DEPARTMENT OF COMPUTER SCIENCE

Minutes of the meeting of Board of Studies in Computer Science

13-09-2024

Minutes of the meeting of Board of Studies in Computer Science for Semester I, III & V of I, II & III years B.Sc. Honours Computer Science, BCA, B.Com. (Honours Computer Applications) & B.Sc. (MPCs, MCCs, MSCs), B.Com. (C.A.) and B.Com (e-Commerce) Life Skill Course and Multidisplinary Course of AG & SG Siddhartha Degree College of Arts & Science, Vuyyuru, held at 3.00P.M on 13-09-2024 in the Department of Computer Science in offline/online mode.

Sri T. Naga Prasada Rao   ...   Presiding

Members Present:

1) ……………………………Chairman   Head ,Department of Computer Science,
    (T. Naga Prasada Rao)   AG & SG Siddhartha Degree College of Arts & Science.

2) ------------------------------   University   Principal, Krishna University College of
  (Dr.M.BabuReddy)   Nomine   Engineering and Technology, Machilipatnam.

3) ---------------------------Subject Expert   Principal, HOD of Department of Computer Science
  (Dr.P.J.S Kumar)   A.N.R College Gudivada.

4) -----------------------------Subject Expert   TPO ,Department of Computer Science
  (Mr.K.Sridhar)   PB Siddhartha College of Arts & Science, VJA

5)-------------------------------Industrial Expert   Net Developer, Maven Soft System Pvt. Ltd
  (R.Sowjanya)   Madaapur, Hyderabad.

6). ……………………………   Member   Lecturer in Computer Science, AG & SG Siddhartha
  (S.Prabhavathi)   Degree College of Arts & Science, Vuyyuru-521165

7)..Member   Lecturer in Computer Science, AG&SG Siddhartha
(A.Naga Srinivasa Rao)   Degree College of Arts & Science, Vuyyuru-521165

8)..Member   Lecturer in Computer Science, AG & SG Siddhartha
  (G.Katyayini)   Degree College of Arts & Science, Vuyyuru-521165

9)..Member   Lecturer in Computer Science, AG&SG Siddhartha
  (O.TejaSri)   Degree College of Arts & Science,Vuyyuru-521165

10)--------------------------------Member   Lecturer in Computer Science, AG&SG Siddhartha
(P.SriRam Teja)   Degree College of Arts & Science,Vuyyuru-521165

11)--------------------------------Member   Lecturer in Computer Science, AG&SG Siddhartha
(Sharmila Begum)   Degree College of Arts & Science,Vuyyuru-521165

12)--------------------------------Member   Lecturer in Computer Science, AG&SG Siddhartha
(G.Mahesh)   Degree College of Arts & Science,Vuyyuru-521165

13)------------------------------Member   Student in M.Sc. CS, AG& SG Siddhartha
  (G.Sampoorna)   Degree College of Arts & Science, Vuyyuru-521165

14) -----------------------------Member   Student in B.Sc. MPCs, AG & SG Siddhartha
  (Sk. Shahera Sultana)   Degree College of Arts &

Agenda for B.O.S Meeting.

1.   To Discuss and approve the Program structure, Course structure, Syllabi and model papers of B.Sc. (Computer Science) Honours & BCA program in First year for the student admitted in the academic year 2024-25 and onwards.

2. To discuss structure and syllabi of the Third Semester for **B.Sc. Honours (Computer Science), B. C. A Honours, B.Sc. Honours (Computer Science), B.Com Honours (Computer Applications)** programmes for the students admitted from the academic year 2023 – 2024 and onwards.

3. To discuss Computer Science, BCA and Computer Applications Minor courses to be offered to students admitted in various programmes from academic year 2023 - 2024 and onwards

4. To discuss modified model papers of fifth semester for **B.Sc. (MPCS, MCCS, MSCS)** programmes for the students admitted in the academic year 2022-23 and onwards.

5. To discuss modified model papers of for B.Com.(C.A.) & B.Com(e-commerce-Computers)programmes of the students admitted in the academic year 2022-23

6. Any other information.

Resolutions

1.   To discuss Programme Educational Objectives (PEO), Programme Outcomes (PO), Programme Specific Outcomes (PSO), Course Outcomes (CO) and CO-PO mapping Matrix for B. Sc. Hons. (Computer Science), B.Com. Hons. (Computer Appications), and BCA single major programmes introduced from academic year 2023 – 2025 and onwards.

2. It is resolved to approve the Program structure, Course structure, Syllabi and model papers of B.Sc. (Computer Science) Honours & BCA program in First year for the student admitted in the academic year 2024-25 and onwards.

3.It is resolved and recommend to introduce **23BCMAL231, 23CSMAL231: Data Structures** in III semester of **B.Sc. Hons (CS), BCA** for the batch of students admitted in 2023-24 and onwards. For syllabus and model question paper

4.It is resolved and recommend to introduce **23BCMAP231, 23CSMAP231**: **Data Structures Lab** in III semester of **BSc Hons (CS), BCA** for the batch of students admitted in 2023-24 and onwards.

5.It is resolved and recommend to introduce **23CSMAL232, 23BCMAL233**: **Object Oriented Programming Using Java** in III semester of **BSc Hons (CS)** for the batch of studentsadmitted in **2023-24** and onwards. For syllabus and model question paper

6.It is resolved and recommend to introduce **23CSMAP232, 23BCMAP233**: **Object Oriented Programming Using Java Lab** in III semester of **BSc Hons (CS)** for the batch of students admitted in **2023-24** and onwards.

7.It is resolved and recommend to introduce **23ELMAL235**: **Digital Electronics** in III semester of **BSc Hons (CS)** for the batch of studentsadmitted in **2023-24** and onwards. For syllabus and model question paper

8.It is resolved and recommend to introduce **23ELMAP235**: **Digital Electronics Lab** in III semester of **BSc Hons (CS)** for the batch of students admitted in **2023-24** and onwards.

9.It is resolved and recommend to introduce **23BCMAL232**: **Data Base Management System** in III semester of **BCA. Hons** for the batch of students admitted in **2023-24** and onwards. For syllabus and model question paper

10.It is resolved and recommend to introduce **23BCMAP232**: **Data Base Management System Lab** in III semester of **BCA. Hons** for the batch of students admitted in **2023-24** and onwards.

11.It is resolved and recommend to introduce **23BCMAL234: Software Engineering** in III semester of **BSc Hons (BCA)**for the batch of students admitted in **2023-24** and onwards. For syllabus and model question paper

12.It is resolved and recommend to introduce **23BCMAP234: Software Engineering Lab** in III semester of **BSc Hons (BCA)**for the batch of students admitted in **2023-24** and onwards.

13. It is resolved and recommend to introduce **23CSMIL231**: **Object Oriented Programming Using Java** in III semester of Computer Science as **Minor for** B. Sc. Honours Mathematics and B. Sc. Honours Physics and B.Sc. Honours Chemistry programmes as per APSCHE guidelines for the batch of students admitted in academic year 2023 – 2024 and onwards. For structure, syllabus and model question paper.

14. It is resolved and recommend to introduce **23CSMIP231**: **Object Oriented Programming Using Java Lab** in III semester of Computer Science as **Minor for** B. Sc. Honours Mathematics and B. Sc. Honours Physics and B.Sc. Honours Chemistry programmes as per APSCHE guidelines for the batch of students admitted in academic year 2023 – 2024 and onwards. For structure, syllabus and model question paper
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15. It is resolved and recommend to introduce **23DSMIL231**: **Data Analytics using Python** in III semester of BCA Honours **Minor paper** as per APSCHE guidelines for the batch of students admitted in academic year 2023 – 2024 and onwards. For structure, syllabus and model question paper.

16. It is resolved and recommend to introduce **23DSMIP231**: **Data Analytics using Python Lab** in III semester of BCA Honours **Minor Paper** as per APSCHE guidelines for the batch of students admitted in academic year 2023 – 2024 and onwards. For structure, syllabus and model question paper.
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17 It is resolved and recommend to introduce **23CAMAL231: Ecommerce & Web Designing** in III semester of **BCOM HONS(CA)** for the batch of students admitted in **2023-24** and onwards. For syllabus and model question paper

18.It is resolved and recommend to introduce **23CAMAP231 : Ecommerce & Web Designing Lab** in III semester of **BCOM HONS(CA)** for the batch of students admitted in **2023-24** and onwards.

19 It is resolved and recommend to introduce **23CAMAL232: Digital Marketing** in III semester of **BCOM HONS(CA)** for the batch of students admitted in **2023-24** and onwards. For syllabus and model question paper

20.It is resolved and recommend to introduce **23CAMAP232 : Digital Marketing Lab** in III semester of **BCOM HONS(CA)** for the batch of students admitted in **2023-24** and onwards

21 .It is resolved and recommend to introduce **23ITMAL231 : Data Base Management System** in III semester of **BCOM HONS(CA) Minor Paper** for the batch of students admitted in **2023-24** and onwards

22. It is resolved and recommend to introduce **23ITMAP231 : Data Base Management System Lab** in III semester of **BCOM HONS(CA) Minor Paper** for the batch of students admitted in **2023-24** and onwards

23. It is resolved and recommend to introduce **23SDCL01 – Information and Communication Technology in III Semester II BA, BCOM, BSC, BCA students** for the batch of students admitted in **2023-24** and onwards

24 It is resolved and recommend the revision of the model Lab question paper of **WEB INTERFACE DESIGNING TECHNOLOGIES with course code 22CSCSET01** in V/VI semester of BSC (MSCS,MPCS,MECS) for the batch of students admitted in 2022-23.

25. It is resolved and recommend the revision of the model Lab question paper of **WEB INTERFACE DESIGNING TECHNOLOGIES LAB with course code 22CSCSEP01** in V/VI semester of BSC (MSCS,MPCS,MECS) for the batch of students admitted in 2022-23.

26.It is resolved and recommend the revision of the model question paper of **WEB APPLICATIONS DEVELOPMENT USING PHP AND MYSQL with Course Code 22CSCSET02** in V/VI semester of BSC (MSCS,MPCS,MECS) for the batch of students admitted in 2022-23.

27. It is resolved and recommend the revision of the model Lab question paper of **WEB APPLICATIONS DEVELOPMENT USING PHP AND MYSQL with Course Code 22CSCSEP02** in V/VI semester of BSC (MSCS,MPCS,MECS) for the batch of students admitted in 2022-23.

28 .It is resolved and recommended the revision of the model Question paper of 22**SECCAT01: BIG DATA ANALYTICS USING "R"** course in V/VI Semester for B.Com (Computer Applications & E-Commerce-Computers) programmers for the batch of students admitted in the academic year 2022-23

29.It is resolved and recommended the revision of the model Lab paper of 22**SECCAP01: BIG DATA ANALYTICS USING "R" LAB** course in V/VI Semester for B.Com (Computer Applications & E-Commerce-Computers) programmers for the batch of students admitted in the academic year 2022-23

30. It is resolved and recommended the revision of the model Question paper of 22**SECCAT07: DATA SCIENCE USING PYTHON** course in V/VI Semester for B.Com (Computer Applications & E-Commerce-Computers) programmers for the batch of students admitted in the academic year 2022-23

31. .It is resolved and recommended the revision of the model Lab paper of **22SECCAP07: DATA SCIENCE USING PYTHON LAB** course in VI Semester for B.Com (Computer Applications & E-Commerce-Computers) programmers for the batch of students admitted in the academic year 2022-23

Teaching methods:
Besides the conventional methods of teaching, we use modern technology i.e. Using of LMS and LCD projector to display on power board etc..for better understanding of concepts.
Evaluation of a student is done by the following procedure:

There are two components in the Valuation and Assessment of a student – Internal Assessment (**IA**)Semester Examinations (**SE). For the Batch of Students Admitted from 2024-25.**
Internal Assessment (IA)
The maximum mark for IA is 30 and SE is 70 for theory; and for practical marks for IA 10 and 40Marks for External Exam. Each IA written examination is of 1 hour 30 minutes duration for 30 marks. The tests will be conducted centrally. The average of two such IA is calculated for 20 marks. Attendance will be for 5 Marks. The other innovative component is for 5 marks, conducted duringthe class hours by the staff member/ in charge of the subject, in the form of assignments/ quiz/ seminars /PPT/Online- assignments/Open Book/Viva Voce/ Group work/ Mini Project/ Exhibition, etc. The topic and time for submission/ presentation will be announced by the staff member/ in charge of the subject in advance. Each student should explain and defend his/her presentation.
 The semester examination will be of 3 hours with maximum 70 marks.
A student should register himself/herself to appear for the Semester Examinations by payment ofthe prescribed fee. The Semester Examinations will be in the form of a comprehensive examination covering theentire syllabus in each subject. It will be of 3 hours duration, If a candidate fails to obtain pass marks even after the due to less mark in the IA examination, themarks of the next examination will be converted to be out of 100.Even though the candidate is absent for two IA exams/obtain zero marks the external marks are considered (if he/she gets 40/100) and the result shall be declared as 'PASS'.

The maximum marks for each Paper shall be 100.

The maximum marks for each Paper shall be 100.

Question paper guide lines for Practical Examinations at the end of Semesters III & V Two Practical Programs to be conducted out of 15 programs at the end of Semester III & V Practical Examination time 3Hrs and Maximum Marks 50 Scheme of valuation Semesters – III & V B.Sc. & B.Com.(C.A), B.Com.(e-commerce-Computers).

Computer Science Practical's - External (Time: 3 hrs.) Total Marks: 40M

1.   Programs writing (2)   :   20 marks,
2.   Viva voice   :   5 marks
3.   Execution &Result   :   15 marks
                        Total Marks   **:**   **40 marks**

Computer Science Practical's- Internal Total Marks: 10 M

    1.   Record   :   10 marks

3.   Discussed and recommended for organizing Seminars, Guest lectures, Work-shops to upgrade the knowledge of students, for the approval of the Academic Council.

4.   Discussed and empowered the HOD to suggest the panel of the paper setters and examiners to the controller of the examinations.

5.   We implemented online certificate courses & Internships such as NPTL, APSSDC - PYTHON, R-Programming, Amazon Web services and JAVA etc. To fill the curriculum gaps from II year Degree On words

6.   Suggestions

                                                                 Chairman

S.NO	TITLE OF THE PAPER	COURSE CODE	SEM NO	TYPE OF THE PAPER	TOTAL MARKS	IA TEST	SEE	TEACHING HOURS	CREDITS	OFFERED TO (NAME OF THE PROGRAMME)
1	Essentials And Applications Of Mathematical, Physical And Chemical Sciences	23SCIT11	I	CORE	100	30	70	5	4	I B.SC (COMPUTER SCIENCE)
2	Advances Of Mathematical, Physical And Chemical Sciences	23SCIT12	I	CORE	100	30	70	5	4	I B.SC (COMPUTER SCIENCE)
3	Data Structures Using C	23CSMAL231	III	CORE	100	30	70	4	3	II B.Sc. Honors (Computer Science)
4	Data Structures Using C Lab	23CSMAP231	III	LAB	50	10	40	2	1	II B.Sc. Honors (Computer Science)
5	Object Oriented Programming Using Java	23CSMAL232	III	CORE	100	30	70	4	3	II B.Sc. Honors (Computer Science)
6	Object Oriented Programming Using Java Lab	23CSMAP232	III	LAB	50	10	40	2	1	II B.Sc. Honors (Computer Science)
7	Digital Electronics	23ELMAL235	III	CORE	100	30	70	4	3	II B.Sc. Honors (Computer Science)
8	Digital Electronics Lab	23ELMAP235	III	LAB	50	10	40	2	1	II B.Sc. Honors (Computer Science)
9	Descriptive Statistics and Theory of Probability	23STMAL235	III	CORE	100	30	70	4	3	II B.Sc. Honors (Computer Science)
10	Descriptive Statistics and Theory of Probability Lab	23STMAP235	III	LAB	50	10	40	2	1	II B.Sc. Honors (Computer Science)
11	Object Oriented Programming Using Java	23CSMIL231	III	CORE	100	30	70	4	3	II B.Sc Minor (M+P+c)

12	Object Oriented Programming using Java Lab	23CSMIP 231	III	LAB	50	10	40	2	1	II B.Sc Minor (M+P+c)
13	Data Structures using C	23BCMA L231	III	CORE	100	30	70	3	3	II B. C. A Honors (Major)
14	Data Structures using C Lab	23BCMA P231	III	LAB	50	10	40	2	1	II B. C. A Honors (Major)
15	Data Base Management System	23BCMA L232	III	CORE	100	30	70	3	3	II B. C. A Honors (Major)
16	Data Base Management System Lab	23BCMA P232	III	LAB	50	10	40	2	1	II B. C. A Honors (Major)
17	Object Oriented Programming using Java	23BCMA L233	III	CORE	100	30	70	3	3	II B. C. A Honors (Major)
18	Object Oriented Programming using Java Lab	23BCMA P233	III	LAB	50	10	40	2	1	II B. C. A Honors (Major)
19	Software Engineering	23BCMA L234	III	CORE	100	30	70	3	3	II B. C. A Honors (Major)
20	Software Engineering Lab	23BCMA P234	III	LAB	50	10	40	2	1	II B. C. A Honors (Major)
21	Data Analysis using Python	23DSMIL 231	III	CORE	100	30	70	3	3	II B. C. A Honors (Minor)
22	Data Analysis using Python	23DSMIP 231	III	LAB	50	10	40	2	1	II B. C. A Honors (Minor)
23	Ecommerce& Web Designing	23CAMA L231	III	CORE	100	30	70	3	3	II B. Com Honors Computer Applications (Major)
24	Ecommerce& Web Designing Lab	23CAMA P231	III	LAB	50	10	40	2	1	II B. Com Honors Computer Applications (Major)
25	Digital Marketing	23CAMA L232	III	CORE	50	10	40	3	3	II B. Com Honors Computer Applications (Major)
26	Digital Marketing Lab	23CAMA P232	III	LAB	50	10	40	2	1	II B. Com Honors Computer Applications (Major)

27	DBMS	23CSMIL 231	III	CORE	100	30	70	4	3	II B. Com Honors Computer Applications (Minor)
28	DBMS Lab	23CSMIP 231	III	LAB	50	10	40	2	1	II B. Com Honors Computer Applications (Minor)
29	Information and Communicati on Technology	23SDCL0 1	III	SEC	50	15	35	2	2	II B.Sc(Cs),BCA,B. Com(CA),B.Com(G), (A+B+Z),(M+P+C).
30	Web Interface Designing Technologies	22CSCS ET01	V/ VI	CORE	100	30	70	3	3	III B.SC (MPCS, MCCS , MSCS)
31	Web Interface Designing Technologies Lab	22CSCS EP01	V/ VI	LAB	50	10	40	3	2	III B.SC (MPCS, MCCS , MSCS)
32	Web Applications Development Using Php And Mysql	22CSCS ET02	V/ VI	core	100	30	70	3	3	III B.SC (MPCS, MCCS , MSCS)
33	Web Applications Development Using Php And Mysql Lab	22CSCS EP02	V/V I	LAB	50	10	40	3	2	III B.SC (MPCS, MCCS , MSCS)
34	Big data Analytics using R	22SECC AT01	V/V I	core	100	30	70	3	3	III B.Com(CA & E-commerce)
35	Big data Analytics using R Lab	22SECC AP01	V/V I	LAB	50	10	40	3	2	III B.Com(CA & E-commerce)
36	Data Science using Python	22SECC AT07	V/V I	core	100	30	70	3	3	III B.Com(CA & E-commerce)
37	Data Science using Python Lab	22SECC AP07	V/V I	LAB	50	10	40	3	2	III B.Com(CA & E-commerce)

A.G & S.G.SIDDHARTHA DEGREE COLLEGE OF ARTS & SCIENCE

Vuyyuru-521165. NAAC reaccredited at 'A' level
Autonomous-ISO 9001–2015 Certified
COURSE 1:
ESSENTIALS AND APPLICATIONS OFMATHEMATICAL, PHYSICAL AND CHEMICAL SCIENCES

Theory: 5hrs/week   Paper Code: 23SCIT11
Credits: 4

Course Objective:
The objective of this course is to provide students with a comprehensive understanding of the essential concepts and applications of mathematical, physical, and chemical sciences. The course aims to develop students' critical thinking, problem-solving, and analytical skills in these areas, enabling them to apply scientific principles to real-world situations.

Learning outcomes:

CO1	Apply critical thinking skills to solve complex problems involving complex numbers, trigonometric ratios, vectors, and statistical measures.
CO2	To Explain the basic principles and concepts underlying a broad range of fundamental areas of physics and to Connect their knowledge of physics to everyday situations
CO3	To Explain the basic principles and concepts underlying a broad range of fundamental areas of chemistry and to Connect their knowledge of chemistry to daily life.
CO4	Understand the interplay and connections between mathematics, physics, and chemistry in various applications. Recognize how mathematical models and physical and chemical principles can be used to explain and predict phenomena in different contexts.
CO5	To explore the history and evolution of the Internet and to gain an understanding of network security concepts, including threats, vulnerabilities, and countermeasures.

Unit	Learning Units	Lecture Hours
UNIT I	**ESSENTIALS OF MATHEMATICS:** **Complex Numbers**: Introduction of the new symbol i – General form of a complex number – Modulus-Amplitude form and conversions **Trigonometric Ratios**: Trigonometric Ratios and their relations – Problems on calculation of angles **Vectors:** Definition of vector addition – Cartesian form – Scalar and vector product and problems **Statistical Measures**: Mean, Median, Mode of a data and problems	**12Hrs**
UNIT II	**ESSENTIALS OF PHYSICS:** Definition and Scope of Physics- Measurements and Units - Motion of objects: Newtonian mechanics and relativistic mechanics perspective - Laws of Thermodynamics and Significance- Acoustic waves and electromagnetic waves- Electric and Magnetic fields and their interactions- Behaviour of atomic and nuclear particles- Wave-particle duality, the uncertainty principle- Theories and understanding of universe.	**12Hrs**
UNIT III	**ESSENTIALS OF CHEMISTRY: :** Definition and Scope of Chemistry- Importance of Chemistry in daily life - Branches of chemistry and significance- Periodic Table- Electronic Configuration, chemical changes, classification of matter, Bio molecules- carbohydrates, proteins, fats and vitamins.	**12Hrs**
UNIT IV	**APPLICATIONS OF MATHEMATICS, PHYSICS &CHEMISTRY:**	

		Applications of Mathematics in Physics & Chemistry: Calculus , Differential Equations & Complex Analysis **Application of Physics in Industry and Technology**: Electronics and Semiconductor Industry, Robotics and Automation, Automotive and Aerospace Industries, Quality Control and Instrumentation, Environmental Monitoring and Sustainable Technologies. **Application of Chemistry in Industry and Technology:** Chemical Manufacturing, Pharmaceuticals and Drug Discovery, Materials Science, Food and Beverage Industry	**12Hrs**
UNIT V		**ESSENTIALS OF COMPUTER SCIENCE:** Milestones of computer evolution - Internet, history, Internet Service Providers, Types of Networks, IP, Domain Name Services, applications. **Ethical and social implications:** Network and security concepts- Information Assurance Fundamentals, Cryptography-Symmetric and Asymmetric, Malware, Firewalls, Fraud Techniques Privacy and Data Protection	**12Hrs**

Recommended books:
1. Functions of one complex variable by John.B.Conway, Springer- Verlag.
2. 2.Elementary Trigonometry by H.S.Hall and S.R.Knight
3. 3.Vector Algebra by A.R.Vasishtha, Krishna Prakashan Media(P)Ltd.
4. Basic Statistics by B.L.Agarwal, New age international Publishers
5. University Physics with Modern Physics by Hugh D. Young and Roger A. Freedman
6. Fundamentals of Physics by David Halliday, Robert Resnick, and Jearl Walker
7. Physics for Scientists and Engineers with Modern Physics" by Raymond A. Serway and John W. Jewett Jr.
8. Physics for Technology and Engineering" by John Bird
9. Chemistry in daily life by Kirpal Singh
10. Chemistry of bio molecules by S. P. Bhutan
11. Fundamentals of Computers by V. Raja Raman
12. Cyber Security Essentials by James Graham, Richard Howard, Ryan Olson

STUDENT ACTIVITIES

UNIT I: ESSENTIALS OF MATHEMATICS:
1: Complex Number Exploration Provide students with a set of complex numbers in both rectangular and polar forms. They will plot the complex numbers on the complex plane and identify their properties
2: Trigonometric Ratios Problem Solving Give students a set of problems that require the calculation of trigonometric ratios and theirrelations. Students will solve the problems using the appropriate trigonometric functions (sine,cosine,tangent, etc.) and trigonometric identities.
3: Vector Operations and Applications Provide students with a set of vectors in Cartesian form.Students will perform vector addition and subtraction operations to find the resultant vectors.They will also calculate the scalar and vector products of given vectors.
4: Statistical Measures and Data Analysis Give students a dataset containing numerical values.Students will calculate the mean, median, and mode of the data, as well as other statisticalmeasures if appropriate (e.g., range, standard deviation). They will interpret the results and analyze the central tendencies and distribution of the data.

UNIT II: ESSENTIALS OF PHYSICS:
1. Concept Mapping Divide students into groups and assign each group one of the topics.
Students will create a concept map illustrating the key concepts, relationships, and applications related to their assigned topic. Encourage students to use visual elements, arrows, and labels to represent connections and interdependencies between concepts.
2. Laboratory Experiment Select a laboratory experiment related to one of the topics, such as motion of objects Or electric and magnetic fields. Provide the necessary materials, instructions, and safety guidelines for conducting the experiment. Students will work in small groups to carry out the experiment, collect data, and analyze the results. After the experiment, students will write a lab report summarizing their findings,

observations, and conclusions.

UNIT III: ESSENTIALS OF CHEMISTRY
1: Chemistry in Daily Life Presentation Divide students into groups and assign each group a specific aspect of daily life where chemistry plays a significant role, such as food and nutrition, household products, medicine, or environmental issues. Students will research and create a presentation (e.g., PowerPoint, poster, or video) that showcases the importance of chemistry in their assigned aspect.
2: Periodic Table Exploration Provide students with a copy of the periodic table.
 Students will explore the periodic table and its significance in organizing elements based on their properties. They will identify and analyze trends in atomic structure, such as electronic configuration, atomic size, and ionization energy.
3: Chemical Changes and Classification of Matter Provide students with various substances and chemical reactions, such as mixing acids and bases or observing a combustion reaction. Students will observe and describe the chemical changes that occur, including changes in color, temperature, or the formation of new substances.
4: Biomolecules Investigation Assign each student or group a specific biomolecule category, such as carbohydrates, proteins, fats, or vitamins. Students will research and gather information about their assigned biomolecule category, including its structure, functions, sources, and importance in the human body. They can create informative posters or presentations to present their findings to the class.

UNIT IV: APPLICATIONS OF MATHEMATICS, PHYSICS &
CHEMISTRY 1:
Interdisciplinary Case Studies
Divide students into small groups and provide them with interdisciplinary case studies that involve the interdisciplinary application of mathematics, physics, and chemistry.
Each case study should present a real-world problem or scenario that requires the integration of concepts from all three disciplines.
2: Design and Innovation Project Challenge students to design and develop a practical solution or innovation that integrates mathematics, physics, and chemistry principles.
Students can choose a specific problem or area of interest, such as renewable energy, environmental conservation, or materials science.
3: Laboratory Experiments assign students laboratory experiments that demonstrate the practical applications of mathematics, physics, and chemistry. Examples include investigating the relationship between concentration and reaction rate, analyzing the behavior of electrical circuits, or measuring the properties of materials.
.4: Mathematical Modeling Present students with real-world problems that require mathematical modeling and analysis.

UNIT V: ESSENTIALS OF COMPUTER SCIENCE:
 1. Identifying the attributes of network (Topology, service provider, IP address and bandwidth of your college network) and prepare a report covering network architecture.

 2. Identify the types of malwares and required firewalls to provide security.

 3. Latest Fraud techniques used by hackers**.**

A.G & S.G.SIDDHARTHA DEGREE COLLEGE OF ARTS & SCIENCE

Vuyyuru-521165. NAAC reaccredited at 'A' level
Autonomous-ISO 9001–2015 Certified
SEMESTER-I
COURSE 2: ADVANCES IN MATHEMATICAL, PHYSICAL AND CHEMICAL SCIENCES
Theory 5 hrs/week Paper Code: 23SCIT11
Credits: 4

Course Objective:

The objective of this course is to provide students with an in-depth understanding of the recent advances and cutting-edge research in mathematical, physical, and chemical sciences.

The course aims to broaden students' knowledge beyond the foundational concepts and expose them to the latest developments in these disciplines, fostering critical thinking, research skills, and the ability to contribute to scientific advancements.

Learning outcomes:

CO1	Explore the applications of mathematics in various fields of physics and chemistry, to understand how mathematical concepts are used to model and solve real-world problems.
CO2	To explain the basic principles and concepts underlying a broad range of fundamental areas of physics and to connect their knowledge of physics to everyday situations
CO3	Understand the different sources of renewable energy and their generation processes and advances in nano materials and their properties, with a focus on quantum dots. To study the emerging field of quantum communication and its potential applications. To gain an understanding of the principles of biophysics in studying biological systems. Explore the properties and applications of shape memory materials.
CO4	Understand the interplay and connections between mathematics, physics, and chemistry in various advanced applications. Recognize how mathematical models and physical and chemical principles can be used to explain and predict phenomena in different contexts.
CO5	Understand and convert between different number systems, such as binary, octal, decimal, and hexadecimal. Differentiate between analog and digital signals and understand their characteristics. Gain knowledge of different types of transmission media, such as wired (e.g., copper cables, fiber optics) and wireless (e.g., radio waves, microwave, satellite).

Unit	Learning Units	Lecture Hours
UNIT I	**ADVANCES IN BASICS MATHEMATICS** **Straight Lines:** Different forms – Reduction of general equation into various forms – Point of intersection of two straight lines **Limits and Differentiation:** Standard limits – Derivative of a function –Problems on product rule and quotient rule **Integration:** Integration as a reverse process of differentiation – Basic methods of integration **Matrices:** Types of matrices – Scalar multiple of a matrix – Multiplication of matrices – Transpose of a matrix and determinants	12Hrs
UNIT II	**ADVANCES IN PHYSICS:** **Renewable energy**: Generation, energy storage, and energy-efficient materials and devices. **Recent advances in the field of nanotechnology**: Quantum dots,	12Hrs

	Quantum Communication recent advances in biophysics- recent advances in medical physics- Shape Memory Materials.	
UNIT III	**ADVANCES IN CHEMISTRY:** Computer aided drug design and delivery, nano sensors, Chemical Biology, impact of chemical pollutants on ecosystems and human health, Dye removal - Catalysis method	12Hrs
UNIT IV	**ADVANCED APPLICATIONS OF MATHEMATICS, PHYSICS &** **CHEMISTRY** **Mathematical Modelling applications in physics and chemistry** **Application of Renewable energy**: Grid Integration and Smart Grids, **Application of nanotechnology**: Nano medicine, **Application of biophysics**: Biophysical Imaging, Biomechanics, Neurophysics, **Application of medical physics**: Radiation Therapy, Nuclear medicine Solid waste management, Environmental remediation- Green Technology, Water treatment.	12Hrs
UNIT V	**Advanced Applications of computer Science** Number System-Binary, Octal, decimal, and Hexadecimal, Signals- Analog, Digital, Modem, Codec, Multiplexing, Transmission media, WiFi – Network – Configuring WiFi Router- Networking devices- Repeater, hub, bridge, switch, router, gateway	12Hrs

Recommended books:
1. Coordinate Geometry by S.L.Lony, Arihant Publications
2. Calculus by Thomas and Finny, Pearson Publications
3. Matrices by A.R.Vasishtha and A.K.Vasishtha, Krishna Prakashan Media(P)Ltd.
4. "Renewable Energy: Power for a Sustainable Future" by Godfrey Boyle 5. "Energy Storage: A Nontechnical Guide" by Richard Baxter
6. "Nanotechnology: Principles and Applications" by Sulabha K. Kulkarni and Raghvendra A. Bohara
7. "Biophysics: An Introduction" by Rodney Cotterill
8. "Medical Physics: Imaging" by James G. Webster
9. "Shape Memory Alloys: Properties and Applications" by Dimitris C. Lagoudas
10. Nano materials and applications by M.N.Borah
11. Environmental Chemistry by Anil.K.D.E.
12. Digital Logic Design by Morris Mano
13. Data Communication & Networking by Bahrouz Forouzan.

STUDENT ACTIVITIES

UNIT I: ADVANCES IN BASIC MATHEMATICS
1: Straight Lines Exploration Provide students with a set of equations representing straight lines in different forms, such as slope intercept form, point slope form, or general form. Students will explore the properties and characteristics of straight lines, including their slopes, intercepts, and point of intersection.

2: Limits and Differentiation Problem Solving Students will apply the concept of limits to solve various problems using standard limits. Encourage students to interpret the results and make connections to real-world applications, such as analyzing rates of change or optimizing functions.

3: Integration Exploration Students will explore the concept of integration as a reverse process of differentiation and apply basic methods of integration, such as the product rule, substitution method, or integration by parts. Students can discuss the significance of integration in various fields, such as physics and chemistry

4: Matrices Manipulation Students will perform operations on matrices, including scalar

multiplication, matrix multiplication and matrix transpose. Students can apply their knowledge of matrices to real-world applications, such as solving systems of equations or representing transformations in geometry.

UNIT II: ADVANCES IN PHYSICS:

1: Case Studies Provide students with real-world case studies related to renewable energy, nano technology, biophysics, medical physics, or shape memory materials. Students will analyze the case studies, identify the challenges or problems presented, and propose innovative solutions based on the recent advances in the respective field. They will consider factors such as energy generation, energy storage, efficiency, sustainability, materials design, biomedical applications, or technological advancements.

2: Experimental Design Assign students to design and conduct experiments related to one of the topics: renewable energy, nanotechnology, biophysics, medical physics, or shape memory materials. They will identify a specific research question or problem to investigate and design an experiment accordingly. Students will collect and analyze data, interpret the results, and draw conclusions based on their findings. They will discuss the implications of their experimental results in the context of recent advances in the field.

3: Group Discussion and Debate Organize a group discussion or debate session where students will discuss the ethical, social, and environmental implications of the recent advances in renewable energy, nanotechnology, biophysics, medical physics, and shape memory materials. Assign students specific roles, such as proponent, opponent, or moderator, and provide them with key points and arguments to support their positions.

UNIT III: ADVANCES IN CHEMISTRY:

1. Experimental Design and Simulation In small groups, students will design experiments or simulations related to the assigned topic. For example, in the context of computer-aided drug design, students could design a Virtual screening experiment to identify potential drug candidates for a specific disease target. For nano sensors, students could design an experiment to demonstrate the sensitivity and selectivity of nano sensors in detecting specific analytes. Chemical biology-related activities could involve designing experiments to study enzyme-substrate interactions or molecular interactions in biological systems.
Students will perform their experiments or simulations, collect data, analyze the results, anddraw conclusions based on their findings.

2. Case Studies and Discussion Provide students with real-world case studies related to the impact of chemical pollutants on ecosystems and human health. Students will analyze the case studies, identify the sources and effects of chemical pollutants, and propose mitigation strategies to minimize their impact. Encourage discussions on the ethical and environmental considerations when dealing with chemical Pollutants. For the dye removal using the catalysis method, students can explore case studies where catalytic processes are used to degrade or remove dyes from wastewater. Students will discuss the principles of catalysis, the advantages and limitations of the catalysis method, and its applications in environmental remediation.

3: Group Project Assign students to work in groups to develop a project related to one of the topics. The project could involve designing a computer-aided drug delivery system, developing a nano sensor for a specific application, or proposing strategies to mitigate the impact of chemical pollutants on ecosystems. Students will develop a detailed project plan, conduct experiments or simulations, analyze data, and present their findings and recommendations. Encourage creativity, critical thinking, and collaboration throughout the project.

UNIT IV: ADVANCED APPLICATIONS OF MATHEMATICS, PHYSICS &CHEMISTRY 1:

Mathematical Modeling Experiment Provide students with a mathematical modeling experiment related to one of the topics. For example, in the context of renewable energy, students can develop a

mathematical model to optimize the placement and configuration of solar panels in a solar farm. Students will work in teams to design and conduct the experiment, collect data, and analyze the results using mathematical models and statistical techniques. They will discuss the accuracy and limitations of their model, propose improvements, and interpret the implications of their findings in the context of renewable energy or the specific application area.

2: Case Studies and Group Discussions Assign students to analyze case studies related to the applications of mathematical modeling in nanotechnology, biophysics, medical physics, solid waste management, environmental remediation, or water treatment. Students will discuss the mathematical models and computational methods used in the case studies, analyze the outcomes, and evaluate the effectiveness of the modeling approach. Encourage group discussions on the challenges, ethical considerations, and potential advancements in the field. Students will present their findings and engage in critical discussions on the advantages and limitations of mathematical modeling in solving complex problems in these areas.

3. Group Project Assign students to work in groups to develop a group project that integrates mathematical modeling with one of the application areas: renewable energy, nanotechnology, biophysics, medical physics, solid waste management, environmental remediation, or water treatment. The project could involve developing a mathematical model to optimize the delivery of radiation therapy in medical physics or designing a mathematical model to optimize waste management practices. Students will plan and execute their project, apply mathematical modeling techniques, analyze the results, and present their findings and recommendations.   Encourage creativity, critical thinking, and collaboration throughout the project

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UNIT V: Advanced Applications of computer Science Students must be able to convert numbers from other number system to binary number systems
1. Identify the networking media used for your college network
2. Identify all the networking devices used in your college premises.

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Data Structures Using C SEM:III

Offered to: II B.Sc. Honors (Computer Science)/II BCA HONOURS

Course Code	23CSMAL231/**23BCMAL23**	Course Delivery Method	Class Room / Blended Mode - Both
Credits	3	CIA Marks	30
No. of Lecture Hours / Week	4	Semester End Exam Marks	70
Total Number of Lecture Hours	60	Total Marks	100
Year of Introduction :2017-18	Year of Offering: 2024 -25	Year of Revision: -- --	Percentage of Revision:

Course Description:

To introduce the fundamental concept of data structures and to emphasize the importance ofvarious data structures in developing and implementing efficient algorithms.

Course Aims and Objectives:

S.NO	COURSE OBJECTIVES
1	Understand various Data Structures for data storage and processing.
2	Realize Linked List Data Structure for various operations
3	Analyze step by step and develop algorithms to solve real world problems by implementing Stacks, Queues data structures.
4	Understand and implement various searching & sorting techniques
5	Understand the Non-Linear Data Structures such as Binary Trees and Graphs

Course Outcomes At the end of the course, the student will be able to…

CO NO	COURSE OUTCOME	BTL	PO	PSO
CO1	Describe and differentiate between various data structures and their uses.	K2	6,7	1,2
CO2	Implement and manipulate data structures using C.	K3	6,7	1,2
CO3	Analyze and evaluate the efficiency of algorithms.	K4	6,7	1,2
CO4	Solve complex problems by selecting and applying appropriate data structures.	K3	6,7	1,2
CO5	Demonstrate proficiency in dynamic memory management and pointer manipulation in C.	K3	6,7	1,2

For BTL: K1: Remember; K2: Understand; K3: Apply; K4: Analyze; K5: Evaluate;K6: Create

CO-PO MATRIX									
CO NO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1						2	3		
CO2						3	2		
CO3					3	2	3		
CO4						3	3		
CO5						3	3		

Use the codes 3, 2, 1 for High, Moderate and Low correlation Between CO-PO-PSO respectively

Syllabus		
Unit	**Learning Units**	**Lecture Hours**
I	**Introduction to data structures:** Types of data structures-Primitive data structures, No primitive data structures – linear data structures, nonlinear data structures, real world applications of data structures, Abstract data types-ADT for stack, queue, linked list, Performance analysis of algorithms-time complexity, space complexity. Description: Data structures are fundamental concepts in computer science and programming, designed to organize, manage, and store data efficiently. Understanding data structures is essential for solving complex problems and optimizing the performance of software. Examples: **Time Complexity:** Looking up a specific page number in a well-organized notebook. If you know the page number, you can go directly to that page without flipping through the rest of the notebook. The time taken is the same regardless of how many pages are in the notebook. **Space Complexity:** Exchanging two items between your hands. No matter how large the items or how many times you swap, you only need a fixed amount of space (your two hands). Similarly, the algorithm only requires a constant amount of extra space, regardless of the input size. Exercises Program to insert, update, delete an element Learning Outcomes: Understand various Data Structures for data storage and processing. **Specific Resources: (web)** https://onlinecourses.swayam2.ac.in/nou24_cs15/preview	10Hrs
II	Liner Data Structures :Linked List: Introduction to Linked Lists, linked lists ADT, Comparison between Linked List and Array, Types of Linked Lists and their implementations - Singly Linked list, Doubly Linked list, Circularly Singly Linked list, Application of linked lists Description: Linear data structures are data structures where elements are arranged sequentially, one after another. In a linear data structure, each element has a unique predecessor and successor (except the first and last elements). These structures are simple and easy to implement, making them foundational in computer science. Examples: The university's administration requires a system to manage student records, which include operations such as adding, searching, updating, and deleting student records as well as deleting student reports Exercises: Implement Single Linked List with insertion, deletion and traversal operations Learning Outcomes: Realize Linked List Data Structure for various operations *Specific Resources: (web)* *https://onlinecourses.swayam2.ac.in/nou24_cs15/preview*	14Hrs
III	**Stacks:** Introduction to stack, Stack ADT, stacks using array and Linked List, Application of stacks – Converting Infix to Post Fix Notation - Evaluation of Post Fix Notation - Tower of Hanoi, Recursion: Introduction to Queue, Queue ADT, Queues using arrays and Linked List, Application of Queues Types of Queues- Circular Queues, De-queues, Priority Queue Description: A stack is a linear data structure that follows the Last In, First Out (LIFO) principle. This means that the last element added to the stack will be the first one to be removed. Stacks are used in various applications, including algorithm implementation, memory management, and backtracking problems. Examples: To store data of books in a last-in, first-out (LIFO) manner. An online bookstore needs to manage its inventory, process customer orders, and recommend books to users. To achieve these tasks efficiently, the bookstore must use various data structures.	14Hrs

	Exercises:Programs to implement the Queue operations using an array and linked Lists Learning Outcomes:Analyze step by step and develop algorithms to solve real world problems by implementingStacks, Queues data structures Specific Resources: (web) https://onlinecourses.swayam2.ac.in/nou24_cs15/preview	
IV	**Searching:** Linear or Sequential Search, Binary Search and Indexed Sequential Search Sorting: SelectionSort, Bubble Sort, Insertion Sort, Quick Sort and Merge Sort Description: Searching is the process of finding a particular element or a set of elements in a collection of data. It is a fundamental operation in computer science, crucial for various applications like databases, information retrieval, and algorithms Examples:To search books based on user requirement such as specific book title , author etc…. Imagine an online bookstore where books are stored in an array or a list. If a usersearches for a book by its title, the system can use linear search to find the book. Exercises: program to search an item in a given list using Linear Search & Binary Search. Searching Algorithms program for implementation of Bubble Sort Insertion Sort Quick Sort SortingAlgorithms Learning Outcomes: Understand and implement various searching & sorting techniques. Specific Resources: (web) https://onlinecourses.swayam2.ac.in/nou24_cs15/preview	12Hrs
V	**Binary Trees:** Introduction to Non- Linear Data Structures, Introduction Binary Trees, Types of Trees, Basic Definition of Binary Trees, Properties of Binary Trees, Representation of Binary Trees, Operations on a Binary Search Tree, Binary Tree Traversal, Applications of Binary Tree. Graphs: Introduction to Graphs, Terms Associated with Graphs, Sequential Representation of Graphs, Linked Representation of Graphs, Traversal of Graphs (DFS, BFS), Application of Graphs. Description: A binary tree is a hierarchical data structure in which each node has at most two children, referred to as the left child and the right child. Binary trees are used in various applications, such as searching, sorting, and representing hierarchical data like file systems. Examples: To search books based on user requirement such as ISBN or ISSN number. Imagine an onlinebookstore where books are stored in an array or a list. If a user searches for a book by its ISSN or ISBN number, the system can use binary search tree to store and retrieve the book based on unique keys. Exercises: program for Binary Search Tree Traversals Learning Outcomes: Understand the Non-Linear Data Structures such as Binary Trees and Graphs	12Hrs

Specific Resources: webhttps://onlinecourses.swayam2.ac.in/nou24_cs15/preview

Text Books:

1. Horowitz and Sahani, "Fundamentals of Data Structures", Galgotia Publications Pvt LtdDelhi India.

2. A.K. Sharma ,Data Structure Using C, Pearson Education India.

3. "Data Structures Using C" Balagurusamy E. TMH

Reference Books

1. "Data Structures through C", Yashavant Kanetkar, BPB Publications

2. Rajesh K. Shukla, "Data Structure Using C and C++" Wiley Dreamtech Publication.

3. Lipschutz, "Data Structures" Schaum's Outline Series, Tata Mcgraw-hill Education (India)Pvt. Ltd .

4. Michael T. Goodrich, Roberto Tamassia, David M. Mount "Data Structures and Algorithms in C++", Wiley India

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Data Structures Using C MODEL PAPER

CLASS: II B.Sc. Honours (Computer Science)/ II BCA HONOURS	**Max. Marks:70M**
Course Code: 23CSMAL231 /23BCMAL23	**Min. Pass: 28M**
Semester: III	**Time: 3 Hours**

Section A: Short Answer Questions (20 Marks)

Answer All questions. Each question carries   4 Marks.

1 a) Write ADT for stacks and explains it.   K1
                 (or)
b) Write real world applications of data structures   K1
2 a) compare linked lists with arrays   K2
                 (or)

b) Explain about different types of linked lists   K2
3 a) Write differences between stacks and queues   K2
                 (or)
b) convert following expression from infix to postfix.   K2
        a+b*c+(d*e+f) +g.
4.a) Write program for linear search. K1
                 (or)
b) Write program for Bubble sort.   K1

5.a) Discuss applications of graphs.   K2
                 (or)

b) Explain with examples sequential and linked representation of graphs. K2

Long Answer Questions (50 Marks)
Section B:

Answer All questions. Each question carries 10 Marks.

6.a) Give classification of Data structures and explain them.K2
                 (or)
b) Explain about analysis of algorithms. K2

7 a) Develop code insertion and deletion in single linked list.   K2
                 (or)
b) Write functions for insertion, display of values in doubly linked list. K2

8 a) Write code to implement queues using arrays. K2
                 (or)
b) write code to implement stacks using linked list. K2

9 a) Write program for binary search. K2
                 (or)
b) Apply quick sort for below given values and write code to implement quick K2sort.   11 2 9 13 57 25 17 1 90 3.

10 a) Explain with code deletion in binary search tree. K2
                 (or)
  b) Explain Depth first search with an example.   K2

Note:

➢ Short answer questions assess foundational knowledge (Remembering, Understandingand Apply).

➢ This structure emphasizes a focus on higher-order thinking skills (Understand,Application, Analysis, and Evaluation) in the long answer section.

➢ Consider including a mix of question types within each section to ensure acomprehensive assessment.

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Data Structures Using C

INTERNAL ASSESMENT QUESTION PAPER STRUCTURE I

CLASS: **II B.Sc. Honours (Computer Science)/ II BCA HONOURS**   Max. Marks: 30M
Course Code: 23CSMAL231   /23BCMAL23   **Min. Pass: 12M**
Semester: III   **Time: 90 Min**

Section A: Short Answer Questions (10

Marks)Answer All questions. Each question carries 4 Marks.

1. **(i)** Differentiate between primitive and non-primitive data types.
    OR
    (ii) Differentiate between abstract data types, data types and data structures

2. **(i)** Design an algorithm to insert a node in the middle of the single linked list?

    OR
    (ii) Design a C program to print factorials of a given number using recursion

Section B: Long Answer Questions (20 Marks)

Answer All questions. Each question carries 10 Marks.

3. **(i)** Explain different types of approaches for designing an algorithm..
    OR
    (ii) Explain about algorithm analysis with example

4. **(i)**Design an algorithm to perform
    a)   Create doubly linked list   - 5M
    b)   Insert a node in the middle of doubly linked list
    OR

    (ii) Explain various types of linked lists.

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Data Structures Using C

INTERNAL ASSESMENT QUESTION PAPER STRUCTURE II

CLASS: II B.Sc. Honours (Computer Science)/ II BCA HONOURS	**Max. Marks: 30M**
Course Code: 23CSMAL231	**Min. Pass: 12M**
Semester: III	**Time: 90 Min**

Section A: Short Answer Questions (10 Marks)Answer All questions. Each question carries 4 Marks.

1. (i)Differentiate between stacks and queues

    OR

    (ii)Explain about representation of stacks with examples

2. **(i)** Design an algorithm to traverse binary trees in post order technique

    OR

    (ii) Illustrate creating a binary tree from given
    traversalsInorder: D B E A F C
    Postorder: A B D E C F

Section B: Long Answer Questions (20 Marks)

Answer All questions. Each question carries 10 Marks.

3. (A) Design a C program to demonstrate stack operations using arrays

    (or)

    (B) Discuss about various applications of queues with examples

4. (A) Illustrate BST creation from given preorder

    traversalpreorder: {10, 5, 1, 7, 40, 50}

    (or)

    (C) Illustrate the following operations on the given inorder:{1, 3, 4, 6, 7, 8, 10, 14}
    (D) Searching for node 6   -5M
    (**E**) Inserting a node   12   - 5M

COMPUTERSCIENCE	23CSMAP231/23BC MAP23	2024-25	II B.Sc. Honours (Computer Science)/ II BCA HONOURS

DATA STRUCTURE LAB

Course Description:

The objective of course is to provide students with practical experience in using data structures. Students will learn to perform data manipulation and retrieval, implement advanced techniques in real life applications.

Course Aims and Objectives:

S.NO	COURSE OBJECTIVES
1	Students will learn to implement fundamental data structures such as arrays, linked lists, stacks, queues, and hash tables.
2	Students will explore and implement more complex data structures including trees and graphs.
3	Students will analyze the time and space complexity of different data structures and their operations.
4	Students will apply data structures to solve practical problems, enhancing their problem-solving and programming skills.
5	Students will improve their proficiency in programming languages commonly used for data structures, such as C++, Java, or Python.

Course Outcomes

At the end of the course, the student will be able to…

CO NO	COURSE OUTCOME	BTL	PO	PSO
CO1	Implement and manipulate basic and advanced data structures.	K2	6,7	1,2
CO2	Analyze the performance of data structures and algorithms.	K3	6,7	1,2
CO3	Apply data structures to solve practical computing problems.	K3	6,7	1,2
CO4	Develop efficient and optimized code for various data structure operations.	K3	6,7	1,2
CO5	Demonstrate proficiency in a programming language used for data structure implementation.	K3	6,7	1,2

For BTL: K1: Remember; K2: Understand; K3: Apply; K4: Analyze; K5: Evaluate; K6: Create

CO-PO MATRIX									
CO NO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1						2	3	2	2
CO2						3	2	2	3
CO3					3	2	3	3	2
CO4						3	3	2	3
CO5						3	3	3	3

Use the codes 3, 2, 1 for High, Moderate and Low correlation Between CO-PO-PSO respectively

Course Structure

This lab list covers the key areas of a Data structures lab course, providing hands-on practice with various data structures, enabling students to implement and manipulate these structures to solve real-world problems efficiently. Through a series of programming exercises and projects, students will develop practical skills in designing, analysing, and optimizing data structures.

Unit 1: Basic Concepts: (6Hrs)

Lab 1:

Time Complexity calculation on Linear & Binary Search
Exercise 1:
Linear and binary search :
Objective: Learn to calculate time complexity on linear search binary search
Tasks:
Write a program to calculate time complexity for Linear Search Binary Search

Lab 2:

Time Complexity calculation on Bubble Sort
Bubble Sort
Objective: Learn to calculate time complexity on Bubble sort
Tasks:
Write a program to calculate time complexity for Bubble Sort

Unit 2: Linear Data Structures

Lab 3:

Single Linked Lists Representation of Single Linked Lists
Objective: To understand the concept and types of linked lists better
Tasks:
Write Program to implement Single Linked List with insertion, deletion and traversaloperations

Lab 4:

Double Linked Lists Representation of Double Linked Lists
Objective: To understand the concept and types of linked lists better
Tasks:Write Program to implement Double Linked List with insertion, deletion and traversal
operations

Lab 4:
Circular Linked Lists Representation of Circular Linked Lists
Objective: To understand the concept and types of linked lists better
Tasks: ite Program to implement Circular Linked List with insertion, deletion andtraversal
operations

Unit 3: Stacks

Lab 5:

Stack Operations
Implementing stacks in linked Lists and arrays
Objective: Understanding to implement stacks in linked lists and arrays

Lab 6:

Write Programs to implement the Stack operations using an array .
Write Programs to implement the Stack operations using Linked List.
Write Programs to implement the Queue operations using an array.
Write Programs to implement the Queue operations using Linked List.

Unit 4: Searching Quick Sort

Lab 7:

Objective: Implementation of Sorting Algorithms
 Tasks:
Write a program for implementation of the following Sorting Algorithms
 i)Bubble Sort
 ii) Insertion Sort
iii)Quick Sort
Write a program for implementation of Selection Sort

Unit 5: Binary Search Trees   (6Hrs)

Lab 8:

Creation of binary trees and tree traversals
Binary Trees:
Objective: Understanding Creation of binary trees and tree traversals
Write a program for Binary Search Tree Traversals

References:

1. "Data Structures through C", Yashavant Kanetkar, BPB Publications

2. Rajesh K. Shukla, "Data Structure Using C and C++" Wiley DreamtechPublication.

3. Lipschutz, "Data Structures" Schaum's Outline Series, Tata Mcgraw-hill Education(India)Pvt. Ltd .

4. Michael T. Goodrich, Roberto Tamassia, David M. Mount "Data Structures andAlgorithms in C++", Wiley India.

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COMPUTERSCIENCE	23CSMAP231 /23BCMAP23 1	2024-25	II B.Sc. Honours (Computer Science)/ II BCA HONOURS

DATA STRUCTURE LAB

Semester: III   **Max. Marks : 50 (CIA: 15 + SEE: 35)Hrs/Week: 2**

Model Paper: Practicals

Time: 3 Hrs.   **Max. Marks: 35**

Section – A

1. Experiment-1   15 M

2. Experiment-2   10 M

Section – B

Viva Voce   10 M

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Title of the Paper**: Object Oriented Programming Using JAVA**

SEM:III		Offered to: II B.Sc. Honors (Computer Science)/II BCA Honors	
Offered To:	**II B.Sc. Honors (Computer Science)/II BCA Honors**	**Course Code:**	**23CSMAL232/23BCMAL233**
Course Type:	Core (Theory)	**Course:**	Object Oriented Programming using Java
Year of Introduction:	2016 - 2017	**Year of offering:**	2024 – 2025
Year of Revision:	2021	**Percentage of Revision:**	
Semester:	III	**Credits:**	3
Hours Taught:	60 hrs. per semester	**Max. Time:**	4 Hrs

Course Description:

This course provides the fundamental components and libraries of the Java programming language, with a strong emphasis on object-oriented programming (OOP) principles. It constitutes as the foundation for Java development, providing the essential building blocks and features for creating robust and scalable applications.

Course Aims & Objectives:

S. No	COURSE OBJECTIVES
1	Understand fundamentals of programming such as variables, conditional and iterative execution, methods, etc.
2	Realize fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class libraries, etc.
3	Analyze step by step and develop programs on inheritance and interfaces, arrays and string handling functions
4	Understand the Fundamental features of multi-threaded programs, Exception handling and packages.
5	Understand the principles of applets, I/O streams in java and java database connectivity

Course Outcomes:

At the end of the course, the student will / will be…

NO	COURSE OUTCOME	BTL	PO	PSO
CO1	Develop a comprehensive understanding how object-oriented concepts are incorporated into the Java programming language	K2	1,2,6	1,2
CO2	Implementing Object Oriented Programming Concepts(class, constructor, overloading) in java	K3	2,6	1,2
CO3	Implementing inheritance and interfaces in a Java program.	K3	2,6	1,2
CO4	Implementing Multithreading, exception handling and packages in Java.	K3	2,6	1,2
CO5	Implementing Applets, Files and Jdbc Connectivity in Java programs.	K3	2,6	1,2

For BTL: K1: Remember; K2: Understand; K3: Apply; K4: Analyze; K5: Evaluate; K6: Create

CO-PO-PSO MATRIX									
CO NO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	3	3				2		2	1
CO2		3				2		2	1
CO3		3				2		2	1
CO4		3				2		2	1
CO5		3				2		2	1

Use the codes 3, 2, 1 for High, Moderate and Low correlation Between CO-PO-PSO respectively

Syllabus		
Unit	**Learning Units**	**Lecture Hours**
I	Unit – I: Introduction to Java Programming Introduction-Object Oriented paradigm-Basic Concepts of OOP-Benefits of OOP-Applications of OOP- Java features-Simple Java program structure-Java tokens-Java Statements-Implementing a Java Program-Java Virtual Machine-Command line arguments- Constants-Variables-Data Types-Declaration of Variables-Giving Value to Variables-Scope of variables-Symbolic Constants-Type casting-Getting Value of Variables - types of operators with examples-expressions Description: This course is tailored to understand fundamentals of programming such as variables, conditional and iterative execution, methods, etc. Examples: Operators concept in java Type casting in java Exercises: Design Java program to perform Type Casting in java. Develop a Java program for sorting a given list of names in ascending order.Learning Outcomes: By the end of the unit, students will understand the concept and underlying principles of Object-Oriented Programming and object-oriented concepts are incorporated into the Java programming language Web Resources: Prof.Debasis Samanta, Dept of Computer science, IIT Kharagpur."Basic Concepts of Java Programming", 2018. https://www.youtube.com/watch?v=OjdT2l-EZJA&list=PLfn3cNtmZdPOe3R_wO_h540QNfMkCQ0ho&index=1	12Hrs

		Control statements, Classes, Objects and Methods	
	II	Introduction-Decision making with if statement-Simple if statement-If Else statement-Nesting of if else statements-The else if ladder-The switch statement-The conditional operator-The While statement-The do-while statement-The for statement- Jumps in loops-Defining a class-Adding variables-Adding methods-Creating objects-Accessing class members-Constructors-Method overloading-Static members-Nesting of methods Description: This unit provides fundamentals of object-oriented programming in Java, including definingclasses, invoking methods, using class libraries, etc Examples: Control statements in java Constructors, Method overloading, Static keyword in java Exercises: Create a class Rectangle. The class has attributes length and width. It should have methodsthat calculate the perimeter and area of the rectangle. It should have read Attributes method to read length and width from user. Construct a Java program that implements method overloading Learning Outcomes: By the end of this unit, students will be able to gain knowledge in Implementing ObjectOriented Programming Concepts like class, constructor, overloading concepts in java Web Resources: Introduction to Classes and Objects in Java , Neso Academy, 7 june 2020 https://www.youtube.com/watch?v=W-D71ZeMixQ&list=PLBlnK6fEyqRiwWLbSXKFtdGV8OVqr9dZr	12Hrs
	III	**Arrays, Strings, Inheritance and Interfaces** Extending a class-Overloading methods-Final variables and methods-Final classes-Abstract methods and classes-Arrays- One dimensional arrays- Creating an array – Two dimensional arrays- Strings- Wrapper classes Multiple Inheritance: Introduction- Defining interfaces- Extending interfaces-Implementing interfaces-Accessing interface variables Description: This unit helps in understanding the principles of inheritance and interfaces, array creation and string handling functions Examples: Types of inheritances. String handling functions and array creation in java Exercises: **Design a Java program to calculate multiplication of 2 matrices** Develop a program on Multiple Inheritance.Learning Outcomes: By the end of this unit, students will be able to understand and implement inheritance and interfaces, array creation and string handling functions in a Java program. Web Resources: Prof.Debasis Samanta, Dept of Computer science, IIT Kharagpur."Inheritance in Java",2018. https://www.youtube.com/watch?v=rxsl1TzcEgg Arrays in Java by Neso Academy,2019 https://www.youtube.com/watch?v=kWJHzambtNo&list=PLBlnK6fEyqRiraym3T703apTvE ZLaSVtJ What is string in Java **by Lab Mug** ,2023	12Hrs
	IV	**Multi-Threading, Exception Handling and Packages** Introduction-Creating Threads-Extending the Threads-Stopping and Blocking a Thread-Lifecycle of a Thread-Using Thread Methods-Thread Exceptions-Thread Priority-Implementing the 'Runnable' Interface-Types of errors-Compile time errors-Run-time errors-Exceptions-Exception handling-Multiple Catch Statements-Using finally statement-Java API Packages-Creating Packages-Accessing a Package- Using a Package. Description: This unit helps in understanding and implementing multi-threaded programs, Exceptionhandling and packages. Examples: Multi-threading in java Types of exception handling mechanisms Exercises: **Develop a program to create and Import Packages** Construct Java programs to implement various types of Exception Handling Mechanisms	12Hrs

		Learning Outcomes: By the end of this unit, students will be able to Implement Multithreading, exception handlingand packages in Java	
		Resources: 1. Prof.Debasis Samanta, Dept of Computer science, IIT Kharagpur."Packages in Java", 2018. https://www.youtube.com/watch?v=TwU3cv1FFis&list=PLfn3cNtmZdPOe3R_wO_h 540Q NfMkCQ0ho&index=17	
		2. Prof.Debasis Samanta, Dept of Computer science, IIT Kharagpur."Exception Handling inJava", 2018. https://www.youtube.com/watch?v=vUov8EkjZjU&list=PLfn3cNtmZdPOe3R_wO_h 540Q NfMkCQ0ho&index=23	
		3.Prof.Debasis Samanta, Dept of Computer science, IIT Kharagpur."Multi Threading inJava", 2018. https://www.youtube.com/watch?v=6rYOyIGfy3w&list=PLfn3cNtmZdPOe3R_wO_h 540Q NfMkCQ0ho&index=27	
V		**Applets, Streams, I/O Files and Jdbc** Local and remote applets-Applets and Applications-Building Applet code- Applet Life cycle: Initialization state, Running state, Idle or stopped state, Dead state, Display state-Concept of Streams-Stream classes-Byte Stream Classes-Character Stream classes: Reader stream classes, Writer Stream classes-Reading and writing files. Jdbc introduction-stages in Jdbc program-working with oracle database: inserting, updating and deleting records. Description: This unit focuses Understanding the principles of applets, I/O streams in java and java database connectivity Examples: Applet creation Writing and Reading Files. JDBC Connectivity Exercises: **Design a program to create an Applet** Create a program for writing and reading Files. Learning Outcomes: By the end of this unit, students will be able to implement graphical user interface in Javaprograms, Input/output Streams in java and java database connectivity with oracle Resources: Prof.Debasis Samanta, Dept of Computer science, IIT Kharagpur."Applet Programming inJava", 2018. https://www.youtube.com/watch?v=cC_Ij7WmP_k&list=PLfn3cNtmZdPOe3R_wO_h 540Q NfMkCQ0ho&index=34 Prof.Debasis Samanta, Dept of Computer science, IIT Kharagpur." JDBC", 2018. https://www.youtube.com/watch?v=ajhWv31oN1k&list=PLfn3cNtmZdPOe3R_wO_h 540Q NfMkCQ0ho&index=50	12Hrs

Text Books:

1.E.Balaguruswamy, Programming with JAVA, A primer, 3e, TATA McGraw-HillCompany.
Reference Books:
1. Programming in Java by Sachin Malhotra, OXFORD University Press
2. John R. Hubbard, Programming with Java, Second Edition, Schaum's outline Series, TATA McGraw-Hill Company.
3. Deitel &Deitel. Java TM: How to Program, PHI (2007)
4. Java Programming: From Problem Analysis to Program Design- D.S Mallik
5. Object Oriented Programming Through Java by P. Radha Krishna, Universities Press(2008)
Web Resources:
Prof.Debasis Samanta, Dept of Computer science, IIT Kharagpur."Basic Concepts of Java Programming", 2018.

https://www.youtube.com/watch?v=OjdT2l-

EZJA&list=PLfn3cNtmZdPOe3R_wO_h540QNfMkCQ0ho&index

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Vuyyuru-521165.NAAC reaccredited at 'A' level

Autonomous -ISO 9001 – 2015 Certified

OBJECT ORIENTED PROGRAMMING USING JAVA
MODEL PAPER
CLASS: II B.Sc. Honors (Computer Science)/II BCA Honors

Course Code: 23CSMAL232/23BCMAL233   Max. Marks:70M   Min. Pass: 28M

Semester: III   Time: 3 Hours

Section A: Short Answer Questions (20 Marks)
Answer All questions. Each question carries 4 Marks.

1.   a)Discuss about JVM.   k2
                OR
        b)Explain command line arguments with an example k2

2.   a) Explain method overloading with an example. k2
                OR
        b)Discuss concept of static members in java with example. k2

3.   a)Discuss about final class   k2
                OR

        b)Illustrate implementing interfaces in java with example. k3

4.   a) Describe creating threads in java with an example   k4
                OR
        b)Describe package creation and accessing with example.k4

5.   a) Explain character stream classes in java. k2
                OR
        b) Explain applet creation with example. k2

Section B: Long Answer Questions (50 Marks)
Answer All questions. Each question carries 10 Marks.

6.   a) Discuss Object Oriented Programming Principles. k2)
                        (OR)
        b)Discuss Java Buzz words.k2)

7.   a) Explain accessing class members with an example. k2
                        (OR)
        b)Explain Constructor with an example. k2

8.   a) Illustrate string handling methods in java with examples. k3
                        (OR)
        b)List of different types of inheritance in java and explain with examples. k2

9.   a) Explain life cycle of a thread with neat diagram. k2
                        (OR)
      b) Define Exception. Explain Exception handling mechanism in java with examplesk2

10.   a) Explain life cycle of applet with neat diagram. k2
                        (OR)
      b)Explain different stages in JDBC program with an example.k2

Note:
- Short answer questions assess foundational knowledge (Remembering, Understandingand Apply).
- This structure emphasizes a focus on higher-order thinking skills (Understand,Application, Analysis, and Evaluation) in the long answer section.
-    Consider including a mix of question types within each section to ensure acomprehensive assessment.

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Autonomous -ISO 9001 – 2015 Certified `Object Oriented Programming Using JAVA Lab`

SEMESTER-III

Offered To:	II B.Sc. Honours (Computer Science)/II BCA Honors	Course Code:	23CSMPL232/23BCMAL233
Course Type:	Core (Practical)	Course:	Object Oriented Programming using Java Lab
Year of Introduction:	2016 – 2017	Year of offering:	2024 – 2025
Year of Revision:	2021	Percentage of Revision:	15%
Semester:	III	Credits:	1
Hours Taught:	30 hrs. per semester	Max. Time:	3 Hrs

Course Description:

The objective of course is to provide students with practical experience in Object OrientedProgramming in Java.

Course Aims and Objectives:

S.NO	COURSE OBJECTIVES
1	Teach students to know the fundamental concepts in java
2	Provide comprehensive training in designing classes, objects and methods in java
3	Teach students to know inheritance, interfaces concepts in java
4	Train students to gain knowledge in multi threading , exception handling and Packages
5	Train students to know Applets Creation, File Creation and JDBC Connectivity

Course Outcomes

At the end of the course, the student will be able to…

CO NO	COURSE OUTCOME	BTL	PO	PSO
CO1	Creating java programs that covers fundamental concepts	K6	1,2,6	1,2
CO2	Creating class, constructor, method overloading, method overriding in java.	K6	2,6	1,2
CO3	Creating different types of inheritance and interfaces in a java program	K6	2,6	1,2
CO4	Creating Multithreading, different types of exception handling mechanisms, Creating and accessing packages in java	K6	2,6	1,2
CO5	Creating Applets,files and JDBC Connectivity in Java program	K6	2,6	1,2

CO-PO MATRIX									
CO NO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	3	3				2		2	1
CO2		3				2		2	1
CO3		3				2		2	1
CO4		3				2		2	1
CO5		3				2		2	1

Use the codes 3, 2, 1 for High, Moderate and Low correlation Between CO-PO-PSO respectively

Course Structure

This lab list covers the key areas of Object Oriented Programming in Java Lab course, providing hands-on practice

Unit-1: Introduction to Java Programming

Lab 1

1.   Design Java program to perform Type Casting in java..

2. Develop a Java program for sorting a given list of names in ascending order.

Unit-2: Control statements, Classes, Objects and Methods

Lab 2

1. Create a class Rectangle. The class has attributes length and width. It should have methods that calculate the perimeter and area of the rectangle. It should have read Attributes method to read length and width from user.
2. Construct a Java program that implements method overloading.

Unit-3: Inheritance, Arrays, Strings and Interfaces

Lab 3

3. Design a Java program to calculate multiplication of 2 matrices**.**
4. Construct Java programs to implement various types of inheritance
   i. Single   ii. Multi-Level   iii. Hierarchical   iv. Hybrid

Lab 4

5. Write a java program to implement runtime polymorphism.
6. Develop java program to implement Abstract Classes and Final Keyword

Lab 5

7. Design a program for implementing interfaces.
8. Develop a program on Multiple Inheritance.

Unit-4: Multi-Threading, Exception Handling and Packages

Lab 6

9. Write a Java program which accepts withdraw amount from the user and throws an exception "In Sufficient Funds" when withdraw amount more than available amount.

10. Develop a Java program to create three threads and that displays "good morning", forevery one second, "hello" for every 2 seconds and "welcome" for every 3 seconds byusing extending Thread class.

Lab 7

11. Develop a Java program that creates three threads. First thread displays "OOPS", thesecond thread displays "Through" and the third thread Displays "JAVA" by using Runnable interface.

12. Construct program to create and Import Packages

Lab 8

13. Construct Java program to implement various types of Exception HandlingMechanism
    i.   Arithmetic Exception
    ii.   Number Format Exception
    iii.   ArrayIndexOutofBounds Exception
14. Design a program to demonstrate Catch Blocks

Unit-5: Applets, Streams, Files and Jdbc

Lab -9

15. Design a program to create an Applet
16. Create a program for writing and reading Files.

Lab -10

17. Design a program to insert records in DB table using JDBC.
18. Develop a program to Retrieve records from DB table using JDBC

References:

1.   E.Balaguruswamy, Programming with JAVA, A primer, 3e, TATA McGraw-Hill Company.

Web Resources:

Prof.Debasis Samanta, Dept of Computer science, IIT Kharagpur."Basic Concepts of Java Programming", 2018.

https://www.youtube.com/watch?v=OjdT2l-EZJA&list=PLfn3cNtmZdPOe3R_wO_h540QNfMkCQ0ho&index=1

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Title of the Paper: **Digital Electronics**

SEM:III   **Offered to: B.Sc. Honours (Computer Science)**

Offered To:	II B.Sc. Honours (Computer Science)	**Course Code:**	23CSMAL235/23ELMAL235
Course Type:	Core (Theory)	**Course:**	Digital Electronics
Year of Introduction:	2024 - 2025	**Year of offering:**	2024 – 2025
Year of Revision:	2024	**Percentage of Revision:**	
Semester:	III	**Credits:**	3
Hours Taught:	60 hrs. per semester	**Max. Time:**	4 Hrs

Course Description:

In this lab, we explored fundamental concepts of digital electronics, focusing on logic gates, combinational and sequential circuits. We constructed and tested basic gates (AND, OR, NOT, NAND, NOR, XOR) using integrated circuits. Additionally, we built a 4-bit binary adder to demonstrate combinational logic and a D flip-flop to illustrate sequential logic. Measurements were taken with an oscilloscope to verify the timing and functionality of each circuit. The lab emphasized the importance of accurate wiring and timing analysis. Through these experiments, we gained practical insights into designing and troubleshooting digital systems, which are crucial for modern electronics and computing applications.

Course Aims and Objectives:

S.NO	COURSE OBJECTIVES
1	Understand the operation and application of basic logic gates (AND, OR, NOT, NAND, NOR, XOR).
2	Design and implement combinational circuits such as adders, multiplexers, and decoders
3	Construct and analyze sequential circuits like flip-flops, counters, and registers.
4	Develop skills in reading and creating digital circuit schematics.
5	Apply digital logic principles in practical problem-solving scenarios.

Course Outcomes   At the end of the course, the student will be able to…

CO NO	COURSE OUTCOME	BTL	PO	PSO
CO1	Understand and describe the functions of basic logic gates (AND, OR, NOT, NAND, NOR, XOR)	**K2**		
CO2	Create and analyze combinational circuits such as adders, multiplexers, and decoders,	**K4**		
CO3	Build and test sequential circuits like flip-flops, counters, and registers, and understand their role in digital systems.	**K5**		
CO4	Develop the ability to interpret and produce accurate digital circuit diagrams.	**K5**		
CO5	Enhance skills in identifying and resolving issues in digital circuits through systematic testing and analysis.	**K5**		

For BTL: K1: Remember; K2: Understand; K3: Apply; K4: Analyze; K5: Evaluate; K6: Create

CO-PO MATRIX									
CO NO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**
CO1					3				
CO2						3			
CO3						2			
CO4							3		
CO5					3				

Use the codes 3,2,1 for High, Moderate and Low correlation Between CO-PO-PSO respectively

Unit	Learning Units	Lecture Hours
UNIT I	**NUMBER SYSTEM AND CODES** Decimal, Binary, Hexadecimal, Octal, Code Conversions, Complements (1's,2's, 9's and10's), Addition, Subtraction, Grey, Excess-3, inter Code conversion between number system. **Examples/Applications/Case Studies:** A 4-bit binary number can represent values from 0 to 15, which can be used to control digital switches or memory locations. The decimal number 27 is represented in BCD as 0010 0111 (where 0010 is 2 and 0111 is 7). **Exercises/Projects:** Perform 1's and 2's compliment for this number 1100 Convert the number 1101 in to gray code. **Specific Resources: (web) URL:** https://byjus.com/maths/number-system/	**12Hrs**
UNIT II	BOOLEAN ALGEBRA AND THEOREMS Boolean Theorems, De Morgan's laws. Digital logic gates, Multilevel NAND &NORgates. Standard representation of logic functions (SOP and POS), Minimization Techniques (Karnaugh Map Method: 4 variables), don't care condition. **Examples/Applications/Case Studies:** Simplifying Boolean Expressions $A \cdot (A+B)$. Simplifying Complex Expressions $A \cdot \bar{A} + B \cdot \bar{B} A$ **Exercises/Projects:** simplify the Boolean expression using Demorgan laws simplify 4-variable using k-map method $\sum=(0,2,4,6.11.12.13)$ **Specific Resources: (web) URL: https://www.geeksforgeeks.org/boolean-algebraic-theorems/**	**12Hrs**
UNIT III	IC LOGIC FAMILIES: Digital Logic Families: Characteristics of logic families – fan in, fan out, power dissipation, propagation delay, noise margin., RTL, DTL,TTL and CMOS logic circuits- Inverter, NAND , NOR **Examples/Applications/Case Studies:** TRANSISTOR TRANSISTOR LOGIC FAMILY. CMOS LOGIC **Exercises/Projects:** Identify Logic Family Characteristics Determine the Logic Family Based on IC Numbers **Specific Resources: (web) URL:** https://evelta.com/categories/integrated-circuits-ics/logic-ics/?page=2	**12Hrs**
UNIT IV	COMBINATIONAL DIGITAL CIRCUITS Adders: Half & full adder, Subtractor – Half and Full Subtractor, Parallel binary adder, Magnitude Comparator, Multiplexers (2:1, 4:1)) and De-multiplexers (1:2, 4:1), Encoder (8- line-to-3-line) and Decoder (3-line-to-8-line). **Examples/Applications/Case Studies:** Design 8:1 multiplexer Design 4:16 Decoder **Exercises/Projects:** Design Half adder Design full adder using two half adders. **Specific Resources: (web) URL:** https://circuitverse.org/	**12Hrs**
UNIT V	SEQUENTIAL DIGITAL CIRCUITS**:** Flip -Flops: S-RFF,J-KFF,T and D type FFs, Excitation tables. Registers: shift left register, shift right register, Counters:-Asynchronous-Mod16, Mod-8 Down counter. Synchronous-4-bit Ring counter **Examples/Applications/Case Studies:** Count Occurrences of events or pulses. Measure the frequency of signals. **Exercises/Projects:** Design a shift left register using D-flip-flop Design a down counter using j-k flip-flop. **Specific Resources: (web) URL: https://www.javatpoint.com/sequential-circuits-in-digital-electronics**	**12Hrs**

Text Books:

1. W.H. Gothmann, 2000, "Digital Electronics - An Introduction, Theory and Practice", 2nd Edition Prentice Hall of India.

2. M.MorrisMano, 2003, "DigitalDesign",4thEdition, Pearson Education (Singapore) Pvt. Ltd. New Delhi.

References:

1. A.AnandKumar, (2003) *"Switching Theory and LogicDesign"*–2ndEdition,PHI.

2. HeiserMan, (2002) *"Handbook of Digital IC applications"*2nd Edition, PrenticeHall..

3. T.L. Floyd & Jain,(2010) *"Digital Fundamentals",*10th Edition, Pearson.

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OBJECT ORIENTED PROGRAMMING USING JAVA
MODEL PAPER

CLASS: B.Sc. Honours (Computer Science)	Max. Marks:70M
Course Code: 23CSMAL2325/23ELMAL235	Min. Pass: 28M
Semester: III	Time: 3 Hours

SECTION – A

Answer any FIVE of the following: 5 x 4 = 20 M

1.   (a)Write about Excess-3 code with example **k1**

(or)

   (b)Convert the following decimal number (245) in to binary. **K1**

2.   (a)Explain about universal gates **k2**

(or)

 (b)Explain about multilevel NAND gate **.k2**

3.   (a) Write about the characteristics of logic families. **K3**

(or)

   (b) Explain about ECL logic family**.k3**

4.   (a) Discuss about magnitude comparator in brief. **K2**

(or)

 (b)Explain about decoder and encoder with one example each. **K2**

5. a)Explain the construction and working of D-Flip-flop.**k3**

(or)

 b)Discuss about Shift registers in brief. **K3**

Section – B

Answer the following: 5 x 10 = 50 M

9.(a)Explain about rules of 1's compliment and 2's compliment method.k2

(or)

(b) Convert the following grey code to binary vice-versa.k2
         (1)11101 (2)100110—**(co1)-(L2)**

10.(a)Explain briefly about canonical and standard form of Boolean algebra.**k2**

(or)

   (b)Simplify the following functions in sum of products using K-map and draw their implementation.
   (i)F (A, B, C, D) =∑ (7, 13, 14, 15)
   (ii)F(w,x,y,z)=∑(1,3,7,11,15)+d∑(0,2,5)   **k2**

11. (a) Discuss briefly about CMOS NOR gate with their truth tables. **K3**

(or)

(b)Discuss about the construction and working of TTL NAND gate and Characteristics.k3

12.a)Explain the construction and working of HALF adder and FULL adder with their logic circuits. **K2**

(or)

b)Explain the construction and working of HALF sub tractor and FULL sub tractor with their logic circuits. **K2**

13.(a) Explain the operation of JK-Flip-flop and draw the timing diagram.k3

(or)

 (b) Define counter and Explain briefly about ripple counter.k3

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Autonomous -ISO 9001 – 2015 Certified
Title of the Paper: **Digital Electronics**

SEM:III   **Offered to: B.Sc. Honours (Computer Science)**

Offered To:	B.Sc. Honours (Computer Science)	**Course Code:**	23CSMAP235/23ELMAP235
Course Type:	Core (Practical)	**Course:**	Digital Electronics
Year of Introduction:	2024 - 2025	**Year of offering:**	2024 – 2025
Year of Revision:	2024	**Percentage of Revision:**	
Semester:	III	**Credits:**	1
Hours Taught:	30 hrs. per semester	**Max. Time:**	2 Hrs

Course Description:

In this lab, we explored fundamental concepts of digital electronics, focusing on logic gates, combinational and sequential circuits. We constructed and tested basic gates (AND, OR, NOT, NAND, NOR, XOR) using integrated circuits. Additionally, we built a 4-bit binary adder to demonstrate combinational logic and a D flip-flop to illustrate sequential logic. Measurements were taken with an oscilloscope to verify the timing and functionality of each circuit. The lab emphasized the importance of accurate wiring and timing analysis. Through these experiments, we gained practical insights into designing and troubleshooting digital systems, which are crucial for modern electronics and computing applications.

Course Aims and Objectives:

S.NO	COURSE OBJECTIVES
1	Understand the operation and application of basic logic gates (AND, OR, NOT, NAND, NOR, XOR).
2	Design and implement combinational circuits such as adders, multiplexers, and decoders
3	Construct and analyze sequential circuits like flip-flops, counters, and registers.
4	Develop skills in reading and creating digital circuit schematics.
5	Apply digital logic principles in practical problem-solving scenarios.

Course Outcomes

At the end of the course, the student will be able to…

CO NO	COURSE OUTCOME	BTL	PO	PSO
CO1	Understand and describe the functions of basic logic gates (AND, OR, NOT, NAND, NOR, XOR)	**K2**		
CO2	Create and analyze combinational circuits such as adders, multiplexers, and decoders	**K4**		
CO3	Build and test sequential circuits like flip-flops, counters, and registers, and understand their role in digital systems.	**K5**		
CO4	Develop the ability to interpret and produce accurate digital circuit diagrams.	**K5**		
CO5	Enhance skills in identifying and resolving issues in digital circuits through systematic testing and analysis.	**K5**		

For BTL: K1: Remember; K2: Understand; K3: Apply; K4: Analyze; K5: Evaluate; K6: Create

CO-PO MATRIX									
CO NO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**
CO1					3				
CO2						3			
CO3						2			
CO4							3		
CO5					3				

Use the codes 3,2,1 for High, Moderate and Low correlation Between CO-PO-PSO respectively

Course Structure

This lab list covers the key areas of a Digital Electronics lab course, providing hands-on practice with using Bread board and digital IC's and multimeter.

Experiment 1: Boolean Theorems and De Morgan's Laws
- **Objective:** Understand and verify Boolean theorems and De Morgan's laws.
- **Theory:** Discuss fundamental Boolean theorems and De Morgan's laws for simplification of Boolean expressions.
- **Procedure:**
  1. Simplify given Boolean expressions using Boolean theorems.
  2. Verify the simplified expressions by constructing corresponding logic circuits.
  3. Apply De Morgan's laws to given Boolean expressions and simplify.
  4. Construct and test circuits to verify De Morgan's laws.
- **Report:** Document given expressions, simplification steps, circuit diagrams, and test results.

Experiment 2: Digital Logic Gates
- **Objective:** Understand the function of basic digital logic gates.
- **Theory:** Introduction to AND, OR, NOT, NAND, NOR, XOR, and XNOR gates.
- **Procedure:**
  1. Construct basic logic gates using ICs or discrete components.
  2. Verify their truth tables by applying all possible input combinations.
- **Report:** Include circuit diagrams, truth tables, and observations.

Experiment 3: Multilevel NAND and NOR Gates
- **Objective:** Design and implement multilevel NAND and NOR gate circuits.
- **Theory:** Explain how any Boolean function can be implemented using only NAND or NOR gates.
- **Procedure:**
  1. Design given Boolean expressions using only NAND gates.
  2. Design the same expressions using only NOR gates.
  3. Construct the circuits and verify their functionality.
- **Report:** Provide Boolean expressions, circuit diagrams, and test results for both NAND and NOR implementations.   unit 4:

  Experiment 4: Half Adder Objective: **Understand the basic operation of a half adder.**
- **Components:** XOR gate, AND gate.
- **Circuit Design:** Construct a half adder circuit.
- **Testing:** Verify the output for different combinations of input values (A, B).
- **Measurements:** Measure output for sum and carry.

Activity: Build the half adder circuit and test its functionality.

  Experiment 5: Full Adder Objective: **Learn about the full adder which includes carry-in functionality.**
- **Components:** Two XOR gates, two AND gates, one OR gate.
- **Circuit Design:** Construct a full adder circuit.
- **Testing:** Verify the output for all possible input combinations (A, B, Cin).
- **Measurements:** Measure the sum and carry outputs.

Activity: Build the full adder circuit and test it with different inputs.

  Experiment 6:. Half Subtractor Objective: **Understand the operation of a half subtractor.**
- **Components:** XOR gate, AND gate, NOT gate.
- **Circuit Design:** Construct a half subtractor circuit.
- **Testing:** Verify the output for different combinations of input values (A, B).
- **Measurements:** Measure output for difference and borrow.

Activity: Build the half subtractor circuit and analyze its performance.

  Experiment 7: Full Subtractor Objective: **Learn about the full subtractor, which includes borrow-in functionality.**
- **Components:** Two XOR gates, two AND gates, two OR gates, one NOT gate.
- **Circuit Design:** Construct a full subtractor circuit.
- **Testing:** Verify the output for all possible input combinations (A, B, Bin).
- **Measurements:** Measure the difference and borrow outputs.

Activity: Build the full subtractor circuit and test it.

  Experiment 8: Magnitude Comparator Objective: **Compare two binary numbers and determine their magnitude relationship.**

- **Components:** Combination of logic gates.
- **Circuit Design:** Construct a 4-bit magnitude comparator.
- **Testing:** Verify the comparator's output for different 4-bit input pairs.
- **Measurements:** Measure the outputs for equality, greater than, and less than conditions.

Activity: Build a 4-bit magnitude comparator and analyze its functionality.

unit 5: Experiment 9: S-R Flip-Flop (Set-Reset)

Objective: Understand the basic operation and characteristics of the S-R flip-flop.

- **Components:** NAND or NOR gates.
- **Circuit Design:** Construct an S-R flip-flop using NAND or NOR gates.
- **Testing:** Verify the operation for different combinations of Set (S) and Reset (R) inputs.
- **Measurements:** Measure setup time, hold time, and propagation delay.

Activity: Build and test an S-R flip-flop. Record the truth table and timing diagrams.

Experiment 10: J-K Flip-Flop

Objective: Learn about the J-K flip-flop and its toggling behavior.

- **Components:** Logic gates or JK flip-flop IC (e.g., 7476).
- **Circuit Design:** Construct a J-K flip-flop.
- **Testing:** Verify the operation for different combinations of J, K, and clock inputs.
- **Measurements:** Measure setup time, hold time, and propagation delay.

Activity: Build and test J-K flip-flop. Analyze how the flip-flop toggles on different input conditions.

Experiment 11: D Flip-Flop (Data or Delay)

Objective: Understand the operation of the D flip-flop.

- **Components:** D flip-flop IC (e.g., 7474) or constructed using logic gates.
- **Circuit Design:** Construct a D flip-flop.
- **Testing:** Verify the operation for different Data (D) and clock inputs.
- **Measurements:** Measure setup time, hold time, and propagation delay.

Activity: Build and test a D flip-flop. Record how data is latched on the clock edge.

Lab Manual:
 Supplied by the Department

References:

1. [Reference 1 - Author(s), Year of Publication, Title, Edition, Publisher]
2. [Reference 2 - Author(s), Year of Publication, Title, Edition, Publisher]

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Title of the Paper :**Object Oriented Programming Using JAVA**

SEM:III   **Offered to: (M+P+C) Minor**

Offered To:	(M+P+C) Minor	Course Code:	23CSMIL231
Course Type:	Core (Theory)	**Course:**	OOP using Java
Year of Introduction:	2016 - 2017	**Year of offering:**	2024 – 2025
Year of Revision:	2021	**Percentage of Revision:**	
Semester:	III	**Credits:**	3
Hours Taught:	60 hrs. per semester	**Max. Time:**	4 Hrs

Course Description:

This course provides the fundamental components and libraries of the Java programming language, with a strong emphasis on object-oriented programming (OOP) principles. It constitutes as the foundation for Java development, providing the essential building blocks and features for creating robust and scalable applications.

Course Aims & Objectives:

S. No	COURSE OBJECTIVES
1	Understand fundamentals of programming such as variables, conditional and iterative execution, methods, etc.
2	Realize fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class libraries, etc.
3	Analyze step by step and develop programs on inheritance and interfaces,arrays and string handling functions
4	Understand the Fundamental features of multi-threaded programs, Exception handling
5	Understand packages, I/O streams in java

Course Outcomes: At the end of the course, the student will / will be…

NO	COURSE OUTCOME	BTL	PO	PSO
CO1	Develop a comprehensive understanding how object-oriented concepts are incorporated into the Java programming language	K2	1,2,6	1,2
CO2	Implementing Object Oriented Programming Concepts(class, constructor, overloading) in java	K3	2,6	1,2
CO3	Implementing arrays, inheritance and interfaces in a Java program.	K3	2,6	1,2
CO4	Implementing Multithreading, exception handling in Java.	K3	2,6	1,2
CO5	Implementing Packages and Files in java.	K3	2,6	1,2

For BTL: K1: Remember; K2: Understand; K3: Apply; K4: Analyze; K5: Evaluate;K6: Create

CO-PO-PSO MATRIX									
CO NO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	3	3				2		2	1
CO2		3				2		2	1
CO3		3				2		2	1
CO4		3				2		2	1
CO5		3				2		2	1

Use the codes 3, 2, 1 for High, Moderate and Low correlation Between CO-PO-PSO respectively

	Syllabus	
Unit	**Learning Units**	**Lecture Hours**
I	Introduction-Object Oriented paradigm-Basic Concepts of OOP-Benefits of OOP-Applications of OOP- Java features-Simple Java program structure-Java tokens-Java Statements-Implementing a Java Program-Java Virtual Machine-Command line arguments- Constants-Variables-Data Types-Declaration of Variables-Giving Value to Variables-Scope of variables-Symbolic Constants-Type casting-Getting Value of Variables - types of operators with examples-expressions Description: This course is tailored to understand fundamentals of programming such as variables, conditional and iterative execution, methods, etc. Examples: Operators concept in java Type casting in java Exercises: Design Java program to perform Type Casting in java. Develop a Java program for sorting a given list of names in ascending order. Learning Outcomes: By the end of the unit, students will understand the concept and underlying principles of Object-Oriented Programming and object-oriented concepts are incorporated into the Java programming language Web Resources: Prof.Debasis Samanta, Dept of Computer science, IIT Kharagpur."Basic Concepts of Java Programming", 2018. https://www.youtube.com/watch?v=OjdT2l-EZJA&list=PLfn3cNtmZdPOe3R_wO_h540QNfMkCQ0ho&index=1	12Hrs
II	**Control statements, Classes, Objects and Methods** Introduction-Decision making with if statement-Simple if statement-If Else statement- Nesting of if else statements-The else if ladder-The switch statement-The conditional operator-The While statement-The do-while statement-The for statement- Jumps in loops- Defining a class-Adding variables-Adding methods-Creating objects-Accessing class members-Constructors-Method overloading Description: This unit provides fundamentals of object-oriented programming in Java, including definingclasses, invoking methods, using class libraries, etc. Examples: Control statements in java Constructors, Method overloading, Static keyword in java Exercises: Create a class Rectangle. The class has attributes length and width. It should have methods that calculate the perimeter and area of the rectangle. It should have read Attributes method to read length and width from user. Construct a Java program that implements method overloading Learning Outcomes: By the end of this unit, students will be able to gain knowledge in Implementing ObjectOriented Programming Concepts like class, constructor, overloading concepts in java Web Resources: Introduction to Classes and Objects in Java , Neso Academy, 7 june 2020 https://www.youtube.com/watch?v=W-D71ZeMixQ&list=PLBlnK6fEyqRiwWLbSXKFtdGV8OVqr9dZr	12Hrs
III	**Arrays, Strings, Inheritance and Interfaces** Extending a class-Overloading methods-Final variables and methods-Final classes-Abstract methods and classes-Arrays- One dimensional arrays- Creating an array – Two dimensional arrays- Strings- Wrapper classes Multiple Inheritance: Introduction- Defining interfaces- Extending interfaces-Implementing interfaces-Accessing interface variables Description: This unit helps in understanding the principles of inheritance and interfaces, array creationin java Examples: Types of inheritances. array creation in java Exercises: Design a Java program to calculate multiplication of 2 matrices. Construct a program for extending and implementing interfaces Learning Outcomes: By the end of this unit, students will be able to understand and implement inheritance and interfaces, array creation and string handling functions in a Java program. Web	12Hrs

	Resources: Prof.Debasis Samanta, Dept of Computer science, IIT Kharagpur."Inheritance in Java",2018. https://www.youtube.com/watch?v=rxsl1TzcEgg Arrays in Java by Neso Academy,2019 https://www.youtube.com/watch?v=kWJHzambtNo&list=PLBlnK6fEyqRiraym3T703apTvE ZLaSVtJ What is string in Java by Lab Mug ,2023 https://www.youtube.com/watch?v=Vv8ijzbz22s	
IV	**Multi-Threading, Exception Handling :** Introduction-Creating Threads-Extending the Threads-Stopping and Blocking a Thread- Lifecycle of a Thread-Using Thread Methods-Implementing the 'Runnable' Interface-Types of errors-Compile time errors-Run-time errors-Exceptions-Exception handling-Multiple Catch Statements-Using finally statement Description: This unit helps in understanding and implementing multi-threaded programs, Exception handling Examples: Multi-threading in java Types of exception handling mechanisms Exercises: **Develop a Java program to create three threads and that displays "good morning", for every one second, "hello" for every 2 seconds and "welcome" for every 3 seconds byusing extending Thread class.** Construct Java program to implement various types of Exception Handling Mechanisms **Learning Outcomes:** By the end of this unit, students will be able to Implement Multithreading, exception handling Resources: Prof.Debasis Samanta, Dept of Computer science, IIT Kharagpur."Exception Handling inJava", 2018. https://www.youtube.com/watch?v=vUov8EkjZjU&list=PLfn3cNtmZdPOe3R_wO_h540Q NfMkCQ0ho&index=23 Prof.Debasis Samanta, Dept of Computer science, IIT Kharagpur."Multi Threading inJava", 2018. https://www.youtube.com/watch?v=6rYOyIGfy3w&list=PLfn3cNtmZdPOe3R_wO_h540Q NfMkCQ0ho&index=27	12Hrs
V	**Packages and I/O Files** Java API Packages-Creating Packages-Accessing a Package- Using a Package-Concept of Streams-Stream classes-Byte Stream Classes-Character Stream classes: Reader stream classes, Writer Stream classes-Reading and writing files. Description: This unit focuses Understanding packages, I/O streams in java Examples:Package creation Writing and Reading Files. Exercises: **Write a program to create and Import Packages** Create a program for writing and reading Files Learning Outcomes: By the end of this unit, students will be able to implement packages in Java programs, Input/output Streams in java Resources: Prof.Debasis Samanta, Dept of Computer science, IIT Kharagpur."Packages in Java", 2018. https://www.youtube.com/watch?v=TwU3cv1FFis&list=PLfn3cNtmZdPOe3R_wO_h540Q NfMkCQ0ho&index=17 "File Handling in Java", Learn Coding, 2021. https://www.youtube.com/watch?v=VJgCjLuU4e8&list=PLqleLpAMfxGDVu5tUmUg9jSQ UUB8_5DB0 **Specific Resources**: **Text Books:** E.Balaguruswamy, Programming with JAVA, A primer, 3e, TATA McGraw-HillCompany. Reference Books: Programming in Java by Sachin Malhotra, OXFORD University Press John R. Hubbard, Programming with Java, Second Edition, Schaum's outline Series, TATA McGraw-Hill Company. Deitel &Deitel. Java TM: How to Program, PHI (2007) Java Programming: From Problem Analysis to Program Design- D.S Mallik Object Oriented Programming Through Java by P. Radha Krishna, Universities Press Web Resources: Prof.Debasis Samanta, Dept of Computer science, IIT Kharagpur."Basic Concepts of JavaProgramming", 2018. https://www.youtube.com/watch?v=OjdT2l-EZJA&list=PLfn3cNtmZdPOe3R_wO_h540QNfMkCQ0ho&index=1	12Hrs

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OBJECT ORIENTED PROGRAMMING USING JAVA
MODEL PAPER

CLASS: B.Sc. Honours (Computer Science)	**Max. Marks:70M**
Course Code: **23CSMIL231**	**Min. Pass: 28M**
Semester: III	**Time: 3 Hours**

Section A: Short Answer Questions (20 Marks)
Answer All questions. Each question carries 4 Marks.

1.   A) Discuss about structure of java program.(K2)
                    OR
      B)Discuss about data types in java.(K2)
2.   A) Explain accessing class members with an example. (k2)
                    OR
      B)Explain constructors in java with example. (K2)
3.   A) Discuss about 2-D Array in java with example.(k2)
                    OR
      B)Illustrate implementing interfaces in java with example. (K3)
4.   A) Describe Thread Creation in java with an example.(k2)
                    OR
      B)Explain finally block with an example. (K2)
5.   A) Explain byte stream classes in
            java. (k2)OR
      B) Explain File creation in java with example. (K2)

Section B: Long Answer Questions (50 Marks)
Answer All questions. Each question carries 10 Marks.

6.   (A) Discuss Object Oriented Programming Principles. (k2)
                    (OR)
      (B) Discuss Java Buzz words. (K2)
7.   (A) Describe Method Overloading with an example program. (k2)
                    (OR)
      (B)Describe the concept of static members in java with example. (K2)

8.   (A) Explain the concept of final keyword with example. (k2)
                    (OR)
      (B)List of different types of inheritance in java and explain with examples. (K2)
9.   (A) Explain life cycle of a thread with neat diagram. (k2)
                    (OR)
      (B)Define Exception. Explain Exception handling mechanism in java with
          examples (K2)
10.   (A) Describe package creation and accessing with example. (k2)
                    (OR)
      (B) Explain writing and reading files in java. (K2)

Note:
- Short answer questions assess foundational knowledge (Remembering, Understandingand Apply).
- This structure emphasizes a focus on higher-order thinking skills (Understand, Application, Analysis, and Evaluation) in the long answer section.
- Consider including a mix of question types within each section to ensure a comprehensive assessment.

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Object Oriented Programming Using JAVA Lab

SEMESTER-III

Offered To:	M+P+C (Minor)	Course Code:	23CSMIP231
Course Type:	Core (Practical)	Course:	Object Oriented Programming using Java Lab
Year of Introduction:	2024 – 2025	Year of offering:	2024 – 2025
Year of Revision:	2024	Percentage of Revision:	15%
Semester:	III	Credits:	1
Hours Taught:	30 hrs. per semester	Max. Time:	3 Hrs

Course Description:
The objective of course is to provide students with practical experience in Object OrientedProgramming in Java. Course Aims and Objectives:

S.NO	COURSE OBJECTIVES
1	Teach students to know the fundamental concepts in java
2	Provide comprehensive training in designing classes, objects and methods in java
3	Teach students to know inheritance, interfaces concepts in java
4	Train students to gain knowledge in multi threading , exception handling and packages
5	Teach students to know Applets Creation and File Creation

Course Outcomes
At the end of the course, the student will be able to…

CONO	COURSE OUTCOME	BTL	PO	PS O
CO1	Creating java programs that covers fundamental concepts	K6	2,6	1,2
CO2	Creating class, constructor, method overloading, method overriding in java.	K6	2,6	1,2
CO3	Creating arrays, types of inheritance and interfacesin a Java program	K6	2,6	1,2
CO4	Creating Multithreading, different types of exception handling mechanisms, Creating and accessing packages in Java.	K6	2,6	1,2
CO5	Creating Applets, Files in Java program.	K6	2,6	1,2

CO-PO MATRIX									
CO NO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1		3				2		2	1
CO2		3				2		2	1
CO3		3				2		2	1
CO4		3				2		2	1
CO5		3				2		2	1

Use the codes 3, 2, 1 for High, Moderate and Low correlation Between CO-PO-PSOrespectively

Course Structure

This lab list covers the key areas of Object Oriented Programming in Java Lab course,providing hands-on practice
Unit-1 : Introduction to Java Programming
Lab 1
Design Java program to perform Type Casting in java.
Develop a Java program for sorting a given list of names in ascending order.
Unit-2 : Control statements, Classes, Objects and Methods
Lab 2
Create a class Rectangle. The class has attributes length and width. It should havemethods that calculate the perimeter and area of the rectangle. It should have readAttributes method to read length and width from user.
Construct a Java program that implements method overloading.
Unit-3 : Inheritance, Arrays, Strings and Interfaces
Lab 3
Design a Java program to calculate multiplication of 2 matrices. Construct a Java program to implement various types of inheritance
Single ii. Multi-Level iii. Hierarchical iv. Hybrid
Lab 4
Write a java program to implement Abstract Classes.Develop a program to demonstrate Final Keyword
Lab 5
Design a program for implementing interfaces.Develop a program on Multiple Inheritance.
Unit-4 : Multi-Threading, Exception Handling and Packages
Lab 6
Write a Java program that creates three threads. First thread displays "OOPS", thesecond thread displays "Through" and the third thread Displays "JAVA" by usingRunnable interface.
Write a program to create and Import Packages
Lab 7
Construct Java programs to implement various types of Exception HandlingMechanisms
Arithmetic Exception Number Format Exception ArrayIndexOutofBounds Exception
Design a program to demonstrate Finally Block
Unit-5: Applets, Streams, Files and Jdbc
Lab -8
Write a program to create an Applet
Create a program for writing and reading Files.
References:
E.Balaguruswamy, Programming with JAVA, A primer, 3e, TATA McGraw-HillCompany.
Web Resources:
Prof.Debasis Samanta, Dept of Computer science, IIT Kharagpur."Basic Concepts of JavaProgramming", 2018.
https://www.youtube.com/watch?v=OjdT2l-EZJA&list=PLfn3cNtmZdPOe3R_wO_h540QNfMkCQ0ho&index=1

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Title of the Paper : Data Base Management System

SEM:III   **Offered to: II B. C. A Honours (Major)**

	II B. C. A Honours (Major)		
Offered To:	II B. C. A Honours (Major)	**Course Code:**	23BCMAL232
Course Type:	Core (Theory)	**Course:BCA**	Data Base Management System
Year of Introduction:	2024-2025	**Year of offering:**	2024 – 2025
Year of Revision:	2024	**Percentage of Revision:**	
Semester:	III	**Credits:**	3
Hours Taught:	60 hrs. per semester	**Max. Time:**	4 Hrs

Course Description:

This course provides a comprehensive introduction to the principles and practices of database management systems. Students will start with fundamental concepts, including database users, characteristics, and advantages of the DBMS approach. They will learn about data models, schemas, and database architectures. As they progress, students will explore data modeling using the ER model, the relational data model, and SQL for database operations. Advanced topics include normalization, relational database design, transaction processing, and concurrency control techniques. By the end of this course, students will have a solid understanding of designing, managing, and optimizing databases efficiently.

Course Aims and Objectives:

Sno	COURSE OBJECTIVES
1	Introduce students to the fundamental concepts of DATABASE.
2	Explain the architecture and components of database systems, including data models, schemas, instances, and the three-schema architecture
3	Solve real-world database design problems by applying normalization techniques and understanding functional dependencies to ensure data integrity and efficiency
4	Demonstrate the process of data modeling using the Entity-Relationship (ER) model and relational model, emphasizing the importance of attributes, keys, and constraints.
5	Familiarize students with SQL and PL/SQL including schema definition, constraints,queries, and views, to proficiently interact with and manipulate relational databases.

Course Outcomes

At the end of the course, the student will be able to…

CO NO	COURSE OUTCOME	BTL	PO	PSO
CO1	Understand fundamental database concepts and architecture and data models	K2	6,7	1,2
CO2	Normalize schemas to ensure data integrity and reduce redundancy	K3	6,7	1,2
CO3	Demonstrate proficiency in using SQL for defining and manipulating database structures	K4	6,7	1,2
CO4	Develop the ability to perform data retrieval using joins, subqueries and nested subqueries	K3	6,7	1,2
CO5	Gain proficiency in developing PL/SQL programs and handling exceptions.	K4	6,7	1,2

For BTL: K1: Remember; K2: Understand; K3: Apply; K4: Analyze; K5: Evaluate;K6: Create

CO-PO MATRIX									
CO NO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1						2	3	2	2
CO2						3	2	2	3
CO3					3	2	3	3	2
CO4						3	3	2	3
CO5						3	3	3	3

Use the codes 3, 2, 1 for High, Moderate and Low correlation Between CO-PO-PSO respectively

Syllabus		
Unit	Learning Units	Lecture Hours

		Content	
	I	**Overview of Database Systems Introduction**: Database system, Characteristics (Database Vs File System), Database Users, Advantages of Database systems, Database applications. **Data Models**: Introduction; types of data models, Concepts of Schema, Instance and data independence; Three tier schema architecture for data independence; Database system structure, environment, Centralized and Client Server architecture for the database. Description: A database system is a system for managing data that allows users to store, modify, and extract information from a database. It provides a systematic and organized way of managingdata. Learning Outcome: Understand the fundamental concepts and purpose of database systems. Develop the ability to differentiate between databases and traditional file systems. Appreciate the role of databases in modern applications and enterprises. Exercises: **Databases and Database Users** Explain with an example how a database differs from traditional file processing systems. Discuss the advantages of using a DBMS approach over traditional file processingsystems. Outline the characteristics that define the database approach. Database System Concepts and Architecture Differentiate between data models, schemas, and instances, using examples whereapplicable. Explain the concept of three-schema architecture and how it achieves dataindependence. Compare and contrast centralized and client/server architectures for DBMSs. Classify different types of database management systems based on their characteristicsand functionalities. Specific Resources: Fundamentals ofDatabase System, Esraa Adnan Hadi. https://www.researchgate.net/publication/336472480_Fundamentals_of_Database_System Fundamentals of Database Systems Fourth Edition, Ramez Elmasri Department of Computer Science Engineering University of Texas at Arlington, Shamkant B. Navathe College of Computing Georgia Institute of Technology. https://www.uoitc.edu.iq/images/documents/informatics-institute/Competitive_exam/Database_Systems.pdf	12Hrs
	II	**Relational Model** Introduction to relational model, Codd's rules, concepts of domain, attribute, tuple, relation, constraints (Domain, Key constraints, integrity constraints) and their importance , concept of keys (super key, candidate key, primary key, surrogate key, foreign key) , relational Algebra & relational calculus. Normalization: Purpose of Normalization or schema refinement, concept of functional dependency, normal forms based on functional dependency(1NF, 2NF and 3 NF), Boyce- codd normal form(BCNF) Description: This unit focuses on principles and techniques essential for structuring relational databases. It begins with understanding functional dependencies and progresses through normalization processes from First Normal Form (1NF) to Fifth Normal Form (5NF) and Boyce-Codd Normal Form (BCNF). The unit also covers advanced topics such as handling multivalued and join dependencies to optimize database design for data integrityand query efficiency in various application domains. Learning Outcomes: Demonstrate proficiency in identifying functional dependencies, applying normalization techniques (1NF to 5NF), and understanding algorithms for	12Hrs

handling multivalued and join dependencies in relational database design

Exercises:

The marketing company wishes to computerize their operations by using following tables:

CLIENT_MASTER (Client_No, Name, Address1, Address2, City, State, Pincode, Bal_Due) PRODUCT_MASTER (Product_No, Description, Profit_Percent, Unit_Measure, Qty_On_Hand, Reorder_Lvl, Sell_Price, Cost_Price) SALESMAN_MASTER (Salesman_No, Name, Address1, Address2, City, State, Pincode, Sal_Amt, Target_Amt, Remarks) SALES_ORDER(S_Order_No, S_Order_Date, Client_No, Delve_Address, Salesman_No,Delve_Type, Billed_Yn, Delve_Date, Order_Status) SALES_ORDER_DETAILS (S_Order_No, Product_No, Qty_Ordered, Qty_Disp, Product_Rate)

CHALLAN_MASTER (Challan_No, S_Order_No, Challan_Date, Billed_Yn) CHALLAN_DETAILS (Challan_No, Product_No, Qty_Disp)

Learning Outcomes:

Proficient in using the Entity-Relationship (ER) model for high-level conceptual data modeling and implementing the Relational Data Model to design schemas, enforce constraints, manage updates, transactions, and handle constraint violations effectively in databases.

Specific Resources:

Data Models, geeksforgeeks, https://www.geeksforgeeks.org/data-models-in-dbms/ "Understanding SQL and Relational Databases" by Cristian Darie, KarliWatson, Chris Hart, Kevin Hoffman & Julian Skinner. https://link.springer.com/chapter/10.1007/978-1-4302-0800-6_1

		Entity Relationship Model: Introduction, Representation of entities, attributes, entity set, relationship, relationship set, constraints, sub classes, super class, inheritance, specialization, generalization using ERDiagrams **BASIC SQL:** Database schema, data types, DDL operations (create, alter, drop, rename), DML operations (insert, delete, update), basic SQL querying (select and project) using where clause, arithmetic & logical operations, aggregation, grouping, ordering. Description: This unit covers Entity-Relationship (ER) modeling for database design, emphasizing entity types, attributes, keys, and weak entity types. It also explores the Relational Data Model, including schema concepts, constraints, update operations, transactions, and managing constraint violations. Learning Outcomes: Proficient in using the Entity-Relationship (ER) model for high-level conceptual data modeling and implementing the Relational Data Model to design schemas, enforce constraints, manage updates, transactions, and handle constraint violations effectively in databases. Exercises: An enterprise wishes to maintain a database to automate its operations. Enterprise divided into two certain departments and each department consists of employees. The following two tables describes the automation schemas: DEPT (Deptno, Dname, Loc) EMP (Empno, Ename, Job, Mgr, Hiredate, Sal, Comm, Deptno) Design an ER diagram for a hospital management system that includes entities likepatients, doctors, and appointments, with appropriate attributes and relationships. Identify and define entity types and attributes for a university database system thatmanages students, courses, and enrolment Specific Resources:	
	III		12Hrs

		"Understanding SQL and Relational Databases" by [Cristian Darie](), [KarliWatson](), [Chris Hart](), [Kevin Hoffman]() & [Julian Skinner](). https://link.springer.com/chapter/10.1007/978-1-4302-0800-6_1	
IV	**SQL** Nested queries/ sub queries, implementation of different types of joins, SQL functions(Date, Numeric, String, Conversion functions), Creating tables with relationship, implementation of key and integrity constraints, views, relational set operations , Transaction Control Language: commit, Rollback, Savepoint , DCL :Grant, Revoke Description: This unit delves into advanced topics in relational database theory, focusing on the fundamental operations of relational algebra and calculus, including unary and binary relational operations. It also covers SQL standards, providing an in-depth understanding of schema definition, constraints, queries, and views, as well as data manipulation through INSERT, DELETE, and UPDATE statements. The purpose is to equip learners with the knowledge to design, query, and manage relational databases effectively. Learning Outcomes: Apply advanced relational algebra and calculus operations to database queries and design, implement, and manage complex schemas, constraints, and data manipulations using SQL-99 standards. Exercises: List the products which have highest sales. Find out the details of top 5 earners of company. Determine the names of employee, who earn more than their managers. Find the names of clients who have placed orders worth of Rs. 10,000/- or more. Determine the names of employees, who take highest salary in their departments. Find the names of clients who have placed orders before the month of may 2006. Find the customer names and address for the clients, who placed the order '019001' Display names of the managers who is having maximum number of employeesworking under him. Create a view, which contain employee names and their manager names working in sales department. Find out if the product is '1.44 drive' is ordered by any client and print the clientnumber, name to whom it is sold. Queries using Aggregate functions (COUNT, SUM, AVG, MAX and MIN) Queries (along with sub Queries) using ANY, ALL, IN, EXISTS, NOTEXISTS Ex: Select roll number, name of the student who secured fourth rank in the class. Queries (along with sub Queries) using UNION, INTERSECT (i) Create a user (ii) Create an varray, which holds the employee phone numbers (i) Grant Privileges on Tables (ii) Revoke Privileges from Tables Learning Outcomes: Apply advanced relational algebra and calculus operations to database queries and design, implement, and manage complex schemas, constraints, and data manipulations using SQL-99 standards. Specific Resources: G. Ozsoyoglu, Z. M. Ozsoyoglu and V. Matos, "Extending relational algebra and relational calculus with set-valued attributes and aggregate functions", https://dl.acm.org/doi/10.1145/32204.32219 Jan L. Harrington, "SQL Clearly Explained". https://www.sciencedirect.com/science/article/abs/pii/B9780123756978500017?via% 3Dihub	12Hrs
V	**PL/SQL** Introduction , Structure , Control Structures , Cursors , Procedure , Function , Packages ,Exception Handling ,Triggers. Description: This unit helps to understand the basics of programming and database management, layingthe groundwork for more complex concepts. Learning Outcomes: These concepts form the basis of PL/SQL programming, allowing you to write	12Hrs

efficient andeffective database applications

Exercises: (i) Lock table in share mode (ii) Lock table in Exclusive mode

Create a trigger to insert information about the transaction of a customer table. The customer table consists of custno, custname, and money. The information table consists of message field. Design a banking application that handles transactions (e.g., deposits, withdrawals) using the Two-Phase Commit Protocol to ensure data consistency across distributed databases.

Implement a simple online shopping cart system where transactions (e.g., adding items, updating quantities, checkout) are managed, ensuring atomicity and isolation properties.

Specific Resources:

Dardina Tasmere, Senior Lecturer, Department of Computer Science and Engineering, Bangladesh Army University of Engineering & Technology, Natore, Bangladesh, Md. NazmusSalehinB.Sc Student, Department of Computer Science and Engineering, Bangladesh Army University of Engineering & Technology, Natore, Bangladesh, "Concurrency Control in Database Systems" https://www.cribfb.com/journal/index.php/BJMSR/article/view/365 SeppoSippu , Eljas Soisalon-Soininen,"Transaction Processing" Management of theLogical Database and its Underlying Physical Structure. https://link.springer.com/book/10.1007/978-3-319-12292-2

TextBooks:
 1. Raghurama Krishnan, Johannes Gehrke, 2003, Database Management Systems, 3rd Edition, TMH Silberschatz, Korth, 2005, Database System Concepts, 5th edition, TMH

References:
Abraham Silberschatz, Henry F. Korth, S. Sudarshan, (2006), *Database SystemConcepts.* (6th Ed.) McGraw hill.
Peter Rob, A. Anand Rao, Carlos Coronel, *Database Management Systems*. CengageLearning
Raghu Ramakrishnan, (2015), *Database Management Systems.* (4th Ed) McGraw-Hill.
Peter Rob & Carlos Coronel, (2008), *Database System Concepts.* Cengage Learning.
Web Resources:
[1] Abraham Silberschatz, Henry F. Korth, S. Sudarshan, 2013,**"Database SystemConcepts"**, (6th Edition), McGraw hill, https://www.amazon.in/Database-System-Concepts-Abraham- Silberschatz/dp/9332901384
[2] Elmasri and Navathe : Fundamentals of Database Systems,
https://edurev.in/p/97587/Fundamentals-of-Database-Systems-by-Elmasri--Navat,
https://www.amazon.in/Fundamentals-Database-Systems-Elmasri-
Shamkant/dp/B076K8CM55
[3] P .S. Gill, Database Management System,
https://www.amazon.in/Database-Management-Systems-P-Gill-ebook/dp/B01GUZBN9K,
https://books.google.co.in/books?id=mK4COraJvlIC&printsec=copyright&redir_esc=y#v=onepage&q&f=false
[4] Raghu Ramakrishan, Database Management System,
https://www.amazon.in/Database-Management-Systems-Raghu- Ramakrishnan/dp/0072465638,
https://xuanhien.wordpress.com/wp-content/uploads/2011/04/database- management-systems-raghu-ramakrishnan.pdf

A.G & S.G.SIDDHARTHA DEGREE COLLEGE OF ARTS & SCIENCE

DATABASE MANAGEMENT SYSTEMS
MODEL PAPER

CLASS: **II B. C. A Honours (Major)**

Course Code: 23BCMAL232

Semester: III

Max. Marks:70M
Min. Pass: 28M
Time: 3 Hours

Section A: Short Answer Questions (20 Marks)Answer All questions.

Each question carries 4 Marks.

1. a)What are the differences between data and information.(K1)
    (OR)
   b) Write a short note on evolution of data models. (k2)
2 a).Explain different types of attributes with neat diagrams. (k2)
    (OR)
   b). Explain about different keys in dbms? (k2)
3. a) Explain about Integrity rules (k2)
    (OR)
   b) Write about CODD'S rules? (k2)

4. a) Explain different types of Aggregate functions in SQL. (k2)
    (OR)
   b) Write a short note on string functions in SQL. (k2)

    5. a) Explain Structure of PL/SQL (k2)

   (OR)

   c)   Explain Functions in PL/SQL (k2)

   d)   Section B: Long Answer Questions (50 Marks)
Answer All questions. Each question carries 10 Marks.
6. a) Explain the role and advantages of DBMS? (k2)
    (OR)
   b) Explain briefly about degrees of data abstraction? (k2)
7.a) Explain Specialization hierarchy with an example? (k2)
    (OR)
   b). Explain Entity Relationship diagram with an example (k2)

8. a) Write a short note on relational set operators. (k2)
    (OR)
   b) What is normalization? Explain with an example upto 3NF? (k1)
9.   a) Explain DDL, DML, DCL commands in SQL with example (k2)
    (OR)
   b). Explain views in SQL with syntax and examples. (k2)
10.   a) Discuss about iterative control statements available in PL/SQL with syntax
   and examples.(k3)
    (OR)
   b). Explain types of Triggers in PL/SQL (k3)

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DBMS LAB

SEMESTER-III

Offered To:	II B. C. A Honours (Major)	**Course Code:**	**23BCMAP232**
Course Type:	Core (Practical)	**Course:**	DBMS Lab
Year of Introduction:	2024-25	**Year of offering:**	2024 – 2025
Year of Revision:		**Percentage of Revision:**	
Semester:	III	**Credits:**	1
Hours Taught:	30 hrs. per semester	**Max. Time:**	3 Hrs

Course Description:

The objective of course is to provide students with practical experience in database management using Oracle SQL and PL/SQL. Students will learn to create and manage database objects, perform data manipulation and retrieval, implement advanced querying techniques, and develop PL/SQL programs

Course Aims and Objectives:

S.NO	COURSE OBJECTIVES
1	Introduce students to the foundational concepts and syntax of SQL
2	Equip students with the skills to design and manage relational databases
3	Develop students' ability to perform complex data retrieval and manipulation.
4	Provide comprehensive training in procedural programming using PL/SQL
5	Teach students how to manage errors and optimize database performance

Course Outcomes

At the end of the course, the student will be able to…

CO NO	COURSE OUTCOME	BTL	PO	PSO
CO1	Using DDL commands in Oracle, including creating, altering, and dropping tables	K2	6,7	1,2
CO2	Performing data manipulation operations using DML commands	K3	6,7	1,2
CO3	Understand and implement various types of joins	K3	6,7	1,2
CO4	Write and execute basic PL/SQL programs	K3	6,7	1,2
CO5	Use both implicit and explicit cursors in Oracle PL/SQL, execute triggers	K3	6,7	1,2

CO-PO MATRIX									
CO NO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1						2	3	2	2
CO2						3	2	2	3
CO3					3	2	3	3	2
CO4						3	3	2	3
CO5						3	3	3	3

Use the codes 3, 2, 1 for High, Moderate and Low correlation Between CO-PO-PSO respectively

Course Structure

This lab list covers the key areas of a Database management systems lab course, providinghands-on practice with Oracle technology

Unit 1: Implementing DDL commands in Oracle   (6Hrs)

Lab 1:

Exercise 1: Creating Tables without Constraints

1. Create tables without applying any constraints to understand basic table creation.

> **Tasks:**
> - o Create a table Employees with columns: Employee_ID, First_Name,Last_Name, Hire_Date, and Department.
> - o Create a table Projects with columns: Project_ID, Project_Name, andStart_Date.

2. Creating Tables with Primary Key and Foreign Key Constraints

Exercise 2:

Defining Tables with Primary and Foreign Keys

1. **Objective:** Learn to create tables with primary key and foreign key constraints toensure referential integrity.
2. **Tasks:**
    1. Create a table Departments with columns: Department_ID and Department_Name, and apply a primary key constraint on Department_ID
    2. Create a table Employees with columns: Employee_ID, First_Name, Last_Name, Hire_Date, Department_ID, and apply a primary key constraint on Employee_ID. Add a foreign key constraint on Department_ID to referenceDepartments.

Lab 2:

Exercise 3: Creating Tables with Unique and Check Constraints

Objective: Create tables with unique and check constraints to enforce data uniqueness andvalid data values.

1. **Tasks:**
    1. Create a table Products with columns: Product_ID, Product_Name, Price, andCategory. Apply a primary key constraint on Product_ID and a unique constraint on Product_Name.
    2. Create a table Orders with columns: Order_ID, Order_Date, Product_ID, and Quantity. Apply a primary key constraint on Order_ID and a check constraintto ensure Quantity is greater than 0.

Exercise 4: Creating Tables with Composite Keys and Default Values

1. **Objective:** Create tables with composite primary keys and default values for columns.
2. **Tasks:**

   o Create a table Order_Items with columns: Order_ID, Product_ID, Quantity,and Price. Apply a composite primary key constraint on Order_ID and Product_ID. Set default values for Quantity (1) and Price (0.00).
   o Create a table Customer_Reviews with columns: Review_ID, Customer_ID, Review_Date, and Rating. Apply a primary key constraint on Review_ID andset a default value for Review_Date as the current date.

Exercise 5: Creating Tables with Referential Integrity Constraints

1. **Objective:** Create tables that enforce referential integrity between parent and child tables.

2.**Tasks:**

   o Create a table Customers with columns: Customer_ID, Customer_Name, andContact_Number, and apply a primary key constraint on Customer_ID.
   o Create a table Invoices with columns: Invoice_ID, Customer_ID, Invoice_Date, and Amount. Apply a primary key constraint on Invoice_ID anda foreign key constraint on Customer_ID to reference Customers.

Unit 2: DML commands

<center>Lab 3:</center>

Exercise 6: Insert Data into emp and dept tables

DEPTNO	DNAME	LOC
10	ACCOUNTING	NEW YORK
20	RESEARCH	DALLAS
30	SALES	CHICAGO
40	OPERATIONS	BOSTON

	A	B	C	D	E	F	G	H
1	7839	KING	PRESIDENT		1981-11-1	5000		10
2	7698	BLAKE	MANAGEF	7839	1981-05-0	2850		30
3	7782	CLARK	MANAGEF	7839	1981-06-0!	2450		10
4	7566	JONES	MANAGEF	7839	1981-04-0:	2975		20
5	7788	SCOTT	ANALYST	7566	1982-12-0!	3000		20
6	7902	FORD	ANALYST	7566	1981-12-0:	3000		20
7	7369	SMITH	CLERK	7902	1980-12-1	800		20
8	7499	ALLEN	SALESMAI	7698	1981-02-2(	1600	300	30
9	7521	WARD	SALESMAI	7698	1981-02-2:	1250	500	30
10	7654	MARTIN	SALESMAI	7698	1981-09-2:	1250	1400	30
11	7844	TURNER	SALESMAI	7698	1981-09-0:	1500	0	30
12	7876	ADAMS	CLERK	7788	1983-01-1:	1100		20
13	7900	JAMES	CLERK	7698	1981-12-0:	950		30
14	7934	MILLER	CLERK	7782	1982-01-2:	1300		10

https://livesql.oracle.com/apex/livesql/file/content_O5AEB2HE08PYEPTGCFLZU 9YCV.ht ml

Queries

Exercise 7:

1. Display all the information of the EMP table?

2. Display unique Jobs from EMP table?

3. List the emps in the asc order of their Salaries?

4. List the details of the emps in asc order of the Dptnos and desc of Jobs?

5. Display all the unique job groups in the descending order?

6. Display all the details of all 'Mgrs'

7. List the emps who joined before 1981.

8. List the Empno, Ename, Sal, Daily sal of all emps in the asc order of Annsal

9. Display the Empno, Ename, job, Hiredate, Exp of all Mgrs

10. List the Empno, Ename, Sal, Exp of all emps working for Mgr 7369. 11. Display all thedetails of the emps whose Comm. Is more than their Sal.

12. List the emps in the asc order of Designations of those joined after the second half of1981.

13. List the emps along with their Exp and Daily Sal is more than Rs.100.

14. List the emps who are either 'CLERK' or 'ANALYST' in the Desc order.

Unit 3: Joins and views

Lab 5:

joins

Exercise 8:

15. List the total information of EMP table along with DNAME and Loc of all the empsWorking Under 'ACCOUNTING' & 'RESEARCH' in the asc Deptno.
16. List the Empno, Ename, Sal, Dname of all the 'MGRS' and 'ANALYST' working inNew York, Dallas with an exp more than 7 years without receiving the Comm asc order of Loc.
17. Display the Empno, Ename, Sal, Dname, Loc, Deptno, Job of all emps working at CJICAGO or working for ACCOUNTING dept with Ann Sal>28000, but the Sal should not be=3000 or 2800 who doesn't belongs to the Mgr and whose no is havinga digit '7' or '8' in 3rd position in the asc order of Deptno and desc order of job.
18. Display the total information of the emps along with Grades in the asc order.
19. List all the Grade2 and Grade 3 emps
20. Display all Grade 4,5 Analyst and Mgr.
21. List the Empno, Ename, Sal, Dname, Grade, Exp, and Ann Sal of emps

working forDept10 or20.

Lab 6:

views

Exercise 9

1. Create a simple view to display specific columns from a table.
   Task: Create a view named Employee_View that displays Employee_ID,
   First_Name, andLast_Name from the Employees table.

2. Create a view that joins multiple tables.
   Task: Create a view named Employee_Department_View that displays Employee_ID,
   First_Name, Last_Name, and Department_Name by joining the Employees and
   Departments tables.
3. Create an updatable view that allows DML operations.
   Task: Create a view named Updateable_Employee_View that displays Employee_ID,
   First_Name, and Last_Name and allows updates to the Last_Name column.
4. Create a view that is read-only and does not allow DML operations.

   Task: Create a view named ReadOnly_Department_View that displays
   Department_IDand Department_Name.

Unit 4: joins, subqueries, nested subqueries

Lab 7:

Exercise 10:

1. List the total information of EMP table along with DNAME and Loc of
   all the empsWorking Under 'ACCOUNTING' & 'RESEARCH' in the
   asc order of Deptno.

2. List the Empno, Ename, Sal, Dname of all the 'MGRS' and 'ANALYST'
   working inNew York, Dallas with an experience more than 7 years without
   receiving the Commasc order of Loc.
3. List the Empno, Ename, Sal, Dname, Grade, Exp, and Ann Sal of emps
   working forDept10 or20.
4. List the details of the Depts along with Empno, Ename or without the
   emps
5. List the details of the emps whose Salaries more than the employee BLAKE
6. List the Emps who are senior to their own MGRS
7. List the emps whose jobs same as SMITH or ALLEN

Lab 8:

Exercise 11:

1. **Create some sub-quries on emp and dept tables.**
2. **Create some nested subq-ueries on emp, dept tables.**
3. Concatenation of strings
4. Finding the length of a string
5. Substring extraction
6. String replacement
7. String case conversion

Unit 5: PL/SQl programs, triggers and exception handling   (6Hrs)

Lab 9: basic PL/SQL

programsExercise 12:

1. Write programs on Nested Blocks and Control Structures
2. Display Employee Details Using PL/SQL
3. Write a program to check the given number is prime or not.

Lab 10: Triggers and exceptions

Exercise 13:

1. Create a Trigger to Automatically Update Book Quantity When a Book is Returned
2. Create a Trigger to Update Last_Updated Column
3. Test the Trigger
4. Handle Exception for Division by Zero
5. Handle Exception for No Data Found
6. Create a user defined exception

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Title of the Paper: Software Engineering

SEM:III   **Offered to: II B. C. A Honours (Major)**

Offered To:	II B. C. A Honours (Major)	Course Code:	23BCMAL234
Course Type:	Core (Theory)	Course:	Software Engineering
Year of Introduction:	2024 – 2025	Year of offering:	2024 – 2025
Year of Revision:		Percentage of Revision:	
Semester:	III	Credits:	3
Hours Taught:	60 hrs. per semester	Max. Time:	4 Hrs

Course Description:

The course is to assist the student in understanding the basic theory of software engineering, and to apply these basic theoretical principles to a group software development project.

Program Design Tools:

1. To draw dataflow diagrams using Microsoft Visio Software, SmartDraw,

2. To draw UML diagrams using Rational Rose Software, Star UML, etc.

Course Aims and Objectives:

S.NO	COURSE OBJECTIVES
1	Grasp fundamental software engineering concepts, methodologies, and principles
2	Known about ethical responsibilities of software engineers.
3	Gain the ability to design software systems that are modular, scalable, and maintainable.
4	Study the cognitive, physical, and social aspects of human interaction with technology.
5	Learn techniques for software testing and quality assurance and theoretical knowledge to real-world scenarios through case studies and practical exercises..

Course Outcomes

At the end of the course, the student will be able to…

CO NO	COURSE OUTCOME	BTL	PO	PSO
CO1	Understand the requirements of the software projects.	K2	PO5,PO7	PSO2

CO2	Ability to analyze software requirements with existing tools	K4	PO5,PO7	PSO1PSO,2
CO3	Apply different testing methodologies	K3	PO5,PO7	PSO1,PSO2
CO4	Understand and apply the basic project management practices in real life projects	K2, K4	PO5,PO7	PSO1,PSO2
CO5	Apply on software projects	K4	PO5,PO7	PSO1,PSO2

For BTL: K1: Remember; K2: Understand; K3: Apply; K4: Analyze; K5: Evaluate; K6: Create

CO-PO MATRIX									
CO NO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**
CO1					3		2		1
CO2					3		2	3	2
CO3					3		2	2	
CO4					3		2	2	2
CO5					3		2	3	2

Use the codes 3, 2, 1 for High, Moderate and Low correlation Between CO-PO-PSOrespectively

Syllabus		
Unit	**Learning Units**	**Lecture Hours**
I	**Introduction to Software Engineering:** The Software Engineering – Evolution and impact, Software Development Projects, Software Process and Project Metrics, Emergence of Software Engineering, Computer Systems Engineering, **Software Life cycle models**: Need for life Cycle model, classical waterfall model, Iterativewaterfall model, V-model, Prototyping model, Evolutionary model, Spiral model, Agile Development Models, Comparison of different life cycle models. Description: Software Engineering is the systematic application of engineering principles to the development, operation, maintenance, and retirement of software. It's a discipline focused onproducing high-quality software that meets user needs within budget and on time. Learning Outcomes: Understanding software project management principles. Proficiency in software development tools and environments. Knowledge of software design patterns and architectures. Examples: Conduct workshops and training sessions to ensure all team members understand the principles and practices of software engineering. Create a repository of reference materialsand best practices Exercises Analyze the size factors of a software project Building online stores, payment gateways Specific Resources: (web) **Prof. Rajib Mall, Assistant Professor, Department of Computer Science and Engineering, IIT Kharagpur** https://youtu.be/Ln_LP7c23WM	12Hrs
II	**Software Project Management**: Responsibilities of a Software Project Manager, Projectplanning, Metrics for Project size estimation and scheduling. **Requirement Analysis**: Requirements gathering and analysis, Software Requirements Specification contents of the SRS document, Functional requirements, Traceability, Characteristics of good SRS DOCUMENT, Organization of the SRS document. Description: Software cost estimation is the process of predicting the financial resources required to develop and maintain a software system. Accurate cost estimation is crucial for project planning, budgeting, and resource allocation. Various techniques are employed to estimatesoftware costs Learning Outcomes: Understand the concept of software cost estimation Identify key factors Apply various cost estimation techniques Estimate staffing levels Determine the factors influencing software maintenance costs Create comprehensive software requirements specifications Utilize formal specification techniques Select appropriate languages and processors Evaluate the impact of software requirements on project costs Examples: Detailed Explanation of the COCOMO Model Exercises: The basic COCOMO formula is:$Effort = a \times (KLOC)^b$ Where: **Effort** is the number of person-months. **KLOC** is the estimated number of thousands of lines of code. **a** and **b** are coefficients that vary depending on the project type (organic, semi-detached, or embedded). For example, for an organic project: $a=2.4, b=1.05$ $a = 2.4, \, b = 1.05$ $a=2.4, b=1.05$ Suppose we estimate the size of the software to be 50 KLOC: Specific Resources: (web)**Prof. Rajib Mall, Assistant Professor, Department of Computer Science andEngineering, IIT Kharagpur** https://youtu.be/ilHPCbkZLV4	12Hrs

III	**Software design:** Desirable characteristics of a good software design, Cohesion and coupling,Layer Arrangement of Modules, Function-oriented design and Object-oriented design. **Function-oriented software Design:** Overview of SA/SD methodology, structured analysis,Data Flow Diagrams, Structured Design and Detailed Design. Description:Software design is the process of conceptualizing the software solution to a problem, transforming user requirements into a suitable form, and producing a design document basedon the customer requirements. It's a crucial phase that bridges the gap between requirementsanalysis and software implementation. Learning Outcomes: Define software design Transform user requirements Apply fundamental design concepts Utilize various design notations Employ different design techniques Conduct detailed design Design software for real-time and distributed systems Develop comprehensive test plans to ensure software quality. Participate in software design reviews Examples:Software Design for an E-Commerce Platform Exercises:Represent Design Notations for e-commeerce platform UML Diagrams **Class Diagrams**: Represent classes and relationships in each module. **Sequence Diagrams**: Show interactions between objects during user registration, product search, order placement, and payment processing. Data Flow Diagrams (DFDs) Illustrate how data flows through the system, from user inputs to databasestorage and retrieval. Specific Resources: (web) Prof. Mythii Vutukuru, assistant Professor, IIT Bombay, software Design, https://youtu.be/3fLahzQr8EI?list=PLDW872573QAZNlUzWVzoU8cCadXg1N UGK	12Hrs
IV	**User interface design**: Characteristics of good user interface design, Basic concepts, Types of user interfaces, component-based GUI development, A user interface Design Methodology **Unified Modeling Language:** Overview of Object-oriented concepts, Unified Modeling Language, UML diagrams, use case model class diagrams, Interaction diagrams, Activitydiagrams, state chart diagrams Description: User Interface (UI) design is the process of creating effective interactions between humansand computer systems. It's about designing the look, feel, and behavior of software applications to ensure they are user-friendly, efficient, and enjoyable to use. Learning Outcomes: Define user interface design. Apply human factors principles. Understand the fundamentals of human-computer interaction. Develop effective user interfaces. Create visually appealing and intuitive user interfaces. Evaluate user interface designs.Design user interfaces for specific user groups. Apply user interface design principles to real-time systems . Stay updated on emerging trends and technologies. Examples: User Interface Design for a Real-Time Patient Monitoring System Exercises: **Example Interface Design:** Dashboard: **Patient List**: A list of all monitored patients with summary information (name, roomnumber, key vital signs). **Critical Alerts**: A section for critical alerts, sorted by severity and time. **Navigation**: Easy access to patient detail views, settings, and system logs. Patient Detail View:	12Hrs

	Vital Signs Graphs: Real-time graphs showing trends for heart rate, blood pressure,temperature, etc. **Alerts History**: A log of all alerts for the patient, with timestamps and statuses. **Actions**: Buttons for common actions, such as acknowledging alerts, adding notes, orcalling for assistance. Settings and Customization: **Alert Thresholds**: Interface for setting and adjusting alert thresholds for different vital signs. **Display Options**: Options for customizing the layout, themes, and data visibility. Specific Resources: (web) Dr. Samit Bhattacharya, Assistant Professor, Computer Science and Engineering, IITGUWAHATI, Design & Implementation of Human-Computer Interfaces **https://youtu.be/uFYuHHglC6U?list=PLwdnzlV3ogoVKbbd4bwgSoga7EEuX5kFf**	
V	**Software quality and testing:** Software Quality Assurance - Quality metrics - Software Reliability - Software testing - Path testing – Control Structures testing - Black Box testing - Integration, Validation and system testing - Reverse Engineering and Reengineering. **CASE Tools:** Projects management, tools - analysis and design tools – programming tools -integration and testing tool - Case studies. Description: software quality and testing are critical for producing reliable and efficient software. CASE tools can significantly enhance the software development process by automating tasks and improving productivity Learning Outcomes: Define software quality assurance. Identify and apply quality metric. Explain the concept of software reliabilit. Design and execute various software testing techniques. Conduct integration, validation, and system testing. Apply reverse engineering and reengineering techniques to analyze and modify existing software systems. Utilize CASE tools to support software quality assurance and testing activities. Create and manage software test plans and test cases. Analyze test results and generate test reports to identify defects and recommendcorrective actions. Understand the importance of software quality Examples: Implementing Test Automation for a E-commerce Platform Exercises: **Client:** A large online retailer looking to improve software quality and reduce testingtime. **Project:** Implement a test automation framework for functional, regression, and performance testing of their e-commerce platform. Specific Resources: (web) **Prof. Rajib Mall, Assistant Professor, Department of Computer Science and Engineering, IIT Kharagpur https://youtu.be/ilHPCbkZLV4** **Choose any two of above case studies and do the following exercises for that Case Study** Write the software requirements specification document Draw the entity relationship diagram Draw the data flow diagrams Draw use case diagrams Draw activity diagrams for all use cases Draw sequence diagrams for all use cases Draw collaboration diagram Assign objects in sequence diagrams to classes and make class diagram. Student Activity: Visit any financial organization nearby and prepare requirement analysis report Visit any industrial organization and prepare risk chart	12Hrs

Text Books:

     1.   Fundamentals of Software Engineering, Fourth Edition, Rajib Mall, PHI

References: R.Fairley, Software Engineering Concepts, Tata McGraw-Hill, 1997. Software Engineering, H. Sommervill Ian , Addition Wesley Pub. Co.

Software Engineering: An object Oriented Perspective by Braude, E.J., Willey, 2001

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SOFTWARE ENGINEERING

MODEL PAPER

CLASS: **II B. C. A Honours (Major)**

	Max. Marks:70M
Course Code: **23BCMAL234**	**Min. Pass: 28M**
Semester: III	**Time: 3 Hours**

Answer All questions. Each question

carries 4 Marks.

1   (a)   Why Software Engineering is required?(K2)

OR

(b)   What are the phases of the waterfall model? (K1)

2   (a)   Summarize responsibilities of software manager. (K3)

OR

(b)   Summarize Characteristics of SRS Document. (K3)

3   (a)   What is DFD? Explain with an example. (K2)

OR

(b)   Write about Modular Design. (K1)

4   (a)   Differentiate Graphical user interface and text ‑ based user interface. (K3)

OR

(b)   List and explain various types of user interfaces. (K2)

5   (a)   Write about Glass Box testing. (K1)

OR

(b)   Summarize Quality metrics (K3)

Section B: Long Answer Questions (50 Marks)

Answer All questions. Each question carries 10 Marks.

6   (a)   Compare different software development life cycle modes. (K3)

OR

(b)   Explain about spiral model. (K2)

7   (a)   What are the reas6ns to spend time and resources to develop a SRS
document. (K1)

OR

(b)   Explain metrics for project size estimation. (K2)

8   (a)   Explain about coupling and cohesion. (K2)

OR

(b)   Write about overview of SA/SD methodologies. (K1)

9   (a)   Explain different types of user interfaces (K2)

OR

(b)   Explain IJML class diagrams with an example (K2)

(a)   What is program testing? Briefly explain the following tests:,

a) Unit testing.

b) Block box testing

c) White box testing   (K1)OR

(b)   Discuss analysis and design tools. (K2)

Note:

nswer questions assess foundational knowledge (Remembering, Understandingand

.cture emphasizes a focus on higher-order thinking skills (Understand,Application,
.nalysis, and Evaluation) in the long answer section.

•   Consider including a mix of question types within each section to ensure a
comprehensive assessment.

Section A : Short Answer Questions (10 Marks)

Answer All questions. Each question carries 4

Marks.

Q1   (a)   Why Software Engineering is required?(K2)

OR

(b)   What are the phases of the waterfall model? (K1)

Q2   (a)   Summarize responsibilities of software manager. (K3)

OR

(b)   Summarize Characteristics of SRS Document. (K3)

Section B: Long Answer Questions (20 Marks)

Answer All questions. Each question carries 10 Marks.

Q3 (a) What is DFD? Explain with an example. (K2)

OR

(b) Write about Modular Design. (K1)

Q4 (a) Differentiate Graphical user interface and text - based user interface. (K3)

OR

(b) List and explain various types of user interfaces. (K2)

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SOFTWARE ENGINEERING LAB

SEMESTER-III

Offered To:	II B. C. A Honours (Major)	**Course Code:**	**23BCMAP234**
Course Type:	Core (Practical)	**Course:**	**Software Engineering Lab**
Year of Introduction:	2024 – 2025	**Year of offering:**	2024 – 2025
Year of Revision:		**Percentage of Revision:**	
Semester:	III	**Credits:**	1
Hours Taught:	30 hrs. per semester	**Max. Time:**	3 Hrs

Course Description:

This course provides basic an opportunity to practically implement various OOSE concepts using various case studies. This course enables students to analyse and design the system in object oriented manner using Eclipse tool.

Course Aims and Objectives:

S.NO	COURSE OBJECTIVES
1	**Understand the basics and planning of a software project**
2	**Analyse software cost estimation and its techniques**
3	**Software Design**
4	**User interface design**
5	**Software testing and validations**

Course Outcomes

At the end of the course, the student will be able to…

CO NO	COURSE OUTCOME	BTL	PO	PSO
CO1	Understand the requirements of the software projects.	**K2**	5,7	2
CO2	Ability to analyze software requirements with existing tools	**K4**	5,7	1,2
CO3	Apply different testing methodologies	**K3**	5,7	1,2
CO4	Understand and apply the basic project management practices in real life projects	**K2, K4**	5,7	1,2
CO5	Apply on software projects	**K4**	5,7	1,2

For BTL: K1: Remember; K2: Understand; K3: Apply; K4: Analyze; K5: Evaluate;

K6:   Create

CO-PO MATRIX									
CO NO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1					3		2		1
CO2					3		2	3	2
CO3					3		2	2	
CO4					3		2	2	2
CO5					3		2	3	2

Use the codes 3, 2, 1 for High, Moderate and Low correlation Between

CO-PO-PSOrespectively

Course Structure

This lab list covers the key areas of a Software Engineering course, providing hands-onpractice with Eclipse UML2/any other Open Source Tools Design Following Systems in Object Oriented Approach using UML withopen source tools (Eclipse UML2 or any other Open source tools):

1. Online Examination System.
2. Online Railway Reservation.
3. Library Maintenance System.
4. Any E-Commerce Portal.
5. Biometric Attendance System.

1. Write down the problem statement for a suggested system of relevance.

2. Do requirement analysis and develop Software Requirement Specification Sheet (SRS) forsuggested system.

3. To perform the function oriented diagram: Data Flow Diagram (DFD) and Structuredchart.

4. To perform the user's view analysis for the suggested system: Use case diagram.

5. To draw the structural view diagram for the system: Class diagram, object diagram.

6. To draw the behavioral view diagram : State-chart diagram, Activity diagram

7. To perform the behavioral view diagram for the suggested system : Sequence diagram,Collaboration diagram

8. To perform the implementation view diagram: Component diagram for the system.

9. To perform the environmental view diagram: Deployment diagram for the system.

10. To perform various testing using the testing tool unit testing, integration testing for asample code of the suggested system.

11. Perform Estimation of effort using FP Estimation for chosen system.

12. To Prepare time line chart/Gantt Chart/PERT Chart for selected software project
    Note: Student is expected to analyze the system in object oriented manner and design the system in object oriented approach using UMLwith open source tools

References:

1. Fundamentals of Software Engineering, Fourth Edition, Rajib Mall, PHI

2. R.S. Pressman, Software Engineering a practitioner's approach, Fourth Ed., McGrawHill, 1997

Data Analysis Using Python   SEMESTER-III

Offered To:	II B. C. A Honours (Minor)	Course Code:	**23DSMIL231**
Course Type:	Core (Theory)	**Course: Minor**	**Data Analysis Using Python**
Year of Introduction:	2024 – 2025	**Year of offering:**	2024 – 2025
Year of Revision:	2024	**Percentage of Revision:**	
Semester:	III	**Credits:**	1
Hours Taught:	30 hrs. per semester	**Max. Time:**	3 Hrs

Course Description:

This course offers a detailed introduction to DataScience, emphasizing practical applications in Python. It covers key areas such as data exploration, cleaning, and visualization using libraries like NumPy, pandas, and matplotlib. Students will learn to handle and analyze data with pandas, create and manipulate arrays with NumPy, and visualize data with matplotlib and seaborn. The course also includes advanced topics such as data aggregation, group operations, and time series analysis, equipping students with the skills to manage and interpret complex datasets effectively. Ideal for those seeking a solid foundation in data science with hands-on Python experience.

CourseAimsand Objectives:

S.NO	COURSEOBJECTIVES
1	Understand the basics of Data Science, including the data analysis process, and how to Use Python tools like iPython and Jupyter Note book for data analysis.
2	Apply NumPy to handle arrays and matrices, including creating, reshaping, and Performing operations on them.
3	Use pandas to analyze data by cleaning, organizing, and exploring data sets, and create Visualizations to gain insights.
4	Perform data wrangling by combining and reshaping datasets, and use visualization Tools like matplotlib and sea born to present data effectively.
5	Conduct advanced data analysis by aggregating and grouping data, and analyze time Series data with techniques such as re sampling and frequency conversion.

Course Outcomes

Attheend ofthecourse,thestudent willbeableto…

CONO	COURSEOUTCOME	BTL	PO	PSO
CO1	**Understand**thebasicsof DataScience,the dataanalysisprocess,andhowPythontools likeiPythonandJupyter Notebookcanhelp.	K2	PO1,PO5, PO6, PO7	PSO1, PSO2

CO2	**Apply** NumPy to work with arrays and matrices, including creating, reshaping, and performing basic operations on them.	**K3**	**PO1,PO5, PO6, PO7**	**PSO1, PSO1**
CO3	**Analyze** data using pandas by cleaning, organizing, and exploring datasets, and create simple visualizations to understand the data better.	**K4**	**PO1,PO5, PO6, PO7**	**PSO1, PSO1**
CO4	**Evaluate** and combine data from different sources, reshape it, and use visualization tools like matplotlib and seaborn to gain insights.	**K5**	**PO1,PO5, PO6, PO7**	**PSO1, PSO1**
CO5	**Create** advanced data analysis techniques by working with grouped data, time series, and more complex operations to uncover deeper insights.	**K6**	**PO1,PO5, PO6, PO7**	**PSO1, PSO1**

ForBTL:K1:Remember;K2:Understand;K3:Apply;K4:Analyze;K5:Evaluate;K6: Create

CO-POMATRIX									
CONO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**
CO1	**1**	**-**	**-**	**-**	**3**	**2**	**3**	**3**	**2**
CO2	**1**	**-**	**-**	**-**	**3**	**3**	**3**	**3**	**2**
CO3	**1**	**-**	**-**	**-**	**3**	**3**	**3**	**3**	**3**
CO4	**1**	**-**	**-**	**-**	**3**	**3**	**3**	**3**	**3**
CO5	**1**	**-**	**-**	**-**	**3**	**3**	**3**	**3**	**3**

Usethecodes3,2,1forHigh,ModerateandLowcorrelationBetweenCO-PO-PSOrespectively

Unit	Learning Units	Lecture Hours
UNIT I	**Introduction**: Introduction to Data Science, Exploratory Data Analysis and Data Science Process. Motivation for using Python for Data Analysis, Introduction of Python shell iPython and Jupyter Notebook. **EssentialPythonLibraries**:NumPy,pandas,matplotlib,SciPy,scikit-learn, statsmodels. Examples/Applications/CaseStudies: WriteaProgramtoprint"HelloWorld!"usingJupyter Notebook. Writeaprogramtoaccesstheelements inalistusingJupyter Notebook. Exercises/Projects: WriteaprogramtoDisplayKeysandvaluesinaDictionaryusingJupyterNotebook. Specific Resources:(web) W3Schools	**12Hrs**
UNIT II	**Numpy:** NumPyArrays - difference betweenpythonlists and NumPyarray, What is NumPy array, creating basic array, adding, removing and sorting elements, reshaping array, converting 1d array to 2d array, indexing and slicing, creating array from existing data, creating matrices, getting random numbers getting count and unique numbers, transposing and reshaping a matrix, reverse an array, reshaping multidimensional arrays. Examples/Applications/CaseStudies: Create a panda's series from a dictionaryyofvaluesand andarray. GiveanexampletocreateaDataFramefromasinglendarray. Exercises/Projects: WriteaPandasprogramtoselecttherowswherethescoreis missing, i.e.NaN. Write a programto generate a series of float numbersfrom21.0 to 30.0 withan increment of 1.5 each.SpecificResources:(web)3Schools.	**12Hrs**
UNIT III	**Pandas**: Introduction, Getting Started, Series, Data Frame**,** Read CSV, Read JSON **-** Analyzing DataFrames, Cleaning Data, Cleaning Empty Cell, Cleaning Wrong Format, Cleaning Wrong Data,Removing Duplicates, Correlations, Plotting. Examples/Applications/CaseStudies:	**12Hrs**

	Writeaprogramtogenerateaseriesofthefirst10numbers. WriteaPandasprogramtocountthe numberofrowsandcolumnsofa Data Frame. Exercises/Projects:Writeaprogramto generateaseriesandprintthetop3elementsusingtheheadfunction. Writeaprogramin PythontocreateaSeries inPython fromthegiven dictionary. D= {"Jan" : 31, "Feb" : 28, "Mar" : 31}. SpecificResources:(web) W3Schools	
UNIT IV	**Data Wrangling**: Hierarchical Indexing, Combining and Merging Data Sets Reshaping and Pivoting. **DataVisualization matplotlib**: Basicsofmatplotlib, plottingwithpandasandseaborn,other python visualization tools. Examples/Applications/CaseStudies: PlottingalinechartofdateversustemperaturebyaddingLabelonXandYaxis,and adding a Title and Grids to the chart. DesignaPlottingHistogram Exercises/Projects: To plot a bar chart, we will specify kind='bar'. We can alsospecify the DataFrame columns to be used as x and y axes.Let us now add a column "Days" consisting of day names to"MelaSales.csv" . UseMatplotlibandSeabornto createlinecharts, barcharts, andscatterplotsfromagiven dataset. Focus on different types of visualizations to represent data effectively. SpecificResources:(web) MatplotlibDocumentation SeabornDocumentation DataWranglingwithPandas	**12Hrs**
UNIT V	**Data Aggregation and Group operations**: Group byMechanics, Data aggregation, General split-apply-combine, Pivot tables and cross tabulation. **Time Series Data Analysis**: Date and Time Data Types and Tools, Time series Basics, date Ranges, Frequencies and Shifting, Time Zone Handling, Periods and Periods Arithmetic, Resampling and Frequency conversion, Moving Window Functions. Examples/Applications/CaseStudies: Howdoesthe "pd.Series"functionutilizethedatesvariabletocreatethetimeseries data. Whatis the purpose of using the groupby function? How does it group the data and what is the result of applying the sum function to the grouped data? Exercises/Projects: Whatdoesthepivot_tablefunctiondointhiscode?ExplainhowittransformstheDataFrame df and the purpose of the index, columns, and aggfunc parameters. SpecificResources:(web) DataAggregationGuide TimeSeriesAnalysisTutorial MatplotlibBasics	**12Hrs**

TextBooks/References:

- McKinney,W.(2017).Python for Data Analysis:Data Wrangling with Pandas,NumPy and IPython. 2nd edition. O'Reilly Media
- O'Neil,C.,& Schutt,R.(2013).DoingDataScience:StraightTalkfrom theFrontline O'Reilly Media

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SEMESTER-III

Course BCA Minor Model Paper

Paper Title Data Analysis Using Python Course Code23DSMIL231

SectionA:ShortAnswerQuestions(20Marks)

AnswerAllquestions.Eachquestion carries4 Marks.

Q1   (a)ExplainthemotivationforusingPythoninData Analysis.

OR

(b)Describethesteps intheDataScience process.

Q2   (a)Howdo you createabasicNumPyarray?Provideanexample.

OR

(b)What isthedifferencebetweenPythonlistsandNumPyarrays?Explainwithan example.

Q3   (a)HowcanyoureadaCSVfileintoaPandasDataFrame?

OR

(b)Explainhowto cleanemptycellsinaPandas DataFrame.

Q4   (a)WhatisHierarchicalIndexinginPandas?Explainits importance.

OR

(b)Describehowtoplotdatausing Matplotlib.

Q5   (a)Whatisthepurposeofthegroupbyfunctionin Pandas?

OR

(b)ExplainthebasicsofTimeSeriesdataanalysis inPython.

SectionB:LongAnswerQuestions(50Marks) Answer
All questions. Each question carries 10 Marks.

Q6   (a)HowisPythonused inDataScience?GiveexamplesofJupyterNotebook features.

OR

(b)What arethe mainstepsintheDataScienceprocess?HowdoPythonlibraries help?

Q7   (a)WhatisthedifferencebetweenPythonlistsandNumPyarrays?Show examples.

OR

(b)HowdoyouperformbasicoperationslikereshapingwithNumPyarrays?

Q8   (a)HowdoyoucreateandcleanaDataFrame inPandas?ExplainwithaCSV example.

OR

(b)HowcanyoumanagemissingvaluesandduplicatesinPandas?

Q9   (a)WhatisHierarchicalIndexinginPandas?HowdoyouuseMatplotlibfor plotting?

OR

(b)Howdoyou mergeandreshapedatainPandas?Give examples.

Q10   (a)How doesthegroupbyfunctionwork inPandas?Provide anexample.

OR

(b)Whatarethekeytechniques for analyzingtimeseriesdatainPython?

Note:

- Shortanswerquestionsassessfoundationalknowledge(Remembering,Understanding and Apply).

- Thisstructureemphasizesa focusonhigher-orderthinkingskills(Understand, Application, Analysis, and Evaluation) in the long answer section.

- Consider includinga mixofquestiontypeswithin eachsectionto ensurea comprehensive assessment.

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Data Analysis Using Python Lab

SEMESTER-III

Offered To:	II B. C. A Honours (Major)	Course Code:	**23DSMAP231**
Course Type:	Core (Practical)	Course:	**Data Analysis Using Python Lab**
Year of Introduction:	2024 – 2025	Year of offering:	2024 – 2025
Year of Revision:		Percentage of Revision:	
Semester:	III	Credits:	1
Hours Taught:	30 hrs. per semester	Max. Time:	3 Hrs

Course Description:

This course offers a detailed introductionto DataScience, emphasizing practicalapplications in Python. It covers key areas such as data exploration, cleaning, and visualization using libraries like NumPy, pandas, and matplotlib. Students will learn to handle and analyze data with pandas, create and manipulate arrays with NumPy, and visualize data with matplotlib and seaborn. The course also includes advanced topics such as data aggregation, group operations, and time series analysis, equipping students with the skills to manage andinterpret complex datasets effectively. Ideal for those seeking a solid foundation in data science with hands-on Python experience.

CourseAimsand Objectives:

S. N O	COURSEOBJECTIVES
1	UnderstandthebasicsofDataScience,includingthedataanalysisprocess,andhowto usePythontools likeiPythonandJupyterNotebookfordata analysis.
2	ApplyNumPytohandlearraysandmatrices,includingcreating,reshaping,and performing operations on them.
3	Usepandastoanalyzedatabycleaning,organizing,andexploringdatasets,andcreate visualizationstogaininsights.
4	Performdatawranglingbycombiningandreshapingdatasets,andusevisualization toolslikematplotlibandseaborntopresentdata effectively.
5	Conductadvanceddataanalysisbyaggregatingandgroupingdata,andanalyzetime

seriesdatawithtechniquessuchasresamplingandfrequencyconversion.

Course Outcomes

Attheend ofthecourse,thestudent willbeableto…

CO NO	COURSEOUTCOME	BTL	PO	PSO
CO1	**Understand**thebasicsofDataScience,thedata analysisprocess,andhowPythontoolslike iPython and Jupyter Notebook can help.	K2	PO1,PO5, PO6, PO7	PSO1, PSO2
CO2	**Apply**NumPytoworkwitharraysand matrices, includingcreating,reshaping,andperforming basicoperationsonthem.	K3	PO1,PO5, PO6, PO7	PSO1, PSO1
CO3	**Analyze** data using pandas by cleaning, organizing, and exploring datasets, and create simplevisualizationstounderstandthedata better.	K4	PO1,PO5, PO6, PO7	PSO1, PSO1
CO4	**Evaluate**andcombinedatafromdifferentsources,re shapeit,andusevisualizationtools likematplotlibandseaborntogaininsights.	K5	PO1,PO5, PO6, PO7	PSO1, PSO1
CO5	**Create** advanced data analysis techniques by working with grouped data, time series, andmorecomplexoperationstouncoverdeeper insights.	K6	PO1,PO5, PO6, PO7	PSO1, PSO1

ForBTL:K1:Remember;K2:Understand;K3:Apply;K4:Analyze;K5:Evaluate;K6: Create

CO-POMATRIX									
CONO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	1	-	-	-	3	2	3	3	2
CO2	1	-	-	-	3	3	3	3	2
CO3	1	-	-	-	3	3	3	3	3
CO4	1	-	-	-	3	3	3	3	3
CO5	1	-	-	-	3	3	3	3	3

Usethecodes3,2,1forHigh,ModerateandLowcorrelationBetweenCO-PO-PSOrespectively

CourseStructure

This lablist coversthekeyareasofa….(titleofthecourse)course, providing hands-on practice with
….(technology/software)

Unit 1:[IntroductiontoPythonandIts Libraries]   *(6Hrs)*

Lab 1:

1. WriteaProgramtoprint"HelloWorld!"usingJupyter Notebook.
2. Writeaprogramtoaccesstheelements inalistusingJupyter Notebook.

- **Dataset**(weblink)/**Experiment**:LearnbasicoperationsinPythonusingJupyter Notebook.

1. *Tasks:HelloWorldProgram:WriteaPython program toprint"Hello,World!"in Jupyter Notebook.*
2. **ListElementAccess:**WriteaPythonprogramtoaccesselementsinalistusing Jupyter Notebook.

Lab 2:

2. WriteaprogramtoDisplayKeysandvaluesinaDictionaryusingJupyterNotebook.
- **Dataset**(weblink)/**Experiment**:ExploredatastructuresinPythonusingJupyter Notebook.
- *Tasks:*
    2. **DictionaryKeys and Values:**
    WriteaPythonprogramtodisplaykeys andvalues inadictionaryusing Jupyter Notebook.

Unit2: [**Numpy**]   (6Hrs)

Lab3:

1. Createapanda'sseriesfroma dictionaryofvaluesand a ndarray.
2. GiveanexampletocreateaDataFramefromasinglendarray.
- **Dataset**(weblink)/**Experiment**:UtilizepandastohandledatastructuresinPython.
- *Tasks:*
    3. **CreatepandasSeries:**
    Writea Pythonprogramtocreatea pandasSeriesfroma dictionaryandanndarray.
    4. *CreateDataFrame:*
    WriteaPythonprogramto createaDataFramefromasinglendarrayusing pandas.

Lab4:

3. WriteaPandasprogramtoselecttherowswherethescoreis missing,i.e. NaN.
4. Writeaprogramtogenerateaseriesoffloatnumbersfrom21.0to30.0withan increment of 1.5 each.
- **Dataset**(weblink)/**Experiment**:Practicedatamanipulationandseriescreationin pandas.
- *Tasks:*
    1. **SelectRowswith NaN:**
    Writeapandasprogramtoselectrowswherethescoreis missing(NaN).
    2. *GenerateFloat Series:*
    WriteaPythonprogramto generate aseriesoffloat numbersfrom21.0 to 30.0witha 1.5increment.

Unit3: [**Pandas**]   (6Hrs)

Lab5:   *Writea programtogenerate aseriesofthe first10numbers.*
    1. Writea Pandasprogramto countthe numberofrowsandcolumnsofa Data Frame
    (weblink)/**Experiment**:Explorebasicoperationsinpandaswithseriesand DataFrames.
- *Tasks:*
    1. **GenerateNumberSeries:**
    Writea Pythonprogramtogenerate aseriesofthefirst10numbers.
    2. *CountRows and Columns:*
    Writeapandasprogramtocountthenumberofrowsand columnsina DataFrame.

Lab6: *Write a program to generate aseriesandprint thetop3elementsusingthe head function.*
    3. WriteaprograminPythonto createaSeries inPythonfromthegivendictionary. D= {"Jan" : 31, "Feb" : 28, "Mar" : 31}.
- **Dataset**(weblink) / **Experiment**:PerformbasicoperationswithpandasSeries.
- *Tasks:*
    1. **Top3Elementswithhead():**
    WriteaPythonprogramtogenerateaseriesandprint thetop3elementsusingthe head() function.
    2. *CreateSeriesfromDictionary:*
    WriteaPythonprogramtocreateaSeries fromthedictionaryD={"Jan":31, "Feb": 28, Mar": 31}.

Unit 4:[DataWrangling and Data Visualization]   *(6Hrs)*
    Lab 7:

    3. Plottinga linechartofdateversustemperaturebyaddingLabelonXandYaxis, and adding a Title and

Grids to the chart.
4. Designa programtovisualizedata witha histogram.
- **Dataset**(weblink)/**Experiment**: Createvisualrepresentationsofdatausingmatplotlib.
- *Tasks:*
  1. **Line Chart:**
     Plotalinechartofdateversustemperature,adding labelsontheXandYaxis, atitle, and grids.
  2. *HistogramVisualization:*
     Designaprogramto visualizedatausing ahistogram.

Lab 8:

3. To plot a bar chart, we will specify kind='bar'. We can also specify the DataFrame columns to be used as x and y axes. Let us now add a column "Days" consisting of day names to "MelaSales.csv".
4. Use Matplotlib and Seaborn to create line charts, bar charts, and scatter plots from a given dataset. Focus on different types of visualizations to represent data effectively.
- **Dataset**(weblink)/**Experiment**:EnhancedatavisualizationskillsusingMatplotliband Seaborn.
- *Tasks:*
  1. **BarChartwithDaysColumn:**
     Plotabarchart specifyingkind='bar',addinga"Days"columntoMelaSales.csvfor the X-axis.
  2. *MultipleVisualizations:*
     UseMatplotlibandSeaborntocreatelinecharts,barcharts,andscatterplots, focusing on
     effective data representation.

Unit 5:[DataAggregationandTimeSeriesData Analysis](6Hrs)

Lab 9:

3. How does the "pd.Series" function utilize the dates variable to create the time series data.
4. Whatis the purpose of using the groupbyfunction? How doesitgroup the data and what is the result of applying the sum function to the grouped data?
- **Dataset**(weblink)/**Experiment**:Exploretimeseriescreationanddatagrouping in pandas.
- *Tasks:*
  3. **TimeSerieswith pd.Series:**
     Utilizethedatesvariablewithpd.Seriestocreatetimeseriesdata.
  4. *Groupbyand Sum Function:*
     Understandthepurposeofthegroupbyfunction, howit groupsdata, andtheresult of applying
     the sum function to grouped data.

Lab 10:

2.Whatdoesthepivot_tablefunctiondointhiscode?Explainhowittransformsthe DataFrame df and
     the purpose of the index, columns, and aggfunc parameters.
- **Dataset**(weblink)/**Experiment**:Learntousepivottablesfordatatransformationin pandas.
- *Tasks:*
  2. **PivotTableFunction:**
     Explainthepivot_table functioninpandas,detailinghowittransformsDataFramedf using the
     index, columns, and aggfunc parameters.

Lab Manual:

- McKinney,W.(2017).Python for Data Analysis:Data Wrangling with Pandas,NumPy and IPython. 2nd edition. O'Reilly Media

References:

3. McKinney,W.(2017).Python for Data Analysis:Data Wrangling with Pandas,NumPy and IPython. 2nd edition. O'Reilly Media
4. O'Neil,C.,& Schutt,R.(2013).DoingDataScience:StraightTalkfrom theFrontline O'Reilly Media

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Title of the Paper : Ecommerce and Web Designing

SEM:III   **Offered to: II B.Com(CA) (Major)**

Offered To:	II B.Com(CA) (Major)	Course Code:	23CAMAL231
Course Type:	Core (Theory)	Course:	E Commerce and Web Designing
Year of Introduction:	2024-25	Year of offering:	2024 – 2025
Year of Revision:		Percentage of Revision:	
Semester:	III	Credits:	3
Hours Taught:	60 hrs. per semester	Max. Time:	4 Hrs

Course Description:

The Objective of E-Commerce revolve around leveraging digital platforms to achieve various business goals. Here are some key objectives. E-commerce aims to boost sales by providing a convenient and accessible platform for customers to browse, choose, and purchase products or services online. The objective is to overcome geographical limitations and reach a global audience. E-commerce allows businesses to transcend borders and cater to customers worldwide.

E-commerce seeks to reduce operational costs associated with traditional brick-and-mortar stores, such as rent, utilities, and staffing. It aims for efficient and streamlined processes. E-commerce platforms are designed to operate 24/7, providing customers with the flexibility to shop at any time. The goal is to eliminate time constraints and cater to diverse time zones.

Course Aims and Objectives:

S.NO	COURSE OBJECTIVES
1	Acquire basic knowledge of fundamental concept of E-commerce & Web Designing.
2	Impact the basic concepts of B2c-Business, B2c Software Systems.
3	Understand the concepts Foundations of Risk Management, Compliance Management.
4	Understand about Introduction to Web Programming.
5	Understand about Introduction to CSS Overview

Course Outcomes

At the end of the course, the student will be able to…

CO NO	COURSE OUTCOME	BTL	PO	PSO
CO1	Gain the knowledge in-depth training in use of E-commerce & Web Designing.	K1	5	1
CO2	Understand the concepts of B2c-Business, B2c Software Systems.	K2	5	1
CO3	Understand the acquire basic knowledge in the Risk Management, Compliance Management.	K2	5	1
CO4	Apply the Web Programming, especially HTML	K3	5	1
CO5	Analysing the concepts of CSS overview and CSS rules.	K4	6	1

CO-PO MATRIX									
CO NO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1					1	2	3	1	
CO2					1	2	3	1	
CO3					1	2	3	1	
CO4					1	2	3	1	
CO5					1	2	3	1	

High , Medium , Low 3, 2, 1

Syllabus		
Unit	Learning Units	Lecture Hours
I	Unit – 1: [Basics and Definitions] Definition, E-Commerce with 5-C Model, Additional Terms, Business Models Related to E-Commerce. Advantages and Disadvantages, Web 2.0, Technical and Economic Challenges. Frameworks and Architectures: Actors and Stakeholders, Fundamental Sales Process and His 7+1 Process Steps Work, Technological Elements, Typical Applications. **Description:** E-commerce, or electronic commerce, refers to the buying and selling of goods and services over the internet. It encompasses a wide range of online business activities, including. **Learning Outcome:** The student should learn E-Commerce with 5-C Model. **Example:** Amazon is one of the largest and most well-known e-commerce platforms in the world. It provides a vast marketplace where consumers can purchase a wide range of products, from books and electronics to clothing and household goods. **Exercise 1:** Create a web page to display a hyperlink which when clicked directs you toAmazon website. **Exercise 2:** Create a web page to demonstrate your college name aligned with the logo ofyour college. **Exercise 3:** Create a web page to demonstrate definition lists taking various applications ofecommerce as an example. **Web links:** https://onlinecourses.swayam2.ac.in/nou21_cm14/preview	12Hrs
II	Unit – 2: B2C Business: (12Hrs) B2c Basics, B2c-Business and CRM, B2c Software Systems, Customer Relationship Management (CRM) B2B Business: B2b Basics, Differences Between B2b And B2c, B2b Software Systems. Supply Chain Management. **Description** B2C, or Business-to-Consumer, refers to the transactions and interactions that occur directly between businesses and individualconsumers. In a	12Hrs

		B2C model, companies sell products or services directly to end-users rather than to other businesses. This is the most common model for retail, e-commerce, and various service industries. **Learning Outcome:** The student should learn B2c-Business and CRM, B2c Software Systems. **Example:** A real-time example of a B2C (Business-to-Consumer) business is Apple. Apple sells its products, such as iPhones, iPads, MacBooks, and accessories, directly to consumers through its physical Apple Stores and its online Apple Store. **Exercise 1:** Create a web page which asks for mode of payment which includes the options: Credit card/Debit card/Online transfer (use radio buttons) **Exercise 2:** Create a web page which asks the user to enter his credit card details. Use textboxes, drop down buttons. **Exercise 3:** Create a web page to display definition list which defines the terms: B2B, B2C, C2B, C2C. **Web links: https://onlinecourses.swayam2.ac.in/nou21_cm14/preview**	
III		**Unit – 3: Security & Compliance Management:** Foundations of Risk Management, Compliance Management, Information Security Management (Ism), Technology. **Electronic Payment:** Business and Money, the Payment Challenge, , ReceivablesManagement, Cyber Money. **Description:** Refers to the processes and technologies that organizations use to protect their information systems and ensure adherence to regulatory and industry standards. this encompasses a broad range of activities designed to safeguard data, maintainsystem integrity, and manage risk. **Learning Outcome:** The student should learn Risk Management, Compliance Management,Information Security Management (Ism), Technology. **Example:** Security and compliance management is Microsoft Azure Security Center. **Exercise 1:** Create a web page which displays four buttons containing text B2B, B2C, C2B, C2C. Also, when a button is clicked details about the clicked subject should appear on a separate page. **Exercise 2:** Create a web page which asks for mode of payment which includes the options: Credit card/Debit card/Online transfer (use radio buttons). **Exercise 3:** Create a web page to scroll the text "E-Commerce" for exactly 5 times from leftto right of the screen. . **Web links: https://onlinecourses.swayam2.ac.in/nou21_cm14/preview**	12Hrs
IV		**Unit 4: Introduction to Web Programming:** Introduction, creating website, (12Hrs) HTML tags, HTML Elements, HTML attributes, CSS Preview, History of HTML, Differencesbetween old HTML and HTML5, how to check your **HTML code** Coding Standards, Block Elements: HTML coding conventions, Comments, HTML Elements, Should Describe Web Page Content Accurately, Content Model Categories, Block Elements, block quote Element, Whitespace Collapsing, pre-Element, Phrasing Elements, Editing Elements, q and cite Elements, dfn, abbr, and time Elements, Code-Related Elements, br and wbr Elements. **Text Elements, and Character References:** sup, sub, s, mark, and small Elements, strong,em, b, u, and i Elements, span Element, Character References, Web Page with Character References, and Phrasing Elements. **Description:** The foundational concepts and technologies used to create and manage websites and web applications. This field involves a combination of languages, tools, and practices that enable developers to build interactive and	12Hrs

| | | dynamic web experiences.
Learning Outcome: The student should learn Risk Management, Compliance Management,Information Security Management (Ism), Technology.
Example: An introduction to web programming could be creating a simple personalportfolio website.
Exercise 1: Create a web page to insert an image which when clicked redirects you to your college website.
Exercise 2: Create a web page to display the name of your college in h6 size with blue as fontcolor and background color yellow separated by a thick line and below which a paragraph about the facilities offered by your college is described.
Exercise 3: Create a web page to demonstrate a pull-down menu. The menu should contain the list of your favorite south Indian dishes.
Web links: https://onlinecourses.swayam2.ac.in/nou21_cm14/preview | |
| V | | **Unit – 5: Cascading Style Sheet (CSS):** CSS Overview, CSS Rules, Example with Type Selectors and the Universal Selector, CSS Syntax and Style, Class Selectors, ID Selectors, spanand div Elements, Cascading, style Attribute, style Container, External CSS Files, CSS Properties, Color Properties, RGB Values for Color, Opacity Values for Color, HSL and HSLA Values for Color, Font Properties, line-height Property, Text Properties, Border Properties, Element Box, padding Property, margin Property.
Description: Cascading Style Sheets (CSS) is a stylesheet language used to describe the presentation of a document written in HTML or XML. CSS allows you to control the layout, colors, fonts, and overall visual appearance of web pages. **Learning Outcome:** CSS effectively equips you with the skills to style and layout web pages with precision and creativity.
Example: CSS would be applied to enhance the visual appeal of product pages, making them more attractive and functional for users.
Exercise 1: Create a web page with name of your college as text. The text should scroll, alternate and slide.
Exercise 2: Create a web page to display an image surrounded by text on all the four sides.
.**Exercise 3:** Create a web page to display 3 images which are aligned left, right and centerrespectively.
Web links: https://onlinecourses.swayam2.ac.in/nou21_cm14/preview | 12Hrs |

Text Books:

1.Introduction to E-Commerce: Combining Business and Information Technology By MartinKutz.

2.Lallana, Quimbo, Andam, 4. Cf. Ravi Kalakota and Andrew B. Whinston, ElectronicCommerce: A Manager's Guide (USA: Addison Wesley Longman, Inc., 1997), 19-20.

References:

1.Web Programming with HTML5, CSS and JavaScript, John Dean, Jones & BartlettLearning

2.HTML & CSS: The Complete Reference, 5th Edition, Thomas. A. Powell.

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E Commerce and Web Designing
MODEL PAPER

CLASS: B. Com C. A   Max. Marks:70M
Course Code: **23CAMAL231**   **Min. Pass: 28M**
Semester: III   **Time: 3 Hours**

Section A: Short Answer Questions

Answer All questions.
Each question carries 4 Marks.   **Marks: 20**

Q1   (a)   Describe E-Commerce with 5-C Model.   K1
         OR
    (b)   Describe the concept of Web 2.0.   K1

Q2   (a)   Interpret B2c Software Systems.   K2
         OR
    (b)   Distinguish Between B2b And B2c.   K2

Q3   (a)   Illustrated the concept of Compliance Management.   K3
         OR
    (b)   Demonstrate Information Security Management (Ism).   K3

Q4   (a)   Illustrated the concept of HTML Elements   K3
         OR
    (b)   Elaborate old HTML and HTML5   K2

Q5   (a)   Describe the CSS Rules.   K1
         OR
    (b)   Describe the concept of Class Selectors   K1

Section B: Long Answer Questions

Answer All questions.
Each question carries 10 Marks.   **Marks: 50**

Q6   (a) Explain about Business Models Related to E-Commerce.   K1
       OR
   (b) What is the Fundamental Sales Process and His 7+1 Process Steps Work? K1

Q7   (a) Explain the concept of Supply Chain Management   K1
        OR
    (b)   What is the Customer Relationship Management (CRM).   K2

Q8
    (a)   Illustrate the concept of Foundations of Risk Management   K3
        OR
    (b)   Describe the Payment Procedures and Cyber Money.   K1

Q9   (a)   Describe the HTML tags, HTML Elements, HTML attributes.   K1
        OR
    (b)   Describe the Web Page with Character References, and Phrasing Elements. K1

Q10   (a)   Explain the concept of CSS Syntax and Style.   K1
        OR
    (b)   Describe the Border Properties, Element Box, padding Property, marginProperty.K4

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Offered To:	II B.Com(CA) (Major)	Course Code:	23CAMAP231
Course Type:	Core (Practical)	Course:	E Commerce and Web Designing LAB
Year of Introduction:	2024-25	Year of offering:	2024 – 2025
Year of Revision:	2024	Percentage of Revision:	
Semester:	III	Credits:	1
Hours Taught:	30 hrs. per semester	Max. Time:	2Hrs

Course Description:

The objective of course is to provide students with practical experience using the questions should be practiced using **Blue Griffon, Google Web Designer, KompoZer and open Element /any related tools.** The students should be taught the usage of appropriate html tags for these questions

Course Aims and Objectives:

S. N O	COURSE OBJECTIVES
1	Students will learn to implement display a hyperlink which when clicked directs you to Amazon website.
2	Students will explore and implement B2c Basics, B2c-Business and CRM, B2c Software Systems
3	Students will analyze Foundations of Risk Management, Compliance Management.
4	Students will apply the concept of html tags, html elements, html attributes, css preview
5	Students will improve their proficiency in programming languages HTML coding conventions, Comments, HTML Elements, Should Describe Web Page

Course Outcomes

At the end of the course, the student will be able to…

CO NO	COURSE OUTCOME	BTL	PO	PSO
CO1	Implement web page to demonstrate taking various applications of ecommerce.	K2	6,7	1,2
CO2	Analyze the performance of Credit card/Debit card/Online transfer.	K3	6,7	1,2
CO3	Apply web page to display definition list which defines the terms: B2B, B2C, C2B, C2C.	K3	6,7	1,2
CO4	Develop efficient and optimize HTML code for various E-Commerce operations.	K3	6,7	1,2
CO5	Demonstrate proficiency in a programming language used for Web Page.	K3	6,7	1,2

For BTL: K1: Remember; K2: Understand; K3: Apply; K4: Analyze; K5: Evaluate; K6: Create

CO-PO MATRIX									
CO NO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1						2	3	2	2
CO2						3	2	2	3
CO3					3	2	3	3	2
CO4						3	3	2	3
CO5						3	3	3	3

Use the codes 3, 2, 1 for High, Moderate and Low correlation Between CO-PO-PSO respectively

Course Structure

This lab list covers the key areas of a Web Designing lab course, providing hands-on practice with various Web Designing, enabling students to implement and manipulate these Web Designing to solve real-world problems efficiently. Through a series of HTML programming exercises and projects, students will develop practical skills in designing, analyzing, and optimizing Web Designing.

Unit 1: Basic Concepts: (6Hrs)

Lab 1: *Create a web page to display a hyperlink which when clicked directs you to Amazon website.*
   Exercise 1: *Display a hyperlink:*

   Objective: Learn to display a hyperlink which when clicked directs you to Amazon website.
   Tasks:

   Write a program to display a hyperlink which when clicked directs you to Amazon website

.Lab 2:

   2. Create a web page to demonstrate your college name aligned with the logo of your college.

   Exercise 1:
   Display a college logos**:**
   Objective: Learn to develop HTML code for creating websites
   Tasks:
   Write a program to create a college name aligned with the logo of your college

   Unit 2: Digital Marketing
   Lab 3:
        Digital Marketing

Representation of Scrolls randomly

Objective: To understand the concept and web page to display the text "Digital Marketing"

2. Tasks:

Write Program Create a web page to display the text "Digital Marketing" which scrollsrandomly.

Lab 4:

E-Commerce" for exactly 5 times from left to right of the screen.

Representation of moving of text left to right

Objective: To understand the concept and types of Web pages.

2. Tasks:

Write Program to implement Create a web page to scroll the text "E-Commerce" for exactly 5 times from left to right of the screen.

Lab 5:

Redirection of pages

Representation of redirects you to your college website.

Objective: To understand the concept how to redirect the web page better

4. **Tasks:**
5. Write Program to implement a web page to insert an image which when clicked redirects you to your college website.
6. Create a web page to display the name of your college in h6 size with blue as font colour

Unit 3: Headings

Lab 6

Headings

Implementing the headings in the web page.

2. **Objective:** Understanding to implement the headings in the webpage.

Create a web page to display the name of your college in h6 size with blue as font colour

Lab 7:

Create a web page to demonstrate a pull-down menu. The menu should contain the list of your favorite south Indian dishes.

Create a web page with name of your college as text. The text should scroll, alternate and slide.

Create a web page to display an image surrounded by text on all the four sides.

Unit 4:

Images Which Are Alignment

Lab 8:

2. **Objective:** Implementation of Alignments
3. **Tasks:**

a) Create a web page to display 3 images which are aligned left, right and center respectively.

b) Create a login page asking the user to enter his username and password followed by a submit button

Unit 5: Form titled as Feedback form   (6Hrs)

Lab 9:

Creation of forms with feedback form

1. Feedback Form:

Objective: Understanding **Creation of Feeback forms**

a) Create a web page using a form titled as Feedback form which takes the feedback of faculty teaching a particular subject in your college.

b) Create an unordered list of popular B2C ecommerce web sites.

References:

1. "Introduction to E-Commerce: Combining Business and Information Technology By Martin Kutz.
2. Web Programming with HTML5, CSS and JavaScript, John Dean, Jones & Bartlett Learning
3. HTML & CSS: The Complete Reference, 5th Edition, Thomas. A. Powell. .

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SEM:III　　　　　　　　**DIGITAL MARKETING Offered to: II B.Com(CA) (Major)**

Offered To:	II B.Com(CA) (Major)	Course Code:	23CAMAL232 / 23DMMIL231
Course Type:	Core (Theory)	Course:	DIGITAL MARKETING
Year of Introduction:	2024-25	Year of offering:	2024 – 2025
Year of Revision:	2024	Percentage of Revision:	
Semester:	III	Credits:	3.
Hours Taught:	30 hrs. per semester	Max. Time:	2Hrs

Course Objectives:

The course aims to identify the impact of digital space and digital marketing in reaching out to customers. Understand the importance of Search Engines and explain the working of Search Engines. Able to Define email Marketing and have knowledge on how Social Media Marketing is to be used by marketers?

Learning Outcomes:

The Students will be able to: Use digital media for the creation of products and services and relate Search Engines in the digital marketing ecosystem. Use Search Engine Marketing for advertisements and know the Social Media platforms like Face book, Twitter, YouTube & LinkedIn for Marketing. Outline email Marketing and strategy to craft email marketing campaign.

Course Aims and Objectives:

S.NO	COURSE OBJECTIVES
1	Analyze the differences between traditional and digital marketing.
2	Familiarize yourself with various online ad formats.
3	Learn about the fundamentals and various types of email marketing.
4	Understand the role of blogs, podcasts, and webinars in social media marketing.
5	Learn about on-page and off-page SEO techniques.

Course Outcomes

At the end of the course, the student will be able to

CO NO	COURSE OUTCOME	BTL	PO	PSO
CO1	Compare and contrast traditional and digital marketing approaches, highlighting their strengths and weaknesses.	K2	1	2
CO2	Understand network advertising and its role in digital marketing.	k2	1	2
CO3	Understand the importance of consent in email marketing and best practices for opt-in advertising.	K3	2	3
CO4	Develop a strategic social media marketing plan tailored to specific goals and objectives.	K4	2	3
CO5	Understand strategies for improving search engine rankings through external factors.	K2	3	2

For BTL: K1: Remember; K2: Understand; K3: Apply; K4: Analyze; K5: Evaluate; K6: Create

CO-PO MATRIX									
CO NO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	1	2							
CO2	1					2			
CO3			1		2				
CO4				1	2				
CO5		1		2					

`

Use the codes 3, 2, 1 for High, Moderate and Low correlation Between CO-PO-PSO respectively

Syllabus:

Unit	Syllabus Topics	Number of hours per week
I	Digital Marketing: Introduction to Digital Marketing. Traditional Vs. Digital Marketing, Technology behind Digital Marketing, Characteristics of Digital Marketing, Digital Marketing Strategy, Understanding Digital Consumer. **EXAMPLES/APPPLICATIONS/CASE STUDIES:** **Examples on Digital marketing vs traditional marketing** **Examples on Digital marketing strategies.** **EXERCISES/PROJECTS:** **Project on different Digital consumers.** **Project on recent technology of Digital marketing.** **SPECIFIC RESOURCES: (WEB)** https://blog.hubspot.com/marketing/traditional-marketing-vs-digital-marketing https://www.smartinsights.com/digital-marketing/technology-behind-digital-marketing/ https://www.forbes.com/sites/forbestechcouncil/2021/03/11/five-characteristics-of-successful-digital-marketing-strategies/?sh=3d86315c11f4	12
II	Online Advertising: Introduction, Objective, Where to Advertise, Online Ad Format, Search Engine Ad, Network Advertising, Affiliate Programs, Landing Pages **EXAMPLES/APPPLICATIONS/CASE STUDIES:** • **Different types of Advertising.** **EXERCISES/PROJECTS:** • **Project on Online advertisements.** • **Project on Online ads formats.** **SPECIFIC RESOURCES: (WEB)** https://blog.hubspot.com/marketing/online-advertising https://support.google.com/google-ads/answer/6320 https://www.adroll.com/blog/marketing/digital-ad-formats	12
III	Email Marketing: Introduction, Types of Email, Email Marketing Campaign Process, Email marketing Tools, Advantages and Disadvantages, Opt-in Email Advertising, Email tracking **EXAMPLES/APPPLICATIONS/CASE STUDIES:** • **Different types of Email marketing.** **EXERCISES/PROJECTS:** • **Project on Email marketing tools.** • **Project on Email tracking.** **SPECIFIC RESOURCES: (WEB)** https://mailchimp.com/email-marketing/ https://blog.hubspot.com/marketing/types-of-marketing-emails https://blogs.constantcontact.com/email-marketing-pros-and-cons/	12

IV	Social Media Marketing (SMM): What is Social Media Marketing, Seven Myths of SMM, Characteristics of Successful Social Media Marketer, Social Media Marketing plan, Social Media marketing Tools, Publishing Blogs, Podcast and Webinars, Social Media Monitoring, Social Media: Face book, Twitter? **EXAMPLES/APPPLICATIONS/CASE STUDIES:** • **Different Social media markets.** **EXERCISES/PROJECTS:** • **Project on Social media marketing tools.** • **Project on Social media monitoring.** **SPECIFIC RESOURCES: (WEB)** https://blog.hubspot.com/marketing/social-media-marketing https://blog.hootsuite.com/social-media-manager-skills/ https://sproutsocial.com/insights/social-media-tools/	12
V	Search Engine Optimization (SEO): Understanding SEO, Search Engine Optimization Process – Goals, On-Page Optimization, Off-Page Optimization and Analyze, Search Engine Result Process (SERP), SEO Tools. **EXAMPLES/APPPLICATIONS/CASE STUDIES:** • **Different** Search Engine Optimization. **EXERCISES/PROJECTS:** • **Project on** Search Engine Result Process (SERP). • **Project on** SEO Tools. **SPECIFIC RESOURCES: (WEB)** https://moz.com/beginners-guide-to-seo https://www.searchenginejournal.com/seo-process/ https://neilpatel.com/what-is-seo-tools/ https://neilpatel.com/what-is-seo-tools/	12

Textbooks:
1. Digital Marketing by Seema Gupta, McGraw Hill Education
2. Fundamentals of Digital Marketing by Punit Singh Bhatia, Pearson

References:

1. Digital Marketing by Mohammed Mustafa, Ramakrishna Dasiga& Kakara VVS Chowdary, first edition 2024, Himalaya Publishing House Pvt Ltd.

2. Digital Marketing by Puneet kumar, Kalyani Publications, first edition in the year 2024.

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DIGITAL MARKETING
MODEL PAPER

CLASS: B. Com CA	Max. Marks:70M
Course Code: **23CAMAL232** / 23DMMIL231	**Min. Pass: 28M**
Semester: III	**Time: 3 Hours**

Section A: Short Answer Questions (20 Marks)

Answer All questions. Each question carries 4 Marks.

Q1   (a)   Explain the Mobile Marketing.

                        OR

    (b)   What is Digital Marketing strategy?

Q2   (a)   What is Search Engine Advertising?.

                        OR

    (b)   What is Advertising Network?

Q3   (a)   Explain the importance of E-mail marketing.

                        OR

    (b)   What is Single Opt-in Email?

Q4   (a)   What is Twitter Marketing?

                        OR

    (b)   What are the Face book- Do's and Don'ts?

Q5   (a)   Explain Sear Engine Rank.

                        OR

    (b)   What is Off-Page SEO?

Section B: Long Answer Questions (50 Marks)

Answer All questions. Each question carries 10 Marks.

Q6   (a)Explain the Differences between Traditional Marketing Vs Digital Marketing.

                        OR

    (b)   Explain the features and importance of Digital Marketing.

Q7   (a)   What are the Online Advertising Advantages and Dis-advantages?

                        OR

    (b)   Explain the Importance of Landing Pages .

Q8   (a)   What are E-mail Tracking and its characteristics?

                        OR

    (b)   Explain various E-mail Tracking tools..

Q9   (a)   What are the Objectives of Social Media Marketing?

                        OR

    (b)   Explain the Elements including Publish a Blog.

Q10   (a)   Explain different types of On-Page SEO (On-Site SEO).

                        OR

    (b)   What is Search Engine Optimization Process (SERP) and its features?

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SEM:III   **DIGITAL MARKETING LAB Offered to: II B.Com(CA) (Major)**

Offered To:	II B.Com(CA) (Major)	Course Code:	23CAMAP232 / 23DMMIP231
Course Type:	Core (Practical)	Course:	DIGITAL MARKETING
Year of Introduction:	2024-25	Year of offering:	2024 – 2025
Year of Revision:	2024	Percentage of Revision:	
Semester:	III	Credits:	1
Hours Taught:	30 hrs. per semester	Max. Time:	2Hrs

Course Description:
This Digital Marketing course offers a comprehensive introduction to the fast-paced world of online marketing. Designed for beginners and professionals alike, it covers key strategies and tools used to effectively reach and engage digital audiences.

Course Objectives:
At the end of the course, the student will be able to

CO NO	COURSE OBJECTIVE	BTL	PO	PSO
CO1	Compare and contrast traditional and digital marketing approaches, highlighting their strengths and weaknesses.	K2	1	2
CO2	Understand network advertising and its role in digital marketing.	k2	1	2
CO3	Understand the importance of consent in email marketing and best practices for opt-in advertising.	K3	2	3
CO4	Develop a strategic social media marketing plan tailored to specific goals and objectives.	K4	2	3
CO5	Understand strategies for improving search engine rankings through external factors.	K2	3	2

For BTL: K1: Remember; K2: Understand; K3: Apply; K4: Analyze; K5: Evaluate; K6: Create

CO-PO MATRIX									
CO NO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	1	2							
CO2	1					2			
CO3			1		2				
CO4				1	2				
CO5		1		2					

`

Use the codes 3, 2, 1 for High, Moderate and Low correlation Between CO-PO-PSO respectively

LIST OF EXPERIMENTS

1. Digital Marketing Implementation in Business Scenario
2. Create the Digital Marketing Webpage
3. Conducting the Search Engine Optimization and Search Engine Marketing
4. Using Google Analytics to analyze website performance
5. Creating Promotional banner through Canva
6. Face book Promotion using banners
7. Creating YouTube Channel for Marketing
8. Twitter Marketing
9. Instagram Marketing
10. Email Marketing

Offered To:	**II B.Com(CA) (Minor)**	**Course Code:**	**23ITMIL231/23BAMIL231**
Course Type:	Core (Practical)	**Course:**	**Data Base Management Systems**
Year of Introduction:	2024-25	**Year of offering:**	2024 – 2025
Year of Revision:	2024	**Percentage of Revision:**	
Semester:	III	**Credits:**	3
Hours Taught:	60 hrs. per semester	**Max. Time:**	4Hrs

Course Description:

This course provides an in-depth introduction to DBMS. Students will explore the fundamental concepts and techniques for designing, implementing, and managing databases.

Course Aims & Objectives:

S. No	COURSE OBJECTIVES
1	An ability to apply Knowledge of computing and mathematics in Computer Science.
2	An ability to analyse a problem, identify and define the computing requirements appropriate to its solution.
3	An ability to design, implement and evaluate a computer-based system to meet desired needs with appropriate societal considerations.
4	An ability to conduct investigations, interpret data and provide conclusions in investigating complex problems related to Computer Science.
5	An ability to engage in continuing professional development and life-long learning.

Course Outcomes:

At the end of the course, the student will / will be…

NO	COURSE OUTCOME	BTL	PO	PSO
CO1	An ability to apply Knowledge of computing and mathematics in Computer Science.	K3	6,7	1,2
CO2	An ability to analyse a problem, identify and define the computing requirements appropriate to its solution.	K4	6,7	1,2

CO3	An ability to create, implement and evaluate a computer-based system to meet desired needs with appropriate societal considerations.	**K6**	**6,7**	**1,2**
CO4	An ability to evaluate investigations, interpret data and provide conclusions in investigating complex problems related to Computer Science.	**K5**	**6,7**	**1,2**
CO5	An ability to understand continuing professional development and life-long learning.	**K2**	**6,7**	**1,2**

For BTL: K1: Remember; K2: Understand; K3: Apply; K4: Analyze; K5: Evaluate;K6: Create

CO-PO-PSO MATRIX									
CO NO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**
CO1						1	2	1	1
CO2						2	1	1	2
CO3					2	1	2	2	1
CO4						2	2	1	2
CO5						2	2	2	2

Use the codes 3, 2, 1 for High, Moderate and Low correlation Between CO-PO-PSO

respectively

Syllabus		
Unit	**Learning Units**	**Lecture Hours**
I	Overview of Database Management System: **Introduction:** Database system, Characteristics (Database Vs File System), Database Users, Advantages of Database systems, Database applications. **Data Models:** Introduction; types of data models, Concepts of Schema, Instance and data independence, Three tier schema architecture for data independence; Database system structure. Description : Databases describe the differences between Database systems and File based systems. It also studies database models and their advantages and dis-advantages. Database system architecture is designed at different levels. Learning Outcomes:Explain the basic concepts of database and file system with its applications, types of datamodels, database system structure and architecture. Exercises/Projects:Draw the architecture for the database structure. Special Resources: (web) Introduction to Database Systems by Prof. Srineevasa Kumar, IIT Madras **https://archive.nptel.ac.in/courses/106/106/106106220/**	12Hrs
II	**Relational Model:** Introduction to relational model, Codd's rules, concepts of domain, attribute,tuple, relation, constraints (Domain, Key constraints, integrity constraints) and their importance. **Normalization:** Purpose of Normalization or schema refinement, normal forms based on functional dependency(1NF, 2NF and 3 NF), Boyce-codd normal form(BCNF). Description: Describe Relational model and normalization for database design for reducing redundancy indata with the help of several normalization techniques. Learning Outcomes: Explain the relational model and normalization techniques for database design in databasesystem. Exercises/Projects:Draw the relational database model with a real time example.	12Hrs

	Special Resources: (web) Normalization Techniques by Dr. Ganapathy Krishnamurthy , IIT Madras **https://www.youtube.com/watch?v=9rj.JDHAkitY**	
III	**Entity Relationship Model:** Introduction, Representation of entities, attributes, entity set, relationship, relationship set, constraints, sub classes, super class, inheritance, specialisation, generalisation using ER Diagrams. **BASIC SQL:** Database schema, data types, DDL operations (create, alter, drop, rename),DMLoperations (insert, delete, update), basic SQL querying (select and project) using whereclause,arithmetic & logical operations, aggregation. Description: Entity Relationship is examined in data storage and query processing using SQL. It helps in create, maintain and manipulate a relational database using SQL. Learning Outcomes: Explain the Relationship model with its constraints using real time examples. Exercises/Projects: Draw the structure of specialisation and generalisation. Special Resources: (web) Entity Relationship Model, Prof. N. L. Sarada, IIT Bombay **https://www.youtube.com/watch?v=WSNqcYqByFk**	12Hrs
IV	**SQL:** Nested queries/ subqueries, implementation of different types of joins, SQL functions (Date,Numeric, String, Conversion functions), Creating tables with relationship, implementation ofkey and integrity constraints, views. Description:SQL queries try to work on different types of data to convert some sample data toinformation and implementation of key and integrity constraints. Learning Outcomes: Explain the implementation of key and integrity constraints and functions in SQL. Exercises/Projects: Draw the structure of the join and its types with suitable examples. Special Resources: (web) Joins and its types, N. Praveen Kumar, IIT Kanpur **https://www.youtube.com/watch?v=a-MELgvfGdQ**	12Hrs
V	**PL/SQL:** Introduction , Structure , Control Structures , Cursors , Procedure , Function , Packages ,Exception Handling. Cursor, using cursors in PL/SQL program Description: Programming Language using SQL and concepts on cursors, control structures, procedures, functions, packages and exception handling. Learning Outcomes: Explain the concepts on cursors, control structures, procedures, functions and packages.Exercises/Projects: Draw the structure of exception handling. Special Resources: (web) PL/SQL Programming by Prof. Srineevasa Kumar, IIT Madras https://www.youtube.com/watch?v=jb-7jDate8w **Specific Resources**:	12Hrs

Text Books:

1. *Database Management Systems, 3rd Edition , Raghurama Krishnan, JohannesGehrke, TMH*
2. **Database System Concepts,5th Edition , Silberschatz, Korth, TMH**

Web Resources: C:/Users/cscdept/Downloads/Ramakrishnan%20-%20Database%20Management%20Systems%203rd%20Edition.pdf
Prof. Partha Pratim Das,Department of Computer science and Engineering,IIT Kharagpur.
https://www.youtube.com/watch?v=OMHbGm9SQuE&list=PLZ2ps_7DhBYc4jkUk_yQAjYEVFzVzhdU&index=1

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Database Management Systems MODEL PAPER

CLASS: B. Com C. A	Max. Marks:70M
Course Code: **23ITMIL231**	**Min. Pass: 28M**
Semester: III	**Time: 3 Hours**

Section A: Short Answer Questions (20 Marks)

Answer All questions. Each question carries 4 Marks.

1   A)What are the differences between data and information.(K1)

(OR)

B) Write a short note on evolution of data models. (k2)

2   A).Write about CODD'S rules? (k2)

(OR)

B). Explain about functional dependency in dbms? (k1)

3   A) Explain about ER model (k1)

(OR)

B) Write about DML operations. (k2)

4   A) Explain different types of Aggregate functions in SQL. (k1)

(OR)

B) Write a short note on views in SQL. (k2)

5   A) Explain Structure of PL/SQL (k1)

(OR)

B) Explain Functions in PL/SQL (k1)

Section B: Long Answer Questions (50 Marks) Answer All
questions. Each question carries 10 Marks.

6   A) Explain the characteristics and advantages of DBMS? (k2)

(OR)

B) Explain briefly about the architecture of DBMS. (k2)

7   A) Explain key and integrity constraints with an example? (k2)

(OR)

B). What is normalization? Explain with an example upto 3NF? (k2)

8   A) Write a short note on specialisation and generalisation. (k2)

(OR)

B) What is DMl and DDL ? Explain its operations with suitable examples. (k1)

9   A) Explain joins and its types with example (k2)

(OR)

B). Explain views in SQL with syntax and examples. (k2)

10   A) Discuss about iterative control statements available in PL/SQL with syntax
and examples.(k3)

(OR)

B). Explain exception handling in PL/SQL (k3)

All questions. Each question carries 5 Marks.

1. A) What are the differences between file system and database system. (k1)

(OR)

B) Write a short note on types of data models. (k2)

2. A) Explain CODD rules. (k1)

(OR)

B) Explain about BCNF in DBMS. (k1)

Section B: Long Answer Questions (20 Marks) Answer All questions. Each question

carries 10 Marks.

3. A) Explain the role and advantages of DBMS? (k2)

(OR)

B) Explain briefly about degrees of data abstraction?
(k2)

4. A) Explain Specialization hierarchy with an
example? (k2)

(OR)

B) Explain Entity Relationship diagram with an example (k2)

INTERNAL ASSESSMENT QUESTION PAPER II

Section A: Short Answer Questions (10 Marks)

Answer All questions. Each question carries 5 Marks.

1. A) Explain implementation of constraints. (k1)

   (OR)

   B) Explain various joins available in SQL. (k2)

2. A) Explain block structure of PL/SQL. (k1)

   (OR)

   B) Create a function in PL/SQL and write it's execution process. (k1)

Section B: Long Answer Questions (20 Marks) Answer All questions. Each question carries 10 Marks.

3. A) Explain nested queries with example? (k2)

   (OR)

   B) Describe SQL functions with syntax and examples. (k2)

4. A) Describe PL/SQL control procedures with examples. (k2)

   (OR)

   B) Define package. Explain various types of packages. (k2)

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SEM:III   DATABASE MANAGEMENT SYSTEM LAB   Offered to: II B.Com(CA) (Minor)

Offered To:	II B.Com(CA) (Minor)	Course Code:	23CAMIP231/23BAMIP231
Course Type:	Core (Practical)	Course:	**DataBaseManagent Systems lab**
Year of Introduction:	2024-25	Year of offering:	2024 – 2025
Year of Revision:	2024	Percentage of Revision:	
Semester:	III	Credits:	1
Hours Taught:	30 hrs. per semester	Max. Time:	2Hrs

Course Description:

The objective of course is to provide students with practical experience in Database Management System using SQL and PL/SQL. Students will learn to create and manage database objects, perform data manipulation and retrieval, implementing queries and applyingPL/SQL programs.

Course Aims and Objectives:

S.NO	COURSE OBJECTIVES
1	Introduce fundamental concepts and syntax of SQL.
2	Proficiency in writing and executing SQL queries to interact with a database.
3	Competence in manipulating and managing data within a database.
4	Ability to optimize database performance through query optimization techniques.
5	Understanding and managing data with the help of Programming Languages.

Course Outcomes

At the end of the course, the student will be able to…

CO NO	COURSE OUTCOME	BTL	PO	PSO
CO1	Implementing DDL commands in SQL by creating, inserting and selecting tables.	K2	6,7	1,2
CO2	Performing data manipulation operations using DML commands.	K3	6,7	1,2
CO3	Understand and implement various types of joins.	K3	6,7	1,2
CO4	Execute basic commands in PL/SQL.	K3	6,7	1,2
CO5	Implement procedures in PL/SQL.	K3	6,7	1,2

CO-PO MATRIX									
CO NO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1						1	2	1	1
CO2						2	1	1	2
CO3					2	1	2	2	1
CO4						2	2	1	2
CO5						2	2	2	2

Use the codes 3, 2, 1 for High, Moderate and Low correlation Between CO-PO-PSO
respectively

Course Structure

This lab list covers the key areas of Database Management System Lab course, providinghands-on practice with basics on PL/SQL.

SEMESTER-III

COURSE 2: DATABASE MANAGEMENT SYSTEM
Practical Credits: 1 2
hrs/weekList of
Experiments

SQL : Unit-I: Implementing DDL commands in SQL(4 Hours)Lab 1:
Exercise 1:   Creating Tables
1. Create a table to understand basic table creation.

Tasks:
- o   Create a table Employee with columns: Employee_ID, First_Name,Last_Name, Hire_Date, and Department_Name.
- o   Create a table Project with columns: Project_ID, Project_Name, andStart_Date.

Execute following commands:
1. Display all the information of the EMP table?
2. List the emps in the asc order of their Salaries?
3. List the details of the emps in asc order of the Dptnos and desc of Jobs?
4. Display all the unique job groups in the descending order?
5. List the emps who joined before 1984.

2. Create a table to understand basic table creation.Tasks:
- o   Create a table Course with columns: Course_ID, Course_Name, College_Name, CourseStart_Date, and CourseEnd_Date.
- o   Create a table College with columns: College_ID, College_Name, and College_Address.

Execute following queries:
1. Retrieve the list of coursenames, college and the address of all the courses.
2. List all the colleges which are located in 'Mumbai' or 'Bangalore'.
3. List the various courses available from the college table.
4. Find the names of colleges who have courses in B.A.
5. List the names of all colleges having 'a' as the second letter in their names.
6. List all courses whose College Name is in Vijayawada..
7. List the colleges who stay in the address whose first letter is 'M'.

Exercise 3:

Defining Tables with Primary and Foreign Keys

1. **Objective:** Learn to create tables with primary key and foreign key constraints toensure referential integrity.
2. *Tasks:*
1. **Table Name: Client- Master**

Description: Used to store client information

Column Name	Data Type	Size	Attribute
CLIENT_NO	Varchar2	6	Primarykey
NAME	Varchar2	20	Not null
ADDRESS1	Varchar2	30	
ADDRESSS	Varchar2	30	
CITY	Varchar2	15	
PINCODE	Varchar2	8	
STATE	Varchar2	15	
BAL_DUE	Number	10,2	

2. **Table Name: Product_Master**

Description: Used to store product information

ColumnName	Data Type	Size	Attribute
PRODUCT_NO	Varchar2	6	Primarykey
DESCRIPTION	Varchar2	15	Not null
PROFIT_PERCENT	Number	4,2	Not null
UNIT_MEASUE	Varchar2	10	
QTY_ON_HAND	Number	8	
REORDER_LVL	Number	8	
SELL_PRICE	Number	8,2	Not null, cannot be 0
COST_PRICE	Number	8,2	Not null,cannot be 0

Solve the following queries by using above tables.

1. Retrieve the list of names, city and the state of all the clients.
2. List all the clients who are located in 'Mumbai' or 'Bangalore'.
3. List the various products available from the product_master table.
4. Find the names of salesman who have a salary equal to Rs.3000.
5. List the names o fall clients having 'a' as the second letter in their names.
6. List all clients whose Baldue is greater than value 1000.
7. List the clients who stay in a city whose first letter is 'M'.

https://livesql.oracle.com/apex/livesql/file/content_O5AEB2HE08PYEPTGCFLZU9Y CV.ht ml

Exercise 4:Tasks: Task I :

Task II:List the total information of EMP table along with DNAME and Loc of all theemps Working Under 'ACCOUNTING' & 'RESEARCH' in the asc Deptno.

1. Display the Empno, Ename, Sal, Dname, Loc, Deptno, Job of all emps working at CJICAGO or working for ACCOUNTING dept with Ann Sal>28000, but the Sal should not be=3000 or 2800 who doesn't belongs tothe Mgr and whose no is having a digit '7' or '8' in 3rd position in the asc order of Deptno and desc order of job.
2. Display the total information of the emps along with Grades in the asc order.
3. List the Empno, Ename, Sal, Dname, Grade, Exp, and Ann Sal of empsworking for Dept 10 or20.

   1. Create a simple view to display specific columns from a table.
   Task: Create a view named Employee_View that displays Employee_ID, First_Name, andLast_Name from the Employees table.

   2. Create a view that joins multiple tables.
   Task: Create a view named Employee_Department_View that displays Employee_ID,First_Name, Last_Name, and Department_Name by joining the Employees and Departments tables.

Unit 5: PL/SQL blocks   *(4 Hours)*

Lab 5: basic PL/SQL programsExercise 5:

1. Write a PL/SQL program to check the given string is palindrome or not.
2. Write a PL/SQL program to display top 10 rows in Emp table based ontheir job and salary.
3. Create a procedure to update the salaries of Employees by 20%, for thosewho are not getting commission

References:

1. Nilesh Shah. (2011). *Database Systems Using ORACLE* (2nd ed.). PHI
2. https://www.youtube.com/playlist?list=PLL_LQvNX4xKyiExzq9GKwORoH6 nvaRn OQ

References:

1. **Database Management Systems, 3rd Edition , Raghurama Krishnan, JohannesGehrke, TMH.**
2. *Database System Concepts,5th Edition , Silberschatz, Korth, TMH.*

Web Resources:

Prof. Partha Pratim Das,Department of Computer science and Engineering,IIT Kharagpur. https://www.youtube.com/watch?v=OMHbGm9SQuE&list=PLZ2ps 7DhBYc4jkUk_yQAjYEVFzVzhdU&index=1

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SEM:III   Paper Title: INFORMATION AND COMMUNICATION TECHNOLOGY

Paper Code: 23SDCL01 Offered to: II B.Sc / B.Com / BCA…

Offered To:	**BSC /BCA / BCOM**	Course Code:	23SDCL01
Course Type:	SDC	**Course:**	**Information and Communication technology**
Year of Introduction:	2024-25	**Year of offering:**	2024 – 2025
Year of Revision:	2024	**Percentage of Revision:**	NIL
Semester:	III	**Credits:**	2
Hours Taught:	30 hrs. per semester	**Max. Time:**	2 Hrs

Objectives:

This course aims at acquainting the students with basic ICT tools which help them in their day to day and life as well as in office and research.

Course outcomes:

After completion of the course, student will be able to;

1. Understand the literature of social networks and their properties.
2. Explain which network is suitable for whom.
3. Develop skills to use various social networking sites like twitter, flickr, etc.
4. Learn few GOI digital initiatives in higher education.
5. Apply skills to use online forums, docs, spreadsheets, etc for communication, collaboration and research.
6. Get acquainted with internet threats and security mechanisms.

Syllabus

Unit	Learning Units	Lecture Hours
I	**Fundamentals of Internet**: What is Internet?, Internet applications,Internet Addressing – Entering a Web Site Address, URL–Components of URL, Searching the Internet, Browser – Types of Browsers, **Introduction to Social Networking**: Twitter, Tumblr, LinkedIn, Facebook, flickr, Skype, yahoo, YouTube, WhatsApp	8
II	**E-mail**: Definition of E-mail -Advantages and Disadvantages –User Ids, Passwords, Email Addresses, Domain Names, Mailers, Message Components, MessageComposition, Mail Management. **G-Suite**: Google drive, Google documents, Google spread sheets, Google Slides and Google forms.	8
III	**Overview of Internet security:** E-mail threats and secure E-mail, Viruses and antivirus software, Firewalls, Cryptography, Digital signatures, Copyright issues. **GOI Initiatives:** What are GOI digital initiatives in higher education? (SWAYAM, SwayamPrabha, National Academic Depository, National Digital Library of India, E-Sodh-Sindhu, Virtual labs, eacharya, e-Yantra and NPTEL).	8

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INFORMATION AND COMMUNICATION TECHNOLOGY
MODEL PAPER

CLASS: II B.Sc(Cs),BCA,B.Com(CA),B.Com(G), (A+B+Z),(M+P+C).
Course Code: 23SDCL01
Semester: III   **Max. Marks:50M   Min. Pass: M**   Time: Hours

Section – A
Answer any THREE of the following, each question carries FIVE marks   3X5 = 15 Marks

1. What is URL? What are the components of URL?
2. Explain about Twitter
3. Write a short note on Google Slides
4. Explain about Digital Signatures
5. Explain about NPTEL

Section – B
Answer any TWO of the following, each question carries TEN marks   2X10 = 20 Marks

6. What is Internet? Write the applications of Internet?
7. Explain about Message Composition?
8. Explain about Cryptography?

9. Write about Swayam?

Title of the Paper: WEB INTERFACE DESIGNING TECHNOLOGIES

Semester: V/VI

Course Code	**22CSCSET01**	Course Delivery Method	Class Room/ Blended Mode -Both
Credits	3	CIA Marks	30
No .of Lecture Hours /Week	3	Semester End Exam Marks	70
Total Number of Lecture Hours	60	Total Marks	100
Year of Introduction:2022-23	Year of Offering: 2022-23	Year of Revision:----	Percentage of Revision: 0%

Course Objective: To create web elements like buttons, banners & Bars and of course complete UI designs. Forms and validations for your website. Setting up page layout, color schemes, contract, and typography in the designs. Writing valid and concise code for web pages.

CO1	Understand web application and static web page using Html. (PO5)
CO2	Gain knowledge about various designing of style sheets. (PO5)

	CO3	Demonstrate skills regarding creation of an interface to dynamic website.(PO7)
	CO4	Gain knowledge about various advantages of XML and validating schema(PO5)
	CO5	Learn how to install word press and gain the knowledge of installing various pluginsto use in their websites. (PO5,PO7)

Syllabus

Unit	Learning Units	Lecture Hours
I	**Web Designing, HTML** **Web Designing :** Introduction To Web Designing, Difference Between Web Applications And Desktop Applications. **HTML :** Introduction To HTML, Introduction To HTML, Headings, Paragraphs Styles & Colors, HTML Formatting, Quotations, Comments, Hyperlinks, Lists, Using colors and images, Tables, Multimedia Objects - Video, Audio, Plugins, YouTube, Frames, Forms	12
II	**CSS, HTML API'S** **CSS** : Introduction, Using Styles, Simple Examples, Defining Your Own Styles, Properties and Values in Styles, Style Sheets, Formatting blocks of information, Layers, CSS Combinators, Pseudo Class, Pseudo Elements, Opacity, ToolTips, Image Gallery, CSS Forms, CSS Counters, CSS Responsive. **HTML API'S:** Geo location, Drag/drop, local storage, HTML SSE	12

III	**Client side Validation:** Introduction to JavaScript: What Is DHTML?, Java Script Basics, Variables, String Manipulations, Mathematical Functions, Statements, Operators, Arrays, Functions. Objects in JavaScript– Data and Objects In Java Script, Regular Expressions, Exception Handling. DHTML with JavaScript :Data Validation, Opening a New Window, Messages and Confirmations, The Status Bar, Different Frames, Rollover Buttons, Moving Images	14	
IV	**XML:** Introduction to xml, How to write a xml document, Elements and attributes ,Comments in xml, Namespace in xml, Xml css, Advantages of xml, Uses of xml, xml schema, data types, simple types, complex types, Validating DTD, XSD.	12	
V	**Word press** Introduction to word press, servers like wamp, bitnami e.tc, installing and configuring word press, understanding admin panel, working with posts and pages, using editor, text formatting with shortcuts, working with media-Adding, editing, deleting media elements, working with widgets, menus.	10	

Text Book/references/e-books/websites

1. Chris Bates ,Web Programming Building Internet Applications ,Second Edition ,Wiley
2. Web technologies by A.A.Puntambekar
3. Web Technologies by N.P.Gopalan,Eastern Economy Edition,2nd edition
4. PaulS.Wang Sanda S.Katila,an Introduction to Web Designplus Programming ,Thomson
5. Head First HTML and CSS, Elisabeth Robson, Eric Freeman ,O'Reilly MediaInc.
6. An Introduction to HTML and Java Script :for Scientists and Engineers, David R. Brooks.
7. Schaum' s Easy Outline HTML,David Mercer , Mcgraw Hill Professional.
8. Word press for Beginners ,Dr.Andy Williams.
9. Professional wordpress ,Brad Williams ,Daviddamstra,Hanstern.
10.   Webresources:
a.   http://www.codecademy.com/tracks/web
b.   http://www.w3schools.com
c.   https://www.w3schools.in/wordpress-tutorial/d.http://www.homeandlearn.co.uk

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(With Effect from Academic Year 2022-23)

COMPUTER SCIENCE	22CSCSET01	2023-24	B.SC(MPCS,MCCS)

SEMESTER–V/VI   **PAPER–VI**   **Max. Marks: 75**

Model Paper: WEB INTERFACE DESIGNING TECHNOLOGIES

SECTION A

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

1.a) Compare web applications with desktop applications.(CO1,L2)
             OR
   b) Write structure of HTML program and explain it. (CO1,L2)

2.a) Explain about CSS combinators with example.(CO2,L1)
             OR
   b) What is a Layer?How are they described with HTML code. (CO2,L1)

3 a) Write differences between HTML and DHTML. (CO3,L1)OR
   b) Write about functions in java script with example code. (CO3,L1)

4 a) How to write XML document? Give example. (CO4,L1)
             OR
   b) What are the elements and attributes used in XML(CO4,L1)

5 a) Write short note on word press menus. (CO5,L1)
             OR
   b) Explain text formatting in word Press.(CO5,L2)

SECTION B (Total: 5 x 10 = 50 Marks)

Answer all questions.

6(a) What is list? Explain various types of lists in HTML.(CO1,L1)
OR
(b)Explain about Frames and forms in HTML(CO1,L2)

7(a)Define CSS, Explain various styles sheets in HTML(CO2,L2)
OR
 (b). Explain HTML APIs.(CO1,L2)

8 (a) What is DHTML? Explain about various string and mathematical functions(CO3,L2)
OR
 (b) Explain Exception handling and rollover buttons in java script with examples.(CO3,L2)

9 (a) What are the advantages of using XML ? How to validate XML schema.(CO4,L1)
OR
 (b) Explain about DTD in XML.(CO4,L2)

10 (a) What is admin panel, what are the steps involved in working with post and pages(CO5,L1)

OR

 (b) Explain how we can add, edit and deleting media elements in word press(CO5,L2)

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Vuyyuru-521165.NAAC credited at'A'level
Autonomous-ISO 9001–2015Certified
Title of the Paper : WEB APPLICATIONS DEVELOPMENT USING PHP AND MYSQL

Semester :V/VI			
Course Code	**22CSCSET02**	Course Delivery Method	Class Room /Blended Mode-Both
Credits	3	CIA Marks	30
No.of Lecture Hours / Week	3	Semester End Exam Marks	70
Total Number of Lecture Hours	60	Total Marks	100
Year of Introduction : 2022-23	Year of Offering: 2022-23	Year of Revision:----	Percentage of Revision:0%

 Course Objective: Upon successful completion of the course, participants should be able to: *List the major elements of the PHP & MySQL work and explain why PHP is good for web development.

*Learn how to take a static website and turn it into a dynamic website run from a database using PHP and MySQL.

Course Outcomes : Students at the successful completion of the course will be able to:

CO$_1$	Learn basic structure and key concepts in PHP, Control statements and functions concept and related programs(PO5)
CO2	Know What is an Array concept related programs, What is an Object, various objects, Formatting strings, Date and time and related programs(PO5)
CO3	Learn importance of Forms,Combining HTML with PHP code. Importance of Cookies and Sessions related programs of forms cookies and Sessions.(PO5)
CO4	Know importance of File concept in PHP how to Create, Open, Read and write data in file related programs, Knowing about Image creation, drawing, and modification image (PO7)
CO5	Know about Database concept of MySQL, Connection, Creation of Database, Table adding Recording to it related programs(PO7)

Unit	Learning Units	Lecture Hours
I	**The Building blocks of PHP :** Variables, Datatypes, Operators and Expressions, Constants. **Flow Control Functions in PHP :** Switching Flow, Loops, Code Blocks and Browser Output. **Working with Functions:** What is function?, Calling functions, Functions, Returning the values from User-Defined Functions, Variable Scope.	12Hrs
II	**Working with Arrays:** What are Arrays?, Creating Arrays, **Working with Objects** Creating Objects, Object Inheritance, **Working with Strings, Dates and Time-**Formatting strings with PHP, Investigating Strings with PHP, Manipulating Strings with PHP, Using Date and Time Functions in PHP.	12Hrs
III	**Working with Forms-**Creating Forms, Accessing Form Input with User defined Arrays, Combining HTML and PHP code on a single Page, **Working with Cookies and User Sessions-**Introducing Cookies, Setting a Cookie with PHP, Session Function Overview, Starting a Session, Working with session Variables	14Hrs
IV	**Working with Files and Directories:** Creating and Deleting Files, Opening a File for Writing, Reading or Appending, Reading from File, Writing or Appending to a File. **Working with Images-**Understanding the Image-Creation Process, Drawing a New Image, Modifying Existing Images, Image Creation from User Input.	12Hrs
V	**Interacting with MySQL using PHP-**MySQL versus MySQLi Functions, Connecting to MySQL with PHP, Working with MySQL Data, **Creating an Online Address Book -** Planning and Creating Database Tables, Creating Menu, Creating Record, Addition Mechanism, Viewing Records, Creating the Record Deletion Mechanism, Adding Sub-entities to a Record.	10Hrs

Text books and References

1. Julie C. Meloni, SAMS Teach yourself PHP MySQL and Apache, Pearson education
2. Steven Holzner ,PHP:The Complete Reference ,Mc Graw-Hill
3. Robin Nixon, Learning PHP, MySQL ,JavaScript, CSS & HTML5 ,Third Edition O' reilly ,2014
4. Xue Bai Michael Ekedahl, The web warrior guide to Web Programming ,Thomson (2006).
5. Web resources:
e. http://www.codecademy.com/tracks/php
f. http://www.w3schools.com/PHP
g. http://www.tutorialpoint.com

COMPUTER SCIENCE	22CSCSET02	2023-24	B.SC(MPCS,MCCS)

SEMESTER–V/VI   **PAPER–VII**   **Max.Marks75**

Model Paper : Web Applications Development using PHP & MYSQL

No of Hours : 3   **No of Credits : 3**   **Pass Marks:30**

SECTION – A

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

1 a) Define Structure of PHP.(CO1,L1)

OR

 b) Explain different operators in PHP.(CO1,L2)

2 a) Explain about arrays in PHP.(CO2,L2)

OR

 b) What is an object? How do you create object in PHP?(CO2,L1)

3 a) Write about setting Cookies in PHP.(CO3,L1)

OR

 b) Explain sending Mail form submission in PHP.(CO3,L2)

4 a) How to create, read and delete files in PHP ? (CO4,L1)

OR

 b) Explain about Image creation.(CO4,L2)

5 a) How to connect MySqli using PHP? (CO5,L2)

OR

 b) What is use of Select query ? Explain with syntax and example?(CO5,L2)

SECTION B   (Total: 5 x 10 = 50 Marks)

Answer all questions. (Two questions should be given from each unit with internal choice)

6 a) Explain about Control Statements.(CO1,L2)

OR

 b) Discuss about Function define,Call and return value with example.(CO1,L6)

7 a) List various types of Formatting strings explain them.(CO2,L2)

OR

 b) Define Array function with example..(CO2,L1)

8 a) Write names of Form objects explain them with example.(CO3,L2)

OR

 b) Compare and Contrast Session and Cookies.(CO3,L4)

9 a) Develop code in PHP for file creation, Opening file and Write to file.(CO4,L3)

OR

 b) Write steps for Interfacing complete image concept explain them with oneexample.(CO4,L2)

10 a) Discuss about DDL commands and DML commands in Mysqli with syntaxes(CO5,L6)

OR

 b) Write code to Create table of Employee by adding any four columns withexample.(CO5,L6)

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BIG DATA ANALYTICS USING 'R'
Offered to III B.Com (Computer Applications & E-Commerce-Computers) – VI Semester

Course Code	:	22SECCAT01	No. Of Lecture Hours per week	:	3
Year of Introduction	:	2022-23	Total No. Of Lecture Hours	:	60
Year of Offering	:	2024-25	CIA Marks	:	30
Year of Revision	:	NIL	SEE Marks	:	70
Percentage of Revision	:	0%	Total Marks	:	100
Course Delivery Method	:	Class Room / Blended Mode - Both	Credits	:	3

Course Objective:
Big data analytics examines large amounts of data to uncover hidden patterns, correlations and other insights. With today's technology, it's possible to analyze your data and get answers from it almost immediately an effort that's slower and less efficient with more traditional business intelligence solutions.

Course Outcomes:
❖ CO1: Understand data and classification of digital data. (PO5)
❖ CO2: Gain knowledge of technologies used in bigdata Analytics. (PO5, PO7)
❖ CO3: Understand basics of R and control structures in R. (PO5)
❖ CO4: Load data into R objects and manipulate them as needed. (PO5)
❖ CO5: Create and edit visualizations with R (PO7)

Course Focus:
R for data science focuses on the language's statistical and graphical uses. When you learn R for data science, you'll learn how to use the language to perform statistical analyses and develop data visualizations. R's statistical functions also make it easy to clean, import and analyze data.

Syllabus

Unit	Learning Units	Lecture Hours
I	**Introduction to Big data**: What is data, Classification of Digital Data-Structured Unstructured, semi-structured data, Characteristics of data, Evaluation of big data, Definition and challenges of big data, what is big data and why to use big data?	12 Hours
II	**Big data Analytics**: What is and isn't big data analytics? Classification of analytics, Importance of big data analytics, Technologies needed to meet challenges of big data, data science, Data scientist	12 Hours
III	**Introduction to R and getting started with R**: What is R? Why R? Advantages of R over other programming languages, Data types in R - logical, numeric, integer, character, double, Complex, raw, coercion, ls () command, Expressions, Variables and functions, control structures, Array, Matrix, Vectors, Factors, R packages	14 Hours
IV	**Exploring data in R**– Data frames-data frame access, Ordering data frames, functions for data frames dim(), nrow(), ncol(), str(), summary(), names(), head(), tail(), edit(), Load data frames—reading from .CSV files, Sub setting data frames, reading from tab separated value files, Reading from tables, merging data frames	12 Hours
V	**Data Visualization using R**: Reading and getting data into R (External Data),Using CSV files, XML files, Web Data, JSON files, Databases, Excel files, Working with R Charts and Graphs: Histograms, Boxplots, Bar Charts,	12 Hours

| Line Graphs, Scatter plots, Pie Chart | |

Prescribed Text Book:
1. Seema Acharya--Data Analytics using R, McGraw Hill education (India) Private Limited.
2. Big Data Analytics, Introduction to Hadoop, Spark, and Machine-Learning, Raj Kamal, PreetiSaxena, McGraw Hill, 2018

Reference Books:
1. SeemaAcharya, SubhashiniChellappan --- Big Data and Analytics second edition, Wiley
2. Big Data, Big Analytics: Emerging Business intelligence and Analytic trends for Today's Business, Michael Minnelli, Michelle Chambers, and AmbigaDhiraj, John Wiley & Sons, 2013
3. An Introduction to R, Notes on R: A Programming Environment for Data Analysis and Graphics. W.N. Venables, D.M. Smith and the R Development Core Team.

COMPUTER SCIENCE   **22SECCAT01**   2024-25   B.COM (CA& E-C-C)
SEMESTER – VI   PAPER – VI   Max. Marks 70

Model Paper: BIGDATA ANALYTICS USING R

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

Answer any FIVE questions. (At least 1 question should be given from each Unit)

1. a) What is a big data and why to use a big data **(CO1, L1)**
                    (OR)
   b) Explain Challenges of big data? **(CO1, L2)**

2. a) What is big data analytics **(CO2, L1)**
                    (OR)
   b) Explain the responsibilities of a Data Scientist **(CO2, L2)**

3. a) Explain ls () command in R with example **(CO3, L2)**
                    (OR)
   b) Write about control structures in R with examples **(CO3 , L1)**

4. a) Explain about merging data frames. **(CO4, L2)**
                    (OR)
   b) Develop R script to load data into data frames from files. **(CO4, L6)**

5.. a) Write short notes on charts. **CO5, L6)**
                 (OR)
   b) Develop bar chart in R? **(CO5, L3)**

SECTION B   (Total: 5 x 10 = 50 Marks)
Answer all questions.
6(a) Give Classification of Digital Data and explain it. **(CO1, L2)**
                 OR
  (b Explain Characteristics of Data and Challenges of big data with an example. **(CO1, L2)**
    7(a) Explain classification of Analytics. (**CO2, L2)**
                 OR
  (b) Write about importance of big data analytics **(CO2, L2)**
8 (a) Explain data types in R with examples
                 (CO3, L2)OR
  (b) Construct vector in R and explain various operations on it **(CO3, L3)**
9 (a) What are the data frames? Write its significance in R-language **(CO4, L1)**
                 OR
  (b) Demonstrate various functions used in data frames **(CO4, L2)**

10 (a)Develop below plots in R. **(CO5, L6)**
       i) Box Whisker plots **ii)** Scatter plots **iii)** Pairs plots
                 OR
(b) Build a code in R for reading and getting data into R from databases **(CO5, L3)**

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DATA SCIENCE USING PYTHON

Offered to III B.Com (Computer Applications & E-Commerce-Computers) – VI Semester

Course Code	:	22SECCAT07	No. Of Lecture Hours per week	:	3
Year of Introduction	:	2022-23	Total No. Of Lecture Hours	:	60
Year of Offering	:	2024-25	CIA Marks	:	30
Year of Revision	:	NIL	SEE Marks	:	70
Percentage of Revision	:	0%	Total Marks	:	100
Course Delivery Method	:	Class Room / Blended Mode - Both	Credits	:	3

Course Objective:

The main objective of the course is to provide students with the basic concepts of Python, its syntax, functions and packages to enable them to write scripts for data manipulation and analysis. The course develops skills of writing and running a code using Python.

Course Outcomes:

Students at the successful completion of the course will be able to:

❖ CO1: Understand the need and importance of data science.(PO5,PO7)
❖ CO2: Understand basic concepts of python and implementing control structures inpython.(PO5)
❖ CO3: Implement strings and other data structures in python(PO5,PO7)
❖ CO4: Learn and Implement functions and modules in python.(PO5)
❖ CO5: Learn and Implement data cleaning and plotting using pandas.(PO5,PO7)

Syllabus

Unit	Learning Units	Lecture Hours
I	**INTRODUCTION TO DATA SCIENCE:** Data science and its importance, Advantages of data science, The process of data science, Responsibilities of a data scientist, Qualifications of data scientists, Would you be a good data scientist?, Why to use python for data science?	11 Hours
II	**INTRODUCTION TO PYTHON:** What is python?, Features of python, History of python, Writing and executing the python program, Basic syntax, Variables, Keywords, Data types , Operators, Indentation, Control Structures-Conditional statements - If, If-else, Nested if-else,Looping statements - for, While, Nested Loops, Break, Continue, Pass	14 Hours
III	**STRINGS AND DATA STRUCTURES:** Strings - definition, accessing, slicing and basic operations, Lists - introduction, accessing list, operations, working with lists, functions and methods, Tuples - introduction, accessing tuple, operations, Dictionaries- introduction, accessingvalues in dictionaries, working with dictionaries.	13 Hours
IV	**FUNCTIONS AND MODULES:**Functions- Defining a function, Calling a function, Types of functions, Function arguments, Local and global variables, Lambda and recursive functions, Modules-Math, Random, OS, Date and Time	11 Hours
V	**PANDAS:**What is Pandas?, Series, Data Frame, Read CSV Files, Analyzing Data Frames, Data Correlations, Data Cleaning---Empty cells, Data in wrong format, Wrong data, Duplicates, Pandas Plotting-- plot () method, bar plot, histplot, box plot, area plot, scatter plot, pie plot	11 Hours

Prescribed Books:

1. Steven cooper--- Data Science from Scratch, Kindle edition
2. Reemathareja—Python Programming using problem solving approach, Oxford Publication

Reference Books: Wes McKinney--- Python for Data Analysis,O'REILLY

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COMPUTER SCIENCE   **22SECCAT07**   2024-25   B.COM (CA& E-C-C)
SEMESTER – VI   PAPER – VI   Max. Marks 70

Model Paper: **DATA SCIENCE USING PYTHON**
SECTION – A
Answer All questions.   **5 x 4=20 Marks**

1. (a)Illustrate the advantages of data science. (CO1, L1)
   OR
   (b)What are the qualifications of data scientist? (CO1, L2)

2. (a) Explain about the history of python. (CO2, L1)
   OR
   (b) Explain about a) Keywords b) Variables in python. (CO2, L1)

3. (a) Explain about string operations in python. (CO3, L1)
   OR
   (b)Describe about the slicing and basic operations. (CO3, L3)

4. (a) Explain about the date and time module in python.
   (CO4, L1)OR
   (b) Explain about the local and global variables in python. (CO4, L1)

5. (a)What is data cleaning? Explain about duplicates in pandas.
   (CO5, L1)OR
   (b)Explain briefly Local and global variables.

SECTION B

Answer All questions.   **(5 x 10 = 50 Marks)**

6. (a) What is Data Science? Explain the Responsibilities of a data scientist. (CO1, L2)
   OR
   (b) Explain the use of python for data science? (CO1, L1)

7. (a) Explain different types of conditional statements with examples. (CO2, L1)
   OR
   (b) Explain different types of Looping statements with examples. (CO2, L1)

8. (a) What is a list? Explain different operations of lists with examples in python. (CO3, L2)
   OR
   (b)What is a Dictionary? Explain accessing values in it with examples in python (CO3, L2)

9. (a) Explain Function definition, calling & different types in python with example. (CO4, L1)
   OR
   (b) Explain about random and math module in python with an example. (CO4, L1)

10. (a) What is a data frame? Illustrate the concept of analyzing the data frames. (CO5, L2)
    OR
    (b).Explain different types of plotting techniques in pandas with examples. (CO5, L1)