



KONGU ARTS AND SCIENCE COLLEGE

(An Autonomous Institution, Affiliated to Bharathiar University, Coimbatore)

ERODE – 638 107

M.C.A



KONGU ARTS AND SCIENCE COLLEGE

(An Autonomous Institution, Affiliated to Bharathiar University, Coimbatore)

ERODE – 638 107

2021-2022



KONGU ARTS AND SCIENCE COLLEGE (AUTONOMOUS)

ERODE – 638 107

DEPARTMENT OF COMPUTER SCIENCE(P.G.)

MASTER OF COMPUTER APPLICATIONS DEGREE
SCHEME OF EXAMINATION – CBCS PATTERN



(For the candidates admitted during the academic year 2021 – 2022 and onwards)

Course Code	Course Title	Inst. Hrs./Week	T/P	Examination Details				Credits
				Duration in Hours	CIA	ESE	Total Marks	
SEMESTER I								
21PBKCT101	Core I: Computer Architecture	4	T	3	50	50	100	4
21PBKCT102	Core II : Data Structures	4	T	3	50	50	100	4
21PBKCT103	Core III :Relational Database Management Systems	4	T	3	50	50	100	4
21PBKCT104	Core IV: Java Programming	4	T	3	50	50	100	4
21PBKET10.	Elective - I	4	T	3	50	50	100	3
21PBKCP109	Core Practical I:Data Structures Lab using Java	4	P	3	50	50	100	3
21PBKCP110	Core Practical II : Relational Database Management Systems Lab	4	P	3	50	50	100	3
21PBKCP111	Core Practical III : Data Visualization Lab	2	P	3	25	25	50	2
Total		30					750	27
SEMESTER II								
21PBKCT201	Core V: Operating Systems	4	T	3	50	50	100	4
21PBKCT202	Core VI: .NET Programming	4	T	3	50	50	100	4
21PBKCT203	Core VII: Computer Networks	4	T	3	50	50	100	4
21PBKCT204	Core VIII: Software Engineering	4	T	3	50	50	100	4
21PBKET20.	Elective - II	4	T	3	50	50	100	3
21PBKCP209	Core Practical IV: Linux Lab	4	P	3	50	50	100	3
21PBKCP210	Core Practical V: .NET Programming Lab	4	P	3	50	50	100	3
21PBKCP211	Core Practical VI – Google Web Designer Lab	2	P	3	25	25	50	2
Total		30					750	27
SEMESTER III								
21PBKCT301	Core IX: Data Mining	4	T	3	50	50	100	4
21PBKCT302	Core X: Internet of Things	4	T	3	50	50	100	4
21PBKCT303	Core XI: Python Programming	4	T	3	50	50	100	4
21PBKCT304	Core XII: Robotic Process Automation	4	T	3	50	50	100	4
21PBKET30.	Elective – III	4	T	3	50	50	100	3
21PBKCP309	Core Practical VII : Mini Project Lab	4	P	3	--	100	100	4
21PBKCP310	Core Practical VIII : RPA Lab using Python	4	P	3	50	50	100	3
21PBKCP311	Core Practical IX: R Programming Lab	2	P	3	25	25	50	2
21PBKCE312	Comprehensive Examination			100 mins	-	-	100	2
Total		30					850	30



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SEMESTER IV								
21PBKCV401	Project work and Viva voce				100	100	200	6
21PSWT402/ 21PADT402	SWAYAM Course / Self-Study Course				--	50	50	2
Total							2600	92

LIST OF ELECTIVES

Students can choose any ONE Elective course from each Elective.

Electives for I Semester

ELECTIVE I

S. No.	Course Name	Course Code
1.	Cloud Computing	21PBKET105
2.	Operations Research	21PBKET106
3.	Compiler Design	21PBKET107
4.	Critical Thinking	21PBKET108

Electives for II Semester

ELECTIVE II

S. No.	Course Name	Course Code
1.	E-Content Writing	21PBKET205
2.	Computer Simulation	21PBKET206
3.	Business Intelligence	21PBKET207
4.	PHP Programming	21PBKET208

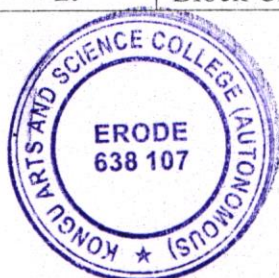
Electives for III Semester

ELECTIVE III

S. No.	Course Name	Course Code
1.	Data Science	21PBKET305
2.	Deep Learning	21PBKET306
3.	GIS Applications	21PBKET307
4.	Digital Image Processing	21PBKET308

ADVANCED LEARNERS COURSES

S. No.	Course Name	Course Code
1.	Mobile Application Development	21PBKAL313
2.	Block Chain Technology	21PBKAL314



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DEPARTMENT OF COMPUTER SCIENCE (P.G.)

MASTER OF COMPUTER APPLICATIONS (MCA) DEGREE
SCHEME OF EXAMINATION – CBCS PATTERN

(For the candidates admitted during the academic year 2020 – 2021 and onwards)

Course Code	Course Title	Inst. Hrs./Week	T/P	Examination Details					
				Duration in Hours	CIA	ESE	Total Marks	Credits	
SEMESTER I									
20PBHCT101	Core I: Open Source Programming	4	T	3	25	75	100	4	
20PBHCT102	Core II: Advanced Java Programming	4	T	3	25	75	100	4	
20PBHCT103	Core III: Programming Logic and Design	4	T	3	25	75	100	3	
20PBHCT104	Core IV: Software Engineering	4	T	3	25	75	100	3	
20PBHCT105	Core V: Optimization Techniques	4	T	3	25	75	100	3	
20PBHCP106	Core Practical I : Open Source Programming Lab	5	P	3	40	60	100	4	
20PBHCP107	Core Practical II : Advanced Java Programming Lab	5	P	3	40	60	100	4	
Total		30					700	25	
SEMESTER II									
20PBHCT201	Core VI: Python Programming	4	T	3	25	75	100	4	
20PBHCT202	Core VII: .NET Programming	4	T	3	25	75	100	4	
20PBHCT203	Core VIII: Data Mining and Warehousing	4	T	3	25	75	100	3	
20PBHET20.	Core IX: Elective - I	4	T	3	25	75	100	3	
20PBHET20.	Core X: Elective - II	4	T	3	25	75	100	3	
20PBHCP210	Core Practical III: Python Programming Lab	5	P	3	40	60	100	4	
20PBHCP211	Core Practical IV: .NET Programming Lab	5	P	3	40	60	100	4	
Total		30					700	25	
SEMESTER III									
20PBHCT301	Core XI: Big Data Analytics	4	T	3	25	75	100	4	
20PBHCT302	Core XII: Internet of Things	4	T	3	25	75	100	3	
20PBHCT303	Core XIII: Cloud Computing	4	T	3	25	75	100	3	
20PBHET30.	Core XIV: Elective - III	4	T	3	25	75	100	3	
20PBHET30.	Core XV: Elective - IV	4	T	3	25	75	100	3	
20PBHCP310	Core Practical V: Software Testing Lab	5	P	3	40	60	100	4	
20PBHCP311	Core Practical VI: Mini Project Lab	5	P	3	--	100	100*	5	
Total		30					700	25	
SEMESTER IV									
20PBHCV401	Project Work and Viva-Voce	-	-	-	-	-	375 ^{##}	15	
Total		-	-	-	-	-	375	15	
TOTAL		-	-	-	-	-	2475	90	


*Mini Project Report - 80 marks; Viva-Voce – 20 marks

Project Report - 300 marks; Viva-Voce – 75 marks

CIA - Continuous Internal Assessment

ESE - End Semester Examinations




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LIST OF ELECTIVES

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Electives for II Semester

ELECTIVE I

S. No.	Course Name	Course Code
1.	Client Server Techniques	20PBHET204
2.	Cryptography and Network Security	20PBHET205
3.	WAP & XML	20PBHET206

ELECTIVE II

S. No.	Course Name	Course Code
1.	Compiler Design	20PBHET207
2.	E-Commerce	20PBHET208
3.	Service Oriented Architecture	20PBHET209

Electives for III Semester

ELECTIVE III

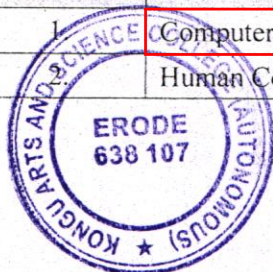
S. No.	Course Name	Course Code
1.	Organizational Behaviour	20PBHET304
2.	Mobile Computing	20PBHET305
3.	Scripting Languages	20PBHET306


ELECTIVE IV

S. No.	Course Name	Course Code
1.	Business Intelligence	20PBHET307
2.	Mobile Application Development	20PBHET308
3.	Information Retrieval Techniques	20PBHET309

ADVANCED LEARNERS COURSES

S. No.	Course Name	Course Code
1.	Computer Simulation	20PBHAL312
	Human Computer Interaction	20PBHAL313




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Advanced Learners Course (ALC) - Guidelines

- ❖ The number of Advanced Learners Courses (ALC) will be 1.
- ❖ These courses are optional and purely self study courses.
- ❖ These courses are offered to the students those who have secured 7.5 and above CGPA up to the respective semesters (I & II).
- ❖ The students can choose any one of the courses offered.
- ❖ Only End Semester Examination (ESE) will be conducted for these courses.
- ❖ 2 Extra credits are allotted for each ALC.
- ❖ The marks are obtained in ALC will not be considered for computation of CGPA.
- ❖ The students who have no standing arrear are eligible to choose ALC.
- ❖ The students who have failed in ALC (III Semester) are not eligible to reappear and choose the ALC in the succeeding Semester (IV Semester).



Dr. B. JAYANTHI

Chairman
Board of Studies – MCA
Kongu Arts and Science College (Autonomous)
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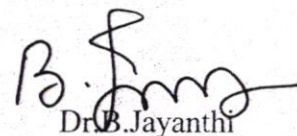
Online Comprehensive Examination

An online Comprehensive Examination is an evaluation that measures a student's competency and mastery of concepts in the field of an academic discipline. The format of comprehensive examination is 100 multiple choice questions (No Essay type questions) comprising of the core areas of the program. Each question carries 1 mark for maximum of 100 marks with duration of 100 minutes.

Extra Credit

Advanced Learners Course (ALC) - Guidelines

- ❖ The number of Advanced Learners Courses (ALC) will be 1.
- ❖ These courses are optional and purely self-study courses.
- ❖ These courses are offered to the students those who have secured 7.5 and above CGPA up to the respective semesters (I& II).
- ❖ The students can choose any one of the courses offered.
- ❖ Only End Semester Examination (ESE) will be conducted for these courses.
- ❖ 2 Extra credits are allotted for each ALC.
- ❖ The marks are obtained in ALC will not be considered for computation of CGPA.
- ❖ The students who have no standing arrear are eligible to choose ALC.
- ❖ The students who have failed in ALC (III Semester) are not eligible to reappear and choose the ALC in the succeeding Semester (IV Semester).



Dr. B. Jayanthi

Chairman- CSPG

Board of Studies

Kongu Arts and Science College (Autonomous)
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Sem.	Course Code	Core Paper – I	Total Marks:100		Hours Per Week	Credits
I	21PBKCT101	COMPUTER ARCHITECTURE	CIA : 50	ESE :50	4	4

Course Objectives: On successful completion of the course the students will have:

1. Understood the computer architecture, Number system, I/O systems, Registers and Memory
2. Skills to frame Boolean equations for ICs and simplify the equations to frame simple ICs.
3. Enhanced knowledge in Computer Architecture to attain Employability opportunity.

Course Outcomes (CO): On completion of the course, students should be able to

CO 1	Draw combinatorial circuits using various basic gates	K1 – K6
CO 2	Simplify the Boolean expressions using Karnaugh Map	
CO 3	Write micro operations and instructions for ALU	
CO 4	Categorize and apply different addressing modes and instruction formats	
CO 5	Explore the hardware and software structure of different types of memories	

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

Unit –I :

Digital Logic Circuits: Digital Computers – Logic Gates – Boolean Algebra – Map Simplification – Combinational Circuits – Flip-flops – Sequential Circuits; Digital Components : Integrated Circuits – Decoders – Multiplexers – Registers – Binary Counters – Memory Unit

Unit –II :

Data representation: Data types – Complements – Fixed-point representation – Floating-point representation – Error Detection codes

Unit –III :

Registers Transfer and Micro operations : Registers Transfer Language – Register Transfer – Bus and memory transfers – Arithmetic micro operations- Logic and shift micro operations- Arithmetic logic shift unit

Unit –IV :

CPU: Register and stack organization – Instruction formats – Addressing modes – Data transfer and manipulation – Program control – RISC

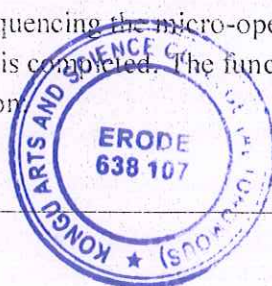
Unit –V :

Input-output organization: Peripheral devices – I/O interface – Asynchronous data transfer. Memory organization: Memory hierarchy – Main memory – Auxiliary memory – Associative memory – Cache memory – Virtual memory

Skill Development Activities:

1. Draw the circuit of an 8-bit parity generator/checker having eight inputs and two outputs, one for even and the other for odd parity. Derive the value of the eighth input when the circuit is used to generate an even parity bit for seven message bits.
2. A digital system has three registers: AR, BR and PR. Three flip-flops provide the control functions for the system: S is a flip-flop which is enabled by an external signal to start the system's operation; F and R are used for sequencing the micro-operations. A fourth flip-flop, D is set by the digital system when the operation is completed. The function of the system is described by the following register transfer operation

S : PR ← 0, S ← 0, D ← 0, F ← 1



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$P : F \leftarrow -0$. if $(AR = 0)$ then $(D \leftarrow 1)$. if $(AR \neq 0)$ then $(R \leftarrow 1)$

$R : PR \leftarrow PR + BR$. $AR \leftarrow 1$. $R \leftarrow 0$. $F \leftarrow 1$

- Show that the digital system multiplies the contents of AR and BR and places the product in PR
 - Draw a block diagram of the hardware implementation. Include a "start" input to set flip-flop S and a "done" output from flip-flop D
3. Assume that you have a computer with 1 clock cycle per instruction (1 CPI) when all accesses to memory are in cache. The only accesses to data come from load and store instructions. Those accesses account for 25 % of the total number of instructions. Miss penalty is 50 clock cycles and miss rate is 5 %. Determine the speedup obtained when there is no cache miss compared to the case when there are cache misses.

TEXT BOOKS

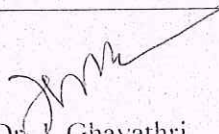
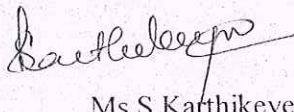

- | | |
|---|--|
| 1 | Computer System Architecture, M.Morris Mano, Pearson Education 3 rd edition. 2007 |
|---|--|

REFERENCE BOOKS

- | | |
|---|--|
| 1 | Digital principles and applications, Albert Paul Malvino, Donald P Leach, TMH, 1996. |
| 2 | Microprocessors and its Applications - Ramesh S. Goanka |
| 3 | Computer Architecture, M. Carter, Schaum's outline series, TMH. |

Web Resources


- | | |
|---|---|
| 1 | https://www.booksfree.org/computer-system-architecture-morris-mano-third-edition-pdf/ |
|---|---|

Course Designed By	Verified By	Approved By HOD
 Dr. J. Ghayathri	 Ms. S. Karthikeyeni	 Dr. B. Jayanthi

QUESTION PAPER PATTERN

SECTION-A (10 X 1 = 10 Marks)	SECTION-B (5 X 3 = 15 Marks)	SECTION-C (5 X 5 = 25 Marks)
Answer ALL the questions Choose the correct answer Four options should be given (None of these should be avoided)	Answer ALL the questions Either or type Two questions from each unit	Answer ALL questions Question Number: 16 to 19 (Either or type) Question Number 20 is Compulsory - Case Study




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Mapping of COs with POs and PSOs:

PO/ PSO	PO							PSO				
	CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
C01	S	M	S	L	L	M	M	M	L	M	M	S
C02	S	M	S	L	M	L	L	L	M	M	S	M
C03	S	S	M	M	M	L	L	S	M	M	S	L
C04	S	M	M	M	L	L	L	M	M	M	M	M
C05	M	S	S	M	L	L	M	M	L	S	L	L


S-Strong, M-Medium, L-Low



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Sem.	Course Code	Core Paper – II DATA STRUCTURES	Total Marks:100		Hours Per Week	Credits
I	21PBKCT102		CIA : 50	ESE :50	4	4
Course Objectives: On successful completion of the course the students will have:						
<ol style="list-style-type: none"> 1. Understood the linear and non-linear data structures. 2. Understood searching and sorting techniques. 3. Employability opportunities by enhancing the knowledge in data structures. 						
Course Outcomes (CO): On completion of the course, students should be able to						
CO 1	Choose an appropriate data structure for an application					K1 - K6
CO 2	Utilize linked list concepts in various applications					
CO 3	Explain the representation of Stacks, Queues and Graphs					
CO 4	Discuss the operations on Trees and Graphs					
CO 5	Apply the concept of searching and sorting in the real world problems					
K1 :Remember; K2: Understand; K3 :Apply; K4: Analyze; K5 : Evaluate; K6 :Create						
Unit –I :						
Introduction and Overview: Definitions – Concept of Data Structures – Overview of Data Structures – Implementation of Data Structures. Arrays: Definition – Terminology – One-Dimensional Array – Multidimensional Arrays – Pointer Arrays						
Unit –II :						
Linked Lists: Definition – Single Linked List – Circular Linked List - Double Linked Lists – Circular Double Linked List. Tables: Hash Tables						
Unit –III :						
Stacks: Definition – Representation of a Stack – Operation of Stacks. Queues: Introduction – Definition – Representation of Queues – Various Queue Structures						
Unit –IV :						
Trees: Basic Terminologies – Definition and Concepts - Representation of Binary Tree – Operations on a Binary Tree. Graphs: Introduction - Graph Terminologies - Representation of Graphs – Operations on Graphs.						
Unit –V :						
Internal Sorting: Searching - Insertion Sort – Quicksort – 2-Way Merge Sort – Heap Sort – Sorting on Several Keys						
Skill Development Activities:						
<ol style="list-style-type: none"> 1. Consider an array with N elements. Perform a search for an array element based on its value or its index. 2. Apply the stack algorithm to transform the following Infix expression $(a+b)*(a-d)$ to Prefix and Postfix expression. 3. Form a heap from the set $\{40,80,35,90,45,50,70\}$. 						
TEXT BOOKS						
1	DebasisSamanta, Classic Data Structures, Second Edition, PHI, 2012 – Unit I - IV.					
2	Ellis Horowitz, SartajSahni, Fundamentals of Data Structures, 1976 – Unit - V					
REFERENCE BOOKS						
1	Ellis Horowitz, SartajSahni, Vishesh Mehta, Fundamentals of Data Structures in C++, Second Edition Universities Press (India) Private Limited, 2007					

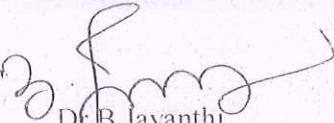
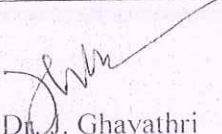
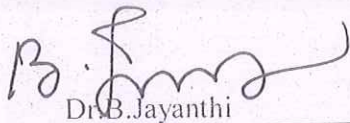



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- 2 G.A.V. Pai, Data Structures and Algorithms - Concepts, Techniques and Applications, TMH Publishing Company Limited, 2008.

Web Resources

- 1 <https://sonucgn.files.wordpress.com/2018/01/data-structures-by-d-samantha.pdf>
 2 <https://fdocuments.in/document/fundamentals-of-data-structures-ellis-horowitz-sartaj-sahnipdf.html>

Course Designed By	Verified By	Approved By HOD
 Dr. B. Jayanthi	 Dr. J. Ghayathri	 Dr. B. Jayanthi

QUESTION PAPER PATTERN


SECTION-A(10 X 1 = 10 Marks) Answer ALL the questions Choose the correct answer Four options should be given ('None of these' should be avoided)	SECTION-B(5 X 3 = 15 Marks) Answer ALL the questions Either or type Two questions from each unit	SECTION-C(5 X 5 = 25 Marks) Answer ALL questions Question Number: 16 to 19 (Either or type) Question Number 20 is Compulsory - Case Study
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Mapping of COs with POs and PSOs:

PO/ PSO	PO							PSO				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	M	M	M	M	M	S	M	L	S	M	S
CO2	M	S	S	L	L	L	M	M	L	S	L	M
CO3	S	S	L	M	M	M	M	S	S	L	M	M
CO4	S	L	M	L	M	M	L	S	S	M	M	L
CO5	M	S	S	M	L	M	S	L	M	M	M	S

S-Strong, M-Medium, L-Low




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Sem.	Course Code	Core Paper – III	Total Marks:100		Hours Per Week	Credits
1	21PBKCT103	RELATIONAL DATABASE MANAGEMENT SYSTEMS	CIA : 50	ESE :50	4	4

Course Objectives: On successful completion of the course the students should have:

1. Acquired Knowledge and Applications of Database Models and Emerging Trends
2. Capable of Framing structured queries to get solution or report for a particular task
3. Refined the database tables to make it more efficient using the normalization techniques
4. Employability opportunities by enhancing the knowledge in Relational Database Management System.

Course Outcomes (CO): On completion of the course, students should be able to

CO 1	Explain the features of database management systems	K1 – K6
CO 2	Design relational models for real life applications and also construct queries with constraints and keys using SQL	
CO 3	Apply the concept of transaction, concurrency control and recovery mechanism in database.	
CO 4	Identify the use of normalization and functional dependency in database design	
CO 5	Discuss the architecture for Parallel, Distributed and Object Database Systems	

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

Unit –I :

Overview of database systems: Managing data- A historical perspective – File systems versus a DBMS - Advantages of a DBMS- Describing and storing Data in a DBMS - Queries in a DBMS - Transaction management – Structure of a DBMS. Database design & ER diagrams – Entities, Attributes, and Entity Sets – Relationships and Relationship Sets- Additional feature of the ER model- conceptual Database design with the ER model.

Unit –II :

Relational Model: Integrity constraints over relations – Enforcing integrity constraints – Querying relational data – Logical database design: ER to Relational –Introduction to Views – Destroying / Altering Tables & Views. Relational Algebra and Calculus: Relational Algebra – Relational Calculus

Unit –III :

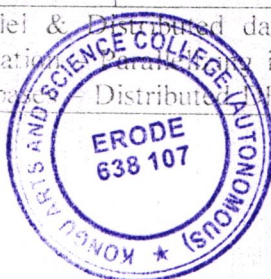
SQL: Queries, Programming, Triggers: The form of a basic SQL Query – UNION, INTERSECT and EXCEPT – Nested Queries – Aggregate operators – Null values –Complex integrity constraints in SQL - Triggers & Active data bases. Transaction Management
Overview: The ACID Properties - Transactions & Schedules – Concurrent execution of Transactions – Lock-based concurrency control – Performance of Locking –Transaction support in SQL.

Unit –IV :

Schema Refinement and Normal forms: Introduction to Schema refinement – Functional dependencies – Reasoning about functional dependencies – Normal forms –Properties of Decompositions – Normalization – Schema Refinement in data base design – other kinds of dependencies. Security: Introduction to Database security -Access control! – Discretionary Access control – Mandatory Access control – Additional issues to security. Concurrency control : 2PL, Serializability and Recoverability – Introduction to Lock Management - Lock Conversions –Specialized Locking techniques - Concurrency control without locking

Unit –V :

Parallel & Distributed databases: Introduction – Architecture for parallel databases – Parallel Query evaluation – Parallel individual operations –Parallel Query Optimization – Introduction to distributed Database – Distributed DBMS architecture sorting data in a distributed DBMS Object Database Systems:



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Motivation Example – Structured data types – Operation on structured data types – Encapsulation & ADTS – Inheritance - Objects, OIDS and Reference Types - Database design for and ORDBMS – OODBMS – Comparing RDBMS, OODBMS and ORDBMS.

Skill Development Activities:

1. A manufacturing company produces products. The following product information is stored: product name, product ID and quantity on hand. These products are made up of many components. Each component can be supplied by one or more suppliers. The following component information is kept: component ID, name, description, suppliers who supply them, and products in which they are used. Draw ERD to show how you would track information.
2. Demonstrate how to convert a database into 1NF, 2NF, 3NF.
3. Illustrate the transaction sequence for debiting a bank account.

TEXT BOOKS

1	Raghu Ramakrishnan, Johannes Gehrke –“Database Management Systems”, Third Edition, McGraw-Hill Higher Education
2	Silberschatry, Korth, Sundarshan, “Database system Concepts”, Fourth Edition, McGraw-Hill Higher Education

REFERENCE BOOKS

1	Elmasri, Navathe, “Fundamentals of Database Systems”, Third Edition, Pearson Education Asia
2	S.S. Khandare, “Database Management and Oracle Programming”, First Edition, 2004, S.Chand and Company Ltd.

Web Resources

1	https://www.javatpoint.com/what-is-rdbms
2	https://www.tutorialspoint.com/sql/sql-rdbms-concepts.htm

Course Designed By

Mr. S. Vijayakumar

Verified By

Dr. J. Ghayathri

Approved By HOD

Dr. B. Jayanthi

QUESTION PAPER PATTERN

SECTION-A(10 X 1 = 10 Marks)

Answer ALL the questions
Choose the correct answer

Four options should be given
(‘None of these’ should be avoided)

SECTION-B(5 X 3 = 15 Marks)

Answer ALL the questions
Either or type

Two questions from each unit

SECTION-C(5 X 5 = 25 Marks)

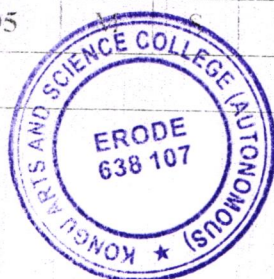
Answer ALL questions
Question Number: 16 to 19
(Either or type)

Question Number 20 is Compulsory - Case Study

Mapping of COs with POs and PSOs:

PO/ PSO	PO							PSO				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	L	L	L	M	M	S	L	M	L	M
CO2	M	M	S	L	M	L	L	S	L	M	M	L
CO3	S	S	M	M	M	M	M	M	M	S	M	S
CO4	S	M	M	M	L	M	M	S	M	M	S	S
CO5			S	M	L	M	S	M	L	L	S	S

S-Strong, M-Medium, L-Low



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Sem.	Course Code	Core Paper – IV	Total Marks:100		Hours Per Week	Credits
I	21PBKCT104	JAVA PROGRAMMING	CIA : 50	ESE :50	4	4

Course Objectives: On successful completion of the course the students will have:

1. Understood the primary structures of writing Java programs
2. Knowledge to design and program stand-alone Java applications
3. Employability opportunities by enhancing the knowledge in Java Programming.

Course Outcomes (CO): On completion of the course, students should be able to

CO 1	Define the program structure	K1 – K6
CO 2	Represent programming logics using operators, controls, loops and arrays	
CO 3	Utilize the concepts of inheritance and exceptions in the programs and handle files.	
CO 4	Explain the String functions and to handle files	
CO 5	Define how image and regular expression are implemented in GUI	

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

Unit –I :

Overview of java: Object-Oriented Programming - Control Statements & Blocks of Code – Lexical Issues – The Java Class Libraries. Data Types, Variables, and Arrays: The Primitive Types – Literals – Variables – Type Conversion and Casting – Automatic Type Promotion in Expressions – Arrays - Strings

Unit –II :

Operators: Arithmetic, Bitwise, Relational Operators, Boolean Logical, Assignment and “?” Operators – Operator Precedence – Control Statements: Selection, Iteration and Jump Statements – Classes: Class Fundamentals – Declaring Objects – Object Reference Variables – Methods – Constructors – this keyword – Garbage Collection – finalize() – Stack Class

Unit –III :

Inheritance: Basics – Superclass –Multilevel Hierarchy – Method Overriding – Dynamic Method Dispatch – Abstract Classes – final class – Object Class - Packages and Interfaces: Packages – Access Protection – Importing Packages - Interfaces – Exception Handling: Fundamentals – Types – Uncaught Exceptions – try and Catch – Multiple catch Clauses – Nested try Statements – throw – throws – finally – Built-in Exceptions – Exception Subclasses – Chained Exceptions

Unit –IV :

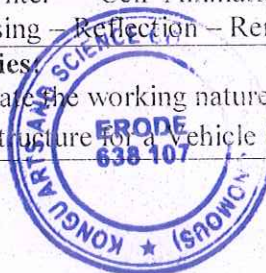
String Handling: Constructors – String Length – Special String Operations – Characters Extraction – String Comparison – Searching & Modifying a String – Data Conversion – StringBuffer – StringBuilder - Input / Output: I/O Classes and Interfaces – File – AutoCloseable, Closeable, and Flushable Interfaces – I/O Exceptions – Stream Classes – Byte & Character Streams - Serialization.

Unit –V :

Applet Class: Types – Basics – Architecture – Applet Skeleton – Display Methods – Requesting Repainting – Status Window – HTML APPLLET Tag – Passing Parameters to Applets – Images: File Formats – Image Fundamentals – ImageObserver – Double Buffering – MediaTracker – ImageProducer – ImageConsumer – ImageFilter – Cell Animation – Regular Expressions: Core Java API Packages – Regular Expression Processing – Reflection – Remote Method Invocation (RMI) – Text Formatting

Skill Development Activities.

1. Prepare a video to illustrate the working nature of control statements and blocks of code
2. Develop an inheritance structure for a Vehicle System.



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3. Design an applet for a moving cat.

TEXT BOOKS

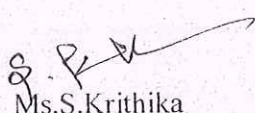
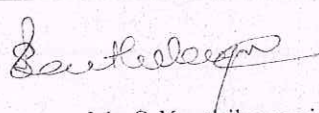
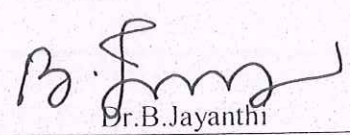
- 1 Herbert Schildt, Java The Complete Reference. Eighth Edition, TMH Publications, 2011
(Unit I: Chapters 2, 3 : Unit II: Chapters 4, 5, 6 : Unit III: Chapters 8, 9, 10
Unit IV: Chapters 15, 19; Unit V: Chapters 22, 26, 28)

REFERENCE BOOKS

- 1 UttamK.Roy, Advanced Java Programming. Oxford University Press, 2015.
2 Deitel and Deitel. JAVA How to Program. Third Edition, PHI/Pearson Education. Asia

Web Resources

- 1 <https://www.javatpoint.com/java-programs>
2 <https://www.tutorialspoint.com/java/index.htm>


Course Designed By	Verified By	Approved By HOD
 Ms.S.Krithika	 Ms.S.Karthikeyeni	 Dr.B.Jayanthi
QUESTION PAPER PATTERN		
SECTION-A(10 X 1 = 10 Marks) Answer ALL the questions Choose the correct answer Four options should be given ('None of these' should be avoided)	SECTION-B(5 X 3 = 15 Marks) Answer ALL the questions Either or type Two questions from each unit	SECTION-C(5 X 5 = 25 Marks) Answer ALL questions Question Number: 16 to 19 (Either or type) Question Number 20 is Compulsory - Case Study

Mapping of COs with POs and PSOs:

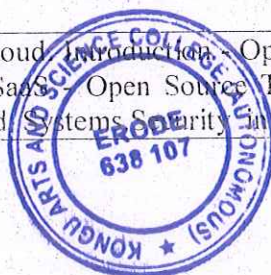
PO/ PSO	PO							PSO				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	M	L	L	M	M	M	S	M	M	M
CO2	M	L	M	L	M	L	M	M	S	M	M	S
CO3	S	S	M	M	M	M	M	L	M	L	S	M
CO4	S	M	M	M	L	M	S	M	M	L	M	S
CO5	M	S	S	M	L	S	M	S	L	L	S	L

S-Strong, M-Medium, L-Low




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Sem.	Course Code	Elective- I CLOUD COMPUTING	Total Marks:100 CIA : 50 ESE :50		Hours Per Week	Credits
I	21PBKET105				4	3
Course Objectives: On successful completion of the course the students will have:						
<ol style="list-style-type: none"> 1. Understood the basic concepts of Cloud Computing Architectures, Applications and Storages 2. Knowledge to define the cloud service models and the Technological Drivers for Cloud Computing 3. Acquire knowledge about IaaS, SaaS and PaaS, Cloud Security 						
Course Outcomes (CO): On completion of the course, students should be able to						
CO 1	Explain the concepts of Cloud Computing, Architecture and deployment models					K1 - K6
CO 2	Utilize the Cloud Service models in application development					
CO 3	Describe Virtualization and cloud-aware SaaS applications / PaaS technology					
CO 4	Handle the services offered by Cloud service providers					
CO 5	Discuss the security issues in cloud					
K1 :Remember; K2: Understand; K3 :Apply; K4: Analyze; K5 : Evaluate; K6 :Create						
Unit -I :						
<p>Cloud Computing Fundamentals: Motivation for Cloud Computing - Defining Cloud Computing - 5-4-3 Principles of Cloud computing - Cloud Ecosystem - Requirements for Cloud Services - Cloud Application - Benefits and Drawbacks.</p> <p>Cloud Computing Architecture and Management: Introduction - Cloud Architecture - Anatomy of the Cloud - Network Connectivity in Cloud Computing - Applications on the Cloud - Managing the Cloud - Migrating Application to Cloud.</p> <p>Cloud Deployment Models: Introduction - Private Cloud - Public Cloud - Community Cloud - Hybrid Cloud.</p>						
Unit -II :						
<p>Cloud Service Models: Introduction - Infrastructure as a Service - Platform as a Service - Software as a Service. Technological Drivers for Cloud Computing: Introduction - SOA and Cloud – Virtualization - Multicore Technology - Memory and Storage Technologies - Networking Technologies - Programming Models - Pervasive Computing - Operating System - Application Environment.</p>						
Unit -III :						
<p>Virtualization: Introduction - Virtualization Opportunities - Approaches to Virtualization - Hypervisors - From Virtualization to Cloud Computing.</p> <p>Software Development in Cloud: Introduction - Different Perspectives on SaaS Development - New Challenges - Cloud-Aware Software Development Using PaaS Technology.</p>						
Unit -IV :						
<p>Networking for Cloud Computing: Introduction. - Overview of Data Center Environment - Networking Issues in Data Centers - Transport Layer Issues in DCNs - TCP Enhancements for DCNs.</p> <p>Cloud Service Providers: Introduction – EMC – Google - Amazon Web Services – Microsoft – IBM - SAP Labs – Salesforce – Rackspace – VMware – Manjrasoft.</p>						
Unit -V :						
<p>Open Source Support for Cloud Introduction - Open Source Tools for IaaS - Open Source Tools for PaaS - Open Source Tools for SaaS - Open Source Tools for Research - Distributed Computing Tools for Management of Distributed Systems Security in Cloud Computing Introduction - Security Aspects -</p>						



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Sem.	Course Code	Elective- I CRITICAL THINKING	Total Marks:100 CIA : 50 ESE :50	Hours Per Week 4	Credits 3
I	21PBKET108				

Course Objectives: On successful completion of the course the students should have:

1. Understood critical thinking, design thinking and Thinking patterns
2. Skills in Problem solving & Reasoning

Course Outcomes (CO): On completion of the course, students should be able to

CO 1	Understand the concepts of Critical thinking and its related technology	K1 - K6
CO 2	Focus on the explicit development of critical thinking and problem solving skills	
CO 3	Apply design thinking in problems	
CO 4	Make a decision and take actions based on analysis	
CO 5	Analyze the concepts of Thinking patterns, Problem solving & Reasoning in real time applications	

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

Unit -I :

Critical Thinking: Definition, Conclusions and Decisions, Beliefs and Claims, Evidence – finding, evaluation, Inferences, Facts – opinion, probable truth, probably false, Venn diagram. Applied critical thinking: Inference, Explanation, Evidence, Credibility, Two Case Studies, critical thinking and science, critical evaluation, self-assessment.

Unit -II :

Design Thinking: Introduction, Need of Design Thinking, problem to question - design thinking process, Traditional Problem Solving versus Design Thinking, phases of Design Thinking, problem exploration, Stake holder assessment, design thinking for manufacturers, smart Idea to implementation

Unit -III :

Thinking to confidence, fear management, duty Vs passion, Team management, Tools for Thinking, prototype design, Relevance of Design and Design Thinking in engineering, human centered design, case study: apply design thinking in problem.

Unit -IV :

Problem solving: problem definition, problem solving methods, selecting and using information, data processing, solution methods, solving problems by searching, recognizing patterns, spatial reasoning, necessity and sufficiency, choosing and using models, making choices and decisions

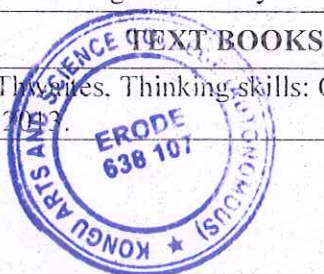
Unit -V :

Reasoning: Deductive and hypothetical reasoning, computational problem solving; generating, implementing, and evaluating solutions, interpersonal problem solving. Advanced problem solving: Combining skills – using imagination, developing models, Carrying out investigations, Data analysis and inference. Graphical methods of solution, Probability, tree diagrams and decision trees

Skill Development Activities:

1. Discuss and compare Marks and Ranks
2. Model a prototype of a product/process of your own innovation
3. Develop any 10 spatial reasoning model of your own

1 | John Butterworth and Geoff Thwaites. Thinking skills: Critical Thinking and Problem Solving. Cambridge University Press, 2003.



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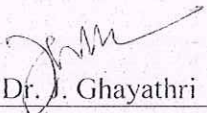
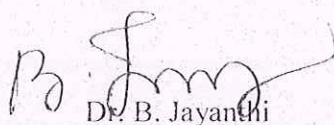
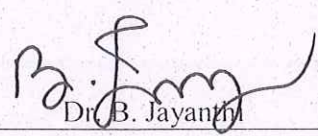
- 2 H. S. Fogler and S. E. LeBlanc, Strategies for Creative Problem Solving, 2nd edition, Pearson, Upper Saddle River, NJ, 2008.

REFERENCE BOOKS

- 1 A. Whimbey and J. Lochhead, Problem Solving & Comprehension, 6th edition, Lawrence Erlbaum, Mahwah, NJ, 1999.
- 2 M. Levine, Effective Problem Solving, 2nd edition, Prentice Hall, Upper Saddle River, NJ, 1994.
- 3 Michael Baker, The Basic of Critical Thinking, The Critical Thinking Co press, 2015.
- 4 David Kelley and Tom Kelley, Creative Confidence, 2013.

Web Resources

- 1 https://www.tutorialspoint.com/critical_thinking/index.htm
- 2 https://www.tutorialspoint.com/design_thinking/design_thinking_quick_guide.htm
- 3 <https://nptel.ac.in/courses/109/104/109104109>

Course Designed By	Verified By	Approved By HOD
 Dr. J. Ghayathri	 Dr. B. Jayanthi	 Dr. B. Jayanthi

QUESTION PAPER PATTERN

SECTION-A(10 X 1 = 10 Marks) Answer ALL the questions Choose the correct answer Four options should be given (None of these' should be avoided)	SECTION-B(5 X 3 = 15 Marks) Answer ALL the questions Either or type Two questions from each unit	SECTION-C(5 X 5 = 25Marks) Answer ALL questions Question Number: 16 to 19 (Either or type) Question Number 20 is Compulsory - Case Study
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Mapping of COs with POs and PSOs:

PO/ PSO	PO							PSO					
	CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	S	M	M	M	M	M	M	L	M	S	L
CO2	S	M	S	M	M	L	L	L	L	L	M	S	L
CO3	S	S	M	M	M	M	M	M	M	M	L	M	M
CO4	S	M	S	S	L	M	L	M	M	M	M	S	M
CO5	M	S	S	M	M	M	M	M	M	L	L	S	M

S-Strong, M-Medium, L-Low



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Sem.	Course Code	Core Practical- 1 DATA STRUCTURES LAB USING JAVA	Total Marks: 100		Hours Per Week	Credits
			CIA : 50	ESE :50		
I	21PBKCP109				4	3

Course Objectives: On successful completion of the course the students will have:

1. Acquire knowledge to implement the concepts of data structures in Java Programming
2. Posses skills to connect server and client for communication
3. The skill set of applying regular expression for pattern matching


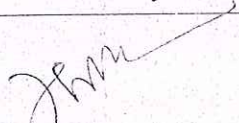
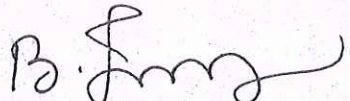
Course Outcomes (CO): On completion of the course, students should be able to

CO 1	Implement Hash table and Array structure to produce List, Stack and Queue structures	K1 - K6
CO 2	Use recursive and non-recursive functions to implement tree traversals	
CO 3	Apply appropriate Searching and Sorting Methods for a given list of items	
CO 4	Invoke the remote methods in an application using Remote Method Invocation	
CO 5	Create an applet application to demonstrate an Image and Pattern Matching	


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

List of Programs

1. Write a Java program to implement a list using Hashtable.
2. Write Java programs to implement the Stack Operations using an array
3. Write Java programs to implement the Queue Operations using an array.
4. Write Java programs that use recursive and non-recursive functions to traverse the given binary tree in (a) Preorder (b) Inorder(c) Postorder.
5. Write a Java program to implement a Binary Search
6. Write a Java program for sorting a given list of names in ascending order using Heap Sort.
7. Write a java program that illustrates the Client Server Communication using RMI.
8. Write a Java program that illustrates how inheritance is implemented.
9. Develop a java program using Image class
10. Implement Java Program for Pattern Matching in Regular Expression.

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Mapping of COs with POs and PSOs:

PO/ PSO	PO							PSO				
	CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	S	M	S	L	L	S	M	M	L	M	S	M
CO2	S	M	S	M	M	L	S	L	L	M	L	S
CO3	S	S	M	M	M	L	L	M	M	L	M	M
CO4	S	M	M	M	L	M	S	S	M	M	M	S
CO5	M	S	S	M	L	M	M	M	L	M	M	M
S-Strong, M-Medium, L-Low												



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Sem.	Course Code	Core Practical- II RELATIONAL DATABASE MANAGEMENT SYSTEMS LAB	Total Marks:100		Hours Per Week	Credits
			CIA : 50	ESE :50		
1	21PBKCP110				4	3

Course Objectives: On successful completion of the course the students will have:

1. Skills to design and build a database system using Structured Query Language
2. Knowledge to apply the built-in functions of SQL in query processing

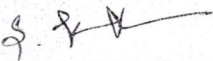


Course Outcomes (CO): On completion of the course, students should be able to

CO 1	Draw Entity-Relationship Diagram for the database systems	K1 - K6
CO 2	Evaluate the mapping between entities and relationship using Schema	
CO 3	Implement the DML , DDL, DCL and TCL Commands	
CO 4	Build a database system using Views and SET Operators	
CO 5	Implement PL/SQL Controls, Triggers, Procedures and Packages	

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

List of Programs

1. Draw an E-R diagram for a Student database and perform the DDL, DQL and DML commands
2. Create database Schema for a Employee-Pay Scenario and present the relational model
3. Write SQL query to implement JOINS, GROUP BY & ORDER BY commands
4. Write a SQL queries for Creating Views (with and without check option), Dropping views and Selecting from a view
5. Write SQL queries using SET Operators
6. Develop a Bank Amount Transaction database and implement Transaction commands
7. Write a SQL query to implement KEY constraints
8. Write a PL/SQL Program by using Iterative Controls and Loops
9. Write Program by the use of PL/SQL Procedures and Packages
10. Create a program to Implement PL/SQL Triggers and Cursors

Course Designed By	Verified By	Approved By HOD
 Ms.S.Krithika	 Mr. S. Vijayakumar	 Dr.B.Jayanthi




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Mapping of COs with POs and PSOs:

PO/ PSO	PO							PSO					
	CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
C01	S	M	S	M	L	M	M	M	M	L	M	M	L
C02	S	M	S	M	M	L	L	L	L	L	M	M	M
C03	S	S	S	M	M	L	L	M	M	L	S	M	
C04	S	M	M	S	L	M	L	M	M	L	M	L	
C05	M	S	S	S	L	L	M	M	L	L	S	M	

S-Strong, M-Medium, L-Low




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Sem.	Course Code	Core Practical- III DATA VISUALIZATION LAB	Total Marks:50		Hours Per Week	Credits
I	21PBKCP111		CIA : 25	ESE : 25	2	2

Course Objectives: On successful completion of the course the students will have:

1. Analyze and create effective data visualizations in order to provide new insights
2. Skills to prepare the visual reports for decision support system

Course Outcomes (CO): On completion of the course, students should be able to

CO 1	Compute Mathematical functions in Excel	K1 - K6
CO 2	Formulate Statistical functions in Excel	
CO 3	Create dashboard to visualize data in real life applications	
CO 4	Analyze data through pivot table	
CO 5	Convert unstructured file to structured file	

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

PROGRAM LIST

1. Enter the following data in an Excel worksheet:

Reg.No	Name	Tamil	English	Maths	History	Science	Total	Result	Class	Rank
M01	Anand	40	45	80	78	90				
M02	Moorthy	50	52	54	54	40				
M03	Lokesh	82	42	52	25	58				
M04	Patel	58	25	60	89	78				
M05	Suresh	45	87	47	39	58				
M06	Ganesan	87	90	89	45	39				
M07	Ravi	29	45	70	40	48				
M08	Madhan	45	39	52	59	49				
M09	Karthick	90	40	69	64	28				

- a) Calculate the TOTAL values using SUM Function.
- b) Calculate the RESULT and CLASS values using IF function.
- c) Calculate the RANK values based on RESULT using RANK Function
- d) Compute and find the average mark for all subjects.
- e) Find the total number of students with First Class using COUNTIF function.
- f) Create a new sheet with the same table data, sort and filter the table using rank values

2. Enter the following data in an Excel worksheet:

S.No.	Goods	Quantity	Cost	Discount	Revenue
1	Bat	263	2000	5%	26300
2	Cricket ball	590	50	10%	2950
3	Basketball	68	500		34000
4	Cotton T-Shirt	730	490	40%	143080
5	Slipper	321	250	20%	16050
6	Basketball net	39	150		5850
7	Basketball bat	76	2500	5%	9500



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8	Dumbles-5Kg	125	1150	10%	14375
9	Dumbles-10Kg	99	2150	10%	21285
10	Shorts	620	350	40%	86800
11	Jacket	465	2500	20%	232500
12	Sneakers	1032	3000	50%	1548000
13	Skipping rope	320	120	15%	5760

- Find out how many items were on discount using COUNT.
- Find out how many items/pieces of equipment are sold by the store using COUNTA.
- What products are not in the discount section using COUNTBLANK.
- Are there any products sold having cost more than 2000 along with a discount rate greater than 50% using COUNTIFS.
- Find out the average number of goods sold.
- Find the median of the number of goods sold in our sports store.
- Find the most frequent discount value given by the sports store using MODE.
- Find out the standard deviation to see the level of dispersion using STDEV.

3. Create a dashboard for Online Sales Tracking system.

4. Draw the Pivot table for the following data:

TripID	Late	Bus Driver	Weekday	Time
1	12	John	Wednesday	8:45 AM
3	1	Paulo	Tuesday	9:25 AM
5	3	Mark	Tuesday	9:25 AM
7	45	Raymond	Thursday	9:25 AM
9	61	Mark	Friday	9:25 AM
11	2	Monica	Tuesday	8:45 AM
13	5	John	Tuesday	8:45 AM
121	10	John	Wednesday	7:15 AM
127	-2	Mark	Monday	9:25 AM
16	14	John	Wednesday	7:15 AM
98	0	Raymond	Friday	9:25 AM
103	-1	Paulo	Friday	9:25 AM
108	3	Mark	Friday	8:00 AM
113	45	John	Monday	9:25 AM
118	7	John	Monday	8:45 AM
757	17	Paulo	Wednesday	9:25 AM
477	8	John	Tuesday	9:25 AM
133	19	Raymond	Tuesday	8:00AM
138	22	John	Tuesday	7:15 AM
128	0	John	Monday	7:15 AM
19	2	John	Monday	8:45 AM
21	7	Paulo	Thursday	9:25 AM
23	7	Paulo	Monday	8:45 AM
25	7	Mark	Thursday	8:00AM

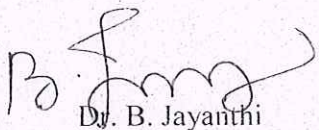
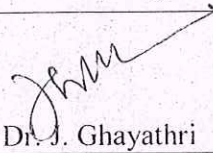
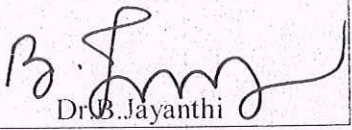
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27	2	John	Monday	8:00AM
143	23	John	Friday	9:25 AM
123	14	Raymond	Thursday	8:45 AM
15	7	Paulo	Wednesday	8:45 AM
758	9	Monica	Tuesday	9:25 AM
17	29	Paulo	Thursday	7:15 AM
401	12	Raymond	Tuesday	9:25 AM
712	11	Raymond	Tuesday	8:45 AM
91	-1	Raymond	Tuesday	7:15 AM
92	7	Paulo	Wednesday	8:45 AM
112	31	Paulo	Wednesday	9:25 AM
94	0	Monica	Wednesday	9:25 AM
814	14	Paulo	Monday	7:15 AM
917	-1	Monica	Tuesday	8:00 AM

5. Convert Text file to CSV file using various formats


Course Designed By	Verified By	Approved By HOD
 Dr. B. Jayanthi	 Dr. J. Ghayathri	 Dr. B. Jayanthi

Mapping of COs with POs and PSOs:

PO/ PSO	PO							PSO				
	CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	S	M	S	L	L	M	M	M	L	M	S	M
CO2	S	M	S	M	M	L	L	L	L	M	M	M
CO3	S	S	M	M	M	M	L	M	M	L	M	S
CO4	S	M	M	M	M	M	M	M	M	M	S	M
CO5	M	S	S	M	L	L	M	M	M	M	M	S


S-Strong, M-Medium, L-Low




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Sem.	Course Code	Core Paper – VIII SOFTWARE ENGINEERING	Total Marks:100 CIA : 50 ESE :50	Hours Per Week 4	Credits 4
Course Objectives: On successful completion of the course the students will have:					
<ol style="list-style-type: none"> 1. Understand the software development models and ethics 2. The capability to plan and maintain software quality 3. Employability opportunities by enhancing the knowledge in Software Engineering 					
Course Outcomes (CO): On completion of the course, students should be able to					
CO 1	Compare and apply the suitable software design model for the particular task				K1 – K6
CO 2	Gather the requirements for the software project and do validation				
CO 3	Design architectural and UML model for the projects				
CO 4	Apply suitable testing methods to proof the software free of error				
CO 5	Work with team and be able to manage teams				
K1 :Remember; K2: Understand; K3 :Apply; K4: Analyze; K5 : Evaluate; K6 :Create					
Unit –I :					
Introduction: Professional Software Development – Software Engineering Ethics – Case Studies. Software Processes: Software Process Models – Process Activities – Coping with Change – Rational Unified Process. Agile Software Development: Agile Methods – Plan-Driven and Agile Development – Extreme Programming – Agile Project Management – Scaling Agile Methods.					
Unit –II :					
Requirements Engineering: Functional and Non-Functional Requirements – Software Requirements Document – Requirements Specification, Engineering Process, Elicitation and analysis, Validation and Management. System Modeling: Context Models – Interaction Models – Structural Models – Behavioral Models – Model-Driven Engineering					
Unit –III :					
Architectural Design: Architectural Design Decisions, Views and Patterns – Application Architectures. Design and Implementation: Object-Oriented Design Using the UML – Design Patterns – Implementation Issues – Open Source Development.					
Unit –IV :					
Software Testing: Development Testing – Test-Driven Development – Release Testing – User Testing. Software Evolution: Evolution Process – Program Evolution Dynamics – Software Maintenance – Legacy System Management.					
Unit –V :					
Project Management: Risk Management – Managing People- Team Work. Project Planning: Software Pricing – Plan-Driven Development – Project Scheduling – Agile Planning – Estimation Techniques. Quality Management: Software Quality and Standards – Reviews and Inspections – Software Measurement and Metrics.					
Skill Development Activities:					
<ol style="list-style-type: none"> 1. Let a Company called ABC group makes consumer products for safe home and releases for commercial use. There is a Software Engineering Team consists of members and team manages. Give a write up on the discussion of the team members and head for selecting the process model. 					




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2. Consider you are developing software for a departmental store in an urban city. To go for design phase, you have to complete the requirement gathering. Sketch the requirements gathering activities carried out by your software development team.
3. Consider you are developing a dynamic website for an autonomous college. Draw the use case diagram for the design of the website. Along with use case diagram sketch the navigation flow for the website.

TEXT BOOKS

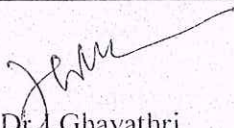
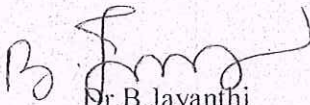
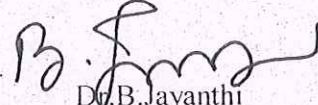
- 1 | Ian Sommerville, Software Engineering, Pearson India Education, Ninth Edition, 2011

REFERENCE BOOKS

- 1 | Roger S. Pressman, Software Engineering A Practitioners Approach , Sixth Edition, McGrawHill, 2005
- 2 | Richard Fairley, Software Engineering Concepts, , TataMcGrawHill Edition, 1997

Web Resources

- 1 | shorturl.at/yzBU4
- 2 | <https://iansommerville.com/software-engineering-book/slides/>

Course Designed By	Verified By	Approved By HOD
 Dr. J. Ghayathri	 Dr. B. Jayanthi	 Dr. B. Jayanthi

QUESTION PAPER PATTERN


SECTION-A(10 X 1 = 10 Marks) Answer ALL the questions Choose the correct answer Four options should be given ('None of these' should be avoided)	SECTION-B(5 X 3 = 15 Marks) Answer ALL the questions Either or type Two questions from each unit	SECTION-C(5 X 5 = 25 Marks) Answer ALL questions Question Number: 16 to 19 (Either or type) Question Number 20 is Compulsory – Case Study
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Mapping of COs with POs and PSOs:

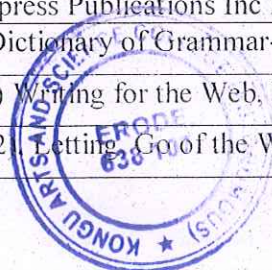
PO/ PSO	PO							PSO				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	S	L	L	M	M	M	L	M	S	M
CO2	S	M	S	L	M	L	L	L	S	M	S	M
CO3	S	S	M	M	M	L	S	M	M	L	S	S
CO4	S	M	M	M	L	M	M	M	M	S	S	M
CO5	M	S	S	M	M	S	M	M	L	L	M	S

S-Strong, M-Medium, L-Low




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Sem.	Course Code	Elective- II E-CONTENT WRITING	Total Marks:100		Hours Per Week	Credits
			CIA : 50	ESE :50		
II	21PBKET205				4	3
Course Objectives: On successful completion of the course the students should have:						
1. Employability opportunities by enhancing the knowledge in writing e-content 2. Classify the type of website and type content to be written						
Course Outcomes (CO): On completion of the course, students should be able to						
CO 1	Differentiate traditional and e-content writing					K1 - K6
CO 2	Design the e-content for various media					
CO 3	Capture the type of audience who are using the particular e-media					
CO 4	Frame technical architecture in the content					
CO 5	Write tutorials for different applications					
K1 :Remember; K2: Understand; K3 :Apply; K4: Analyze; K5 : Evaluate; K6 :Create						
Unit –I :						
Basics of Writing: Content Writing - Definition, Traditional Content, versus E-Content, Coherence, Cohesion, Accuracy, Brevity, and Clarity						
Unit –II :						
Interactive Multimedia –Interactive Writer –Inter activity and Control –Thinking Interactively – Interactive Devices –Information and Interactive Architecture –Narrative Design –Content Expertise and Strategy–Writing for Search Engines –Technical Skills: Flowcharting – Other Organizational Tools						
Unit –III :						
Defining Goals-Techniques to Achieve Common Goals-Audience-Proposal Formatting: Outlines-Proposals-Storyboards-Scripts-Final Documents Role of Content Writer, Role of Subject Matter Expert, Role of Instructional Designer						
Unit –IV :						
Architecture: Linear –Linear with Section Branching –Hierarchical Branching –Parallel/Multiple Path Architecture –Dynamically Generated Websites–Active and Passive Information Delivery – Writing Non-Narrative, Linear Narrative, Interactive Narrative –Interactive Narration: Character and Role of the Player –Structure and Navigation–Exposition						
Unit –V :						
Writing for a corporate website –Writing for a museum kiosk –Writing interactive lessons – Writing learning content for a simulation –Writing classic lessons to a computer game.						
Skill Development Activities:						
1. Create a story board for history of Computers 2. Create content for Wikipedia to upload the information about our college and its activities. 3. Write a screen play for a story.						
TEXT BOOKS						
1	Scott A. Kuehn Andrew LingwallClarion (2017) The Basics of Media Writing: A Strategic Approach, Sage Coppers Publications Inc NY					
2	NP Ahuja,(2013), Dictionary of Grammar-, Anuro Publications Pvt. Ltd., New Delhi 110002.					
3	Lynda Felder(2012) Writing for the Web, New Riders, Berkeley					
4	Jancie Redish (2012) Getting Go of the Words : Writing Web Content that Works					



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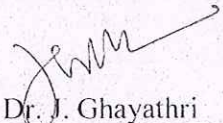
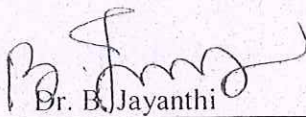
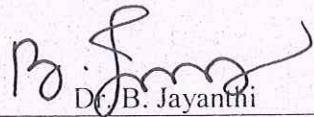
Edition, Elsevier Inc., UK

REFERENCE BOOKS

- 1 Irene Hammerich and Claire Harrison.(2002). Developing Online Content: The Principles of Writing and Editing for the Web, John Wiley & Sons Inc
- 2 Katy Campbell. (2004). Effective Writing for E-Learning Environments (Cases on Information Technology). Information Science Publishing.
- 3 Peter Donnelly et al.. (2012).How to succeed at E-Learning, Wiley.
- 4 Sunny Thomas.(2000). Writing for the Media., Vision Books Pvt. Ltd..
- 5 Timothy Garrand.(2012). Writing for Multimedia and the Web: A Practical Guide to Content Development for Interactive Media. Elsevier

Web Resources

- 1 shorturl.at/IE067
- 2 <https://blog.copify.com/post/what-are-the-roles-and-responsibilities-of-content-writers>

Course Designed By	Verified By	Approved By HOD
 Dr. J. Ghayathri	 Dr. B. Jayanthi	 Dr. B. Jayanthi

QUESTION PAPER PATTERN


SECTION-A(10 X 1 = 10 Marks) Answer ALL the questions Choose the correct answer Four options should be given ('None of these' should be avoided)	SECTION-B(5 X 3 = 15 Marks) Answer ALL the questions Either or type Two questions from each unit	SECTION-C(5 X 5 = 25 Marks) Answer ALL questions Question Number: 16 to 19 (Either or type) Question Number 20 is Compulsory - Case Study
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Mapping of COs with POs and PSOs:

PO/ PSO	PO							PSO				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	S	L	L	M	M	M	L	M	S	M
CO2	S	M	S	L	M	L	L	L	L	M	S	M
CO3	S	S	M	M	M	M	M	S	M	L	S	S
CO4	S	M	M	M	L	L	L	M	M	L	S	M
CO5	M	S	S	M	L	M	M	M	L	M	M	S

S-Strong, M-Medium, L-Low




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Sem.	Course Code	Elective- II PHP PROGRAMMING	Total Marks:100		Hours Per Week	Credit s
II	21PBKET208		CIA : 50	ESE :50	4	3

Course Objectives: On successful completion of the course the students should have:

1. Understood the basic and advanced concepts of PHP
2. Understood the programming and OOP's concepts of PHP
3. Understood Usage of MySQL along with PHP

Course Outcomes (CO): On completion of the course, students should be able to

CO	Outcome	Assessment
CO 1	Apply the concepts of PHP	K1 - K6
CO 2	Implement the OOP's concept in programming	
CO 3	Implement Database connectivity with MySQL and XML	
CO 4	Develop the dynamic webpage	
CO 5	Handle errors using exceptions and validate inputs	

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

Unit -I :

Introducing PHP: History - Unique Features - Basic Development Concepts - Creating Your First PHP Script - Sample Applications. Using Variables and Operators: Storing Data in Variables - Understanding PHP's Data Types - Setting and Checking Variable Data Types -Using Constants - Manipulating Variable with Operators - Handling Form Input. Controlling Program Flow: Writing Simple Conditional Statements - Writing More Complex Conditional Statements - Repeating Actions with Loops - Working with String and Numeric Functions.

Unit -II :

Working with Arrays: Storing Data in Arrays - Processing Array with Loops and Iterators - Using Arrays with Forms - Working with Array Functions - Working with Date and Times. Using Functions and Classes: Creating User - Defined Functions - Creating Classes- Using Advanced OOP Concepts.

Unit -III :

Working with Files and Directories: Reading Files - Writing Files - Processing Directories - Performing Other File and Directory Operations.

Working with Databases and SQL: Introducing Databases and SQL - Using PHP's MySQLi Extension - Adding or Modifying Data - Handling Errors - Using PHP's SQLite Extension - Using PHP's PDO Extension.

Unit -IV :

Working with XML: Introducing XML - Using PHP's Simple XML Extension - Using PHP's DOM Extension.

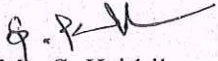
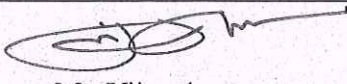
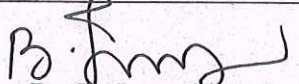
Working with Cookies, Sessions and Headers: Working with Cookies - Working with Sessions - Using HTTP Headers

Unit -V :

Handling Errors: Handling Script Errors - Using Exceptions - Logging Errors - Debugging Errors. Securing PHP: Sanitizing Input and Output - Securing Data - Validating User Input - Configuring PHP Security.

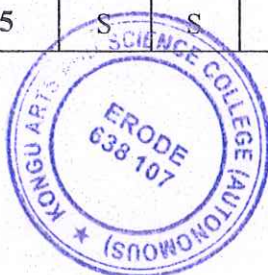


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KONGU ARTS AND SCIENCE COLLEGE
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NANJANAPURAM, ERODE - 638 107

Skill Development Activities:		
1. Illustrate about GET () and POST () methods. 2. Illustrate the usage of session variables. 3. How will you provide security through PHP configuration file?		
TEXT BOOKS		
1	VikramVaswani, PHP A Beginner's Guide, McGraw Hill Education(India) Pvt., Ltd., Delhi, 2014	
REFERENCE BOOKS		
1	Steven Holzner, PHP: The Complete Reference, Tata McGraw Hill Publishing Company Limited, New Delhi, 2008	
2	Luke Welling, Laura Thomson, PHP and MySQL Web Development, 4th Edition, Pearson Education, 2009	
3	Steve Suehring, Tim Converse and Joyce Park, PHP6 and MySQL Bible, Wiley Publishing, 2009.	
Web Resources		
1	www.spoken-tutorial.org	
Course Designed By	Verified By	Approved By HOD
 Ms. S. Krithika	 Mr. Vijayakumar	 Dr. B. Jayanthi
QUESTION PAPER PATTERN		
SECTION-A(10 X 1 = 10 Marks) Answer ALL the questions Choose the correct answer Four options should be given ('None of these' should be avoided)	SECTION-B (5 X 3 = 15 Marks) Answer ALL the questions Either or type Two questions from each unit	SECTION-C(5 X 5 = 25 Marks) Answer ALL questions Question Number: 16 to 19 (Either or type) Question Number 20 is Compulsory - Case Study

Mapping of COs with POs and PSOs:

PO/ PSO	PO							PSO				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	M	S	S	S	M	M	S	S	M	M
CO2	S	S	S	S	S	S	S	M	S	S	S	S
CO3	S	S	S	S	S	S	S	M	S	S	S	S
CO4	S	S	S	S	S	S	S	M	S	S	S	S
CO5	S	S	M	S	S	S	M	M	S	S	S	S



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Sem.	Course Code	Core Practical – IV LINUX LAB	Total Marks:100 CIA : 50 ESE :50	Hours Per Week 4	Credits 3
II	21PBKCP209				

Course Objectives: On successful completion of the course the students will have:

1. Skills to write system program using the open software
2. knowledge to control the operations of the system using the open source environment

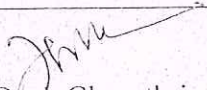
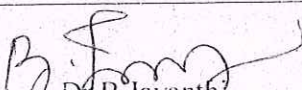
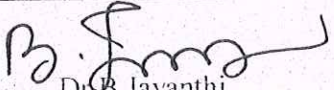
Course Outcomes (CO): On completion of the course, students should be able to

CO 1	Demonstrate the Linux commands and file handling utilities by using Linux shell environment.	K1 – K6
CO 2	Evaluate the concept of shell scripting programs by using an AWK commands.	
CO 3	Create, change and remove the directory	
CO 4	Illustrate the concept of client-server communication	
CO 5	Implement CPU Scheduling	

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

PROGRAM LIST

1. Virtual File System (VFS) Implementation in Linux
2. Implement Linux Kernel Module Program.
3. Implement Deadlock Avoidance Using Semaphores
4. Implement CPU scheduling policy in a Linux OS.
5. Write a C program that illustrates two processes communicating using Shared memory
6. Write a shell script that receives any number of file names as arguments, checks if every argument supplied is a file or directory and reports accordingly that whenever the argument is a file it reports number of lines present in it
7. Write an awk script to count number of lines in a file that does not contain vowels
8. Write a C program to list every file in directory, its inode number and file name
9. Write a C program that receives a message from message queue and display them
10. Write a C program that illustrate the suspending and resuming process using signal

Course Designed By	Verified By	Approved By HOD
 Dr. J. Ghayathri	 Dr. B. Jayanthi	 Dr. B. Jayanthi

Mapping of COs with POs and PSOs:

PO/ PSO	PO							PSO				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	S	L	L	M	M	M	L	M	S	M
CO2	S	M	S	M	M	L	M	L	M	M	S	M
CO3	S	S	M	M	M	M	M	M	M	L	S	S
CO4	S	M	M	M	M	L	M	M	M	M	S	M
CO5	M	S	S	M	L	M	M	M	L	M	M	S

S-Strong, M-Medium, L-Low



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MANNANPURAM, ERODE, TAMIL NADU

Sem.	Course Code	Core Practical- VI GOOGLE	Total Marks:50		Hours Per Week	Credits
II	21PBKCP211	WEB DESIGNER LAB	CIA : 25	ESE : 25	2	2

Course Objectives: On successful completion of the course the students will have:

1. Design dynamic web advertisements effectively
2. Skills to create smart websites seamlessly on their own

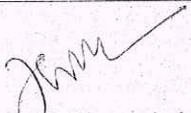
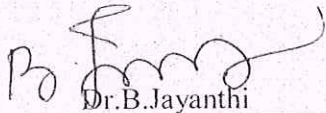

Course Outcomes (CO): On completion of the course, students should be able to

CO 1	Design online real time web advertisement	K1 - K6
CO 2	Incorporate animation in web advertisements	
CO 3	Create websites with images and Videos	
CO 4	Insert customized maps in the web pages	
CO 5	Draw workflow design for the ads and WebPages of a website	

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

Program List

1. Create an Ad using Google web Designer
2. Create an animated Ad using GWD
3. Develop codes using GWD
4. Design a website using the various Medias added to it (images, videos, maps and others)
5. Create a dynamic workflow using GWD

Course Designed By	Verified By	Approved By HOD
 Dr. J. Ghayathri	 Dr. B. Jayanthi	 Dr. B. Jayanthi

Mapping of COs with POs and PSOs:

PO/ PSO	PO							PSO				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	S	L	M	M	M	M	L	M	S	M
CO2	S	M	S	M	M	L	M	L	M	M	S	M
CO3	S	S	M	M	M	L	L	M	M	L	S	S
CO4	S	M	M	M	L	M	M	M	M	L	S	M
CO5	M	S	S	M	L	L	M	M	L	L	M	S

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PRINCIPAL,
KONGU ARTS AND SCIENCE COLLEGE
(AUTONOMOUS)
MANIANAPURAM ERODE 638 107

Sem.	Course Code	ADVANCED LEARNERS COURSE – COMPUTER SIMULATION	Total Marks: 100		Hours Per Week	Credits
III	20PBHAL312		CIA: --	ESE:100	--	2

Objective(s): On successful completion of the course the students should have:

- Understood the basics and applications of simulation
- Understood the design and implementation of simulation concepts using case studies

UNIT-I

Introduction to Computer Simulation: Simulation Defined, Different Types of Simulation, Brief History of Simulation, **Simulation Languages:** Simulation Language Features, Simulators and Integrated Simulation Environments, Hardware Requirements for Simulation, Animation.

UNIT-II

Applications of Simulation: Why Use Simulation, Simulation as a Design Tool, Estimation of Simulation Time, Methodology for Manufacturing Simulations, Forcing Completion of Design with Simulation, The Simulation Decision, Make It Work Vs. Does It Work, Optimizing and Developing Solutions, Genetic Algorithms, Ethics in Simulation.

UNIT-III

Starting a Simulation the Right Way: Intelligence, Managerial Phase, Developmental Phase, Human Component Considerations.

UNIT-IV

Simulation Quality and Development: Quality Assurance Phase, Selection of a Language or Tool, Model Construction, Verification - **Developing a Simulation-Implementation:** Experimental Design, Production Runs, Output Analysis, Output Reporting, Post Processing Output, Operations, Maintenance and Archival Phase.

UNIT-V

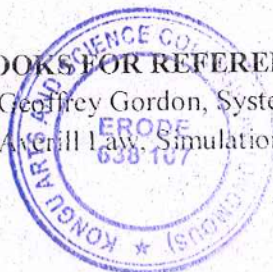
Case Study : DePorres Tours : Intelligence Phase – Maintenance Phase – Managerial Phase – Development Phase – Quality Phase – Implementation – Operations, Maintenance and Archival phase.

TEXT BOOK:

Roger McHaney, Understanding Computer Simulation, Ventus Publishing ApS, First Edition, 2009.

BOOKS FOR REFERENCE:

1. Geoffrey Gordon, System Simulation, PHI Learning, Second Edition, 2009
2. Averill Law, Simulation Modeling and Analysis, Mc Graw Hill Education, V Edition, 2014.



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