DEPARTMENT OF COMPUTER SCIENCE (UG)

Minutes of the Board of Studies meeting in the Department of Computer Science for Under Graduate Programmes held on 06/03/2023 at 11:30 AM in offline/online mode.

LIST OF BOS MEMBERS

Name of the Member	Role
Dr.T.S.RaviKiran, HOD, Dept. of CS, P.B. Siddhartha College of Arts & Science. Mobile: 9440446847, Email:tsravikiran@pbsiddhartha.ac.in	Chairman
Dr.R.VijayaKumari, Head, Department of Computer Science, Krishna University, Machilipatnam. Ph : 9948593964, Email: vijayakumari28@gmail.com	University Nominee, Krishna University
Dr. M. Babu Reddy, Principal, Krishna University College of Engineering and Technology, Krishna University, Machilipatnam. Mobile: 9963436460 Email: m_babureddy@yahoo.com	Subject Expert
Dr.P.Deepalakshmi, ME, Ph.D. , Professor and Dean, School of Computing, Kalasalingam Academy of Research and Education, Krishnankoil - 626126. Virdhunagar(Dist.), Tamil Nadu, India. Email: deepa.kumar@klu.ac.in, deansoc@klu.ac.in Mobile: 9865061291, 8838010443	Subject Expert
Bharat Kumar Reddy Gujavarti (MCA, PGDHRM), Hyderabad Founder & CEO, Pragmatiq Systems Inc. Director, Sunblue Technologies Co-founder, Edify Email: bharat@pragmatiq.in Mobile: 8978191977	Industrialist
Shankar Lakkaraju, Product Director, Blue Yonder India Email: shankar.lakkaraju@gmail.com Mobile: 98851 65651	Alumni MCA: 1999-2002
Mr. K. Sudhir	Member
Mr. K. Sridhar	Member
Mrs. M. Bhadraja	Member
Mr. R. Gopi	Member
Mr. S. Rajesh	Member
Mrs. Y. J. N. Lakshmi	Member
Mrs. V. Jhansi Lakshmi	Member
Mrs. T. Malleswari	Member
Mr. E. V. V. S. Siva Kumar	Member
Mr. K. Veerendranath	Member
Mrs.M.Vijitha	Member
Ms. A. Prathyusha	Member
Mrs. B. Tarmila Devi	Member
Mr. K. Ravisankar	Member
Mrs. Sk. John Bee	Member
Dr. K. UdayaSree	Member
Mrs.M.Gayathri	Member
Mrs.V.Munni	Member
Mrs.V.Sreerekha	Member
Mr. V. Ravi Kiran	Member
Mrs. V. Lakshmi Ravali	Member

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DEPARTMENT OF COMPUTER SCIENCE (UG)						
LIST OF COURSES MODIFIED IN II SEMESTER 2022 - 2023						
Sl. No.	**Title**	**Course Code**	**Offered in Sem**	**Year of Introduction**	**OBE with BTL**	**Offered To**
1	Computer Networks	CGST22A	II	2022 - 2023	YES	B. Sc (CSCS)
2	Computer Networks Lab	CGSP22A	II	2022 - 2023	YES	B. Sc (CSCS)
3	Process Management	CGST42A	IV	2022 - 2023	YES	B. Sc (CSCS)

RESOLUTIONS

1. It is resolved and recommended to revise the syllabus & model question paper of Computer Networks with revised course code CGST22A in II semester of B. Sc (CSCS) programme for the batch of students admitted in 2021-22 academic year and onwards. For the revised syllabus and model question paper vide Page number from 3 to 7.
2. It is resolved and recommended to revise the syllabus & model question paper of Computer Networks Lab with revised course code CGSP22A in II semester of B. Sc (CSCS) programme for the batch of students admitted in 2021-22 academic year and onwards. For the revised syllabus and model question paper vide Page number from 8 to 9.
3. It is resolved and recommended to revise the syllabus & model question paper of Process Management with revised course code CGST42A in II semester of B. Sc (CSCS) programme for the batch of students admitted in 2021-22 academic year and onwards. For the revised syllabus and model question paper vide Page number from 10 to 12.
4. It is resolved and recommended to drop DevOps Lab with course code CGSP42 from the curriculum as per recommendation of TCS for B. Sc. (CSCS) programme in their IV semester with effect from 2021-22 admitted batch and onwards.
5. It resolved and recommended the revision of the model question paper of E - Commerce and Web Designing with course code CABT24 in II semester of B. COM (CA) programme for the batch of students admitted in 2022-23 and onwards. For the revised model question paper vide Page Number 13.
6. It is resolved and recommended the revision of the model question paper of Data Structures with course code CSCT21B CGST21 for B. Sc. (CSCS) and CSCT22B for B. C. A programme in II semester for the batch of students admitted in 2022-23 and onwards. For the revised model question paper vide Page Number 14 to 15.
7. It is resolved and recommended the revision of the model question paper of Web Programming with course code CSCT28 in II semester of B. C. A programme for the

batch of students admitted in 2022-23 and onwards. For the revised model question paper vide Page Number 16 to 17.

8. It is resolved and recommended the revision of the model question paper of Security Analyst - I with course code SDCCSCT01 in II semester of B. C. A programme for the batch of students admitted in 2022-23 and onwards. For the revised model question paper vide Page Number 18.
9. It is resolved and recommended the revision of the model question paper of Digital Marketing with course code SDCCSCT02 in II semester of B. Sc. (CAMS, MSCS) programmes for the batch of students admitted in 2022-23 and onwards. For the revised model question paper vide Page Number 19.

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COMPUTER SCIENCE	CGST22A	2023-2024	B.Sc. (CSCS)

SEMESTER – II **Credits – 4** **Total: 60 Hrs.**

COMPUTER NETWORKS

Course Objectives:

1. Learn about Network hardware and software
2. Learn basics about Networking.
3. Learn about IP Addressing and Switches
4. Learn about VLAN and Routing Protocols.
5. Learn about Network Monitoring, WLAN, NAT

Course Outcome No	Upon successful completion of this course, students should have the knowledge and skills to:	Program Outcome No
CO1	Understand about Network hardware and software	PO7
CO2	Understand the concept of Networking	PO1
CO3	Understand the concepts of IP Addressing and Switching	PO7
CO4	Understand and know about VLAN and Routing protocols	PO1
CO5	Understand and know about Network Monitoring, WLAN, NAT	PO1

Unit I : Need of Network **10 Periods**

Network classifications LAN, MAN, WAN, Data and signals analog and digital, periodic analog signals, digital signals, bit rate, baud rate, bandwidth, Transmission impairments - attenuation, distortion and noise, Data Communication protocols & standards, Network models - OSI model layers and their functions, TCP/IP protocol suite.

Unit II:Bandwidth Utilization and Multiplexing **12 Periods**

Multiplexing - FDM, TDM, Spread spectrum - Frequency hopping spread spectrum, Direct sequence spread spectrum, Transmission media - guided and unguided media, Switching

message, circuit and packet switched networks, Datagram networks and virtual circuit networks.

Unit III:IP Addressing **14 Periods**

IP Addressing Version 4 – IP Addressing Version 6, Subnetting Advanced VLSM - Switch Basic, VLAN - VTP /CDP - Subnetting Basic Version 4, Network Quiz - Routing Static.

Unit IV: Routing Algorithms **12 Periods**

Routing algorithms – Congestion Control Algorithms, CISCO IOS / Managing / Password recovery, Routing Dynamic Routing protocols OSPF RIP EIGRP, Network Advanced Routing Dynamic Routing protocols – OSPF RIP EIGRP.

Unit V: Monitoring Network Devices **12 Periods**

Overview of ACL(Access Control List),**NAT(**Network **Address Translation),WAN**(Wide area network) and Wireless Technologies.

Recommended Books:

- B A Forouzan, Data Communications and Networking, 4th Ed,, M C Graw Hill Publications [PDF]
- David J.Wetherall, Andrew S.Tanenbaum, "Computer Networks", 5th Edition, Pearson Education, 2012 [PDF]

Online Resources:

https://www.youtube.com/watch?v=-6Uoku-M6oY

https://www.youtube.com/watch?v=ZhEf7e4kopM

https://youtu.be/8npT9AALbrI?t=70

Recommended Co – Curricular Activities:

(Co-curricular activities shall not promote copying from textbook or from others work and shall encourage self/independent and group learning)

A. Measurable

1. Assignments (in writing and doing forms on the aspects of syllabus content and outside the syllabus content. Shall be individual and challenging)
2. Student seminars (on topics of the syllabus and related aspects (individual activity))
3. Quiz (on topics where the content can be compiled by smaller aspects and data (Individuals or groups as teams))
4. Study projects (by very small groups of students on selected local real-time problems pertaining to syllabus or related areas. The individual

participation and contribution of students shall be ensured (team activity))

B. General

1. Group Discussion
2. Others

RECOMMENDED CONTINUOUS ASSESSMENT METHODS:

Some of the following suggested assessment methodologies could be adopted;

1. The oral and written examinations (Scheduled and surprise tests),
2. Closed-book and open-book tests,
3. Programming exercises,
4. Practical assignments and laboratory reports,
5. Observation of practical skills,
6. Individual and group project reports.
7. Efficient delivery using seminar presentations,
8. Viva voce interviews.
9. Computerized adaptive testing, literature surveys and evaluations,
10. Peers and self-assessment, outputs form individual and collaborative work.

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SEMESTER END MODEL QUESTION PAPER

TITLE: COMPUTER NETWORKS	**COURSE CODE: CGST22A**
SECTION: B.SC CSCS	**SEMESTER: II**
TIME: 3 Hrs.	**MAX: 75M**

SECTION A

ANSWER THE FOLLOWING QUESTIONS . **5 X 4 = 20 Marks**

1. (a) Explain LAN with an example. (CO1, L2)

OR

(b) Summarize types of communication signals. (CO1, L2)

2. (a) Describe the Spread spectrum? (CO2, L1)

OR

(b) Describe circuit and packet switched networks. ? (CO2, L1)

3. (a) Explain IP addressing. (CO3, L2)

OR

(b) Explain Subnetting. (CO3, L2)

4. (a) Explain routing. (CO4, L2)

OR

(b)Summarize Congestion Control Algorithms(CO4, L2)

5. (a) Explain ACL.(CO5, L2)

OR

(b)Write about WAN. (CO5,L2)

SECTION B

ANSWER THE FOLLOWING QUESTIONS . **5 X 10 = 50 Marks**

6. (a) Classify and explain various types of Networks with neat diagrams. (CO1, L2)

OR

(b) Summarize various layers in the OSI model. (CO1, L2)

7. (a) Explain Multiplexing. (CO2, L2)

OR

(b) Explain guided Transmission media.(CO2, L2)

8. (a) Explain IPV4. (CO3, L2)

OR

(b) Explain IPV6. (CO3, L2)

9. (a) Illustrate configuring the OSPF Protocol with an example.(CO4, L2)

OR

(b) Illustrate configuring the Routing Information Protocol with an example.(CO4, L2)

10. (a) Explain NAT (CO5, L2)

OR

(b) Explain Wireless Communication.(CO5, L2)

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SEMESTER – II **Credits – 1**

COMPUTER NETWORKS LAB

COURSE OUTCOME NO	Upon successful completion of this course, students should have the knowledge and skills to:	PROGRAM OUTCOME NO
CO1	Demonstration of Cisco packet tracer software	PO7
CO2	Perform Configuration of a Switch	PO1
CO3	Perform Configuration of a Router	PO1
CO4	Demonstration of Routing protocols OSPF, RIP	PO1
CO5	Demonstration of Routing protocol EIGRP	PO1

Requirements:

Cisco packet tracer software (Freeware)

Exercises

1. Installation of Cisco Packet Tracer
2. Perform an Initial Switch Configuration
3. Configuring Switch Interfaces
4. Performing an Initial Router Configuration
5. VLAN and VTP Configuration
6. Basic Router Setup
7. Demonstrate Static Routing
8. Demonstrate Dynamic Routing
9. Demonstrate Dynamic Routing protocol OSPF
10. Demonstrate Dynamic Routing protocol RIP

11. Demonstrate Dynamic Routing protocol EIGRP

Faculty & Student Resources:

- Software Download
  - Cisco Packet Tracer Software (Details provided in Getting Started Course)
- Free Online Courses for Cisco Packet Tracer
  - Getting Started with Cisco Packet Tracer
  - Exploring Networking with Cisco Packet Tracer
  - Introduction to Packet Tracer Exam
- Lab Resources
  - Free Cisco Lab
  - Free CCNA Lab
  - Cisco Virtual Lab Simulations
  - Packet Tracer Labs

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PROCESS MANAGEMENT

Offered To:	**B.Sc CSCS**	**Course Code:**	CGST42A
Course Type:	Core (Theory)	**Course:**	Process Management
Year of Introduction:	2022 – 2023	**Year of offering:**	2023 – 2024
Year of Revision:	-	**Percentage of Revision:**	-
Semester:	IV	**Credits:**	4
Hours Taught:	60 hrs. per semester	**Max. Time:**	3 Hrs

Course Prerequisites (if any): Basic knowledge in computers and internet.

Course Description: This course focuses towards Software Engineering, Agile and Scrum, DevOps Tools and Design Thinking

Course Objectives:

1. Understanding the concept of Software Engineering.
2. To Know about Agile and Scrum.
3. To implement DevOps Tools.
4. Understanding the concept of Design Thinking.

Course Outcomes: At the end of this course, students should be able to

CO1: Understand about Software Engineering. (PO5,PO6, PO7)

CO2: Learn about Agile. (PO5, P07)

CO3: Learn about Scrum (PO5, P07)

CO4: Know about DevOps. (PO5, P07)

CO5: Understand Design Thinking is about. (PO5,PO6, PO7)

Syllabus		
Unit	**Learning Units**	**Lecture Hours**
I	**Software and Software Engineering (15 Hrs.)** The Nature of Software, The Unique Nature of WebApps, Software Engineering- Software Process, Software Engineering Practice-Software Myths. Software Process Model: A Generic Process Model, Process Assessment and Improvement, Perspective Process Models, Specialized Process Model, The Unified Process. Software Engineering Code of Ethics.	12
II	**Agile (14 Hrs.)** What Is Agile, Understanding Agile Value, Agile Manifesto, Principles of Agile, Agile Methodologies, Advantages and Disadvantages of Agile - Agile anti-patterns, Scaled Agile Framework, Why Lean UX, The Three Foundations of Lean UX, Principles of Lean UX.	12
III	**Scrum (14 Hrs.)** Definition of Scrum, Uses of Scrum, Scrum Theory, Scrum Values, The Scrum Team, Scrum Events, Scrum Artifacts, Artifact Transparency.	12
IV	**DevOps (15 Hrs.)** Introduction to DevOps, methodologies, principles, strategies, Automation, Performance Measurement through KPIS and Metrics, Agile and DevOps, Agile Infrastructure, Velocity, Lean Startup UPS.	12
V	**Design Thinking (14 Hrs.)** Introduction to Design Thinking – Lean thinking, Actionable Strategy, The Problem with Complexity, Vision and Strategy, Defining Actionable Strategy Act to Learn, Leading Teams to Win.	12

Text Books			
	Author	**Title**	**Publisher**
1	Roger S Pressman,	"Software Engineering A Practitioner's Approach"	7th Edition 2010
2	KalloriVikraman,	"Introduction to Devops"	1st Edition, 2016.
3	Stephen Haunts	Essential of Scrum" Addison-Wesley Professional	1st Edition, 2012
4	Jonny Schneider	"Understanding Design Thinking, Lean, and Agile"	O'Reilly Media 2017.
5	Jeff Gothelf	"Lean vs. Agile vs. Design Thinking"	Sense and Respond Press,2017

Course Delivery method : Face-to-face / Blended

Course has focus on : Skill Development

Websites of Interest:

https://www.javatpoint.com/devops

https://www.tutorialspoint.com/scrum/scrum_overview.htm

https://www.javatpoint.com/agile

https://www.tutorialspoint.com/design_thinking/design_thinking_introduction.htm

Co-curricular Activities: Programming Contests, Assignments & Quiz

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PROCESS MANAGEMENT

SEMESTER END MODEL QUESTION PAPER

COURSE CODE: CGST42A **Max.Marks:75M**

CLASS: B.Sc. (CSCS) **Semester IV**

Section-A

Answer any five questions. **5*5=25M**

1. Explain the nature of Software.(CO1, L2)
2. Describe the unique nature of WebApps.(CO1,L1)
3. List and explain principles of Agile.(CO2, L2)
4. Explain Scrum Roles.(CO2, L2)
5. Summarize the need of DevOps. (CO3, L2)
6. Discuss Velocity in Agile.(CO3, L2)
7. What is Sprint? Explain. (CO4, L2)
8. Explain the Actionable Strategy for Design Thinking.(CO5, L2)

Section-B

ANSWER THE FOLLOWING QUESTIONS5x10M=50M

9. (A)Summarize software myths. (CO1, L2)

OR

(B)Explain Software Process Models (SPM). (CO1, L2)

10. (A) Classify and explain agile methodologies.(CO2, L2)

OR

(B) Summarize scrum artifacts. (CO2, L2)

11. (A) Illustrate measuring performance through KPIS and its metrics. (CO3, L2)

OR

(B) Explain about Lean Startup UPS.(CO3, L2)

12. (A) Illustrate staggering a sprint with an example. (CO4, L2)

OR

(B) Illustrate coordinating multiple Lean UX teams. (CO4, L2)

13. (A) Explain Lean Thinking and its Principles?(CO5, L2)

OR

(B)Explain the vision and Strategy of Design Thinking.(CO5, L2)

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APPENDIX - III

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SEMESTER END MODEL QUESTION PAPER

COURSE CODE: CABT24 **Max.Marks:70M**

CLASS: B.Com(CA) **Semester II**

SECTION A

ANSWER THE FOLLOWING QUESTIONS **5 X 4 = 20 Marks**

1. A) Explain the need of E - Commerce. (CO1, L2)
   OR
   B) Differentiate between traditional and electronic commerce. (CO1, L3)

2. A) Explain about E - Advertising. (CO2, L2)
   OR
   B) Explain Internet marketing. (CO2, L2)

3. A) Summarize the procedure of electronic payment. (CO3, L3)
   OR
   B) Differentiate traditional and modern payment systems. (CO3, L3)

4. A) Illustrate formatting tags in HTML with example, (CO4, L2)
   OR
   B) Illustrate ordered and unordered lists with example, (CO4, L2)

5. A) Illustrate adding video from youtube to the web site using WIX Editor. (CO5, L2)
   OR
   B) Explain gallery management in WIX Editor with examples. (CO5, L2)

SECTION A

ANSWER THE FOLLOWING QUESTIONS **5 x 10 Marks**

6. A) Explain E Commerce transactional issues and challenges. (CO1, L2)
   OR

B) Explain various business models. (CO1, L2)

7. A) Explain characteristics, benefits and goals of E - SCM. (CO2, L2)

OR

B) Discuss about E - CRM architectural components. (CO2, L2)

8. A) Summarize types of EPS. (CO3, L2)

OR

B) Discuss about E - Payment security. (CO3, L2)

9. A) Illustrate creating tables and table attributes in HTML with examples. (CO4, L3)

Or

B) Illustrate forms and frame tags in HTML with examples, (CO4, L3)

10. A) Illustrate arranging content on your web page using WIX editors with examples, (CO5, L3)

OR

B) Illustrate adding an image to your page background using WIX Editor with examples, (CO5, L3)

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MODEL Question Paper: 2022-2023

TITLE: DATA STRUCTURES **COURSE CODE : CSCT21B /CGST21/CSCT22B**

SECTIONS: B.Sc. (CAMS / CAME / MSCS / MPCS / MECS / CSCS), BCA **SEMESTER: II**

TIME: 3 Hrs. **MAX: 70M**

SECTION A

Answer the following questions **5 x 4 = 20 Marks**

1. A) Differentiate between primitive and non primitive data types. (CO1, L2)

OR

B) Differentiate between abstract data types, data types and data structures. (CO1, L2)

2. A) Design an algorithm to insert a node in the middle of the single linked list. (CO2, L6)

OR

B) Design a C program to print factorials of a given number using recursion. (CO2, L6)

3. A) Differentiate between stacks and queues. (CO3, L2)

OR

B) Explain about representation of stacks with examples, (CO3, L2)

4. A) Design an algorithm to traverse binary trees in post order technique. (CO4, L6)

OR

B) Illustrate creating a binary tree from given traversals (CO4, L6)

Inorder: D B E A F C

Postorder: A B D E C F

5. A) Illustrate bubble sort algorithm for the values 6 3 1 2 7 (CO5, L2)

OR

B) Illustrate binary search with an example. (CO5, L2)

SECTION B

Answer the following questions **5 x 10 = 50 Marks**

6. A) Explain different types of approaches for designing an algorithm. (CO1, L2)

   OR

   B) Explain about algorithm analysis with example, (CO1, L2)

7. A) Design an algorithm to perform (CO2, L6)
   i) create doubly linked list - 5M
   ii) insert a node in the middle of doubly linked list - 5M

   OR

   B) Explain various types of linked lists. (CO2, L2)

8. A) Design a C program to demonstrate stack operations using arrays. (CO3, L6)

   OR

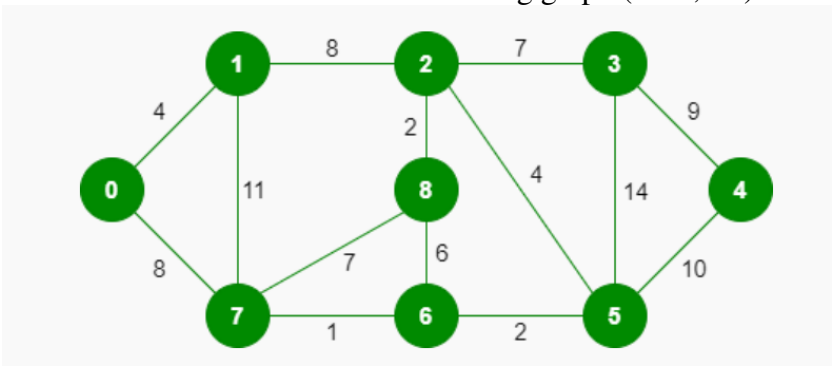
   B) Discuss about various applications of queues with examples, (CO3, L2)

9. A) Illustrate BST creation from given preorder traversal (CO4, L2)
   preorder: {10, 5, 1, 7, 40, 50}

   OR

   B) Illustrate the following operations on the given inorder:{1, 3, 4, 6, 7, 8, 10, 14} (CO4, L2)
   i) Searching for node 6 -5M
   ii) Inserting a node 12 - 5M

10. A) Illustrate the creation of MSP from the following graph (CO5, L2)



OR

B) Explain various applications of graphs with examples. (CO5, L2)

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MODEL Question Paper: 2022-2023

TITLE: WEB PROGRAMMING **COURSE CODE : CSCT28**

SECTIONS: BCA **SEMESTER: II**

TIME: 3 Hrs. **MAX: 70M**

SECTION-A

ANSWER THE FOLLOWING QUESTIONS **5X4=20M**

1. (A) Discuss the need of web browsers. {CO1, L2}

   (OR)

   (B) Explain HTTP functionality. {CO1, L2}

2. (A) Distinguish between tag and attributes with examples. {CO2, L2}

   (OR)

   (B) Illustrate embedding images in Web document {CO2, L2}

3. (A) Illustrate the use of checkbox and radio button in input fields with examples. {CO3, L2}

   (OR)

   (B) Describe properties and values in CSS {CO3, L2}

4. (A) Explain the role of java script in web development. {CO4, L2}

   (OR)

   (B) Explain operators in java script {CO4, L2}

5. (A) Discuss XML and its features. {CO5, L2}

(OR)

(B) Create XML code for breakfast menu with items and price. . {CO5, L6}

SECTION-B **5X10=50M**

ANSWER THE FOLLOWING QUESTIONS

6. A) Give a brief note on various services offered by the internet and the types of internet connections. {CO1, L2}

(Or)

B) Explain about internet protocols. {CO1, L2}

7. A) Illustrate creating a table in HTML with various attributes. {CO2, L2}

(Or)

B) Describe the structure of HTML documents with examples. {CO2, L2}

8. A) Illustrate frame set and frame attributes by writing a program. {CO3, L3}

(Or)

B) Design a form with various tags with suitable examples. {CO3, L6}

9. A) Illustrate control statements in java script with examples. {CO4, L2}

(Or)

B) Create a java script function to find if the given number is prime or not. {CO4, L6}

10. A) What is DTD? Explain the building blocks of DTD. {CO5, L2}

(Or)

B) Illustrate XML schema with an example. {CO5, L2}

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Life Skill Courses and Skill Development Courses

MODEL Question Paper: 2022-2023

TITLE: Security Analyst - I **COURSE CODE :SDC CSCT01**

SECTIONS: B. C. A **SEMESTER: II**

TIME: 90 mins. **MAX: 35M**

Section A (15 Marks)

Answer any THREE Out of FIVE questions

Each Question carries 5 Marks

1. Write about common vulnerabilities and exposures. (CO1, L1)

2. Write about the need of a security analyst. (CO1, L1)

3. Write about Key Performance Indicators (KPI). (CO2, L1)

4. What is the need of information security policy? (CO3, L1)

5. What is risk analysis? How is it useful in providing data security? (CO3, L1)

Section B (20 Marks)

Answer any TWO questions

Each Question carries 10 Marks

1. Explain various types of attacks. (CO1, L1)

2. Explain risks of data leakage. (CO2, L1)

3. Explain characteristics of critical information. (CO2, L1)

4. Write about roles and responsibilities of the information security management team. (CO3, L1)

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P.B. SIDDHARTHA COLLEGE OF ARTS & SCIENCE

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ISO 9001 – 2015 Certified

Life Skill Courses and Skill Development Courses

MODEL Question Paper: 2022-2023

TITLE: Digital Marketing **COURSE CODE :SDCCSCT02**

SECTIONS: B.Sc. (CAMS/MSCS) **SEMESTER: II**

TIME: 90 mins. **MAX: 35M**

Section A (15 Marks)

Answer any THREE Out of FIVE questions

Each Question carries 5 Marks

1. Discuss latest trends in Digital Marketing. (CO1, L2)

2. Explain Google Trend.(CO2, L2)

3. Distinguish between Google and Bing Search Engines. (CO2, L2)

4. Explain link building. (CO2, L2)

5. What is Product Marketing and how does it differ from Service Marketing? (CO3, L2)

Section B (20 Marks)

Answer any TWO questions

Each Question carries 10 Marks

6. Distinguish between traditional marketing and digital marketing. (CO1, L2)

7. Explain social media marketing. (CO2, L2)

8. What is SEO? Explain content writing and rewriting. (CO3, L2)

9. Differentiate free marketing and paid marketing. (CO3, L2)

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Proposals for the Board of Studies meeting in the Department of Computer Science for UnderGraduate Programmes held on 14-03-2023 at 11:00 AM in offline/online mode.

LIST OF BOS MEMBERS

Name of the Member	Role
Dr.T.S.RaviKiran, HOD, Dept. of CS, P.B. Siddhartha College of Arts & Science. Mobile: 9440446847, Email: tsravikiran@pbsiddhartha.ac.in	Chairman
Dr.R. Kiran Kumar, Associate Professor, Department of Computer Science, Krishna University, Machilipatnam. Mobile: 9440872455, Email: kirankreddi@gmail.com	Nominee, Krishna University
Dr. Yogesh Kumar Meena Associate Professor, Department of CSE, MNIT Jaipur. Mobile: 7891005056 Email : ymeena.cse@mnit.ac.in	Subject Expert
Sri. Prashant R. Nair Associate Professor, Vice- Chairman- IQAC, Dept. of CSE, Amrita Viswa Vidyapeetham, Coimbatore. Email: prashant@amrita.edu; Mobile: 9943984483	Subject Expert
Ms. ReemaThareja Professor, Dept. of Computer Science, Shyama Prasad Mukherji College (W), University of Delhi. reemathareja@gmail.com	Subject Expert
Bharat Kumar Reddy Gujavarti (MCA, PGDHRM), Hyderabad Founder & CEO, Pragmatiq Systems Inc. Director, Sunblue Technologies Co-founder, Edify Email:bharat@pragmatiq.in Mobile: 8978191977	Industrialist
Shankar Lakkaraju, M.C.A: 1999-2002 Director, Software Engineer, Lowe's Services Pvt. Ltd.. Bengaluru. Email: shankar.lakkaraju@lowes.com Mobile: 98851 65651	Alumni Representative MCA: 1999-2002
Mr. K. Sudhir	Member
Dr .K. Udaya Sri	Member
Mr. K. Sridhar	Member

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DEPARTMENT OF COMPUTER SCIENCE (UG)						
LIST OF COURSES INTROI IN EVEN SEMESTERS 2022 - 2023 (NO NEW COURSES ARE INTRODUCED)						
Sl. No.	**Title**	**Course Code**	**Offered in Sem**	**Year of Introduction**	**OBE with BTL**	**Offered To**
1	Introduction to Machine Learning	AIMLT41	4	2022 - 2023	YES	B. Sc (AIML)
2	Machine Learning Lab	AIMLP41	4	2022 - 2023	YES	B. Sc (AIML)
3	Data Mining	AIMLT42	4	2022 - 2023	YES	B. Sc (AIML)
4	Data Mining Lab	AIMLP42	4	2022 - 2023	YES	B. Sc (AIML)
5	Operating Systems	AIMLT43	4	2022 - 2023	YES	B. Sc (AIML)
6	Operating Systems Lab	AIMLP43	4	2022 - 2023	YES	B. Sc (AIML)

RESOLUTIONS

- It is resolved and recommended to introduce “Introduction to Machine Learning” with course code AIMLT41 and “Machine Learning Lab " with course code AIMLP4 in fourth semester for B. Sc. (AIML) programme with effect from 2021-22 admitted batch and onwards. For syllabus and model paper vide page numbers from 23 to 26.

- It is resolved and recommended to introduce “Data Mining” with course code AIMLT42 and “Data Mining Lab " with course code AIMLP42 in fourth semester for B. Sc. (AIML) programme with effect from 2021-22 admitted batch and onwards. For syllabus and model paper vide page numbers from 27 to 31.
- It is resolved and recommended to introduce “Operating Systems” with course code AIML43 and “Operating Systems Lab” with course code AIMLP43 in fourth semester for B. Sc. (AIML) programme with effect from 2021-22 admitted batch and onwards. For syllabus and model paper vide page numbers from 32 to 37.

- It is resolved and recommended to revise the model paper for “Data Structures” with course code AIMLT21 in second semester for B. Sc. (AIML) programme with effect from 2022 - 2023 admitted batch and onwards. For revised model paper vide page number 38.

- It is resolved and recommended to revise the model paper for “Python for Data Analysis” with course code AIMLT22 in second semester for B. Sc. (AIML) programme with effect from 2022 - 2023 admitted batch and onwards. For revised model paper vide page number 39.

- It is resolved and recommended to revise the model paper for “Data Structures” with course code DSCT21 in second semester for B. Sc. (MSDS) programme with effect from 2022 - 2023 admitted batch and onwards. For revised model paper vide page number 40.

- It is resolved and recommended to introduce internship in the 6th Semester for the students admitted in the academic year 2020-21 in B.Sc.,(MSDS) Programme.

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Computer Science	**Course Code: AIMLT41**	**Introduced from : 2022 - 2023 A. Y**	**Programme: B.Sc., (AI & ML)**
Semester-IV	**Credits:4**	**Introduction to Machine Learning**	**Total: 60Hrs**

Course Objective:
The objective of the course provides the basic concepts and techniques of Machine Learning and helps to use recent machine learning software for solving practical problems. It enables students to gain experience by doing independent study and research.

Course Outcomes:

COURSE OUTCOME NO	**Upon successful completion of this course, students should have the knowledge and skills to:**	**PROGRAM OUTCOME NO**
CO_1	Identify the characteristics of machine learning	PO2,PO7
CO_2	Summarize the Model building and evaluation approaches	PO3, PO6
CO_3	Apply Bayesian learning and regression algorithms for real-world Problems	PO4, PSO2
CO_4	Apply supervised learning algorithms to solve the real-world Problems	PO1, PO5
CO5	Apply unsupervised learning algorithms for the real world data	PO5, PO7

UNIT-I: Introduction to Machine Learning and Preparing to Model 13 Periods

Introduction to Machine Learning- Introduction, What is Human Learning? Types of Human Learning, What is Machine Learning? Types of Machine Learning, Reinforcement Learning, Problems Not To Be Solved Using Machine Learning, Applications of Machine Learning.
Preparing to Model- Introduction, Machine Learning Activities, Basic Types of Data in Machine Learning, Exploring Structure of Data, Data Quality and Remediation, Data Pre-Processing

UNIT-2: Modelling & Evaluation, Basics of Feature Engineering 10 Periods

Modelling & Evaluation- Introduction, Selecting a Model, Training a Model (for Supervised Learning), Model Representation and Interpretability, Evaluating Performance of a Model.
Basics of Feature Engineering- Introduction, Feature Transformation,PCA.

UNIT-3: Bayesian Concept Learning and Regression 12 Periods
Bayesian Concept Learning - Introduction, Why Bayesian Methods are Important?, Bayes' Theorem, Bayes' Theorem and Concept Learning, Bayesian Belief Network.

Regression: Introduction, Regression Algorithms - Simple linear regression, Logistic Regression, Maximum Likelihood Estimation.

UNIT-4: Supervised Learning: Classification, Ensemble Learning 10 Periods

Classification- Introduction, Example of Supervised Learning, Classification Model, Classification Learning Steps, Common Classification Algorithms - k-Nearest Neighbour (kNN), Decision tree, Random forest model, Support vector machines.

Ensemble Learning- Boosting, Bagging, Semi-supervised Learning.

UNIT-5: Unsupervised learning 15 Periods

Unsupervised Learning- Introduction, Unsupervised vs Supervised Learning, Application of Unsupervised Learning, Clustering –Clustering as a Machine Learning task, Different types of clustering techniques, Partitioning methods, Hierarchical clustering.

Text Books:

1. Subramanian Chandramouli, Saikat Dutt, Amit Kumar Das, "Machine Learning", Pearson Education India ,1st edition.
2. Tom M. Mitchell, "Machine Learning', MGH, 1997.

Reference Books:

1. The Hundred-Page Machine Learning Book by Andriy Burkov
2. Machine Learning For Absolute Beginners by Oliver Theobald
3. Machine Learning for Hackers by Drew Conway and John Myles White
4. An Introduction to Statistical Learning by Gareth James, Daniela Witten, Trevor Hastie, and Robert Tibshirani
5. [Ben_Stephenson]_The_Python_Workbook__A_Brief_Intr(z-lib.org)
6. Peter Harington, "Machine Learning in Action" , Cengage, 1st edition, 2012.
7. Peter Flach, "Machine Learning: The art and science of algorithms that make sense of data", Cambridge university press,2012.
8. Foundations of Machine Learning by Mehryar Mohri Afshin Rostamizadeh Ameet Talwalkar.

Student Activity:

1. Load any new operating system into your computer.
2. Partition the memory in your system
3. Create a semaphore for process synchronization.

Recommended Co – Curricular Activities:

A. Measurable

1. Assignments (in writing and doing forms on the aspects of syllabus content and outside the syllabus content. Shall be individual and challenging)
2. Student seminars (on topics of the syllabus and related aspects (individual activity))
3. Quiz (on topics where the content can be compiled by smaller aspects and data (Individuals or groups as teams))
4. Study projects (by very small groups of students on selected local real-time problems pertaining to syllabus or related areas. The individual participation and contribution of students shall be ensured (team activity))

B. General

1. Group Discussion
2. Others

RECOMMENDED CONTINUOUS ASSESSMENT METHODS:

1. Programming exercises,
2. Practical assignments and laboratory reports,
3. Observation of practical skills,
4. Individual and group project reports.
5. Efficient delivery using seminar presentations,
6. Viva voce interviews.
7. Computerized adaptive testing, literature surveys and evaluations,
8. Peers and self-assessment, outputs form individual and collaborative work.

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MODEL PAPER

TITLE: Introduction to Machine Learning

COURSE CODE: AIMLT41

CLASS: B.Sc. (AI & ML) **Semester IV**

Max. Marks: 75 **Time: 3 Hrs.**

SECTION - A

Answer any *five* of the following: **5 X 5= 25 MARKS**

1. Discuss various types of human learning. (CO1, L2)
2. Write about applications of machine learning. (CO1, L3)
3. Write about the role of modelling in machine learning. (CO2, L3)
4. Describe model training. (CO2, L1)
5. Write a short note on maximum likelihood estimation. (CO3, L4)
6. Describe the need of Bayesian models. (CO3, L1)
7. Briefly write about boosting. (CO4, L4)
8. Discuss about unsupervised and supervised learning.(CO5, L2)

SECTION – B

Answer *all* the following questions **5 X 10 = 50 MARKS**

9. (a) Explain about types of machine learning.(CO1, L1)

OR

(b) Explain about data pre-processing. (CO1, L1)

10. (a) Summarize performance evaluation of a model. (CO2, L2)

OR

(b) Briefly feature transformation. (CO2, L2)

11. (a) Explain about polynomial regression model. (CO3, L1)

OR

(b) Describe about Bayes theorem. (CO3, L1)

12. (a) Explain about random forest model with example. (CO4, L1)

OR

(b) Implement the k – nearest neighbour for given data. (CO4, L1)

13. (a) What are the applications of unsupervised learning. (CO5, L2)

OR

(b) Summarize various clustering techniques? (CO5, L2)

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Computer Science	**CourseCode: AIMLP41**	**Introduced from : 2022 - 2023 A. Y**	**Programme: B.Sc., (AI & ML)**
SEMESTER – IV	**CREDITS: 1**	**Machine Learning LAB**	**Total: 30 Periods**

Course objectives:

This course will enable students to make use of Data sets in implementing the machine learning algorithms, Implement the machine learning concepts and algorithms in any suitable language of choice.

Course outcomes:

COURSE OUTCOME NO	**Upon successful completion of this course, students should have the knowledge and skills to:**	**PROGRAM OUTCOME NO**
CO_1	Understand the implementation procedures for the machine learning algorithms.	PO2,PO6
CO_2	Design Python programs for various Learning algorithms.	PO3, PO5
CO_3	Apply appropriate data sets to the Machine Learning algorithms.	PO4, PSO7
CO_4	Identify and apply Machine Learning algorithms to solve real world problems.	PO5, PO7

Lab Experiments:

Lab Experiments:

1. Write a python program to import and export the data using pandas library.
2. Create random data for Student and Employees and save the file as .csvUsing the student and Employees data set calculate the Descriptive Statistics methods.
3. Data pre-processing - Handling missing values isnull() notnull() dropna() fillna() replace() interpolate()
4. Dimensionality Reduction . Implementing PCA
5. Write a python program to demonstrate various data visualisation
6. Supervised Learning - Implementation of Linear Regression (Salary Dataset)
7. Implementation of Logistic regression
8. Implementation of Decision tree classification
9. Implementation of K-nearest Neighbour (Iris_data)
10. Implementation of Naïve Bayes classifier algorithm
11. Implementing Random Forest
12. Unsupervised Learning Implementing K-means Clustering
13. Build Artificial Neural Network model with back propagation

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COMPUTER SCIENCE	Course Code: AIMLT42	Introduced from : 2022 - 2023 A. Y	B.Sc. (AI &ML)
SEMESTER – IV	Credits – 4	Data Mining	Total: 60Prds.

Course Objective:

To understand data mining principles and techniques: Introduce DM and acquaint the students with the DM techniques for building competitive advantage through proactive analysis, predictive modeling. Develop and apply critical thinking, problem-solving, and decision-making skills.

Course Outcomes:

COURSE OUTCOME NO	Upon successful completion of this course, students should have the knowledge and skills to:	PROGRAM OUTCOME NO
CO1	Understand the knowledge discovery in databases	PO2,PO4
CO_2	Understands OLAP operations and types of OLAP	PO5,PO7
CO_3	Apply Apriori and FP-Growth algorithms to generate frequent item sets in a dataset.	PO3,PO4
CO_4	Apply Decision tree induction and Bayesian algorithm to classify the unknown sample.	PO1,PO7
CO_5	Preparing data for clustering, clustering methods.	PO5,PO7

UNIT –I: Data Mining Systems and Knowledge Discovery Process: 12 Periods

Data Warehouse and OLAP Technology: An Overview- What Is a Data Warehouse. A Multidimensional Data Model - Need for Online Analytical Processing - OLTP V/s OLAP - OLAP Operations in Multidimensional Data Model. Data Warehouse Architecture, From Data Warehousing to Data Mining.

Need and Usage of Data Mining Technologies - Overview of Knowledge Discovery Process from Databases–What Motivated Data Mining - Why Is It Important - Data Mining Functionalities—What Kinds of Patterns Can Be Mined? Are All of the Patterns Interesting Classification of Data Mining Systems, Data Mining Task Primitives, Major Issues in Data Mining.

UNIT–II: Data Preprocessing: 12 Periods

Data Exploration: Data Objects and attribute types -Statistical description of data- Descriptive Data Summarization-Data Visualization - Data similarity and dissimilarity measures.

Data Pre-processing: Why Pre-process the Data -Data Cleaning-Data Integration-Data Reduction- Data Transformation and Data Discretization.

UNIT–III: Classification: 12 Periods

Basic issues regarding classification and predication - General Approach to solving a classification problem- Decision Tree Classification, Attribute Selection Measures, Tree Pruning. **Classification Model Evaluation and Selection** - Accuracy and Error measures, Cross Validation, Comparing Classifier performance using ROC Curves.

UNIT–IV: Mining Frequent Patterns and Association Rules: 12 Periods

Basic Concepts-Problem Definition- Market Basket Analysis- Frequent Itemsets- Closed Itemsets and Association Rules - Frequent Pattern Mining - Efficient and Scalable Frequent Itemset Mining Methods- the Apriori Algorithm for finding Frequent Itemsets Using Candidate Generation - Generating Association Rules from Frequent Itemsets - A pattern growth approach for mining Frequent Itemsets- FP-Growth Algorithm

UNIT V: Cluster Analysis: 12 Periods

Basics and Importance of Cluster Analysis-Strengths and Weaknesses. Hierarchical Methods (Agglomerative, Divisive) - Density-Based Methods (DBSCAN, OPTICS), Text Mining, Sentiment Analysis.

Text Books:

i. Introduction to Data Mining: Pang-Ning Tan & Michael Steinbach, Vipin Kumar, Pearson.

ii. Data Mining concepts and Techniques, 3/e, Jiawei Han, Michel Kamber, Elsevier.

References:

i Data Mining Techniques and Applications: An Introduction, Hongbo Du, Cengage Learning.

ii Data Mining :VikramPudi and P. Radha Krishna, Oxford.

iii Data Mining and Analysis - Fundamental Concepts and Algorithms; Mohammed J. Zaki, Wagner Meira, Jr, Oxford

iv Data Warehousing Data Mining & OLAP, Alex Berson, Stephen Smith, TMH.

E-resources:

i. http://onlinecourses.nptel.ac.in/noc18_cs14/preview (NPTEL course by Prof.Pabitra Mitra)

ii. http://onlinecourses.nptel.ac.in/noc17_mg24/preview

(NPTEL course by Dr. Nandan Sudarshanam & Dr. Balaraman Ravindran)

i iii. http://www.saedsayad.com/data_mining_map.htm

1. https://doc.lagout.org/Others/Data%20Mining/Data%20Mining_%20The%20Textbook%20%5BAggarwal%202015-04-14%5D.pdf
2. https://textbooks.elsevier.com/manualsprotectedtextbooks/9780123814791/Instructor's_manual.pdf

Recommended Co – Curricular Activities:

(Co-curricular activities shall not promote copying from textbook or from others work and shall encourage self/independent and group learning)

a. Measurable

1. Assignments (in writing and doing forms on the aspects of syllabus content and outside the syllabus content. Shall be individual andchallenging)
2. Student seminars (on topics of the syllabus and related aspects (individualactivity))
3. Quiz (on topics where the content can be compiled by smaller aspects and data (Individuals or groups as teams))
4. Study projects (by very small groups of students on selected local real-time problems pertaining to syllabus or related areas. The individual participation and contribution of students shall be ensured (team activity))

b. General

1. Group Discussion
2. Others

RECOMMENDED CONTINUOUS ASSESSMENT METHODS:

Some of the following suggested assessment methodologies could be adopted;

1. The oral and written examinations (Scheduled and surprise tests),
2. Closed-book and open-book tests,
3. Programming exercises,
4. Practical assignments and laboratory reports,
5. Observation of practical skills,
6. Individual and group project reports.
7. Efficient delivery using seminar presentations,
8. Viva voce interviews.
9. Computerized adaptive testing, literature surveys and evaluations,
10. Peers and self-assessment, outputs form individual and collaborative work.

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MODEL PAPER
TITLE: Data Mining

COURSE CODE: AIMLT42 **Max.Marks:75M**
CLASS: B.Sc. (AI & ML) **Semester IV**

SECTION - A

Answer any *five* of the following: **5 X 5= 25 MARKS**

1 How to classify data mining systems? Discuss. (CO1, L2)
2. Compare OLTP and OLAP. (CO1, L6)
3. Write the Aprori Algorithm. (CO2, L6)
4. Write a note attribute selection measures? (CO2, L1)
5. Classify various Clustering methods. (CO3, L6)
6. What is Bayes theorem? Explain (CO3, L1)
7.. Write the FP Growth Algorithm. (CO4, L6)
8.. Roll up operation (CO5, L2)

SECTION – B

Answer *all* the following questions **5 X 10 = 50 MARKS**

9. (a) Explain about the Three-tier data warehouse architecture with a neat diagram. (CO1, L1)

OR

(b). Evaluate the Major issues in Data mining? (CO1, L1)

10. (a) Describe in brief about Data warehouse implementation (CO2, L2)

OR

(b). Write a brief note on Data warehouse implementation (CO2, L2)

11. (a). Describe the data classification process with a neat diagram. How does the Naive Bayesian classification works? Explain. (CO3, L1)

OR

(b). How does the Naïve Bayesian classification works? Explain in detail. (CO3, L1)

12. (a). Explain about the Apriori algorithm for finding frequent item sets Consider the following dataset and we will find frequent itemsets and generate association rules for them.

TID	items
T1	I1, I2 , I5
T2	I2,I4
T3	I2,I3
T4	I1,I2,I4
T5	I1,I3
T6	I2,I3
T7	I1,I3
T8	I1,I2,I3,I5
T9	I1,I2,I3

minimum support count is 2, minimum confidence is 60% (CO4, L1)

OR

(b. What are the various Constraints in Constraint based Association rule mining? Explain. (CO4, L1)

13. (a)?. Define Clustering? Explain about Types of Data in Cluster Analysis? (CO5, L2)

OR

(b)? What are outliers? Discuss the methods adopted for outlier detection (CO5, L2)

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COMPUTER SCIENCE	**Course Code: AIMLP42**	**2022 - 2023**	**B.Sc. (AI &ML)**
SEMESTER – IV	**Credits – 1**	**Data Mining Lab**	**Total: 30 Periods.**

Course Objective:

The objective of this course is to impart knowledge on implementing various data mining models and algorithms and to characterize patterns obtained by association , classification and cluster rule process.

Course Outcomes:

COURSE OUTCOME NO	Upon successful completion of this course, students should have the knowledge and skills to:	**PROGRAM OUTCOME NO**
CO1	Apply logical skills to analyze a given problem	PO1,PO7
CO_2	Data Collection and Preprocessing techniques	PO3,PO4
CO_3	Analyse the datasets by applying different algorithms	PO2,PO6
CO_4	Compare the results of different data on different techniques	PO4,PO7
CO_5	Interpret the Accurate results on the datasets	PO5,PO7

Experiments List

Week 1.Demonstration of pre-processing on dataset student.arff
Week 2. Demonstration of pre-processing on dataset labor.arff

Week 3. Demonstration of Association rule process on dataset contactlenses.arff using apriori algorithm

Week 4. Demonstration of Association rule process on dataset test.arff using apriori algorithm

Week 5. Demonstration of classification rule process on dataset student.arff using j48 algorithm

Week 6. Demonstration of classification rule process on dataset employee.arff using j48 algorithm
Week 7. Demonstration of classification rule process on dataset employee.arff using id3 algorithm

Week 8. Demonstration of classification rule process on dataset employee.arff using naïve bayes algorithm

Week 9. Demonstration of clustering rule process on dataset iris.arff using simple k-means

Week 10. Demonstration of clustering rule process on dataset student.arff using simple k-means.

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Computer Science	**AIMLT43**	**2022 - 2023**	**BSc(AI & ML)**
SEMESTER – IV	**CREDITS: 4**	**Operating Systems**	**Total : 60 Periods**

Course Objective:

The main objective of this course is to understand main concepts of OS and to analyze the different CPU scheduling policies, process synchronization and deadlock management, memory management and virtual memory techniques , Appreciate the concepts of storage and file management, Study OS protection and security concepts.

Course Outcomes:

COURSE OUTCOME NO	**Upon successful completion of this course, students should have the knowledge and skills to:**	**PROGRAM OUTCOME NO**
CO_1	Know basic components of an operating system.	PO2, PO7
CO_2	Will be able to control access to a computer and the files that may be shared	PO1, PO4
CO_3	Demonstrate the knowledge of the components of computers and their respective roles in computing	PO3, PO6
CO_4	Ability to recognize and resolve user problems with standard operating environments.	PO1, PO4
CO5	Gain practical knowledge of how programming languages, operating systems, and architectures interact and how to use each effectively.	PO2, PO5

UNIT I **10 Prds**

Operating System Overview: Objectives and functions, Computer System Architecture, Evolution of Operating Systems, System Services, System Calls, System Programs, OS Structure, Virtual machines. Process Management: Process concepts, CPU scheduling-criteria, algorithms with evaluation, Preemptive / Non-Preemptive Scheduling, Threads, Multithreading Models.

UNIT II **15 Prds**

Concurrency: Process synchronization, the critical- section problem, Peterson's Solution, synchronization Hardware, semaphores, classic problems of synchronization, monitors. Deadlocks: Principles of deadlock–system model, deadlock characterization, deadlock prevention, detection and avoidance, recovery from deadlock.

UNIT III **10 Prds**

Memory Management: Swapping, contiguous memory allocation, paging, structure of the page table, segmentation. Virtual Memory: Demand paging, page replacement algorithms, Allocation of Frames, Thrashing.

UNIT IV **15 Prds**

Mass-storage structure: Overview of Mass-storage structure, Disk structure, disk attachment, disk scheduling, swap-space management. File System implementation: Access Methods, File system structure, file system implementation, directory implementation, allocation methods, free-space management. Protection: Goals and Principles of Protection, Implementation of Access Matrix,

UNIT V **10 Prds**

Overview of different Types of Operating Systems. Single User, Multiuser, linux, Android, Ubuntu, Ios, raspberrypi, Development of a mobile application using android.

TEXT Books

1. Operating System Concepts Essentials, 9th Edition by Avi Silberschatz, Peter Galvin, Greg Gagne, Wiley Asia Student Edition.
2. Operating Systems: Internals and Design Principles, 5th Edition, William Stallings, Prentice Hall of India.
3. Ashwin Pajankar, Raspberry_Pi_Image_Processing

REFERENCE BOOKS:

1. Operating System: A Design-oriented Approach, 1st Edition by Charles Crowley, Irwin Publishing
2. Operating Systems: A Modern Perspective, 2nd Edition by Gary J. Nutt, AddisonWesley
3. Android App Development in Android Studio: Java+Android Edition for Beginners
4. Operating Systems, R. Elmasri, A. G. Carrick and D. Levine, Mc Graw Hill.
5. Operating Systems in depth, T. W. Doeppner, Wiley

Student Activity:

1. Load any new operating system into your computer.
2. Partition the memory in your system
3. Create a semaphore for process synchronization.

Recommended Co – Curricular Activities:

A. Measurable

1. Assignments (in writing and doing forms on the aspects of syllabus content and outside the syllabus content. Shall be individual and challenging)
2. Student seminars (on topics of the syllabus and related aspects (individual activity))
3. Quiz (on topics where the content can be compiled by smaller aspects and data (Individuals or groups as teams))
4. Study projects (by very small groups of students on selected local real-time problems pertaining to syllabus or related areas. The individual participation and contribution of students shall be ensured (team activity))

B. General

1. Group Discussion
2. Others

RECOMMENDED CONTINUOUS ASSESSMENT METHODS:

1. Programming exercises,
2. Practical assignments and laboratory reports,
3. Observation of practical skills,

4. Individual and group project reports.
5. Efficient delivery using seminar presentations,
6. Viva voce interviews.
7. Computerized adaptive testing, literature surveys and evaluations,
8. Peers and self-assessment, outputs form individual and collaborative work.

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MODEL PAPER
TITLE: Operating Systems

COURSE CODE: AIMLT43
Max.Marks:75M
CLASS: B.Sc. (AI & ML) **Semester IV**

Answer <u>any FIVE</u> questions 5*5=25M

1. Write about Components of Computers. (CO1, L1)
2. Write about Central Processing Unit (CO1, L2)
3. Explain the operations in Processes. (CO2, L2)
4. Write about multiprocessor scheduling. (CO2, L1)
5. What is meant by paging? (CO3, L2)
6. Explain how to protect a File. (CO4, L2)
7. What are server roles on Windows Server 2016? (CO5, L2)

Answer all the questions 5*10=50M

9.(a)What are the various Applications of Computers? (CO1, L2)

OR

(b)Explain about various types of operating System. (CO1, L2)

10.(a)Briefly explain about Scheduling Algorithms. (CO2, L2)

OR

(b)Write about CPU Scheduling. (CO2, L2)

11.(a)What are the various Memory management strategies? (CO3, L2)

OR

(b)Explain about Page Replacement Techniques and Algorithms (CO3, L2)

12.(a)Explain various File Access Methods. (CO4, L2)

OR

(b) Write about File Allocation Methods and Free Space Management(CO4, L2)

13. (a)Demonstrate the steps to be followed for Windows Client OS installation (CO5, L2)

OR

(b)Explain the steps to be followed to configure DHCP. (CO5, L2)

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Computer Science	AIMLP43	2021 - 2022	BSc (AI & ML)
SEMESTER – IV	CREDITS: 1	OPERATING SYSTEMS LAB	Total: 30 Periods

Course Objectives:
1. Learn different types of CPU scheduling algorithms.
2. Demonstrate the usage of semaphores for solving synchronization problems.
3. Understand Banker's algorithm used for deadlock avoidance.
4. Understand memory management techniques and various page replacement policies.
5. Learn various disk scheduling algorithms and different file allocation methods.

Course outcomes:

COURSE OUTCOME NO	Upon successful completion of this course, students should have the knowledge and skills to:	PROGRAM OUTCOME NO
CO_1	**Evaluate the performance of different types of CPU scheduling algorithms**	PO5, PO7
CO_2	**Implement producer-consumer problem, reader-writers problem, and Dining philosophers' problem using semaphores.**	PO5, PO7
CO_3	**Simulate Banker's algorithm for deadlock avoidance**	PO5, PO7
CO_4	**Implement paging techniques and page replacement policies, memory allocation techniques in memory management. .**	PO5, PO7
CO5	**Implement disk scheduling techniques and file allocation strategies**	PO5, PO7

Lab Experiments:
TASK 1
Practice the following commands in UNIX environment a) cp b) rm c) mv d) chmod e) ps f) kill
TASK 2
Write a program that makes a copy of a file using standard I/O and system calls.
TASK 3
Simulate the following Scheduling algorithms. a) FCFS b)SJF c)Round Robin
TASK 4
Simulate the Producer Consumer problem using semaphores.
TASK 5
Simulate the Dining Philosophers problem using semaphores
TASK 6
Simulate Bankers Algorithm for Deadlock Avoidance.

TASK 7

Simulate First Fit and Best Fit algorithms for Memory Management

TASK 8

Simulate page replacement Algorithms. a)FIFO b)LRU

TASK 9

Develop a Mobile Application for basic working

TASK 10

Develop a mobile application using Android.

Text Books/ References:

1. Operating System Concepts- Abraham Silberchatz , Peter B. Galvin, Greg Gagne 7th Edition, JohnWiley.

2. Operating Systems– Internal and Design Principles Stallings, Fifth Edition–2005, Pearson education/PHI.

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P.B. SIDDHARTHA COLLEGE OF ARTS & SCIENCE

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Re – Accredited at 'A+' by NAAC – III Cycle

College with Potential for Excellence (Awarded by the UGC)

ISO 9001 – 2015 Certified

TITLE: DATA STRUCTURES **COURSE CODE : AIMLT21**

SECTIONS: B.Sc. (AIML) **SEMESTER: II**

TIME: 3 Hrs. **MAX: 70M**

SECTION A (20 MARKS)

1.(a) Define Data Structure and mention the classification of data structures. 4M (CO1,L1)

OR

(b) List the applications of stack? 4M CO1,L1

2.(a) Define path in a tree. 4M CO2,L1

OR

(b) List and explain types of graph 4M CO2,L1

3.(a) Difference between linear search and binary search? 4M CO3,L2

OR

(b) Define DFS and BFS. What is the difference between them. 4M CO3,L2

4. (a) Define Queue and Dequeue. 4M CO4,L2

OR

(b) Differentiate Circular Queue and Linear Queue. 4M CO4,L2

5. (a) Implement bubble sort for the following data : 12,34,33,44,56,2,35 4M CO5,L3

OR

(b) Differentiate Circular Queue and Linear Queue 4M CO5,L3

SECTION B (50MARKS)

Answer all Questions. (Restrict to a maximum of 2 subdivisions)

6.(a) Write an algorithm to insert new node at the beginning, at middle position and at the end of a singly linked list. 10M CO1,L1

OR

(b) Define ADT. Explain different types of Data Structures available. 10M CO1,L1

7.(a)Show code for insertion and deletion of nodes in a single linked list. 10M CO2,L1

OR

(b)Write code for insertion and display of values in circular linked list . 10M CO2,L1

8. (a)Demonstrate stack. Classify functions for various stack operations using arrays.10M CO3,L2

OR

(b)Interpret code to implement circular queues using arrays. 10M CO3,L2

9.(a) Explain deleting a node in a binary search tree with examples. 10M CO4,L2

OR

(b)Explain binary tree traversals with examples.10M CO4,L2

10. (a) Give an algorithm for quick sort. Trace the algorithm for the following data: 65 70 75 80 85 60 55 50 45. . 10M CO5,L3

OR

(b)Discover Depth first traversal with an example. 10M CO5,L3

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TITLE: PYTHON FOR DATA ANALYSIS **COURSE CODE : AIMLT22**
SECTIONS: B.Sc. (AIML) **SEMESTER: II**
TIME: 3 Hrs. **MAX: 70M**

SECTION A (20 MARKS)

Answer all the questions **5 x 4 = 20 M**

1. a) Create a python program to demonstrate operators. (CO1, L6)
   OR
   b) Discuss type casting with examples. (CO1, L2)
2. a) Create a python program to print the grade of the student. (CO2, L6)
   OR
   b) Create a python program to demonstrate break, continue and pass statements. (CO2, L6)
3. a) Create a python program to print the factorial of a given number using recursive method. (CO3, L6)
   OR
   b) Create a python program to demonstrate user defined modules. (CO3, L6)
4. a) Discuss about set operations with examples, (CO4, L2)
   OR
   b) Discuss about accessing and modifying dictionaries in python with examples. (CO4, L2)
5. a) Create scatter plot using following data set:

```
price = [2.50, 1.23, 4.02, 3.25, 5.00, 4.40]
sales_per_day = [34, 62, 49, 22, 13, 19]
```

   OR
   b) Discuss about exporting and importing data using data frames with examples. (CO4, L2)

SECTION B (50 MARKS)

Answer all the questions **5 x 10 = 50 M**

6. a) Discuss about various string operations in python with examples. (CO1, L2)
   OR
   b) Explain python features. (CO1, L2)
7. a) Illustrate branching control statements with examples. (CO2, L2)
   OR
   b) Illustrate loop control structures with examples. (CO2, L2)
8. a) Discuss defining and accessing user defined functions in python with examples., (CO3, L2)
   OR
   b) Discuss about the packages in python with examples. (CO3, L2)
9. a) Illustrate list operations and methods with examples. (CO4, L2)
   OR
   b) Illustrate set operations and methods with examples. (CO4,L2)
10. a) Illustrate creating, accessing and modifying data frames with examples. (CO5, L2)
    OR
    b) Differentiate univariate and bivariate plots. Illustrate histograms and box plots with examples. (CO5, L2)

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TITLE: DATA STRUCTURES **COURSE CODE : DSCT21**

SECTIONS: B.Sc. (MSDS) **SEMESTER: II**

TIME: 3 Hrs. **MAX: 70M**

SECTION A (20 MARKS)

1.(a) Define Data Structure and mention the classification of data structures. 4M (CO1,L1)

OR

(b) List the applications of stack? 4M CO1,L1

2.(a) Define path in a tree. 4M CO2,L1

OR

(b) List and explain types of graph 4M CO2,L1

3.(a) Difference between linear search and binary search? 4M CO3,L2

OR

(b) Define DFS and BFS. What is the difference between them. 4M CO3,L2

4. (a) Define Queue and Dequeue. 4M CO4,L2

OR

(b) Differentiate Circular Queue and Linear Queue. 4M CO4,L2

5. (a) Implement bubble sort for the following data : 12,34,33,44,56,2,35 4M CO5,L3

OR

(b) Differentiate Circular Queue and Linear Queue 4M CO5,L3

SECTION B (50 MARKS)

Answer all Questions. (Restrict to a maximum of 2 subdivisions)

6.(a) Write an algorithm to insert a new node at the beginning, at middle position and at the end of a singly linked list. 10M CO1,L1

OR

(b) Define ADT. Explain different types of Data Structures available. 10M CO1,L1

7.(a)Show code for insertion and deletion of nodes in a single linked list. 10M CO2,L1

OR

(b)Write code for insertion and display of values in circular linked list . 10M CO2,L1

8. (a)Demonstrate stack. Classify functions for various stack operations using arrays.10M CO3,L2

OR

(b)Interpret code to implement circular queues using arrays. 10M CO3,L2

9.(a) Explain deleting a node in a binary search tree with examples. 10M CO4,L2

OR

(b)Explain binary tree traversals with examples.10M CO4,L2

10. (a) Give an algorithm for quick sort. Trace the algorithm for the following data: 65 70 75 80 85 60 55 50 45. . 10M CO5,L3

OR

(b)Discover Depth first traversal with an example. 10M CO5,L3

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