

Sample Employability Development Courses at CMRU

In this category, we have provided twelve sample courses from our list of all courses. Please find them below.

1. 9PDES2081: Furniture Design
2. 3ACCT5021: Advanced Cost and Management Accounting
3. 3FINC5071: Advanced Financial Management.pdf
4. 4CSGC2021: Database Management Systems
5. 4CSGC2041: Operating Systems
6. 4CSGC2051: Design and Analysis of Algorithms
7. 4CSGC2071: Cloud Computing
8. 4CSGC2081: Software Engineering
9. 4CSPL1011: Problem Solving Using Python
10. 4CSPL2011: Web Development Using PYTHON and Django
11. 4CSPL2021: Object Oriented Programming Using JAVA
12. 9FDES1011: Introduction to Fashion Design (Idea to Prototype)

The details of the syllabus and other information you can find in the following pages.



9PDES2081 - Furniture Design

A.Course Framework

Credits: L-T-P-C: — 3-1-4-8

SyllabusVersion: V1.0

Contact Hours / Week:12

Level: 100

Prerequisite/Corequisite:
(If applicable)

Students should have attended following courses -

- Introduction to Product Design
- Drawing I
- Computer - Aided Design (CAD)

Course Learning Objectives:

CLO1: To understand various types of mechanisms and their working principles and analyze mechanisms and its applications in the context of furniture, interior and products

CLO2: Overview of the calculations involved while choosing the mechanisms

CLO3: Understand concept of physical ergonomics and its importance in furniture design and spaces

CLO4: To consider anthropometric data while designing furniture and spaces

CLO5: To understand the relevance of anatomic and physiological characteristics of the user

CLO6: To understand role of an ergonomist in design firms, Research and development departments, etc

CLO8: Understanding types of natural and artificial wood, Hemp, Bamboo and Metal

CLO9: understand manufacturing process of wood, Hemp, Bamboo and Metal and its applications in product and furniture industry

CL10: Understand purpose behind the invention

CL11: Analyse the concept, functionality and material of the furniture

CL12: Study evolution of the furniture

CL13: socio economical and technological influences on furniture

Course Outcomes: On successful completion of the course, the students will be able to:

CO1: Choose and use mechanisms to achieve a prescribed movement / mechanical advantage

CO2: Analyse mechanisms in existing products and furnitures

CO3: analyze furniture, spaces, and communication materials from usability perspective and redesign keeping in mind target audience

CO4: understand relation between poor postures and ergonomic hazards

CO5: Design and develop prototypes for ergonomic testing



CO6: Design Furniture in wood, hemp, bamboo and metal by using the appropriate production technique

CO7: discuss the relevance of specific material in given furniture

CO8: Document using illustration, photographs and text to showcase types of furniture based on the following factors - sociocultural influences, technological influences, Type, Usage, Materials, Scale, Measurement, made by, Origin...

CO9: understand and implement visual design / aesthetics , joineries, finishes and overall aesthetics in upcoming design project

CO10: prepare design document and presentation for selected product/furniture

CO11: To be able to respond as a designer ,to the ever changing trends and styles

PPO: PO1/PO2/PO3/PO4/PO5

PSO: PSO1/PSO2/PSO3/PSO4/PSO5

B. Syllabus

Module 1: History of Furnitures

Hours: 22

- Vernacular furnitures of India and abroad
- Furniture and materials
- importance of craftsmanship in furniture design
- Cultural factors in furniture design
- Political factors in furniture design
- Environmental factors in furniture design
- Documentation methods

Module 2: Mechanisms

Hours: 23

- Introduction to mechanisms and working principles - Gears, pulley, cams, levers, ,etc
- Introduction to hardware used in furniture
- Application of various motions and transmission systems - hinges, pivots, latches, slides
- collapsible furniture in interior

Module 3: Mechanisms

Hours: 22

- Introduction to kinematics - sculptures (mini project)

Module 4: Physical and cognitive ergonomics

Hours: 23

- Introduction to physical and cognitive ergonomics - Anthropometrics, Posture Support, Seating Comfort, Reach and Accessibility, Workstation Design, Movement and Flexibility, Safety and Stability, User Interaction
- Relation between productivity and ergonomics
- Safety, comfort and psychological satisfaction - in the context of productivity
- Safety and Injury Prevention in furniture
- Industry Standards and Regulations
- role of ergonomist in furniture design

Module 5: Material - Wood Workshop

Hours: 22

- Introduction to wood and types of wood -
- Wood seasoning - Natural and artificial
- WoodWorking techniques



- Wood joineries
- Surface finishes - varnish, wax, lacquer, paint, etc
- Artificial wood
- Traditional and Modern woodworking tools and techniques
- Wood and Flexibility
- Community visit - Channapatna, (place near mysore),

Module 6: Material - Bamboo, cane, Lantana, Hemp Workshop

Hours: 23

- Introduction to Bamboo, cane, Lantana, Hemp
- Tools and working techniques
- Cultural and political factors
- Furniture and products with cane
- Community visit - craftsman community visit, ATREE (Banglore)

Module 7 : Material - Metal Workshop

Hours: 22

- Introduction to Metals and types of metals - mild steel, aluminium, brass, cast iron
- Forms of metals - Sheet metal, bar, rods, pipes, flats, plates etc
- Metal processing techniques - cutting, punching, bending, blanking, casting, welding, etc
- Surface finishes - anodising, powder coating, painting, electroplating, galvanising, etc

Module 8: Material - Wood / Bamboo / Cane / Lantana / Hemp / Metal - Mini Project

Hours: 23

- Mini project - Build piece of furniture using Wood / Bamboo / Cane / Lantana / Hemp / Metal in 1:1 scale (chair)
- Production drawing

1) References

Books:

- Mechanisms and Machines: Kinematics, Dynamics, and Synthesis, SI Edition By Michael M. Stanisic
- Motion Structures Deployable Structural Assemblies of Mechanisms By Zhong You, Yan Chen
- Motion Geometry of Mechanisms By E. A. Dijksman
- Ergonomics Foundational Principles, Applications, and Technologies By Pamela McCauley-Bush
- Work Study and Ergonomics By Lakhwinder Pal Singh
- Fundamentals of industrial ergonomics By Babur Mustafa Pulat
- Ergonomics for the Layman - Applications in Design By Prabir Mukhopadhyay
- Indian anthropometric dimensions for ergonomic design practice. by Debkumar Chakrabarti
- The Essential Wood Book - The Woodworker's Guide to Choosing and Using Lumber
- Forest Products and Wood Science An Introduction By Rubin Shmulsky, P. David Jones
- Wood Composites by Martin P Ansell
- Defects in Wood Caused by Insects By Andrew Delmar Hopkins
- Solid Wood Case Studies in Mass Timber Architecture, Technology and Design By Joseph Mayo
- Metal Forming Handbook By Schuler
- Metal Sustainability Global Challenges, Consequences, and Prospects
- City Steel - Contemporary Metal Furniture By Ed Barber
- <https://www.atree.org/media-feature/lantana-camara-trainings-livelihood-and-management>
- Furniture Design By James Christopher Postell, Jim Postell
- Furniture Design By Stuart Lawson
- Fine Woodworking Design Book Eight Original Furniture from the World's Finest Craftsmen By Scott Gibson
- Furniture for Interior Design By Drew Plunkett, Sam Booth



- Catalog of Vernacular Furniture - Rajasthan, Haryana, Gujrat, Punjab : as Part of the Vernacular Furniture of North-West India Project : Phase II

1) Mode of Assessment

1. Continuous Internal Assessment (CIE) : 100 marks (scaled down to 50 marks)

| Components | Assignments | Mini project | Total Marks (Average of Assignments & mini project) |
|------------|-------------|--------------|---|
| Max. Marks | 100 | 100 | 100 |

F. CO-PO-PSO Mapping

| CO | PO | | | | | PSO | | | | |
|----|----|---|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 1 | * | | * | * | * | * | * | * | * | * |
| 2 | | * | * | | * | * | | | * | * |
| 3 | * | * | * | | * | * | * | * | | * |
| 4 | * | * | * | | * | * | * | * | * | * |
| 5 | | * | * | * | | * | * | * | * | * |
| 6 | * | * | * | * | * | * | * | * | * | * |
| 7 | | * | * | * | | * | * | * | * | * |
| 8 | * | * | * | * | | * | * | | * | * |
| 9 | * | * | * | * | * | * | * | * | * | * |
| 10 | * | * | * | | * | * | * | | * | * |
| 11 | * | * | * | * | * | * | * | * | * | * |



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| 3ACCT5021: Advanced Cost & Management Accounting | | |
|---|--------------------------------|-------------------|
| A. Course Framework | | |
| Credits: L-T-P-C: 3-0-0-3 | Syllabus Version: 1 | |
| Contact Hours / Week: 4 | Total Contact Hours: 60 | Level: 500 |
| Prerequisite:(If applicable) | Cost Accounting | |
| Course Learning Objectives: | | |
| <p>CLO1: To acquaint students with the principles of cost and management accounting, the difference between financial accounting, cost accounting and management accounting, concepts and techniques of ABC Costing</p> <p>CLO2: To help students understand ratio analysis techniques, and variable & absorption costing and CVP analysis & calculate break even points and understand applications of marginal costing for business decision-making.</p> <p>CLO3: To explain the process costing and standard costing and variance analysis and techniques.</p> <p>CLO4: To enable the students to understand preparing Fund Flow and Cash Flow Statement</p> <p>CLO5: To lay a base for budgeting and Budgetary Control</p> | | |
| Course Outcomes: On successful completion of the course, Students will be able to, | | |
| <p>CO1: Recall the Cost Accounting Techniques, cost concepts and techniques of ABC Costing (Level 2)</p> <p>CO2: Calculate different types of ratio analysis and variable & absorption costing and CVP analysis. (Level 3)</p> <p>CO3: Evaluate process costing and standard costing & variance analysis, and techniques. (Level 4)</p> <p>CO4: Calculate Fund Flow and Cash Flow Statement and explain applications for decision-making. (Level 3)</p> <p>CO5: Re-calculate different types of Budgets. (Level 3)</p> | | |
| PO: PO1/PO2 | PSO: PSO1/PSO2 | |
| B. Syllabus | | Hours |
| Module – 1 Introduction of Cost and Management Accounting, Application of ABC Costing as Modern Techniques & Cost Reduction Process | | 12 |
| <p>Cost and Management Accounting: Nature and functions; Financial vs. Management Accounting; Cost vs. Management Accounting; Role of Management Accountant. Cost concepts and classifications.</p> <p>Activity Based Costing (ABC): Concept and Uses; Flow of Costs in ABC; Traditional Costing System vs. ABC.</p> <p>Cost reduction – Meaning and special features; cost control versus cost reduction; organization; cost reduction Programme; value analysis; cost audit – functions and scope</p> | | |
| Module – 2 Ratio Analysis, Variable & Absorption Costing and CVP Analysis | | 12 |
| <p>Ratio Analysis – Advantages – Limitations – Classification & computation of Ratio Cost Management- Absorption and Marginal Costing - Cost - volume-profit analysis-Applications and techniques.</p> | | |
| Module – 3 Performance Analysis with Standard Costing and Variance Analysis, Responsibility Accounting | | 12 |

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Standard Costing and variance analysis – Concept of Standard Costs – Uses of Standard Product Costs- Fixation of Standard Costs – Material – Labour – Overhead, Profit and Sales Variances Leading to Decision Making and Reporting.

Responsibility Accounting Meaning, objectives and structure of Responsibility Accounting as a divisional performance measurement. Types of Responsibility Centers: Cost/Expense Centers, Profit Centers, Investment Centers.

Module – 4 Fund Flow Statement and Cash Flow Statement

12

Funds Flow Statement – Concept of Funds and Flow of Funds – Importance of Funds Flow Statements – Limitations – Schedule of Changes in Working Capital – Preparation of Funds Flow Statement

Cash Flow Statement – Funds Flow Statement Vs Cash Flow Statement – Uses of Cash Flow Statement – Limitations – Preparation of Cash Flow Statement.

Module – 5 Budgeting and Budgetary Control

12

Budgeting and Budgetary Control – Objectives of Budgetary Control – Essentials of Budgetary Control – Advantages – Limitations – Classification and Types of Budgets – Sales, Production, Cost of Production, Purchase and Flexible Budgets – Cash Budget.

C. References

1. Jain and Narang, “Advanced Cost Accounting”, Kalyani Publication, New Delhi
2. Prof. M.L. Agrawal, Dr. K.L. Gupta "Advanced Cost Accounting Paperback" January 2018
3. ICWA, Calcutta, Advanced Cost and Management Accountancy Methods, Techniques and Applications.
4. R.K.Sharma & Shashi K.Gupta, “Management Accounting Principles and Practice”, Kalyani Publishers, New Delhi
5. Manmohan Goyal, “Management Accounting”, Sahitya Bhawan Publishers and Distributors Pvt Ltd, Uttar Pradesh

D. Mode of Assessment

IAT / CCE / SEE

E. Scheme of Evaluation

1. Continuous Internal Evaluation (CIE): 50 Marks

| Components | Average of 2 IATs | CCE | Total Marks |
|------------|-------------------|-----|-------------|
| Max. Marks | 20 | 30 | 50 |

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2. Semester End Examination (SEE) Scheme: 100 Marks (Scaled down to 50 Marks)

| Section | No of Questions | No of Questions to be attempted | Marks / Question | Total Marks for the Section | Revised Bloom's Taxonomy |
|---------|-----------------|---------------------------------|------------------|-----------------------------|--------------------------|
| A | 7 | 5 | 3 | 15 | L1, L2 |
| B | 7 | 5 | 8 | 40 | L3 & L4 |
| C | 4 | 3 | 15 | 45 | L4 & L6 |

F. CO-PO-PSO Mapping

| CO-PO-PSO Mapping | | | | | | | | | | |
|-------------------|----|---|---|---|---|-----|---|---|---|---|
| CO | PO | | | | | PSO | | | | |
| | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 1 | * | | | | | * | | | | |
| 2 | | * | | | | | * | | | |
| 3 | | * | | | | | * | | | |
| 4 | | * | | | | | * | | | |
| 5 | | * | | | | | * | | | |

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| 3FINC5071: ADVANCED FINANCIAL MANAGEMENT | | |
|---|--------------------------------|-------------------|
| A. Course Framework | | |
| Credits: L-T-P-C: 3-0-0-3 | Syllabus Version: 1 | |
| Contact Hours / Week: 4 | Total Contact Hours: 60 | Level: 500 |
| Prerequisite:(If applicable) | Financial Management | |
| Course Learning Objectives: | | |
| <p>CLO1: To explain the effect of leverage on the cost of capital and value of the firm to the students</p> <p>CLO2: To elucidate the differential effects of cost of capital on a firm's value and earning capacity of the firm</p> <p>CLO3: To illustrate the effects of dividend policy on the earning per share of the firm and the value of the firm</p> <p>CLO4: To familiarize students with the significance and techniques of working capital management</p> | | |
| Course Outcomes: On successful completion of the course, Students will be able to, | | |
| <p>CO1: Critically appraise the investment plan in terms of its investment recovery and profitability (Level 5)</p> <p>CO2: Determine the most profitable source of capital and optimal capital structure yielding greater value for the firm (Level 3)</p> <p>CO3: Illustrate the effect of dividend policy decision on the value of the firm and cost of capital (Level 4)</p> <p>CO4: Estimate the working capital requirement based on the business requirements and determine the cash and inventory requirements for the daily business operation (Level 4)</p> | | |
| PO: PO1/PO2 | PSO: PSO1/PSO2/PO3/PO4 | |
| B. Syllabus | | Hours |
| Module –1 Financial Management: | | 10 |
| Financial Management: Meaning, nature and scope of finance; financial goal - profit Vs. Wealth Maximization; Finance functions – investment, financing and dividend decisions; Capital Budgeting: Nature of investment decisions; Investment evaluation criteria – net present value, Internal rate of return, Profitability index, payback period, accounting rate of return, NPV and IRR comparison; Capital rationing; Risk analysis in capital budgeting. | | |
| Module – 2: Cost of Capital | | 10 |
| Cost of Capital: Meaning and significance of cost of capital: Calculation of cost of debt, preference capital, equity capital and retained earnings; Combined cost of capital (weighted); Cost of equity and CAPM. Operating and Financial Leverage: Measurement of Leverages; Effects of operating and financial leverage on profit; Analyzing alternative financial plans; Combined financial and operating leverage. | | |
| Module – 3: Capital Structure Theories | | 18 |
| Capital Structure Theories: Traditional and M.M. Hypotheses – without taxes and with taxes; Determining capital structure in practice. | | |

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|--|-----------|
| Module-4: Dividend Policies | 17 |
| Dividend Policies: Issues in dividend decisions, Walter's model, Gordon's model, MM Hypothesis, dividend and uncertainty, relevance of dividend; Dividend policy in practice; Forms of dividends; Stability in dividend policy; Corporate dividend behavior. | |
| Module – 5: Management of Working Capital | 5 |
| Management of Working Capital: Meaning, significance and types of working capital; Calculating of operating cycle period and estimation of working capital requirements; Financing of working capital; Sources of working capital; Factoring services; Dimensions of working capital management. Management of cash, receivables and inventory | |
| C. Reference | |
| <ol style="list-style-type: none"> 1. Pandey, I.M: Financial Management, Vikas Publishing House, Delhi 2. Khan MY, Jain PK: Financial Management; Tata McGraw Hill, New Delhi 3. Chandra, Prasanna: Financial Management, Tata Mc Graw Hill, Delhi. 4. Hampton , John: Financial Management, Vikas Publishing House, Delhi. 5. Van Horne, J.C. and J.M Wachowicz Jr.: Fundamentals of Financial Management, Prentice – Hall, Delhi. | |
| D. Mode of Assessment | |
| IAT / CCE/ Mini Project / SEE | |
| E. Scheme of Evaluation | |

1. Continuous Internal Evaluation(CIE): 50 Marks

| Components | Average of 2 IATs | CCE | Total Marks |
|-------------------|-------------------|-----------|-------------|
| Max. Marks | 20 | 30 | 50 |

2. Semester End Examination (SEE) Scheme: 100 Marks (Scaled down to 50 Marks)

| Section | No of Questions | No of Questions to be attempted | Marks / Question | Total Marks for the Section | Revised Bloom's Taxonomy |
|---------|-----------------|---------------------------------|------------------|-----------------------------|--------------------------|
| | | | | | |

School of Economics and Commerce

M.Com

| | | | | | |
|---|---|---|----|----|---------|
| A | 7 | 5 | 3 | 15 | L1, L2 |
| B | 7 | 5 | 8 | 40 | L3 & L4 |
| C | 4 | 3 | 15 | 45 | L4 & L6 |

F. CO-PO-PSO Mapping

| CO-PO-PSO Mapping | | | | | | | | | | |
|-------------------|----|---|---|---|---|-----|---|---|---|---|
| CO | PO | | | | | PSO | | | | |
| | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 1 | * | | | | | * | | | | |
| 2 | | * | | | | | * | * | | |
| 3 | * | * | | | | | * | * | * | |
| 4 | * | | | | | | | * | * | |

| 4CSGC2021: DATABASE MANAGEMENT SYSTEMS | | |
|---|--------------------------------|----------------------------|
| A. Course Framework | | |
| Credits: 2-0-1-3 | | Syllabus Version: 1 |
| Contact Hours / Week: 4 | Total Contact Hours: 60 | Level: 200 |
| Prerequisite: (If applicable) | Nil | |
| Course Learning Objectives: | | |
| <p>This course enables the student to:</p> <p>CLO1: Understand the data models, conceptualize and depict a database system using E-R diagram.</p> <p>CLO2: Gain knowledge on the design principles of a relational database system and SQL.</p> <p>CLO3: Impart knowledge in transaction processing, concurrency control and recovery techniques.</p> <p>CLO4: Understand the design principles of a relational database system and SQL.</p> <p>CLO5: Implement programs using SQL and PL/SQL.</p> | | |
| Course Outcomes: | | |
| On successful completion of the course, students will be able to: | | |
| CO1: Differentiate database systems from file system by understanding the features of database system and design a ER model for a database system | | L4 |
| CO2: Develop solutions to a broad range of query and data update problems using relational algebra, relational calculus and SQL. | | L3 |
| CO3: Apply the normalization theory in relational databases for removing anomalies. | | L3 |
| CO4: Compare database storage and access techniques for file organization, indexing methods and Query Processing. | | L2 |
| CO5: Analyze the basic issues of transaction processing, concurrency control, deadlock and its recovery schemes | | L2 |
| PO: PO1/PO2/PO3/PO4/PO5 | | PSO: PSO1/PSO2/PSO3 |
| A. Syllabus | | |



| | |
|--|----------------|
| Module 1: Introduction | L[6] h |
| Database system application, purpose of database system View of Data –Database Languages-Data Storage and Querying-Database Architecture - Database design and ER model: Overview of the design process-The ER Model - Constraints - Removing redundant attributes in Entity Sets-ER Diagram - Reduction to Relational Schemas - ER Design Issues. | |
| Module 2: Relational Model and Database Design | L[6] h |
| Introduction to Relational Model - Formal Relational Query Languages - Introduction to SQL: Data definition-Basic structure of SQL Queries-Additional Basic operations -Set operations-Aggregate functions Nested sub queries-Intermediate SQL: Joins-Views-Integrity Constraints. | |
| Module 3: Normal Forms | L[6] h |
| Functional Dependencies - Normal Forms Based on primary Keys-General Definition of Second and Third Normal Form - Boyce Codd Normal Form -Multi valued dependencies and Fourth Normal Form. | |
| Module 4: Data Storage and Query Processing | L[6] h |
| Overview of Physical Storage Media - Magnetic disk Flash storage -RAID-File and Record Organization -Indexing and Hashing :Ordered Indices - B+Tree Index File-Static Hashing -Dynamic Hashing-Query Processing: Overview-measures of Query Cost. | |
| Module 5: Transaction Management | L[6] h |
| Transactions: Transaction concept-Transaction Atomicity and Durability-Transaction Isolation Serializability-Transaction Isolation and Atomicity-Transaction Isolation levels-Implementation of Isolation Levels-Concurrency Control: Lock based protocols -Deadlock handling-Time stamp based protocols-Recovery system: Failure classification -Storage-Recovery and atomicity. | |
| SYLLABUS–LABORATORY | P[30] h |
| <ol style="list-style-type: none"> 1. Working with SQL commands like DDL, DML, TCL, and DCL 2. Performing Single- row functions and group functions in SQL. 3. Execute simple queries using joins and Integrity constraints. 4. Creation and manipulation of database objects. 5. Simple programs using PL/SQL block. 6. Implementation of cursor in PL/SQL block. | |



7. Generate trigger in PL/SQL block.
8. Write PL/SQL block Programs using exception handling.
9. Design a PL/SQL blocks using subprograms namely functions and procedures

C. References

- [1] Abraham Silberschatz, Henry F. Korth and S. Sudarshan, Database System Concepts , McGraw - Hill, 2019.
- [2] R. Mehta. *Principles of Electrical Engineering & Electronics*. S. Chand Publications.
- [3] B. L. Theraja. (2013). *Fundamentals of Electrical Engineering and Electronics*. S. Chand & Company Ltd; Reprint Edition.
- [4] R. Prasad. (2014). *Fundamentals of Electrical Engineering*. PHI; 3rd Edition.

D. Mode of Assessment

IAT / CCE / Practical / SEE

E. Scheme of Evaluation

1. Continuous Internal Evaluation (CIE-Theory) : 50 Marks

| Components | Average of 2 IATs | CCE | Total Marks |
|------------|-------------------|-----|-------------|
| Max. Marks | 20 | 30 | 50 |

2. Continuous Internal Evaluation (CIE-Practicals) :100 Marks [scaled down to 25]

| Components | Experiments | Viva-Voce | Record Submission | Total |
|------------|-------------|-----------|-------------------|-------|
| Max. Marks | 50 | 30 | 20 | 100 |

3. Semester End Examination (SEE) Scheme (Theory): 100 Marks [scaled down to 50]



Question paper pattern:

1. The question paper shall have FIVE main questions corresponding to the FIVE modules. Internal choices shall be given only in the main questions.
2. Each main question will have TWO full questions carrying TWENTY marks each.
3. A full question may have a maximum of FOUR sub questions, covering the topics under the module.
4. The students will have to answer all FIVE main questions, selecting ONE full question out of the two full questions from each module.

Note: A student has to obtain a minimum of 40% in the course to be eligible to appear for SEE.

F. CO-PO-PSO Mapping

| CO-PO-PSO Mapping | | | | | | | | | | | | | | | |
|-------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| CO | PO | | | | | | | | | | | | PSO | | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| CO1 | * | * | * | | | | | | | | | | * | | |
| CO2 | * | * | | | * | | | | | | | | * | * | |
| CO3 | * | * | * | * | | | | | | | | | * | * | * |
| CO4 | * | * | * | | * | | | | | | | | * | * | |
| CO5 | * | * | | | | | | | | | | | * | | * |



| 4CSGC2041: OPERATING SYSTEMS | | |
|--|--------------------------------|----------------------------|
| A. Course Framework | | |
| Credits: 2-0-1-3 | | Syllabus Version: 1 |
| Contact Hours / Week: 2+2 | Total Contact Hours: 60 | Level: 200 |
| Prerequisite: (If applicable) | Nil | |
| Course Learning Objectives: This course aims at learning fundamentals of Operating Systems. The course will cover details of concurrent processes, multi-threads, CPU scheduling, memory management, file system, storage subsystem, input/output management and deadlock detection etc. | | |
| This course enables the student to: CLO1: To comprehend how an operating system virtualizes CPU and memory CLO2: To discuss various scheduling and swapping policies CLO3: To learn basic deadlock and how to manage the memory CLO4: To explain how a simple file system organizes data in the hard disk CLO5: To get to know how an operating system protects the computer system | | |
| Course Outcomes: | | |
| On successful completion of the course, students will be able to: | | |
| CO1: Explain various functionalities of OS and concept of multithreading | | L4 |
| CO2: Apply process scheduling and synchronization techniques | | L3 |
| CO3: Apply appropriate method to overcome deadlock and explain concept of various memory management techniques | | L3 |
| CO4: Explain the structure and implementation of various secondary storage devices | | L2 |
| CO5: Explain various protection and security management techniques in OS | | L2 |
| PO: PO1/PO2/PO3/PO5 | | PSO: PSO1 |
| Syllabus | | |
| Module 1: Introduction to Operating Systems | | L[6] h + P[6]h |
| Introduction to operating systems, components of OS, examples of various OS, concept of a process: states, operations, process scheduling, inter-process communication. Threads: overview; multithreading models; thread libraries, threading issues | | |
| Module 2: Process Scheduling | | L[6] h + P[6]h |
| Process Scheduling: basic concepts, scheduling criteria, scheduling algorithms, examples. Process Synchronization: critical sections, classical two process and n-process solutions, semaphores, monitors, classical problems in synchronization: producer-consumer, readers - writer, dining philosophers | | |
| Module 3: Deadlocks | | L[6] h + P[6]h |
| Deadlocks: characterization, prevention, avoidance, detection. Memory Management: with and without swapping, paging and segmentation, demand paging, virtual memory, page replacement algorithms | | |



| | |
|--|-----------------------|
| Module 4: Secondary Storage | L[6] h + P[6]h |
| Secondary Storage: File systems, Directory structure, Device controllers and device drivers, Disks, Disk space management, Disk scheduling, NFS, RAID | |
| Module 5: Protection and Security in Operating Systems | L[6] h+ P[6]h |
| Protection and Security in Operating Systems: goals, principles and domain of protection, access matrix, revocation of access rights, capability-based systems. Program threats, system and network threats, cryptography, user authentication. Advanced Topics- distributed OS, mobile OS | |
| C. References | |
| TEXT BOOKS: | |
| 1. Abraham Silberschatz, Peter B. Galvin, Greg Gagne, John Wiley, Operating System Concepts, 9th Edition, ISBN-13: 9781118890356 | |
| 2. Andrew S. Tanenbaum, Albert S. Woodhull, Operating Systems Design and Implementation, Prentice Hall, 3rd Edition, ISBN-13: 9780136386773 | |
| REFERENCES: | |
| 1. William Stallings, Operating Systems: Internals and Design Principles, Prentice-Hall, 9th Edition, ISBN-13: 9780134670959 | |
| 2. Andrew S. Tanenbaum, Modern Operating Systems, Pearson, ISBN-13: 9780133591620 | |
| SYLLABUS-LABORATORY | |
| <ol style="list-style-type: none"> 1. Illustrative examples on basics of UNIX commands and editors. 2. Programs using the following system calls of UNIX operating system fork, exec, getpid, exit, wait, close, stat, opendir, readdir 3. Write a program to simulate UNIX commands like cp, ls, grep. 4. CPU Scheduling Algorithms (Priority, Round Robin, FCSFS,SJF) 5. Solve producer-consumer problem using semaphores 6. Write a c program to implement IPC using shared memory. 7. Illustration of Banker's Algorithm for Deadlock avoidance. 8. Write a program for deadlock detection 9. Illustrative program on threading and synchronization applications 10. Demonstrate memory allocation methods for fixed partition 11. Demonstrate paging techniques for memory management 12. Page Replacement Algorithms 13. File organization techniques | |
| D. Mode of Assessment | |
| IAT / CCE / SEE | |
| E. Scheme of Evaluation | |

1. Continuous Internal Evaluation (CIE-Theory) : 50 Marks [scaled down to 25]



| Components | Average of 2 IATs | CCE | Total Marks |
|------------|-------------------|-----|-------------|
| Max. Marks | 20 | 30 | 50 |

2. Continuous Internal Evaluation (CIE-Practical's) : 100 Marks [scaled down to 25]

| Components | Experiments | Viva-Voce | Record Submission | Total |
|------------|-------------|-----------|-------------------|-------|
| Max. Marks | 50 | 30 | 20 | 100 |

0. Semester End Examination (SEE) Scheme (Theory): 100 Marks [scaled down to 50]

Question paper pattern:

1. The question paper shall have FOUR main questions corresponding to the FOUR modules. Internal choices shall be given only in the main questions.
2. Each main question will have TWO full questions carrying TWENTY FIVE marks each.
3. A full question may have a maximum of FOUR sub questions, covering the topics under the module.
4. The students will have to answer all FOUR main questions, selecting ONE full question out of the two full questions from each module.
5. A minimum of 12.5/25 is required in each CIE-Theory and CIE-Laboratory in order to be eligible to appear for the SEE.

| Break-up of Marks for Final Evaluation | | | |
|--|----------------|-----|-------------|
| CIE-Theory | CIE-Laboratory | SEE | Total Marks |
| 25 | 25 | 50 | 100 |

F. CO-PO-PSO Mapping

| CO-PO-PSO Mapping | | | | | | | | | | | | | | | |
|-------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|--|--|
| CO | PO | | | | | | | | | PSO | | | | | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PSO0 | PSO1 | PSO2 | PSO3 | | |
| CO1 | * | * | * | | | | | | | | * | | | | |
| CO2 | * | * | | | * | | | | | | * | * | | | |
| CO3 | * | * | * | * | | | | | | | * | * | * | | |
| CO4 | * | * | * | | * | | | | | | * | * | | | |
| CO5 | * | * | | | | | | | | | * | | * | | |



| 4CSGC2051: DESIGN AND ANALYSIS OF ALGORITHMS | | |
|--|--------------------------------|----------------------------|
| A. Course Framework | | |
| Credits: 3-0-1-4 | | Syllabus Version: 1 |
| Contact Hours / Week: 5 | Total Contact Hours: 75 | Level: 200 |
| Prerequisite: (If applicable) | Nil | |
| Course Learning Objectives: The course introduces students to various computational problem solving techniques, apply appropriate method to solve a given problem and describes various algorithm analysis methods. | | |
| This course enables the student to: CLO1: To Analyze the asymptotic performance of algorithms CLO2: To Write rigorous correctness proofs for algorithms CLO3: To Demonstrate a familiarity with major algorithms and data structures CLO4: To Apply important algorithmic design paradigms and methods of analysis CLO5: To Synthesize efficient algorithms in common engineering design situations | | |
| Course Outcomes: | | |
| On successful completion of the course, students will be able to: | | |
| CO1: Identify various algorithm design techniques and strategies | | L4 |
| CO2: Represent various asymptotic performance of algorithm | | L3 |
| CO3: Illustrate the computational complexity of different algorithms | | L3 |
| CO4: Analyse and find the best algorithm for real time problem solving | | L2 |
| CO5: Construct best algorithm for real time problem solving | | L2 |
| PO: PO1/PO2/PO3/PO5 | | PSO: PSO1 |
| Syllabus | | |
| Module 1: Introduction to Algorithm | | L[6] h |
| Definition, algorithm specification for iterative and recursive algorithm, fundamental data structures: graph theory terminology, representation of graph and weighted graph, representation of trees, sets and dictionaries, performance analysis: space and time complexity, asymptotic notations: big-oh notation (O), omega notation (ω), theta notation (Θ), and little-oh notation (o), property of asymptotic notations, mathematical analysis of non-recursive and recursive algorithms with examples. important problem types | | |
| Module 2: Divide and Conquer | | L[6] h |
| General method, Sum of n elements of array, Sorting using divide and conquer: Merge sort, Quick sort, Analysis of quick sort, Binary search, Defective chess board, Multiplication of largest integers, Strassen's matrix multiplication, Advantages and Disadvantages of divide and conquer | | |
| Module 3: Greedy Techniques | | L[6] h |



General method, Knapsack Problem, Job sequencing with deadlines, Single source shortest paths: Dijkstra's Algorithm, Minimum cost spanning trees: Prim's Algorithm, Kruskal's Algorithm, Transform and Conquer Approach: Heaps and Heap Sort, Huffman tree

Module 4: Dynamic Programming

L[6] h

General method with Examples, Transitive Closure: Warshall's Algorithm, All Pairs Shortest Paths: Floyd's Algorithm, Knapsack problem, Bellman-Ford Algorithm, Travelling Sales Person problem: Using brute force, Multistage graph: Forward and backward approach, Optimal Binary search tree, Decrease and Conquer: Topological sorting using DFS method and source removal method

Module 5: Advanced Topics

L[6] h

Limitations of algorithm power: Introduction, Lower bound arguments, decision trees, P, NP and NP, challenges of numerical algorithm. Backtracking: N-Queens problem, Sum of subsets problem, Hamiltonian cycles, Branch and Bound: Assignment Problem, Traveling Sales Person problem

A. SYLLABUS-LABORATORY

30 h

1. **Sorting Algorithms:** Use a class of sort, that performs different sorting algorithms and determine the time taken for sorting with different values of n
2. **Knuth-Morris-Pratt:** Implement Knuth-Morris-Pratt (KMP) string searching algorithm
3. **Topological ordering:** Obtain the Topological ordering of vertices in a given digraph
4. **Knapsack Algorithm:** Implement 0/1 Knapsack problem using Dynamic Programming
5. **Dijkstra's Algorithm:** From a given vertex in a weighted connected graph, find shortest paths to other vertices using Dijkstra's algorithm
6. **Kruskal's Algorithm:** Find Minimum Cost Spanning Tree of a given undirected graph using Kruskal's algorithm
7. **Breadth First Search (BFS):** a. Print all the nodes reachable from a given starting node in a digraph using BFS method.
Depth First Search (DFS): b. Check whether a given graph is connected or not using DFS method
8. **Travelling Sales Person Problem:** Implement any scheme to find the optimal solution for the Traveling Salesperson problem and then solve the same problem instance using any approximation algorithm and determine the error in the approximation
9. **Prim's Algorithm:** Minimum Cost Spanning Tree of a given undirected graph using Prim's algorithm
10. **N Queen's Algorithm:** Implement N Queen's problem using Back Tracking

B. References

TEXT BOOKS:

1. Anany Levitin, Introduction to the Design and Analysis of Algorithms, Pearson, 2009, ISBN: ISBN-13: 978-0-13-231681-1



2. S. Sridhar ,Design and Analysis of Algorithms, Oxford University Press, 2015, ISBN: 9780198093695

REFERENCES:

- 1) Jon Kleinberg and Eva Tardos , Algorithm Design, Pearson Education Limited, 2017, ISBN 0-321-29535-8
- 2) T.H. Corman, Charles E. Leiserson and Ronald L. Rivest, Introduction to Algorithms, MIT Press, 2009, ISBN: 9780262033848

D. Mode of Assessment

IAT / CCE / SEE

E. Scheme of Evaluation

1. Continuous Internal Evaluation (CIE-Theory) : 50 Marks

| Components | Average of 2 IATs | CCE | Total Marks |
|------------|-------------------|-----|-------------|
| Max. Marks | 20 | 30 | 50 |

2. Continuous Internal Evaluation (CIE-Practicals) :100 Marks [scaled down to 25]

| Components | Experiments | Viva-Voce | Record Submission | Total |
|------------|-------------|-----------|-------------------|-------|
| Max. Marks | 50 | 30 | 20 | 100 |

3. Semester End Examination (SEE) Scheme (Theory): 100 Marks [scaled down to 50]

Question paper pattern:

1. The question paper shall have FIVE main questions corresponding to the FIVE modules. Internal choices shall be given only in the main questions.
2. Each main question will have TWO full questions carrying TWENTY marks each.
3. A full question may have a maximum of FOUR sub questions, covering the topics under the module.
4. The students will have to answer all FIVE main questions, selecting ONE full question out of the two full questions from each module.

Note: A student has to obtain a minimum of 40% in the course to be eligible to appear for SEE.



E. CO-PO-PSO Mapping

| CO-PO-PSO Mapping | | | | | | | | | | | | | | | |
|-------------------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|
| CO | PO | | | | | | | | | | | | PSO | | |
| | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PS O1 | PS O2 | PS O3 |
| CO1 | * | * | * | | * | | | | | | | | * | | |
| CO2 | * | * | * | | * | | | | | | | | * | | |
| CO3 | * | * | * | | * | | | | | | | | * | | |
| CO4 | * | * | * | | * | | | | | | | | * | | |
| CO5 | * | * | * | | * | | | | | | | | * | | |



| 4CSGC2071: CLOUD COMPUTING | | |
|--|---|--------------------------------|
| Course Framework: | | |
| Credits: L–T–P: 3–0–0 | | Total Credits: 3 |
| Contact Hours/Week: 3 | Direct Teaching Hours: 45 | Total Contact Hours: 45 |
| Course Learning Objectives: In this course the students will be introduced to the concepts of cloud computing, its evolution and various issues associated with cloud. The students will learn different players in cloud technology. | | |
| Course Outcomes (COs): On successful completion of the course, students will be able to: | | |
| CO1 | Explain main concepts, key technologies, strengths and limitations of cloud computing | L2 |
| CO2 | Explain the cloud enabling technologies that help in the development of cloud | L2 |
| CO3 | Develop the ability to use the architecture of compute and storage cloud, service and delivery models | L3 |
| CO4 | Explain core issues of cloud computing such as resource management and security | L2 |
| CO5 | Choose the appropriate technologies and approaches for implementation and use of cloud | L3 |
| SYLLABUS | | Hours |
| Module–I: Introduction to Cloud Computing | | 09 |
| The vision of cloud computing, defining a cloud, a closer look, on premise data center v/s cloud, characteristics and benefits, evolution of cloud computing, cloud computing reference model, challenges ahead, computing platforms and technologies | | |
| Module–II: Virtualization | | 09 |
| Describing virtualization, understanding the importance of virtualization, examining today’s trends, understanding virtualization software operation, understanding hypervisors, understanding the role of a hypervisor, comparing today’s hypervisors | | |
| Module–III: Cloud Computing Architecture | | 09 |
| Cloud reference model- architecture, IAAS, PAAS, SAAS, types of clouds - public clouds, private clouds, hybrid clouds, community clouds, economics of the cloud, open challenges, architectural design challenges, cloud storage, advantages of cloud storage, cloud storage providers | | |
| Module–IV: Inter Cloud Resource Management | | 09 |
| Inter cloud resource management, resource provisioning and resource provisioning methods, global exchange of cloud resources. Security Overview: cloud security challenges, software as a service security, security governance, virtual machine security, IAM, security standards | | |
| Module–V: Cloud Platforms in Industry | | 09 |
| Amazon web services, Google web services, Microsoft web services, cloud applications | | |



EVALUATION SCHEME

A. Continuous Internal Evaluation (CIE):

| Components | Internal Assessment Test | Assignment | Total |
|------------|--------------------------|------------|-------|
| Max. Marks | 20 | 30 | 50 |

Note: A student shall obtain a minimum of 50% in CIE to be eligible to appear for SEE.

B. Semester End Evaluation (SEE): 100 Marks

Question paper pattern:

1. The question paper shall have FIVE main questions corresponding to the FIVE modules. Internal choices shall be given only in the main questions.

Each main question will have TWO full questions carrying TWENTY marks each.

A full question may have a maximum of FOUR sub questions, covering the topics under the module.

The students will have to answer all FIVE main questions, selecting ONE full question from each module.

| Weightage for Final Evaluation | |
|--------------------------------|-----|
| CIE | SEE |
| 1.00 | 0.5 |

BOOKS and REFERENCES

TEXT BOOKS:

1. Rajkumar Buyya, Christian Vecchiola, S. Thamarai Selvi, *Mastering Cloud Computing*, Tata McGraw Hill, 1st edition, 2013, ISBN-13: 9781259029950
2. Matthew Portnoy, Wiley-John Wiley and sons Inc, *Virtualization Essentials*, 1st edition, 2012, ISBN-13: 9781118176719
3. Kai Hwang, Geoffrey C. Fox, Jack G. Dongarra, *Distributed and Cloud Computing, From Parallel Processing to the Internet of Things*, Morgan Kaufmann Publishers, 1st edition, 2012, ISBN 9780123858801

REFERENCES:

1. Barrie Sosinsky, *Cloud Computing Bible*, Wiley Publishing Inc. 2011, ISBN-13: 9788126529803
2. Toby Velte, Anthony Velte, Robert Elsenpeter, *Cloud Computing – A Practical Approach*, Tata McGraw Hill, 1st edition, 2009, SBN 13: 9780070683518



| 4CSGC2081- Software Engineering | | |
|---|----------------------------------|--------------------------------|
| Course Framework: | | |
| Credits: L-T-P: 3 – 0 – 0 | | Total Credits: 3 |
| Contact Hours/Week: 3 | Direct Teaching Hours: 45 | Total Contact Hours: 45 |
| Course Learning Objectives: To introduce the essential software engineering concepts involved. To impart skills in the design and implementation of efficient software systems across disciplines. To familiarize engineering practices and standards used in developing software products and components | | |
| Course Outcomes: On successful completion of the course, students will be able to: <ol style="list-style-type: none"> 1. Explain the principles of the engineering processes in software development. (L2) 2. Develop the software projects through activities such as planning and scheduling. (L3) 3. Classify and specify the requirements for the software projects. (L2) 4. Design the prototype of the software projects. (L4) 5. Implement the software development processes activities from requirements to validation and verification. (L3) | | |
| Syllabus | | Hours |
| Module – 1 Overview Of Software Engineering | | 09 |
| Nature of Software, Software Engineering, Software process, project, product, Process Models Classical Evolutionary models, Overview of System Engineering. | | |
| Module – 2 Introduction To Software Project Management and Modeling requirements | | 09 |
| Planning scope, milestones deliverables, Risk Management, Metrics Measurement Requirements Engineering process Requirement Elicitation, System Modelling - Requirements Specification and Requirement Validation | | |
| Module – 3 Software Design | | 09 |
| Design concepts and principles - Abstraction - Refinement - Modularity Cohesion coupling, Architectural design, Detailed Design Transaction Transformation, Refactoring of designs, Object oriented Design User-Interface Design | | |
| Module – 4 Validation And Verification | | 09 |
| Strategic Approach to Software Testing, Testing Fundamentals Test Plan, Test Design, Test Execution, Reviews, Inspection Auditing | | |
| Module – 5 Software Evolution and Quality Assurance | | 09 |
| Software Maintenance, Types of Maintenance, Software Configuration Management, Overview of RE-engineering Reverse Engineering Product Process Metrics, Quality Standards Models ISO, TQM, Six-Sigma | | |



SCHEME OF EVALUATION:**A. Continuous Internal Evaluation (CIE) Scheme: 50 Marks**

| Components | IAT | Assignment | Theory Total |
|------------|-----|------------|--------------|
| Max. Marks | 30 | 20 | 50 |

Note: A student shall obtain a minimum of 50% in CIE of the course to be eligible to appear for SEE.

B. Semester End Evaluation (SEE) Scheme: 50 Marks**Question paper pattern:**

1. Question paper shall have 5 main questions corresponding to 5 modules.
2. Each main question will have two full questions carrying 20 marks each.
3. A full question may have a maximum of four sub questions, covering the topics under a module.
4. The student will have to answer all 5 main questions, selecting one full question from each.

Text Book:

1. Roger Pressman, Software Engineering: A Practitioner's Approach, 7th Edition, McGraw Hill, 2010.

Reference Books:

1. Ian Sommerville, Software Engineering, 9th Edition, Addison-Wesley, 2016
2. William E. Lewis, Software Testing and Continuous Quality Improvement, Third Edition, Auerbach Publications, 2008
3. Pankaj Jalote, A Concise Introduction to Software Engineering, Springer, 2008

EVALUATION SCHEME**A. Continuous Internal Evaluation (CIE):**

| Components | Internal Assessment Test | Assignment | Total |
|------------|--------------------------|------------|-------|
| Max. Marks | 20 | 30 | 50 |

Note: A student shall obtain a minimum of 50% in CIE to be eligible to appear for SEE.

B. Semester End Evaluation (SEE): 100 Marks**Question paper pattern:**

1. The question paper shall have FIVE main questions corresponding to the FIVE modules. Internal choices shall be given only in the main questions.
2. Each main question will have TWO full questions carrying TWENTY marks each.
3. A full question may have a maximum of FOUR sub questions, covering the topics under the module.
4. The students will have to answer all FIVE main questions, selecting ONE full question from each module.

| Weightage for Final Evaluation | |
|--------------------------------|-----|
| CIE | SEE |
| 1.00 | 0.5 |





| 4CSPL1011: PROBLEM SOLVING USING PYTHON | | |
|--|-------------------------------|----------------------------|
| A. Course Framework | | |
| Credits: 2-0-1-3 | | Syllabus Version: 1 |
| Contact Hours / Week: 30+30 | Total Contact Hours:60 | Level: 100 |
| Prerequisite: (If applicable) | | |
| Course Learning Objectives: | | |
| This course enable the students to: | | |
| CLO1: Become familiar with the basics of algorithm writing and to use the programming constructs of Python to solve real world problems. | | |
| CLO2: Handle Python conditionals and loops. | | |
| CLO3: Use Python data structures – lists, tuples, dictionaries to represent complex data and to use python libraries in programs. | | |
| CLO4: Learn decomposition of problem into functions and solve them. | | |
| CLO5: Write simple GUI Python programs using Tkinter. | | |
| CLO6: To write Object Oriented programs using Python | | |
| Course Outcomes: | | |
| On successful completion of the course, students will be able to: | | |
| CO1: Understand the basis of algorithm problem solving | | L2 |
| CO2: Read/Write simple python programs | | L3 |
| CO3: Develop python programs with conditionals and loops | | L4 |
| CO4: Use python functions and python data structures | | L3 |
| CO5: Read and write data from/to files in python programs | | L3 |
| PO: PO1/PO2/PO3/PO4/PO5 | | PSO:PSO1/PSO2/PSO3 |
| B. Syllabus | | |
| Module:1: Introduction | | L[6]+P[6] h |
| Algorithms, building blocks of algorithms (statements, state, control flow, functions), notation (pseudo code, flow chart, programming language), algorithmic problem solving, simple strategies for developing algorithms (iteration, recursion). Illustrative problems: find minimum in a list, insert a card in a list of sorted cards, and guess an integer number in a range, Towers of Hanoi. | | |
| Module:2: Basics of Python | | L[6]+P[6] h |
| Variables and Operators, Data Types Implicit/Explicit Type conversions, Decision Constructs, Iteration Control structures (for, while)- break-continue-pass, Strings-String functions Illustrative programs: exchange the values of two variables, circulate the values of n variables, distance between two points. | | |
| Module:3: Collections and Functions | | L[6]+P[6] h |
| Lists, Tuples, Sets & Dictionary, Mutable & Immutable data types Defining & calling a function, passing arguments, Types of arguments, Scope of a variable, Recursive functions, try, except, try...finally, Handling exception in code | | |



Illustrative programs: square root, gcd, exponentiation, sum an array of numbers, selection sort, insertion sort, merge sort, histogram.

Module:4: Modules and Packages, Libraries, Files and GUI

L[6]+P[6] h

Modules and Packages, Random Library, Math Library, Date and Time functions, File Handling- Reading files, Writing files in python, Understanding read functions, read(), readline(), readlines(). Understanding write functions, write() and writelines() Manipulating file pointer using seek Programming, using file operations., GUI Programming: Tkinter Introduction, Tkinter and Python Programming, Tk Widgets, Tkinter Examples. Python programming with IDE.

Illustrative programs: word count, copy file.

Projects: Color Game in Python Using Tkinter,
AI Sudoku Project using Tkinter,
Age Calculator Application using Tkinter,
Restaurant management system using Tkinter,
Snake game project.

Module:5: Object Oriented Programming

L[6]+P[6] h

Creating classes, Instance variables & access specifiers, methods and complete python program, importance of self, __init__() method, instance method, class method and static method, using default parameters in methods

Illustrate programs: accessing data members, class method to create a person object by birth year, call- method in a class.

C. Text Books and References

Text Books

[1] Karl Beecher, “Computational Thinking: A Beginner's Guide to Problem Solving and programming”, 1st Edition, BCS Learning & Development Limited, 2017

[2] Allen B. Downey, “Think Python: How to Think Like a Computer Scientist”, 2nd Edition, Green Tea Press, 2015

[3] John E. Grayson, "Python and Tkinter Programming", Manning Publication, January 2000

References

[1] Wesley J Chun, “Core Python Applications Programming”, 3rd Edition, Pearson Education India, 2015. ISBN-13: 978-9332555365

[2] Paul Deitel and Harvey Deitel, “Python for Programmers”, Pearson Education, 1st Edition, 2021.

[3] Mark Lutz, “Learning Python”, 5th edition, Orelly Publication, 2013, ISBN 978- 1449355739

[4] John Zelle, “Python Programming: An Introduction to Computer Science”, Second edition, Course Technology Cengage Learning Publications, 2013, ISBN 978- 1590282410

[5] Michel Dawson, “Python Programming for Absolute Beginners” , Third Edition, Course Technology Cengage Learning Publications, 2013, ISBN 978-1435455009

[6] David Beazley, Brian Jones., “Python Cookbook”, Third Edition, Orelly Publication, 2013, ISBN 978-1449340377

[6] <https://infytq.infosys.com/>

[7] <https://www.geeksforgeeks.org/python-programming-examples/>

D. Mode of Assessment

IAT / CCE / Mini Project / SEE

E. Scheme of Evaluation

1. Continuous Internal Evaluation (CIE) : 50 Marks



| Components | Average of 2 IATs | CCE | Total Marks |
|------------|-------------------|-----|-------------|
| Max. Marks | 20 | 30 | 50 |

1. Semester End Examination (SEE) Scheme (Theory): 100 Marks [scaled down to 50]

Question paper pattern:

1. The question paper shall have FIVE main questions corresponding to the FIVE modules. Internal choices shall be given only in the main questions.
2. Each main question will have TWO full questions carrying TWENTY marks each.
3. A full question may have a maximum of FOUR sub questions, covering the topics under the module.
4. The students will have to answer all FIVE main questions, selecting ONE full question out of two full questions from each module.
5. A minimum of 25/50 is required in CIE in order to be eligible to appear for the SEE.

| Break-up of Marks for Final Evaluation | | |
|--|-----|-------------|
| CIE | SEE | Total Marks |
| 50 | 50 | 100 |

| CO | PO | | | | | | | | | | | | PSO | | |
|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| CO 1 | * | * | * | | * | | | | | | | | * | | |
| CO 2 | * | | | | * | | | | | | | | * | | |
| CO 3 | * | * | * | * | * | | | | | | | | * | | |
| CO 4 | * | * | * | * | * | | | | | | | | * | | |
| CO 5 | * | | | | * | | | | | | | | * | | |



4CSPL2011: WEB DEVELOPMENT USING PYTHON AND DJANGO

A. Course Framework

| | |
|-------------------------|----------------------------|
| Credits: 2-0-1-3 | Syllabus Version: 1 |
|-------------------------|----------------------------|

| | | |
|--------------------------------|-------------------------------|-------------------|
| Contact Hours / Week: 4 | Total Contact Hours:60 | Level: 200 |
|--------------------------------|-------------------------------|-------------------|

Prerequisite:
(If applicable)

Course Learning Objectives:

This course enables the students to:

CLO1: Learn How to use Python object-oriented programming techniques within web-based projects, from online databases to complete websites.

CLO2: How to install and configure basic web-based databases using Python code.

CLO3: The essentials of XML and how it can be used in conjunction with Python projects.

CLO4: How to implement and work with Django to manage full database-driven websites.

CLO5: Write simple to-do applications using Django and React JS.

Course Outcomes:

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

| | |
|--|----|
| CO1: Create database using SQLite | L6 |
|--|----|

| | |
|---|----|
| CO2: Create web client programs using python | L6 |
|---|----|

| | |
|---|----|
| CO3: Create web server programs using python | L6 |
|---|----|

| | |
|---|----|
| CO4: Create website using Django framework | L6 |
|---|----|

| | |
|--|----|
| CO5: Create to-do application using Django and React JS | L6 |
|--|----|

PO: PO1/PO2/PO3/PO4/PO5

PSO:PSO1/PSO3



| B. Syllabus | |
|---|--------------------|
| Module:1: Web and database Programming with Python | L[6]+P[6]h |
| Introduction to web development, python fundamentals, sequence and iteration, file operations, functions, libraries. | |
| Introduction to Databases, Data Definition, Constraints, ER Diagrams, SQL Queries – DDL, DQL, DML, DCL and TCL Commands, Database Design Theory: Normalization, SQL – Join (Inner, Left, Right and Full Joins) | |
| Illustrative programs: | |
| 1. Connecting to SQL databases | |
| a. Sqlite/oracle/mysql | |
| 2. Data manipulation using python | |
| Module:2: Web Client Programming with Python | L[6]+P[6] h |
| Web page structure, using urllib, parsing HTML-part 1, parsing HTML-part 2, screen scraper, web crawler | |
| Web scraping: Web Scraping, Downloading Files from the Web with the requests Module, Saving Downloaded Files to the Hard Drive, HTML, Parsing HTML with the Beautiful Soup Module | |
| Illustrative programs: | |
| 1. MAPIT.PY with the web browser Module | |
| 2. “I’m Feeling Lucky” Google Search | |
| Module:3: Web server programming with Python | L[6]+P[6] h |
| Introduction to simple HTTP server, simple HTTP and base HTTP server, CGI programming part-1, CGI programming part-2, Form processing | |
| Illustrative programs: | |
| 1. Downloading All XKCD Comics, Controlling the Browser with the selenium Module. | |
| 2. Read website data using Urllib library | |
| Module:4: Introduction to Django Framework | L[6]+P[6] h |
| Introduction to existing Frameworks, Introduction to Design Patterns, MVC and MVT design pattern in web development, Introduction to Django Python framework, Installing DJango, setting up DJango-part 1, setting up DJango part-2, DJango API, DJango admin application, DJango views, DJango templates, add/remove data. | |
| Illustrative programs: | |



1. Create website using Django framework:

- Creating the app
- Url mapping
- Error handling
- Running the server
- Connecting to databases
- Creating html files

2. Adding images and media

3. Add login/logout/user registration to website using “just works”

Module:5: Full Stack web App Development using Django and React JS

L[6]+P[6] h

Introduction to NodeJS, Getting Started with Node, Installing React, Your first React Web Application, components, Components and Servers, JSX and the Virtual DOM, Routing, Intro to Flux and Redux. Building a to-do application using Django and React.

Illustrative programs:

1. Building a to-do application using Django and React.

C. Text Books and References

Reference Books:

- [1] Detailed guide for web scraping and data analysis with BeautifulSoup (with Python 3) - <https://www.dataquest.io/blog/web-scraping-tutorial-python/> Quick guide for webscraping with lxml and requests - <http://python-guide-pt-br.readthedocs.io/en/latest/scenarios/scrape/>
- [2] An open source and collaborative framework for web scraping in a Python environment and quickly writing spiders - <https://scrapy.org/>
- [3] Al Sweigart, “Automate the Boring Stuff with Python”, 1st Edition, No Starch Press, 2015. (Available under CC-BY-NC-SA license at <https://automatetheboringstuff.com>)
- [4] Allen B. Downey, “Think Python: How to Think Like a Computer Scientist”, 2nd Edition, Green Tea Press, 2015. (Available under CC-BY-NC license at <http://greenteapress.com/thinkpython2/thinkpython2.pdf>)
- [5] Gowrishankar S, Veena A, “Introduction to Python Programming”, 1st Edition, CRC Press/Taylor & Francis, 2018. ISBN-13: 978-0815394372
- [6] William S Vincent, “Django for Beginners: Build websites with Python and Django”, ISBN-13 - 978-1983172663, ISBN-10 – 1983172669



[7] Fabrizio Romano, Gaston C.Hillar, Arun Ravindran , “Learn Web Development with Python: Get hands-on with Python Programming and Django web development”
ISBN-9781789593299

[8] Vivian Siahaan, Rismon Hariholan Sianipar, “Learn SQLite with Python: Building Database-Driven Desktop Projects”.

[9] Fundamentals of Database Systems, Pearson by Elmasri Ramez, Navathe Shamkant

[10] Learning-Django-Web-Development, Sanjeev Jaiswal, Ratan Kumar, packt, 2015

[11] Erich Gamma, Richard Helm, Ralph Johnson and john Vlissides: Design Patterns – Elements of Reusable Object-Oriented Software, Pearson Education,2007

[12] Web Development with Node and Express, Ethan Brown, O’Reilly publications, 1st Edition, ISBN: 978-1-491-94930-6, 2014.

[13] The complete Guide to ReactJS and Friends, Anthony Accomazzo, Ari Lerner et.al, 2017

- **Link:**
<https://www.digitalocean.com/community/tutorials/build-a-to-do-application-using-django-and-react>

D. Mode of Assessment

IAT / CCE / SEE

E. Scheme of Evaluation

1.Continuous Internal Evaluation (CIE-Theory) : 50 Marks

| Components | Average of 2 IATs | CCE | Total Marks |
|------------|-------------------|-----|-------------|
| Max. Marks | 20 | 30 | 50 |



2. Continuous Internal Evaluation (CIE-Practicals) :100 Marks [scaled down to 25]

| Components | Experiments | Viva-Voce | Record Submission | Total |
|------------|-------------|-----------|-------------------|-------|
| Max. Marks | 50 | 30 | 20 | 100 |

3. Semester End Examination (SEE) Scheme (Theory): 100 Marks [scaled down to 50]

Question paper pattern:

1. The question paper shall have FIVE main questions corresponding to the FIVE modules. Internal choices shall be given only in the main questions.
2. Each main question will have TWO full questions carrying TWENTY marks each.
3. A full question may have a maximum of FOUR sub questions, covering the topics under the module.
4. The students will have to answer all FIVE main questions, selecting ONE full question out of the two full questions from each module.

Note: A student has to obtain a minimum of 40% in the course to be eligible to appear for SEE.

| Break-up of Marks for Final Evaluation | | |
|--|-----|-------------|
| CIE | SEE | Total Marks |
| 50 | 50 | 100 |



F. CO-PO-PSO Mapping

| CO-PO-PSO Mapping | | | | | | | | | | | | | | | |
|-------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| CO | PO | | | | | | | | | | | | PSO | | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| CO1 | * | * | * | | * | | | | | | | | * | | |
| CO2 | * | * | | | * | | | | | | | | * | | |
| CO3 | * | * | * | * | * | | | | | | | | * | | |
| CO4 | * | * | * | * | * | | | | | | | | * | | * |
| CO5 | * | * | | | * | | | | | | | | * | | * |



| 4CSPL2021: OBJECT ORIENTED PROGRAMMING USING JAVA | | |
|---|--------------------------------|----------------------------|
| A. Course Framework | | |
| Credits: 2-0-1-3 | | Syllabus Version: 1 |
| Contact Hours / Week: 4 | Total Contact Hours: 60 | Level: 200 |
| Prerequisite: (If applicable) | Nil | |
| Course Learning Objectives: The course introduces students to object oriented programming concepts in java and familiarizes the students with designing, developing and deploying a wide range of java applications. | | |
| This course enables the student to: | | |
| CLO1: To identify Java language components and how they work together in applications | | |
| CLO2: To learn how to implement object-oriented designs with Java. | | |
| CLO3: To learn how to use exception handling in Java applications. | | |
| CLO4: To learn Java generics and how to use the Java Collections API. | | |
| CLO5: To understand how to design GUI components with the Java Swing API | | |
| Course Outcomes: | | |
| On successful completion of the course, students will be able to: | | |
| CO1: Apply Java programming constructs for problem solving | | L4 |
| CO2: Apply object oriented programming concepts for problem solving | | L3 |
| CO3: Analyze various run-time exceptions and can handle those exceptions | | L3 |
| CO4: Make use of classes and interfaces of Java collection framework | | L2 |
| CO5: Develop GUI based applications in Java | | L2 |
| PO: PO1/PO2/PO3/PO5 | | PSO: PSO1 |
| Syllabus | | |
| Module 1: Java Programming | | L[6] h |



| | |
|---|---------------|
| Java programming : the history of Java, Java’s magic: the byte code, the evolution of Java, Java keywords, data types, user-defined and pre-defined data types, variables, constants, scope and life time of variables, operators, operator hierarchy, expressions, type conversion and casting, programming constructs in Java, console i/o, objects and classes, constructors, static attributes and methods, access control | |
| Module 2:Introduction to Object-Oriented Programming Concept | L[6] h |
| Data hiding, abstraction, encapsulation, inheritance, and polymorphism. applications of object-oriented programming, procedural languages vs object-oriented programming, this keyword, this() method, super keyword and super() method, wrapper classes | |
| Module 3:Exception Handling and Multithreading | L[6] h |
| Exception handling: dealing with errors, benefits of exception handling, the classification of exceptions- exception hierarchy, checked exceptions and unchecked exceptions, usage of try, catch, finally, throw, throws and re-throwing exceptions, built in exceptions, creating own exception sub classes. Multithreading: differences between multiple processes and multiple threads, creating threads, thread states, thread priorities, synchronizing threads, interrupting threads, inter thread communication | |
| Module 4: Introduction to Java Collections | L[6] h |
| overview of Java collection frame work, collection framework hierarchy, collection interfaces and collection classes, commonly used collection classes, why generic collections, generics, classes and methods. Java lang: strings and string buffer | |
| Module 5: Introduction to GUI | L[6] h |
| swing, swing vs awt, the awt class hierarchy, hierarchy for swing components, containers, overview of swing components, layout management, event handling in java – events, event sources, event classes, event listeners, using the delegation event model, adapter classes. applets: differences between applets and applications, life cycle of an applet. | |
| B. SYLLABUS–LABORATORY | 30 h |
| <p>1.Constructs: Exercises on Java programming constructs.</p> <p>2. Oops Concepts: Program to implement oops concepts.</p> <p>3. Wrapper Classes: Program to demonstrate use of wrapper classes.</p> <p>4. Exception Handling: Program to implement concept of exception handling.</p> | |



5. Exception Sub Classes: Program to demonstrate creating own exception sub classes.

6. Multithreading: Program to demonstrate Multithreading.

7. Interfaces: Program to demonstrate use of implementing interfaces.

8. Generic Classes: Program to demonstrate generic classes.

9. Swings: Program to demonstrate swings.

10. Applet: Develop an applet in java that displays a simple message

C. References

TEXT BOOKS:

- 1) Daniel Liang, *Introduction to Java Programming*, Ninth edition, Pearson Education India 2013, ISBN 13: 978-0-13-292373-6 ISBN 10: 0-13-292373-4
- 2) Herbert Schildt, *Java: The Complete Reference*, Seventh edition, McGraw Hill, 2007, ISBN: 978-0-07-163177-8

REFERENCES:

- 1) Kathy Sierra and Bert Bates, *Head First Java*, Second edition, O'Reilly, 2005, ISBN-13: 9788173666025

D. Mode of Assessment

IAT / CCE / SEE

E. Scheme of Evaluation

1. Continuous Internal Evaluation (CIE-Theory) : 50 Marks

| Components | Average of 2 IATs | CCE | Total Marks |
|------------|-------------------|-----|-------------|
| Max. Marks | 20 | 30 | 50 |

2. Continuous Internal Evaluation (CIE-Practicals) :100 Marks [scaled down to 25]

| Components | Experiments | Viva-Voce | Record Submission | Total |
|------------|-------------|-----------|-------------------|-------|
|------------|-------------|-----------|-------------------|-------|



| | | | | |
|-------------------|----|----|----|-----|
| Max. Marks | 50 | 30 | 20 | 100 |
|-------------------|----|----|----|-----|

3. Semester End Examination (SEE) Scheme (Theory): 100 Marks [scaled down to 50]

Question paper pattern:

1. The question paper shall have FIVE main questions corresponding to the FIVE modules. Internal choices shall be given only in the main questions.
2. Each main question will have TWO full questions carrying TWENTY marks each.
3. A full question may have a maximum of FOUR sub questions, covering the topics under the module.
4. The students will have to answer all FIVE main questions, selecting ONE full question out of the two full questions from each module.

Note: A student has to obtain a minimum of 40% in the course to be eligible to appear for SEE.

F. CO-PO-PSO Mapping

| CO-PO-PSO Mapping | | | | | | | | | | | | | | | |
|-------------------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|
| CO | PO | | | | | | | | | | | | PSO | | |
| | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PS O1 | PS O2 | PS O3 |
| CO1 | * | * | * | | * | | | | | | | | * | | |
| CO2 | * | * | * | | * | | | | | | | | * | | |
| CO3 | * | * | * | | * | | | | | | | | * | | |
| CO4 | * | * | * | | * | | | | | | | | * | | |
| CO5 | * | * | * | | * | | | | | | | | * | | |



9FDES1011 - Introduction to Fashion Design (Idea to Prototype)

A. Course Framework

Credits: L-T-P-C: 3-2-2-7

SyllabusVersion: V1.0

Contact Hours / Week: 9

Level: 100

Prerequisite/Corequisite: (If applicable)

- NA

Course Learning Objectives:

CLO1: To give a strong sense of ideation, direction and vision during the creative process

CLO2: To acquaint students with basic terms in fashion illustration, pattern drafting and garment construction

CLO3: To describe pattern development and its significance in turning a design sketch into 3D form.

CLO4: To introduce machine operation, different sewing techniques to the finishing process.

CLO5: To create a simple outfit (kurta / shirt for male / female figure)

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

CO1: Create an effective, usable, wearable outfit

CO2: Understand the process of ideation to hard prototyping and final presentation of fashion products

CO3: Understand pattern making and garment construction

CO4: Develop a sensitivity for the right kind of finish on the garment

PO: PO1 / PO2 / PO3 / PO4 / PO5
PSO2 / PSO3 / PSO4 / PSO5

PSO: PSO1 /

B. Syllabus



Module 1: Brief, Research and IDEATION**Hours: 30**

- Fashion Design Process - Introduction
- Analysing the brief, Research - Brief, First stage, Second Stage
- Creative Process - Idea Sketch, Design development, Production sketch, Presentation drawing, Prototyping, Layout and composition
- Evaluation of design, Spec sheet & cost sheet
- Research boards - theme, color, fabric, design illustration, layout. technical flats, specs

Module 2: Visualization and Soft Prototyping**Hours: 30**

- Pattern making tools, Patternmaking terms, Fabric terms, Pattern Grainline
- Body measurements, types, taking measurements
- Basic pattern set drafting - Bodice - front, back & sleeve - on paper for standard size
- Pattern Manipulation - Slash-spread & Pivotal transfer - on paper standard size

Module 3: Hard Prototyping**Hours: 30**

- Introduction to sewing machines, its parts and processing, Machine problem and remedies
- Seams and types of seams - plain, french, flat & fell, lapped, turn and stitch. Different fasteners and its type
- Machine Balance exercise on fabric
- Toile sewing - documentation
- Toile trials - finish and fit (to know assembly sequence)
- Pattern cutting and development - actual fabric

Module:4: REFINEMENT OF GARMENT and Presentation**Hours: 35**

- Final garment development - actual fabric - documentation
- Final trial fit and Photoshoot
- Presentation Layouts

1) References

- Research and Design for Fashion, by Richard Sorger, Simon Seivewright (Author)
- Patternmaking for Fashion, Fifth Edition, by Armstrong (Author)
- Inside Fashion Design, by Sharon Lee Tate, Mona S. Edwards (Author)
- Garment Technology for Fashion Designer's, by Gerry Cooklin (Author)



2) Mode of Assessment

- Practical Assignments
- Mini Project

3) Scheme of Evaluation

Only CIE

1. Continuous Internal Assessment (CIE): 100 marks (Scaled down to 50 Marks)

| Components | Assignments | Mini Project | Total Marks (Average of Assignments and Mini Project) |
|------------|-------------|--------------|---|
| Max. Marks | 100 | 100 | 100 |

F. CO-PO-PSO Mapping

| CO-PO-PSO Mapping | | | | | | | | | | |
|-------------------|----|---|---|---|---|-----|---|---|---|---|
| CO | PO | | | | | PSO | | | | |
| | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 1 | * | * | * | * | * | * | * | * | * | * |
| 2 | * | * | * | * | * | * | * | * | * | * |
| 3 | | * | | * | * | * | * | | * | * |
| 4 | | * | | * | * | * | * | | * | * |

