FACULTY OF COMPUTER SCIENCE & IT

SYLLABUS

of

Bachelor of Science (Information Technology)

(Semester V-VI)

(Under Continuous Evaluation System)

(12+3 System of Education)

Batch: 2022-25
Session 2024-25

The Heritage Institution

KANYA MAHA VIDYALAYA JALANDHAR

(Autonomous)

Program Specific Outcomes

Bachelor of Science (Information Technology)
(Session 2024-25)

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.

PS03: 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 2024-25

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	* Job Readiness Course	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**

**** An Internship/MOOCs of not less than 30 hours (either online or offline mode) in either of Semester V or Semester VI**

The students will have to submit the Certificate of Completion to the department (No marks or credits – only completion required).

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATIONS OF THREE YEAR DEGREE PROGRAMME

Bachelor of Science (Information Technology)

Session 2024-25

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	Digital Marketing	C	75	60	-	15	3
BITP-6113	Lab on Computer Graphics	C	50	-	40	10	3
BITD-6114	Project	C	200	-	160	40	3
	Total		**400**				

Note:

C - Compulsory

**** An Internship/MOOCs of not less than 30 hours (either online or offline mode) in either of Semester V or Semester VI**

The students will have to submit the Certificate of Completion to the department (No marks or credits – only completion required).

Bachelor of Science (Information Technology) Semester – V

Session 2024-25
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: Identify various network devices and the layers on which it operates.

CO3: Describe the Data Link layer and Network layer design issues.

CO4: Comprehend the functioning of Transport layer and Application layer protocols.

Bachelor of Science (Information Technology) Semester – V

Session 2024-25
COURSE CODE: BITL-5111
COMPUTER NETWORKS

Examination Time: 3 Hours. **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: Introduction to Analog and Digital Signals. Modems, Types of modems, pulse code modulation. Multiplexing and its types, Circuit Switching, Packet Switching, Message Switching.

Data Link Layer Design Issues: Error Control, Flow Control, Error Detection & Correction

UNIT - III

Media Access Protocols: CSMA, CSMA/CD, CSMA/CA.

IEEE standards 802: Token Ring, FDDI.

Design Issues of Network Layer: Routing Algorithm- Distance Vector Routing, Link state Routing and The Dijkstra Algorithm, IPv4: Notation, Classful addressing, Header Format, IPv6 addressing.

UNIT – IV

Design issues of Transport Layer: Introduction to TCP, TCP Services, features, TCP segment format, Introduction to UDP, User Datagram Format, UDP Operation

Network Security and Privacy: Introduction to Cryptography, types of Key.

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 2024-25
COURSE CODE: BITL-5112
WEB TECHNOLOGIES

Course Outcomes:

After passing course the student will be able to:

CO1: Apply JavaScript code for interaction with content of webpage.

CO2: Apply PHP as server side scripting language for control of flow, file handling, cookie and session handling, database interactions, etc.

CO3: Comprehend the application of XML, AJAX, JQuery and REST.

CO4: Use Laravel framework to create web applications.

Bachelor of Science (Information Technology) Semester – V

Session 2024-25
COURSE CODE: BITL-5112
WEB TECHNOLOGIES

Examination Time: 3 Hours. **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 (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 script language: 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-II

Introduction to Server Side Scripting using PHP: Basics, Control Statement, Array, Functions.

Core PHP Concepts: Superglobals, Form Handling, PHP Include, Sessions, PHP File Handling, File Upload, Cookies, Error Handling, Exception Handling.

Introduction to OOPs in PHP: Classes, Object, Constructor, Inheritance. Access MySQL Database in PHP.

UNIT-III

XML: Basics, Structure, Namespace, Parsing.

AJAX: Fetching response from server (Textual and XML form), Basics of JQuery.

Introduction to **REST**.

UNIT-IV

Laravel: MVC Framework, Role of Model-View-Controller, Routing, Blade Templating.

Components, Form Handling and Validation, Session Handling, Pagination.

Handling Database: Creating Table, Inserting Data, Update, Delete and Query data.

References / Textbooks:

1. Jeffery C Jackson, "Web Technology- A Computer Science perspective", Pearson Education, 1st Edition, 2007.
2. Chris Bates, "Web Programming- Building Internet Applications", Wiley India, 1st Edition, 2006.
3. Achyut S Godbole and Atul Kahate, "Web technologies", Tata McGraw Hill, 1st Edition, 2008.
4. Web Technologies, Uttam K Roy, Oxford University Press, 1st Edition, 2010.
5. Kirupa Chinnathambi, Learning React, Addison-Wesley Professional, 1st Edition, 2019.
6. Mark Masse, REST API Design Rulebook, O'Reilly Media, 2011.
7. Lynn Beighley, Michael Morrison, Head First PHP & MySQL, O'Reilly Media, 2009.
8. Vikram Vaswani, PHP: A Beginner's Guide, O'Reilly Media, 2008.
9. Gregory Blake, Laravel Basics, CreateSpace Independent Publishing Platform, 2016.
10. Matt Stauffer, Laravel: Up & Running: A Framework for Building Modern PHP Apps, O'Reilly Media; 2nd edition, 2019.

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

Bachelor of Science (Information Technology) Semester – V

Session 2024-25
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 synchronization policies and CPU scheduling.

CO3: Describe and analyze the memory management and its allocation policies.

CO4: Comprehend about the application of virtual memory and disk scheduling.

Bachelor of Science (Information Technology) Semester – V

Session 2024-25
COURSE CODE: BITL-5113
OPERATING SYSTEM

Examination Time: 3 Hours. **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 handing 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 2024-25
COURSE CODE: BITP-5114
LAB ON WEB TECHNOLOGIES

Examination Time: 3 Hours.

Max. Marks: 50
Practical: 40
CA: 10

Lab on Web Technologies.

Bachelor of Science (Information Technology) Semester – V

Session 2024-25
COURSE CODE: BITP-5115
LAB ON OPERATING SYSTEM

Examination Time: 3 Hours. **Max. Marks: 50**
Practical: 40
CA: 10

Implementation of different algorithm in C / C++ based on BITL-5113.

Bachelor of Science (Information Technology) Semester – V
(Session 2024-25)
COURSE CODE: SECJ-5551
JOB READINESS COURSE

Course Duration: 30 hours

Course intended for: Semester V students of undergraduate degree programmes of all streams.

Course Credits: 2

Course Code: SECJ-5551

Objectives of the Course:

It is a specialized Programme structured to prepare the students job ready and adaptable for the work place. The main purpose of the course is to enhance their live skills and increase their chances of success in job interviews. It aims at improving their employability skills by making them ready for competitive jobs. It will help them synergizing with others, making realistic expectations and goals.

Learning Outcomes:

On successful completion of this course, students will be able to:

- help them building a professional resume to start their career
- learn represent themselves and communicate better in all areas
- make them understand how speaking skills can help them excelling in job interviews
- boost self confidence
- share their ideas in the group and improve their listening skills
- make them aware about critical thinking and leadership qualities

CURRICULUM

Course Code: SECJ-5551 Course Credits: 2 Total contact hours: 30

MODULE	TITLE	HOURS
I	Resume Building	5 Hours
II	Positive Attitude	2 Hours
III	Presentation Skills	5 Hours
IV	Leveraging LinkedIn	4 Hours
V	E-Mail Etiquette and Telephonic Conversation	4 Hours
VI	Organizational Structure and Corporate Jargons	3 Hours
VII	Tips for Personal Interviews	5 Hours
VIII	Final Assessment, Feedback and Closure	2 Hours

EXAMINATION

- **Total Marks:** 25 (Final Exam: 20; Internal Assessment: 5)
- **Final Exam:** Multiple Choice Quiz; Marks – 20; Time: 1 hour
- **Internal Assessment:** 5 (Assessment: 3; Attendance:2)

  Comparative assessment questions (medium length) in the beginning and close of the programme. Marks: 3; Time: 0.5 hour each at the beginning and end.

- **Total marks:** 25 converted to grade for final result
- **Grading system:**

90.1% -100% marks: O grade
80.1% - 90% marks: A+ grade
70.1% - 80% marks: A grade
60.1% - 70% marks: B+ grade
50.1% -60% marks: B grade
45%- 50 % marks: C grade
35%-44.9% marks: P grade
Below 35% marks: F grade
Absent: Ab

Bachelor of Science (Information Technology) Semester – VI
(Session 2024-25)

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 and techniques to clip and transform various objects and viewports.

CO4: Identify the importance of viewing and projections.

Bachelor of Science (Information Technology) Semester – VI
(Session 2024-25)

COURSE CODE: BITL - 6111

COMPUTER GRAPHICS

Examination Time: 3 Hours **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 (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

Overview of Graphics System: Computer Graphics and their applications.
Display Devices: CRT Monitors, Random Scan, Raster Scan, LED & LCD Monitors, Virtual Reality and Workstation.

UNIT – II

Elementary Drawing: Points and various line drawing Algorithms and their comparisons and Circle & Ellipse Generating Algorithms.

UNIT – III

Two Dimensional Transformations: Basic Transformations - Translation, Rotation, Scaling, Reflection and Shearing. Matrix representation of Basic Transformations, Homogenous Coordinates and Composite transformations.

Windowing and Clipping: Windowing Concepts, Clipping and its Algorithms and 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 Easter 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, Peson Education India (2002), 2nd Edition

Bachelor of Science (Information Technology) Semester – VI
(Session 2024-25)

COURSE CODE: BITL - 6112

DIGITAL MARKETING

Course Outcome:

After passing the course the student will be able to:

CO1: Identify impact of digital space and digital marketing in reaching out to customers.

CO2: Comprehend importance of Keywords in Search Engine Optimization.

CO3: Outline factors affecting Social Media Marketing.

CO4: Comprehend importance of Tools and Analytics in social media marketing.

Bachelor of Science (Information Technology) Semester- VI
(Session 2021-22)

COURSE CODE: BITL–6112

DIGITAL MARKETING

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 (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 Marketing: Meaning, 4 Ps of Marketing, Value creation, communication, delivery and exchange. Segmentation, target marketing and positioning.

Consumer Behavior, Environmental and Psychological factors, decision making process and its stages. AIDAA model, Marketing Mix.

UNIT - II

Introduction to Digital Marketing: Introduction, Search Engine Optimization – Keywords, on page and off page optimization, Ad-Words, Meta-tags

Search Engine Marketing: Advertising, PPC, SEM Strategy, SEM Auction models.

UNIT – III

Social Media Marketing: Word of Mouth, factors affecting social media marketing, social media platforms- B2B and B2C.

UNIT – IV

Social Media Marketing Tools: Mobile marketing, website planning and creation, e-mail marketing, content marketing, online reputation management, digital analytics.

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References / Textbooks:

1. Phillip Kotler and Lane Keller Kevin, Marketing Management, Pearson Education
2. Seema Gupta, Digital Marketing, Tata McGraw Hill Education (2018)

3. Ian Dodson, The Art of Digital Marketing: The defensive guide to Creating Strategic, Targeted and measurable Online campaigns, Wiley Publishers
4. Stephanie Diamond, Digital Marketing - All in One for Dummies, Wiley Publishers
5. Digital Marketers, The Ultimate Guide to Digital Marketing, https://www.digitalmarketer.com/digital-marketing/assets/pdf/ultimate-guide-to-digital-marketing.pdf
6. Damian Ryan, Understanding Digital Marketing: Marketing strategies for engaging, Cogan page Publishers Third Edition

Bachelor of Science (Information Technology) Semester – VI
(Session 2024-25)

COURSE CODE: BITP - 6113

LAB ON COMPUTER GRAPHICS

Max. Marks: 50
Practical: 40
CA: 10

Examination Time: 3 Hours

Lab on implementation of applications of Computer Graphics in C / C++.

Bachelor of Science (Information Technology) Semester – VI
(Session 2024-25)

COURSE CODE: BITD - 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 2024-25)

COURSE CODE: BITD - 6114

PROJECT

Max. Marks: 200
Practical: 160
CA: 40

Examination Time: 3 Hours

General Instructions:

1. 1. A software module based on the work done in the entire course is to be developed.
2. Candidates have to submit one hard copy and two CDs/DVDs of documentation which shall be kept with the HoD in the college only. Further, supervisor/guide shall forward one copy of DVD/CD containing all the documentation files of the students (file name to be saved as Rollno_of_the_ student.pdf) to the COE Office. The Covering letter (duly signed by the guide and Head of the department) should contain the following information. Candidate name, Candidate Roll no, Project Title of the student and .pdf file name of her project documentation.
3. The software module / website may be developed in groups, consisting of at most two students in a group.
4. The 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 and 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 under semester system.