving workbook. Formatting number and texts. Protecting cells. Producing Charts and printing operations graphs.

Presentation: Presentation Basics Menus and Toolbars, Opening and saving and existing presentation creating and saving a presentation using auto content wizard. Design Template Blank Presentation. The slides sorter view. Insert slides from another presentation. Inserting pictures and graphics. Slide show, printing, slides.

References / Textbooks:

1. Peter Norton, Introduction to Computers, Tata McGraw-Hill, 2006.
2. Sanjay Sexana, A First Course in Computers, Vikas Publishing House, New Delhi, 2015.
3. V. Rajaraman, Neeharika Adabala, Fundamentals of Computers, PHI Learning, 2015.
4. Dr. S.S Srivastava., MS-Office, Firewall Media, New Delhi, 2008.
5. Anshuman Sharma, A book of Fundamentals of Information Technology, Lakhanpal Publishers, 5th Edition.

Note: The latest editions of the books should be followed.

(Annexure G-4)

FACULTY OF COMPUTER SCIENCE & IT

SYLLABUS

of

COMPUTER FUNDAMENTALS

for

Bachelor of Commerce (Pass) Semester – I

(Under Continuous Evaluation System)

(12+3 System of Education)

Session: 2021-22



The Heritage Institution

**KANYA MAHA VIDYALAYA
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Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATIONS OF THREE YEAR DEGREE

Bachelor of Commerce (Pass)

(Session 2021-22)

Bachelor of Commerce (Pass) Semester I								
Course Name	Program Name	Course Code	Course Type	Marks				Examinati on time (in Hours)
				Total	Ext.		CA	
					L	P		
Computer Fundamentals	Bachelor of Commerce (Pass) Semester I	BCRM–1127	C	50	25	15	10	3+3

Bachelor of Commerce (Pass.) Semester – I

(Session 2021-22)

Course Code: BCRM–1127

COMPUTER FUNDAMENTALS

COURSE OUTCOMES:

After passing this course the student will be able to:

CO1: understand the basic knowledge of computer and its uses.

CO2: gain knowledge about office tools like word processing, spreadsheets, etc.

CO3: learn basic word processing skills such as text input formatting, editing, cut, copy, paste, spell check, margin, printing, charts etc.

CO4: use spreadsheet application for data organization and manipulation.

Bachelor of Commerce (Pass.) Semester – I

(Session 2021-22)

Course Code: BCRM–1127

COMPUTER FUNDAMENTALS

Examination Time: (3+3) Hours

Max. Marks: 50

Theory: 25

Practical: 15

CA: 10

Instructions for Paper Setter -

Eight questions of equal marks (5 marks each) are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT – I

Introduction: Computer as System, Features, Computer Memory –Primary (RAM & ROM) and Secondary (Hard Disk, CD, DVD), Storage Devices (Magnetic and Optical).

Computer Applications: Data Processing, Information Processing, Commercial, Office

Automation, Industry, Healthcare, Education, Graphics and Multimedia

UNIT-II

Word Processing: Introduction to word, features, Parts of window of word (Title bar, menu bar, ribbon, office button, status bar, and ruler), creation of new documents, opening document, insert a document into another document. Page setup, margins, gutters, font properties, Alignment, page breaks, header and footer, deleting, moving, replace, editing text in document, saving a document, spell checker, printing a document.

UNIT-III

Word Processing: Creating a table, entering and editing text in tables, changing format of table, height, width of row/column, adding and deleting rows/columns, adding picture and shapes, page colors and watermarks, borders, shading, templates, wizards and mail merge

Spreadsheet: Introduction to worksheet, features, creating a new workbook, manual math formulas (average, count, etc.), use “cell references” with formulas.

UNIT IV

Spreadsheet: Creation of graphs, editing it and formatting, adding/deleting/moving the text in worksheet, linking different sheets, sorting the data, filtering the data (auto and advance filters), What-if analysis, open an already existing workbook, saving workbook, printing a worksheet, closing the workbook.

References/Textbooks:

1. Anshuman Sharma, A book of Fundamentals of Information Technology, Lakhanpal Publishers, 5th Edition.
2. Prof. Satish Jain, M. Geetha, Kratika, BPB's Office 2010 Course Complete Book, BPB Publications, 2017.
3. Joyce Cox, Joan Lambert and Curtis Frye, Microsoft office Professional 2010 Step by Step, Microsoft Press, 2010.
4. V. Rajaraman, Neeharika Adabala, Fundamentals of Computers, PHI Learning, 2015.
5. P.K. Sinha, Computer Fundamentals, BPB Publications, 2004.
6. Peter Norton, Peter Norton's Computing Fundamentals, McGraw-Hill Technology Education, 2006.
7. R. Parameswaran, Computer Applications in Business, S Chand & Company, 2010.

Note: The latest editions of the books should be followed.

(Annexure G-5)

FACULTY OF COMPUTER SCIENCE & IT

SYLLABUS

of

BASICS OF COMPUTER

for

BACHELOR OF SCIENCE (FASHION DESIGNING)

Semester–I

(Under Continuous Evaluation System)

Session: 2021-22



The Heritage Institution

**KANYA MAHA VIDYALAYA
JALANDHAR
(Autonomous)**

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATIONS OF THREE YEAR DEGREE PROGRAMME

BACHELOR OF SCIENCE (FASHION DESIGNING) (Session 2021-22)

Bachelor of Science (Fashion Designing) Semester I								
Course Name	Program Name	Course Code	Course Type	Marks				Examination time (in Hours)
				Total	Ext.		CA	
					L	P		
Basics of Computer	Bachelor of Science (Fashion Designing) Semester-I	BFDM-1126	C	100	50	30	20	3+3

Note

C-Compulsory

BACHELOR OF SCIENCE (FASHION DESIGNING) SEMESTER-I

(Session 2021-22)

COURSE CODE: BFDM-1126

BASICS OF COMPUTER

Course Outcomes:

After passing this course the student will be able to:

CO1: analyse basic working of computer and its components.

CO2: gain knowledge of computer Equipments- hardware and software.

CO3: recognize how to use word processing software for creating professional documents.

BACHELOR OF SCIENCE (FASHION DESIGNING) SEMESTER-I

(Session 2021-22)

COURSE CODE: BFDM-1126 BASICS OF COMPUTER

Examination Time: 3+3Hrs

Max. Marks: 100

Theory: 50

Practical: 30

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (10 marks each) are to set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT I

Introduction to Computer, Data Processing, Concept of data and information,

UNIT II

Classification of computer.

Computer Hardware-Central Processing Unit, Main Memory, Secondary Memory I/O devices

UNIT III

General concept of Word Processor: Word Processing, Formatting, editing

Word Processing: Spell- grammar check, Mail Merge, Printing and saving.

UNIT IV

Computer applications in various fields of fashion Industry.

References/Textbooks:

1. Anshuman Sharma, Fundamentals of Information Technology, Lakhanpal Publishers, 5th Edition.
2. Rachhpal Singh and Gurvinder Singh, PC Software, Kalyani Publisher, 2009.
3. Peter Norton, Peter Norton's Computing Fundamentals, McGraw-Hill Technology Education, 2006.

Note: The latest editions of the books should be followed.

(Annexure G-6)

FACULTY OF COMPUTER SCIENCE & IT

SYLLABUS

For

BACHELOR OF SCIENCE (HONOURS) PHYSICS

Semester–III

(Under Continuous Evaluation System)

Session: 2021-22



The Heritage Institution

**KANYA MAHA VIDYALAYA
JALANDHAR
(Autonomous)**

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATIONS OF THREE YEAR DEGREE PROGRAMME

BACHELOR OF SCIENCE (HONOURS) PHYSICS (Session 2021-22)

BACHELOR OF SCIENCE (HONOURS) MATHEMATICS SEMESTER III								
Course Name	Program Name	Course Code	Course Type	Marks				Examination time (in Hours)
				Total	Ext.		CA	
					L	P		
Python Programming	Bachelor of Science (Honours) Physics Semester III	BOPM-3135	C	50	25	15	10	3+3

Bachelor of Science (Honours) Physics Semester III

Session 2021-22

PYTHON PROGRAMMING

Course Code: BOPM-3135

Course Outcomes:

After completion of this course, the students will be able to:

CO1: Comprehend the use of various programming constructs like data types, operators, string processing and control structures.

CO2: Identify the flow of control in various control statement.

CO3: Implement various built-in and user defined function, packages and modules to solve basic problems in Physics.

CO4: Comprehend file manipulation using various built-in functions.

CO5: Comprehend visualization of data and result through graphics.

Bachelor of Science (Honours) Physics Semester III

Session 2021-22

PYTHON PROGRAMMING

Course Code: BOPM-3135

Examination Time: (3+3) Hours

Max. Marks: 50

Theory: 25

Practical: 15

CA: 10

Instructions for the Paper Setters:

Eight questions of equal marks (05 marks each), (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

UNIT I

Introduction to python and Setting up the Python development Environment, Basic syntax, interactive shell, editing, saving, and running a script, Concept of data types, Declaring and using Numeric data types: int, float, complex Lists and Tuples and their basic operations, Python console Input / Output. Arithmetic operators and expressions, Conditions, Comparison operators, Logical Operators, Is and In operators.

UNIT II

String Handling, Unicode strings, Strings Manipulation: - compare strings, concatenation of strings, slicing strings in python, converting strings to numbers and vice versa. Dictionaries Control statements: if-else, Nested If-Else, Loops (for, while) Loop manipulation using pass, continue, break and else.

Matrix operations using NumPy array (Multiplication. Addition, matrix multiplication, inverse, determinant, adjoint, Eigenvalues, etc).

UNIT III

Built in function and modules in python, user defined functions, passing parameters, arguments and return values; formal vs actual arguments, Lamda function in python, Recursion, organizing python codes using functions, modules and external packages.

Case study of Projectile Motion.

UNIT IV

SciPy: Integration, differentiation and interpolation.

Files: manipulating files and directories, OS and Sys modules; text files: reading/writing text and numbers from/to a file; creating and reading a formatted file (csv or tab separated) understanding read functions, read(), readline() and readlines() Understanding write functions, write() and writelines() Manipulating file pointer using seek. Introduction to graphics. **Plotting graphs and objects.**

References / Textbooks:

1. Mark Lutz, Learning Python, O'Reilly Media, 2013.
2. David Beazley, Python cookbook, O'Reilly Media, 2013.
3. David Beazley, Python Essential Reference, Addison-Wesley Professional, 2009.
4. John Zelle, Python programming: An Introduction to Computer Science, Franklin, Beedle & Associates Inc, 2004.
5. Alex Mortelli, Python in a Nutshell, O'Reilly Media, 2006.

Note: The latest editions of the books should be followed.

(Annexure G-7)

FACULTY OF COMPUTER SCIENCE & IT

SYLLABUS

of

COMPUTER BASICS

for

**Bachelor of Science (Home Science) Semester - I &
II
(Under Continuous Evaluation System)**

Session: 2021-22



The Heritage Institution

**KANYA MAHA VIDYALAYA
JALANDHAR
(Autonomous)**

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATIONS OF THREE YEAR DEGREE PROGRAMME

Bachelor of Science (Home Science)

SESSION: 2021-22

Bachelor of Science (Home Science) Semester I								
Course Name	Program Name	Course Code	Course Type	Marks				Examination time (in Hours)
				Total	Ext.		CA	
					L	P		
Computer Basics	Bachelor of Science (Home Science) Semester – I	BHSM - 1127	C	100	50	30	20	3+3

Bachelor of Science (Home Science) Semester II								
Course Name	Program Name	Course Code	Course Type	Marks				Examination time (in Hours)
				Total	Ext.		CA	
					L	P		
Computer Applications for Home Scientists	Bachelor of Science (Home Science) Semester – II	BHSM - 2127	C	100	50	30	20	3+3

Bachelor of Science (Home Science) Semester-I
Session 2020 - 21
Course Code: BHSM - 1127
COMPUTER BASICS (Theory)

Course Outcomes:

After passing this course the students will be able to:

CO1: understand the basics knowledge of Computer and its uses.

CO2: find and evaluate information on the Web effectively.

CO3: learn the basics of e-mail, such as sending, forwarding and receiving mail, attaching documents, creating mailboxes, filters, and address books.

CO4: learn basic word processing skills such as text input formatting, editing, cut, copy, paste, spell check, margin, tab controls, keyboard shortcuts, printing, clipart, charts etc.

Bachelor of Science (Home Science) Semester-I
Session 2020 - 21
Course Code: BHSM - 1127
COMPUTER BASICS (Theory)

Examination Time: (3 + 3) Hrs

Max. Marks: 100

Theory: 50

Practical: 30

CA: 20

Instructions for Paper Setter -

- Eight questions of equal marks (10 marks each) are to be set, two in each of the four Sections (A-D).
- Questions of Sections A-D should be set from Units I-IV of the syllabus respectively.
- Questions may be subdivided into parts (not exceeding four).
- Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

UNIT -I

Introduction to computer and its characteristic:

History of computers, Generations of Computers, Types of Computers, input devices, output devices, memory devices, software and its types, working with windows, features, desktop, using context menu, creating shortcut, working with dialog box, arranging windows, setting properties of desktop, transfer from CD, DVD. Pen Drive to Hard disk and vice versa, coping files.

Definition of Virus, Malware, Spyware and removal.

UNIT -II

Word Processing: Opening document, editing, formatting, use of fonts, styles and colors, exiting document. Inserting pictures from a file, inserting a Table or a chart. Copying from one document to other, using headers and footers on a document.

UNIT- III

Presentation: Presentation and its features, components, viewing a slide show using blank presentation adding text, saving, closing, opening the presentation, viewing presentation, normal view, Outline view, slide sorter view, slide show, creating a wizard using presentation,

editing presentations, adding new slide, changing the new slides, editing text type, deleting the text object, interesting text boxes, formatting text, modifying slides, working with slide outlines, moving objects , copying objects, searching text, replacing text, spell check, using clip art, word Art, auto shapes.

UNIT-IV

Internet and E-mail: What Internet Provides, Internet terms, Internet requirements, getting started Internet, Surfing Net, moving about the Web, E-Mail, its features, creating and E-Mail message, Reading Mail, replying mail, draft message, sending mail. Phishing and SPAM mail.

References / Textbooks:

1. Anshuman Sharma, Fundamentals of Information Technology, Lakhanpal Publishers, 5th Edition.
2. Rachhpal Singh & Gurvinder Singh, Windows based computer courses, Kalyani Publisher, 2014.
3. Peter Norton, Introduction to Computers, Tata McGraw-Hill, 2006.
4. P.K. Sinha, Computer Fundamentals, BPB Publications, 2004.
5. Prof. Satish Jain, M. Geetha, Kratika, BPB's Office 2010 Course Complete Book, BPB Publications, 2017.

Note: The latest editions of the books should be followed.

Bachelor of Science (Home Science) Semester-I
Session 2021-22
COURSE CODE: BHSM - 1127
COMPUTER BASICS (PRACTICAL)

Examination Time: (3 + 3) Hrs

Max. Marks: 100

Theory: 50

Practical: 30

CA: 20

Practical on Computer Basics.

BACHELOR OF SCIENCE (HOME SCIENCE) SEMESTER II
(Session 2021-22)

COURSE CODE: BHSM - 2127
COMPUTER APPLICATIONS FOR HOME SCIENTISTS

Course Outcomes:

After passing this course the students will be able to:

CO1: Apply features of spreadsheet software for data manipulation, data entry, worksheet formatting, functions and formulae.

CO2: Comprehend the basics of E-Commerce and various multimedia devices.

CO3: Comprehend internet basics, its working and the use of email.

CO4: Create and manage YouTube channel and blog.

CO5: Comprehend about the process of Social Media Marketing.

BACHELOR OF SCIENCE (HOME SCIENCE) SEMESTER II
(Session 2021-22)

COURSE CODE: BHSM - 2127
COMPUTER APPLICATIONS FOR HOME SCIENTISTS
(Theory)

Examination Time: (3+3) Hrs.

Max. Marks: 100

Theory: 50

Practical: 30

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (10 marks each) are to be set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT-I

Spreadsheet Software: Workbook and worksheet, entering data, editing cell contents, Inserting and deleting rows, column, using auto-fill, creating list, formatting data, using formula

Internet: Introduction to internet, searching information on internet.

UNIT-II

WWW: Introduction, working of WWW, Web browsing (opening, viewing, saving and printing a web page and bookmark).

E-Commerce: Basics, Architecture, Types, Applications.

UNIT-III

Payment gateway: Popular payment methods (Net-banking, m-Banking, UPI, Debit/Credit Card, Mobile Wallets)

Multimedia & its Applications: Introduction to Multimedia and its usage, record sound using devices, using scanner, Web Camera.

UNIT IV

YouTube Studio: Navigating studio, Uploading videos, Edit Video settings, Analytics, Copyright and Monetization.

Blog Writing: Blog Domain, choice of CMS, Register a domain or subdomain with a website host.

Social Media Marketing: Social Media, Importance of Social Media, SMO Strategy for Business, Business Profile Creation, Viral Marketing, Application of Facebook and Twitter for social media marketing.

References/Textbooks:

1. Prof. Satish Jain, M. Geetha, Kratika, BPB's Office 2010 Course Complete Book, BPB Publications (2017).
2. Rachhpal Singh, Gurvinder Singh, Windows based computer courses, Kalyani Publishers (2011).
3. Anshuman Sharma, A book of Fundamentals of Information Technology, Lakhanpal Publishers (2016), 5th ed.
4. Ramesh Bangia, Introduction To Multimedia, Laxmi Publications Pvt. Ltd.(2015).
5. Laudon, E-Commerce, Pearson Education India (2016), 10th ed.
6. https://www.tutorialspoint.com/social_media_marketing/
7. <https://blog.hubspot.com/marketing/how-to-start-a-blog>

BACHELOR OF SCIENCE (HOME SCIENCE) SEMESTER II
(Session 2021-22)
Course Code: BHSM - 2127
COMPUTER APPLICATIONS FOR HOME SCIENTISTS
(Practical)

Examination Time: (3+3) Hrs.

Max. Marks: 100

Theory: 50

Practical: 30

CA: 20

Note: Paper will be set on the spot by the examiner.

- 1) Microsoft Excel
- 2) Searching on Internet
- 3) Multimedia Usage
- 4) YouTube and Blog

(Annexure G-8)

FACULTY OF COMPUTER SCIENCE & IT

SYLLABUS

For

BACHELOR OF SCIENCE (HONOURS) MATHEMATICS

Semester–II, III, IV

(Under Continuous Evaluation System)

Session: 2021-22



The Heritage Institution

**KANYA MAHA VIDYALAYA
JALANDHAR
(Autonomous)**

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATIONS OF THREE YEAR DEGREE PROGRAMME

BACHELOR OF SCIENCE (HONOURS) MATHEMATICS (Session 2021-22)

BACHELOR OF SCIENCE (HONOURS) MATHEMATICS SEMESTER II								
Course Name	Program Name	Course Code	Course Type	Marks				Examination time (in Hours)
				Total	Ext.		CA	
					L	P		
Computer Fundamentals and Introduction to C Programming Language	Bachelor of Science (Honours) Mathematics Semester II	BOMM-2137	C	100	50	30	20	3+3

BACHELOR OF SCIENCE (HONOURS) MATHEMATICS SEMESTER III								
Course Name	Program Name	Course Code	Course Type	Marks				Examination time (in Hours)
				Total	Ext.		CA	
					L	P		
Python Programming	Bachelor of Science (Honours) Mathematics Semester III	BOMM-3135	C	100	50	30	20	3+3

BACHELOR OF SCIENCE (HONOURS) MATHEMATICS SEMESTER IV								
Course Name	Program Name	Course Code	Course Type	Marks				Examination time (in Hours)
				Total	Ext.		CA	
					L	P		
Foundation of Statistical Computing	Bachelor of Science (Honours) Mathematics Semester IV	BOMM-4135	C	100	50	30	20	3+3

Bachelor of Science (Honours) Mathematics Semester–II
Session 2021-22
Course Code: BOMM-2137
COMPUTER FUNDAMENTALS AND INTRODUCTION TO C PROGRAMMING
LANGUAGE

Course Outcome:

After passing course the student will be able to:

CO1: Understand formulation of algorithms and flowcharts for problem solution and different programming constructs.

CO2: Have knowledge of execution flow of a C program for programming and maintenance.

CO3: Apply programming concepts to provide solution in different problem domains.

Bachelor of Science (Honours) Mathematics Semester–II
Session 2021-22
Course Code: BOMM-2137
COMPUTER FUNDAMENTALS AND INTRODUCTION TO C PROGRAMMING
LANGUAGE

Examination Time: (3+3) Hrs.

Max. Marks: 100

Theory: 50

Practical: 30

CA: 20

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

UNIT-I

Introduction : Early computing devices, diverse uses of computers, block diagram, use of CPU and I/O devices, software and hardware, application software and system software, primary and secondary storage devices, Flowcharts and algorithms.

UNIT-II

Introduction to ‘C’ language: Tokens, Identifiers, Keywords, constants and literals, Data types. Operators: arithmetic, relational and logical, precedence and order of evaluation

UNIT-III

Control Statements: Decision control, loop control and case control. Functions and storage classes.

UNIT-IV

Arrays: initializing an array. one dimensional arrays: array manipulation; searching, insertion, deletion of an element from an array; finding the largest/smallest element in array; two dimensional arrays, addition/multiplication of two matrices, program to transpose a square matrix; null terminated strings as array of characters.

References / Textbooks:

1. E. Balagurusamy, Programming in ANSI C, Tata McGraw-Hill (2002), 5th edition.
2. Stephen G. Kochan, Programming in C, Pearson Education (2015), 4th edition.
3. Rachhpal Singh, Gurvinder Singh, Windows based computer courses, Kalyani Publishers (2011).
4. Yashwant Kanetkar, Let us C, BPB Publications (2020), 17th edition.
5. R.S. Salari, Application Programming in C, Khanna Book Publishing (2012), 4th edition.
6. Anshuman Sharma, Learn programming in C, Lakhanpal Publishers (2016), 7th edition.

Bachelor of Science (Honours) Mathematics Semester III

Session 2021-22

Course Code: BOMM-3135

PYTHON PROGRAMMING

Course Outcomes:

After completion of this course, the students will be able to:

CO1: Comprehend the use of various programming constructs like data types, operators, and string processing and control structures.

CO2: Apply logic in calculation of area, surface area and volume of geometrical objects.

CO3: Identify the flow of control in various control statement.

CO4: Implement various built-in and user defined function, packages and modules to solve mathematical problems.

CO5: Comprehend visualization of data and result through graphics.

Bachelor of Science (Honours) Mathematics Semester III
Session 2021-22
Course Code: BOMM-3135
PYTHON PROGRAMMING

Examination Time: (3+3) Hours

Max. Marks: 100

Theory: 50

Practical: 30

CA: 20

Instructions for the Paper Setters:

Eight questions of equal marks (10 marks each), (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

UNIT I

Introduction to python and Setting up the Python development Environment, Basic syntax, interactive shell, editing, saving, and running a script, Concept of data types, Declaring and using Numeric data types: int, float, complex Lists and Tuples and their basic operations, Python console Input / Output. Arithmetic operators and expressions, Conditions, Comparison operators, Logical Operators, Is and In operators.

UNIT II

Calculation of area, surface area and volume of geometrical objects. String Handling, Unicode strings, Strings Manipulation: - compare strings, concatenation of strings, slicing strings in python, converting strings to numbers and vice versa. Dictionaries Control statements: if-else, Nested If-Else, Loops (for, while) Loop manipulation using pass, continue, break and else.

UNIT III

Built in function and modules in python, user defined functions, passing parameters, arguments and return values; formal vs actual arguments, Lamda function in python, Recursion, organizing python codes using functions, modules and external packages.

Math Module: Constants, Arithmetic functions, Power functions, Logarithmic functions, Trigonometric and Angular functions.

UNIT IV

Matrix operations using NumPy array (Multiplication, Addition, matrix multiplication, inverse, determinant, adjoint, Eigenvalues, etc).

Files: manipulating files and directories, OS and Sys modules; creating and reading a geometric file (csv or tab separated) understanding read functions, read(), readline() and readlines(), Understanding write functions, write() and writelines(), Manipulating file pointer using seek. Introduction to graphic. **Plotting graphs and objects.**

References / Textbooks:

1. Mark Lutz, Learning Python, O'Reilly Media, 2013.
2. David Beazley, Python cookbook, O'Reilly Media, 2013.
3. David Beazley, Python Essential Reference, Addison-Wesley Professional, 2009.
4. John Zelle, Python programming: An Introduction to Computer Science, Franklin, Beedle & Associates Inc, 2004.
5. Alex Mortelli, Python in a Nutshell, O'Reilly Media, 2006.

Note: The latest editions of the books should be followed.

Bachelor of Science (Honours) Mathematics Semester-IV

Session: 2021-22

COURSE CODE: BOMM-4135

FOUNDATION OF STATISTICAL COMPUTING

Course Outcomes:

After passing this course the student will be able to:

CO1: Comprehend basics of Statistical Computing and role of constructs like control statements, string functions, array, list, etc in R programming.

CO2: Create, operate and manage data frames.

CO3: Apply R programming from a statistical perspective.

CO4: Simulate various descriptive and analytical algorithms using R language.

Bachelor of Science (Honours) Mathematics Semester-IV

Session: 2021-22

COURSE CODE: BOMM-4135

FOUNDATION OF STATISTICAL COMPUTING

Examination Time: (3+3) Hrs.

Max. Marks: 100

Theory: 50

Practical: 30

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (10 marks each) are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section

UNIT - I

Data Statistics: Sampling, Cumulative statistics, Statistics for Data frames, matrix objects and lists. Introduction to R, Help functions in R, Vectors, Common Vector Operations, Using all and any function, subletting of vector. Creating matrices, Matrix operations, Applying Functions to Matrix Rows and Columns, Adding and deleting rows and columns, lists, Creating lists, general list operations, Accessing list components and values, applying functions to lists, recursive lists

UNIT - II

Creating Data Frames – Matrix-like operations in frames , Merging Data Frames, Applying functions to Data frames, Factors and Tables , factors and levels , Common functions used with factors , string operations

UNIT - III

Input/ Ouput: scan() , readline() Function, Printing to the Screen Reading and writing CSV and text file. Control statements: Loops, Looping Over Nonvector, Sets, if-else , writing user defined function, scope of the variable, R script file

UNIT - IV

Graphics in R: Graph Syntax ((title, xlabel, ylabel, pch, lty, col.), Simple graphics (Bar, Multiple Bar, Histogram, Pie, Box-Plot, Scatter plot, qqplot), Low-level and High-Level plot functions, par() command to generate multiple plots.

Note:

Practical: Based on simple mathematical problems and based on syllabus of Statistical Methods for descriptive Statistics.

References / Textbooks:

1. Andrie de Vries and Joris Meys, R Programming for Dummies, Wiley (2016), 2nd Edition.
2. Sandip Rakshit, R Programming for Beginners, McGraw Hill Education (2017), 1st Edition.
3. Sandip Rakshit, Statistics with R Programming, McGraw Hill Education (2018), 1st Edition.
4. Garrett Golemund, Hands on Programming with R, O'Reilly (2014), 1st Edition
5. Mark Gardener, Beginning R: The Statistical Programming Language, Wiley (2013)
6. Tilman M. Davies, The Book of R: A first Course in Programming and Statistics, No Strach Press (2016), 1st Edition

(Annexure G-9)

FACULTY OF COMPUTER SCIENCE & IT

SYLLABUS

of

E-COMMERCE

for

MASTER OF COMMERCE SEMESTER – IV

(Under Continuous Evaluation System)

Session 2021-22



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 COMMERCE SEMESTER- IV SESSION: 2021-22

MASTER OF COMMERCE SEMESTER- IV							
Course Name	Program Name	Course Code	Course Type	Marks			Examination time (in Hours)
				Total	Ext	CA	
					P		
E - Commerce	Master of Commerce Semester- IV	MCML - 4122	C	100	80	20	3

MASTER OF COMMERCE SEMESTER- IV

(Session 2021-22)

COURSE CODE: MCML - 4122

E-COMMERCE

Course Outcomes:

After passing course the student will be able to:

CO1: Comprehend on basic terms of E-Commerce, its evolution, aims and benefits.

CO2: Acquaint the steps to be followed for opening a new E-Commerce business.

CO3: Discuss knowledge on various issues involved in relation to secure electronic transactions and Laws for E-Commerce.

CO4: Comprehend about BPR and Case Studies of E-Business related applications.

MASTER OF COMMERCE SEMESTER- IV

(Session 2021-22)

COURSE CODE: MCML - 4122

E-COMMERCE

Examination Time: 3 Hrs.

Max. Marks: 100

Theory: 80

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (16 marks each) are to be set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section

UNIT-I

Introduction: Introduction to E Commerce and Definition, E-Commerce based activities, Goals of E- Commerce, Functions, Advantages and disadvantages of E-Commerce, Scope of E- Commerce, Framework of E-Commerce, Electronic Commerce and Electronic Business.

Steps to open online business store.

UNIT-II

Electronic Business models: B2B, B2C, C2C, Websites as market place. Pure online vs. brick and click business.

Electronic Payment systems: Payment Gateways; Different methods of E-payments: Debit Cards, Credit Cards, Paytm, UPI, Google Pay.

UNIT-III

Security and Legal Aspects of E-Commerce: Threats in E-Commerce, Security of Clients and Service-Provider; Cyber Laws – Relevant provisions of Information Technology Act 2000, offences. Secure electronic records and digital signatures.

UNIT-IV

Business process Re-engineering, Methodology, Planning methods for change. Case studies of E-Banking, E-Governance, Supply chain management, e-Retailing.

References/Textbooks:

1. Laudon, E-Commerce, Pearson Education India (2016), 10th edition.
2. David Whiteley, E - Commerce: Strategy, Technologies and Applications, McGraw Hill Education (2017).
3. K.K. Bajaj, Debjani Nag, E-Commerce: The Cutting Edge of Business, McGraw Hill Education (2017), 2nd edition.
4. Nidhi Dhawan, A Handbook of E-commerce, Sun India Publications (2017).
5. Janice Reynolds, The Complete E-Commerce Book: Design, Build & Maintain a Successful Web-based Business, CRC Press (2004), 2nd edition.
6. Syamales Maiti, Sweety Sadhukhan, E-commerce and business communication, McGraw-Hill (2019), 1st edition.

(Annexure G-10)

FACULTY OF COMPUTER SCIENCE & IT

SYLLABUS

of

COMPUTER FOR CHEMISTS

for

Master of Science (Chemistry) Semester-I

(Under Continuous Evaluation System)

Session: 2021-22



The Heritage Institution

KANYA MAHA VIDYALAYA

JALANDHAR

(Autonomous)

Kanya Maha Vidyalaya, Jalandhar (Autonomous)
CURRICULUM AND SCHEME OF EXAMINATIONS OF TWO YEAR MASTER DEGREE
PROGRAMME

Master of Science (Chemistry)

Session 2021-22

Master of Science (Chemistry) Semester – I								
Course Name	Program Name	Course Code	Course Type	Marks				Examination time (in Hours)
				Total	Ext.		CA	
					L	P		
Computer for Chemists	Master of Science (Chemistry) Semester-I	MCHM-1135	C	75	40	20	15	3+3

Master of Science (Chemistry) Semester - I
Session 2021-22

COURSE CODE: MCHM - 1135
COMPUTER FOR CHEMISTS
(Theory)

Examination Time: (3+3) Hours

Max. Marks: 75
Theory: 40
Practical: 20
CA: 15

Note: The students are allowed to use Non-Programmable Calculator.

Instructions for Paper Setter -

Eight questions of equal marks (8 marks each) are to set, two in each of the four sections (AD). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

1. Computer Programming in C language (30 Hrs.)

UNIT-I

Principles of programming, algorithms and flowcharts.

Elementary programming, a typical C program, print function.

Introduction of declarations, assignments and variables: concept of an integer, concept of a variable, rules for naming variables, assignment statement, arithmetic operators.

Integer arithmetic expressions, truncation effects, relative priority of arithmetic operators, use of parenthesis, modulus operator.

UNIT-II

Floating point numbers, scientific notation, converting integers to floating point and vice versa, coercion and cast operator, type char.

Decision making in C, scanf function, relational operators, logical operators, if statement, if else statement, nesting of if statement.

UNIT-III

The while loop, do while loop, for loop, nesting of for loop.

Type char and ASCII code, character strings and how to print them, octal and hexadecimal notation.

User defined functions, returning value from a function, functions with more than one parameters.

UNIT-IV

Arrays, declaring an array, initializing an array, break statement, strings and character arrays, sorting an array, finding maximum and minimum in an array, multidimensional arrays. Input and output.

2. Computer programs in Chemistry (15Hrs.)

(these are to be done in the practical class)

Development of small computer codes involving simple formulae in chemistry:

UNIT - I

1. Calculation of mean, median, mode.
2. Solution of a quadratic equation.
3. Calculation of linear regression.
4. Calculation of curve linear regression.

UNIT - II

5. Calculation of Bohr orbit from de Broglie Lambda for electron.
6. Calculation of wave number and frequency from value of wavelength.
7. Calculation of van der Waals radii.
8. Radioactive decay.
9. Rate constant of a 1st order reaction, 2nd order reaction.
10. Determination
11. Calculation of lattice energy using Born Land e equation.

UNIT - III

12. Addition, multiplication and solution of inverse of 3 X 3 matrix.
13. Calculation of average molecular weight of a polymer containing n_1 molecules of molecular weight m_1 , n_2 molecules of molecular weight M_2 and soon.
14. Program for calculation of molecular weight of organic compound containing C, H, N, O and S.
15. Calculation of reduced mass of diatomic molecule.
16. Calculate the RMS and most probable velocity of a gas.

UNIT - IV

17. Calculate the ionic mobility from ionic conductance values.
18. Determine the thermodynamic parameters for isothermal expansion of monoatomic ideal gas.
19. Calculation of value of g- factor from value of J and S.
20. Calculate the bond length and bond angles using crystal structure data.

References / Textbooks:

1. K.V. Raman, Computers in Chemistry, Tata McGraw Hill, 1993.
2. Henry Mullish, Herbert L. Cooper, The Spirit of C: An Introduction to Modern Programming, Jaico Publications, 1987.
3. Anshuman Sharma, Learn Programming in C, Lakhanpal Publishers, 7th Edition.
4. E Balagurusamy, Programming in ANSI C, Tata McGraw-Hill, 2002.
5. Yashvant Kanetkar, Let Us C, BPB Publications, 2016.
6. Byron Gottfried, Schaum's Outline Programming with C, McGraw Hill, 1996.

Note: The latest editions of the books should be followed.

(Annexure G-11)

FACULTY OF COMPUTER SCIENCE & IT

SYLLABUS

of

COMPUTER PROGRAMMING & DATA PROCESSING

for

Master of Science (Zoology) Semester–I

(Under Continuous Evaluation System)

Session: 2021-22



The Heritage Institution

KANYA MAHA VIDYALAYA

JALANDHAR

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Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATIONS OF TWO YEAR MASTER DEGREE PROGRAMME

Master of Science (Zoology) Session 2021-22

Master of Science (Zoology) - Semester I								
Course Name	Program Name	Course Code	Course Type	Marks				Examination time (in Hours)
				Total	Ext.		CA	
					L	P		
Computer Programming and Data Processing	Master of Science (Zoology) Semester-I	MZOM-1134	C	50	25	15	10	3+3

Master of Science (Zoology) Semester-I

Session 2021-22

COURSE CODE: MZOM-1134

**COMPUTER PROGRAMMING AND DATA PROCESSING
(Theory)**

Examination Time: 3+3 Hours

Max. Marks: 50

Theory: 25

Practical: 15

CA: 10

Instructions for Paper Setter -

Eight questions of equal marks (5 marks each) are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT - I

Introduction to Computer capabilities, Classifications and generations.

Computer architecture, organization, its components, Introduction to hardware and software concepts, operating systems, peripherals, I/O devices, Limitations of computer.

UNIT - II Basic Features and usage of:

Word Processing Software: Creating, Editing, Formatting and Printing document

Spreadsheet Software: Creating, Editing, Formatting and Printing a sheet

Presentation Software: Creating, Editing, Formatting and Printing a presentation

UNIT -III

Introduction to C Programming language.

Program structure, elements, character set, constants, variables, data types, identifiers, operators and expressions.

I/O Statements: printf and scanf statement.

UNIT - IV

Control statements: if, if else, else if ladder, nesting, switch, Looping statements: do while, while, for

Arrays: Basic usage, Declaration, Initialization and Types.

References / Textbooks:

1. Anshuman Sharma, Learn Programming in C, Lakhanpal Publishers, 7th Edition.
2. E Balagurusamy, Programming in ANSI C, Tata McGraw-Hill, 2002.
3. Yashvant Kanetkar, Let Us C, BPB Publications, 2016.
4. Gurwinder Singh, Rachhpal Singh, Fundamentals of Computer and PC Software, Kalyani Publishers, 2015.
5. Anshuman Sharma, Fundamentals of Information Technology, Lakhanpal Publishers, 5th Edition.
6. Byron Gottfried, Schaum's Outline Programming with C, McGraw Hill, 1996.

Note: The latest editions of the books should be followed.

(Annexure G-12)

FACULTY OF COMPUTER SCIENCE & IT

SYLLABUS of COMPUTER APPLICATIONS FOR ECONOMISTS

for

Master of Economics (Semester – I/II/III/IV)

**(Under Continuous Evaluation System) (12+3 System of
Education)**

Session: 2021-22



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 ARTS (ECONOMICS) SEMESTER - II (Session 2021-22)

MASTER OF ARTS (ECONOMICS) SEMESTER – II								
Course Name	Program Name	Course Code	Course Type	Marks				Examination time (in Hours)
				Total	Ext.		CA	
					L	P		
Computer Applications for Economists	Master of Arts (Economics) Semester – II	MECM-2125 (OPT- XI)	E	100	50	30	20	3+3

MASTER OF ARTS (ECONOMICS) SEMESTER - II

(Session 2021-22)

COURSE CODE: MECM- 2125 (OPT - XI)

COMPUTER APPLICATIONS FOR ECONOMISTS

COURSE OUTCOME

After passing this course the student will be able to:

CO1: Comprehend the organization of Computer System, functioning of various units and storage.

CO2: Demonstrate the use of Mobile as computing device and apply new technology in day-to-day activities.

CO3: Apply features of word processing and spreadsheet software for data manipulation, data entry, worksheet formatting, functions and formulae.

CO4: Comprehend and apply SPSS for economics related calculations.

MASTER OF ARTS (ECONOMICS) SEMESTER - II
(Session 2021-22)
COURSE CODE: MECM- 2125 (OPT - XI)
COMPUTER APPLICATIONS FOR ECONOMISTS

Examination Time: (3+3) Hrs.

Max. Marks: 100

Theory: 50

Practical: 30

CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (10 marks each) are to be set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT I

Fundamentals of Computer: Introduction to computer, Applications of computer, Input and Output devices, Memory – Primary and Secondary.

Latest trends and Technologies in IT: Digital Camera, Smart finger: Distance measuring tool, Nipper, Stylus, Tiny cube speaker, Airpods, Mobile as a computing device, Payment gateway, Payment methods: Net-banking, m-Banking, UPI, Debit/Credit Card, Mobile Wallets.

UNIT II

Word Processing: Introduction to word processing & its features, parts of window of word processing (Title bar, menu bar, status bar, and ruler), understanding the ribbon, use of office button and quick access toolbar, creation of new documents, opening document, insert a document into another document. Page setup, margins, gutters, font properties, alignment, page breaks, header & footer, deleting, moving, replace, editing text in document, saving a document, spell checker, printing a document. Creating a table, entering and editing text in tables, changing format of table, height and width of row/column editing, adding and deleting rows/columns. Adding picture, page colors and watermarks, borders, shading, drawing objects.

UNIT –III

Spreadsheet: Introduction to worksheet/spreadsheet, features, creating a new workbook, different functions on different data in excel, creation of chart, creation of worksheet, adding, deleting, moving the text in worksheet, linking, sorting the data, querying the data, filtering the

data (auto and advance filters), open an already existing workbook, saving workbook, printing a worksheet, closing the workbook & exiting.

UNIT -IV

SPSS: Introduction, Data editor Window, Syntax, Output basics, If command, Filter command, Entering and modifying data, Creating a chart, using interactive chart function, difference between excel and SPSS.

References/Textbooks:

1. Prof. Satish Jain, M. Geetha, Kratika, BPB's Office 2010 Course Complete Book, BPB Publications (2017).
2. Rachhpal Singh, Gurvinder Singh, Windows based computer courses, Kalyani Publishers (2011).
3. Anshuman Sharma, A book of Fundamentals of Information Technology, Lakhanpal Publishers (2016), 5th ed..
4. E. Balagurusamy, Programming in ANSI C, Tata McGraw-Hill (2002), 5th ed.
5. Yashwant Kanetkar, Let us C, BPB Publications (2020), 17th ed.
6. Anshuman Sharma, Learn programming in C, Lakhanpal Publishers (2016), 7th ed.
7. Lokesh Jasrai, Data Analysis using SPSS, SAGE Publications Pvt. Ltd. (2020), 1st Edition