



KONGU ARTS AND SCIENCE COLLEGE

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

ERODE – 638 107

M.Sc (Computer Science)



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ERODE – 638 107

2020-2021



KONGU ARTS AND SCIENCE COLLEGE (AUTONOMOUS)

ERODE – 638 107

DEPARTMENT OF COMPUTER SCIENCE

MASTER OF COMPUTER SCIENCE (M.Sc) DEGREE

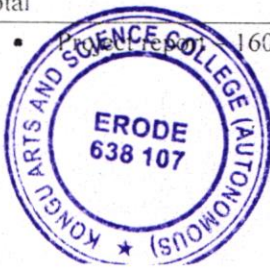
SCHEME OF EXAMINATION – CBCS PATTERN

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



Course Code	Course Title	Inst. Hrs./Week	T/P	Examination Details				Credits
				Duration in Hours	CIA	ESE	Total Marks	
SEMESTER I								
20PBICT101	Core I: Analysis & Design of Algorithms	5	T	3	25	75	100	4
20PBICT102	Core II : Object Oriented Analysis and Design & C++	5	T	3	25	75	100	4
20PBICT103	Core III : Advanced Networks	5	T	3	25	75	100	4
20PBICT104	Core IV: Advanced Software Engineering	5	T	3	25	75	100	4
20PBICP105	Core Practical I: Algorithm and OOPS Lab	5	T	3	40	60	100	4
20PBICP106	Core Practical II : Software Testing Lab	5	P	3	40	60	100	4
Total		30					600	24
SEMESTER II								
20PBICT201	Core V: Data Mining and Warehousing	4	T	3	25	75	100	4
20PBICT202	Core VI: Advanced Operating Systems	4	T	3	25	75	100	4
20PBICT203	Core VII: Advanced Java Programming	4	T	3	25	75	100	4
20PBICT204	Core VIII: Artificial Intelligence & Expert Systems	4	T	3	25	75	100	4
20PBIET20.	Elective - I	4	T	3	25	75	100	4
20PBICP208	Core Practical III: Advanced Java Programming Lab	5	P	3	40	60	100	4
20PBICP209	Core Practical IV: Data Mining using R Lab	5	P	3	40	60	100	4
Total		30					700	28
SEMESTER III								
20PBICT301	Core IX: Digital Image Processing	4	T	3	25	75	100	4
20PBICT302	Core X: Python Programming	4	T	3	25	75	100	4
20PBICT303	Core XI: Network Security and Cryptography	4	T	3	25	75	100	4
20PBICT304	Core XII: Business Intelligence	4	T	3	25	75	100	4
20PBIET30.	Elective – II	4	T	3	25	75	100	4
20PBICP308	Core Practical V : Python Programming Lab	5	P	3	40	60	100	4
20PBICP309	Core Practical VI : Digital Image processing using Matlab	5	P	3	40	60	100	4
20PBICP310	Core Practical VII : Web Designing Lab	2	P	3	20	30	50	2
Total		30					750	30
SEMESTER IV								
20PBICV401	Project work and Viva voce						200*	8
Total							2250	90

* 160 marks; Viva-voce – 40 marks



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LIST OF ELECTIVES

Students can choose any ONE Elective course from each

Elective. Electives for II Semester

ELECTIVE I

S. No.	Course Name	Course Code
1.	Multimedia and its Applications	20PBIET205
2.	Embedded Systems	20PBIET206
3.	PHP Programming	20PBIET207

Electives for III Semester


ELECTIVE II

S. No.	Course Name	Course Code
1.	Mobile Computing	20PBIET305
2.	Cloud Computing	20PBIET306
3.	Web Services	20PBIET307

ADVANCED LEARNERS COURSES

S. No.	Course Name	Course Code
1.	Computer Simulation	20PBIAL311
2.	Human Computer Interaction	20PBIAL312




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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).

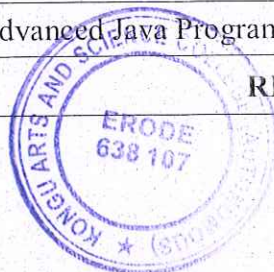

Chairman

Board of Studies - CSPG
Kongu Arts and Science College (Autonomous)
Erode.

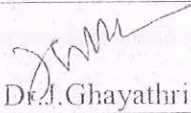
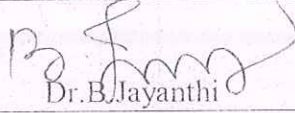
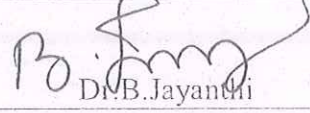



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Sem.	Course Code	Core Paper – II ADVANCED JAVA PROGRAMMING	Total Marks:100		Hours Per Week	Credits
I	21PBICT102			CIA : 50	ESE :50	5
Course Objectives: On successful completion of the course the students will have:						
1. Employability opportunities by enhancing the knowledge in advanced JAVA concepts 2. Skills to develop web based applications by applying the advanced Java concepts						
Course Outcomes (CO): On completion of the course, students should be able to						
CO 1	Create Applications using Swing Components.					K1 – K6
CO 2	Write distributed applications using RMI					
CO 3	Establishing Database Connectivity using JAVA					
CO 4	Implement application using Applets and Servlet					
CO 5	Apply XML Schemas in web					
K1 :Remember; K2: Understand; K3 :Apply; K4: Analyze; K5 : Evaluate; K6 :Create						
Unit –I :	JAVA SWING					
Introduction – AWT Class Hierarchy – Creating Container – Adding Components – Layout – Panel – Text Filed – TextArea – List – Checkbox – Check Box Group – Choice – Event Handling – Dialog Boxes – ScrollBar – Menu – Swing – JTree – JColorChooser - Dialogs						
Unit –II :	REMOTE METHOD INVOCATION AND JDBC					
RMI : Introduction – Remote Method Invocation – Java RMI Interfaces and Classes- Application – Compiling the Program – Generating Stub Classes – Running the Program – Callback JDBC: Introduction – Drivers – Architecture – Classes and Interfaces – SQL Statements – Retrieving Result						
Unit –III :	JAVA and XML					
Introduction – XML and DOM – DOM Nodes – Node Interface – Document Node – Element Node – Text Node – Attr Node – Parsing XML						
Unit –IV :	APPLETS & SERVLET					
Client Side Java – Life Cycle – Writing an Applet – Class File – Running the Applet – Security – Utility Methods – AppletContext Interface - Passing Parameters - Event Handling - Server-Side Java – Advantages Over Applets – Servlet Alternatives – Servlet Strengths – Architecture – Life Cycle – GenericServlet – HttpServlet – Passing Parameters - Retrieving Parameters – Cookies – Filters – Problems – Security Issues						
Unit –V :	JSP					
Introduction – JSP and HTTP – Engines – JSP and Servlet – Anatomy - Syntax – Components						
Skill Development Activities:						
1 Prepare a slide to demonstrate JDBC connectivity using MySQL in Java.						
2. From a desktop which is using Windows OS explore the DOM nodes and write a report on it.						
3. Take a screen shot of browser cookies and demonstrate its nature and process.						
TEXT BOOKS						
1	Uttam K. Roy, Advanced Java Programming, Oxford University Press, 2015.					
REFERENCE BOOKS						



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1	Deitel and Deitel, "Java How to Program", Third Edition, PHI/Pearson Education Asia.	
2	Campione, Walrath and Huml, "The Java Tutorial", AddisonWesley, 1999.	
Web Resources		
1	http://www.sietk.org/downloads/javabook.pdf	
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

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	M	M	S	L	S	L	S	S	M
CO2	S	S	L	M	M	S	S	S	S	S	M	S
CO3	S	M	S	L	L	M	S	S	S	S	S	S
CO4	S	M	M	M	S	S	S	M	S	M	S	M
CO5	S	M	M	L	M	S	S	S	S	S	S	M
S-Strong, M-Medium, L-Low												



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Sem.	Course Code	Core Paper – III ADVANCED DATABASE MANAGEMENT SYSTEMS	Total Marks:100		Hours Per Week	Credits
I	21PBICT103		CIA : 50	ESE :50	5	4

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

1. Acquire Knowledge of Database Models, Applications of Database Models and Emerging Trends
2. Skills to use normalized database tables for the software programs and projects.
3. 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	Improve the database design by normalization.	K1 - K6
CO 2	Analyze the concepts of transaction management, concurrency control, and reliability in Distributed and object oriented Databases	
CO 3	Apply recursive query processing techniques	
CO 4	Illustrate experiments using XML databases	
CO 5	Enforce Integrity constraints in Temporal databases	

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

Unit –I :

Relational and Parallel Database Design: Basics, Entity Types, Relationship Types, ER Model, ER-to-Relational Mapping algorithm.

Normalization: Functional Dependency, 1NF, 2NF, 3NF, BCNF,4NF and 5NF. Architecture,I/O Parallelism, Interquery Parallelism, Intraquery Parallelism, Intraoperation Parallelism, Interoperation Parallelism.

Unit –II :

Distributed and Object based Databases: Architecture, Distributed data storage, Distributed transactions, Commit protocols, Concurrency control, Query Processing.

Complex Data Types, Structured Types and Inheritance, Table Inheritance, array and Multiset, Object Identity and Reference Types, Object Oriented versus Object Relational.

Unit –III :

Spatial Database: Spatial Database Characteristics, Spatial Data Model, Spatial Database Queries, Techniques of Spatial Database Query.

Logic based Databases: Introduction, Overview, Propositional Calculus, Predicate Calculus, Deductive Database Systems, Recursive Query Processing.

Unit –IV :

XML Databases: XML Hierarchical data model, XML Documents, DTD, XML Schema, XML Querying, XHTML, Illustrative Experiments.

Unit –V :

Temporal Databases: Introduction, Intervals. Packing and Unpacking Relations, Generalizing the relational Operators, Database Design, Integrity Constraints, Multimedia Databases: Multimedia Sources, Multimedia Database Queries, Multimedia Database Applications

Skill Development Activities:

1. A manufacturing company produces products. The following product information is stored: product ID and quantity on hand. These products are made up of many components.



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3. Demonstrate XQuery with XML.

TEXT BOOKS

- | | |
|---|---|
| 1 | Abraham Silberschatz, Henry F Korth , S Sudarshan, "Database System Concepts", 6th edition , McGraw-Hill International Edition , 2011 |
| 2 | C.J.Date, A.Kannan, S.Swamynathan, "An Introduction to Database Systems", 8th Edition, Pearson Education Reprint 2016 |

REFERENCE BOOKS

- | | |
|---|---|
| 1 | RamezElmasri, Shamkant B Navathe, "Fundamental of Database Systems", Pearson, 7th edition 2016. |
| 2 | Mark. L. Gillenson, "Fundamentals of Database System", Wiley India, 2008 |

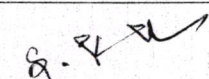
Web Resources

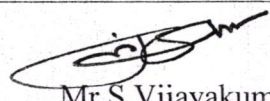
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|---|---|
| 1 | http://deccancollege.ac.in/csestdmat/dr.p.vishvapathi/korth6thed.pdf |
| 2 | https://docs.google.com/file/d/0b9aja_iv4khyr1i1q1mxq2vzx0u/edit |

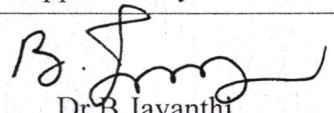
Course Designed By

Verified By

Approved By HOD


 Ms. S. Krithika


 Mr. S. 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	M	M	S	L	S	L	S	S	M
CO2	S	M	S	M	M	S	S	S	S	S	M	S
CO3	S	M	S	L	L	M	S	S	S	S	M	S
CO4	S	S	M	M	S	S	S	M	S	M	M	S
CO5	M	S	M	L	M	S	S	S	S	S	S	M

S-Strong, M-Medium, L-Low




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Sem.	Course Code	Core Paper – IV SOFTWARE PROJECT MANAGEMENT & SOFTWARE ENGINEERING	Total Marks:100		Hours Per Week	Credits
			CIA : 50	ESE :50		
I	21PBICT104				5	4

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

1. Understood the concepts of Project Planning and Estimation
2. Understood the concepts of Software Quality Management
3. Knowledge in alternate plans to handle expected/unexpected risk during project development
4. Employability opportunities by enhancing the knowledge in Software Quality Management

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

CO 1	Identify the challenges in Software Development process.	K1 - K6
CO 2	Explain about the Software Requirement Analysis and Specification	
CO 3	Do the Project planning, tracking, Risk analysis, Quality management and Project Cost estimation using different techniques.	
CO 4	Solve the issues and challenges faced in Software Design Process	
CO 5	Predict the possible causes of Software failure and knowledge of how to prevent them	

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

Unit –I :

Introduction to Software Project Management: Importance – Contract Management and Technical Project Management – Activities – Plans, Methods and Methodologies – Categories – Project Charter – Stakeholders – Objectives – Management – Management Control – Life Cycle - Traditional Versus Modern Project Management Practices – Project Evaluation and Programme Management: Introduction - Business Case – Portfolio Management – Cost-benefit Evaluation Techniques – Risk Evaluation - Programme Management- Allocation of Resources – Strategic Programme Management- Creating a Programme – Reservations - Benefits

Unit –II :

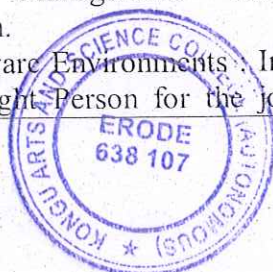
Project Planning – Project Planning Steps – Selection of an Appropriate Project Approach: Introduction – Methodologies and Technologies - Software Processes and Process Models – Waterfall Model – Spiral Model – Software Prototyping – Incremental Delivery – Systems Development Method – Rapid Application Development – Agile Methods – Extreme Programming – Scrum – Lean Software Development

Unit –III :

Software Effort Estimation : Introduction – Problems – Basis of Software Estimation – Techniques – Models – Expert Judgement – Analogy – Function Point Analysis – COSMIC – COCOMO II – Cost Estimation – Staffing Pattern-
Activity Planning: Introduction – Objectives – Plan – Project Schedules & Activities – Network Planning Models – Forward & Backward Pass – Identifying the Critical Path – Activity Float

Unit –IV :

Risk Management: Introduction – Risk – Categories – Approaches – Framework – Identification – Assessment – Planning – Management – Evaluation – Applying PERT Technique – Monte Carlo Simulation – Critical Chain.
Managing People in Software Environments: Introduction – Understanding Behaviour & organizational Behaviour – Selecting Right Person for the job- Motivation – Oldham Hackman Job Characteristics



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Model – Stress – Management - Health and Safety – Ethical and Professional concerns.

Unit –V :

Working in teams : Introduction – Becoming a Team – Decision Making – Organization and Team Structures – Coordination Dependencees – Dispersed and Virtual Teams – Communication Genres & Plans – Leadership

Software Quality: Introduction – Software Quality in Project Planning – Importance of Software Quality – Defining Software Quality – Software Quality Models – ISO 9126 – Product and Process Metrics – Product versus Process Quality Management – Quality Management System – Process Capability Models – Techniques for enhancing quality – Testing – Software Reliability – Quality Plans.

Skill Development Activities:

1. Incorporate and develop a portfolio for our college ERP software development.
2. Using COOCOMO II model do the cost analysis for a retail shop software project development.
3. Develop a model for ticket reservation system for Bus and depict the risks and exhibit the risk management of the system.

TEXT BOOKS

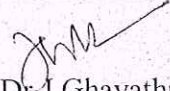
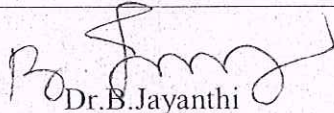
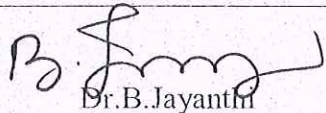
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|---|--|
| 1 | Bob Hughes, Mike Cotterell, Rajib Mall “ Software Project Management, McGraw Hill Education, 6 th Edition, 2018 |
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REFERENCE BOOKS

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|---|---|
| 1 | S.A. Kelkar, Software Project Management: A concise study, PHI, Third edition, 2012. |
| 2 | Walker Royce, Software Project Management : A unified frame work, Pearson Education, 1998 |

Web Resources

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|---|---|
| 1 | https://www.docdroid.net/JubqqhZ/software-project-management-2nd-ed-by-bob-hughes-mike-cotterell-and-rajib-mall-pdf |
| 2 | http://engineersevanigam.blogspot.com/2013/07/software-project-management-5th-edition.html |

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




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Sem.	Course Code	Core Practical- II ADVANCED DATABASE MANAGEMENT SYSTEMS LAB	Total Marks:100		Hours Per Week	Credits
I	21PBICP106		CIA : 50	ESE :50	5	4

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

1. Acquired knowledge in SQL, PL/SQL commands, and XML databases
2. Implement the database concepts using standard queries
3. Manage to create reports using the queries and tables

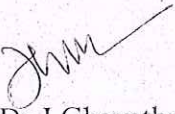
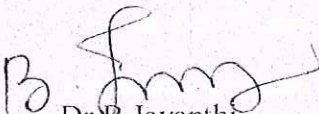
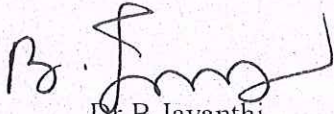
Course Outcomes (CO): On completion of the course, students should be able to

CO 1	Design the database schema with the use of appropriate data types for storage of data in database	K1 - K6
CO 2	Application of SQL commands	
CO 3	Implementation of PL/SQL Concepts	
CO 4	Application of Concurrency mechanism in Databases	
CO 5	Create XML databases	

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

Program List

1. Creation of tables and views.
2. Application of DML and DCL Commands
3. Application of TCL commands
4. Application of PL/SQL.
5. Use of Cursors, Procedures and Functions
6. Application of Triggers.
7. Application of Concurrency control in Distributed databases
8. Application of XML Database
9. Application of Temporal Database using Integrity constraint
10. Multimedia database queries

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



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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	L	M	M	S	L	S	L	S	S	L
CO2	M	S	L	M	M	S	S	S	S	S	S	S
CO3	S	M	S	L	L	M	S	S	S	S	M	L
CO4	M	S	M	M	S	S	S	M	S	M	M	S
CO5	M	S	L	L	M	S	S	S	S	S	S	S

S-Strong, M-Medium, L-Low



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Sem.	Course Code	Core Paper – V CRYPTOGRAPHY & NETWORK SECURITY	Total Marks:100		Hours Per Week	Credits
II	21PBICT201		CIA : 50	ESE : 50	4	4

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

1. Understood Cryptography Theories, Algorithms and Systems.
2. Understood Approaches and Techniques to build protection mechanisms in order to secure computer networks.
3. Understood about the malicious software & firewalls.

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

CO 1	Outline the fundamentals of networks security, security architecture, threats and vulnerabilities	K1 – K6
CO 2	Apply the different cryptographic operations of symmetric cryptographic algorithms	
CO 3	Apply the different cryptographic operations of public key cryptography	
CO 4	Apply the various Authentication schemes to simulate different applications.	
CO 5	Understand various Security practices and System security standards	

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

Unit –I :

Introduction - Security trends – Legal, Ethical and Professional Aspects of Security, Need for Security at Multiple levels, Security Policies – Model of network security – Security attacks, services and mechanisms – OSI security architecture – Classical encryption techniques: substitution techniques, transposition techniques, steganography- Foundations of modern cryptography: perfect security – information theory – product cryptosystem – cryptanalysis.

Unit –II :

Symmetric Encryption and Message Confidentiality - Symmetric Encryption Principles, Symmetric Block Encryption Algorithms, Stream Ciphers and RC4, Cipher Block Modes of Operation, Location of Encryption Devices, Key Distribution. Public-key Cryptography and Message Authentication: Approaches to Message Authentication, Secure Hash Functions and HMAC, Public-Key Cryptography Principles, Public-Key Cryptography Algorithms, Digital Signatures, Key Management.

Unit –III :

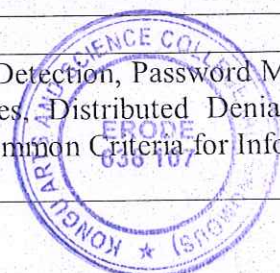
Authentication Applications - Kerberos, x.509 Authentication Service, Public-Key Infrastructure. Electronic Mail Security: Pretty Good Privacy (PGP), S/MIME.

Unit –IV :

IP Security - IP Security Over view, IP Security Architecture, Authentication Header, Encapsulating Security Payload, Combining Security Associations. Web Security: Web Security Considerations, Secure Socket Layer(SSL) and Transport Layer Security(TLS), Secure Electronic Transaction(SET).Network Management Security: Basic Concepts of SNMP, SNMPv1 Community Facility, SNMPv3.

Unit –V :

Intruders - Intruders, Intrusion Detection, Password Management. Malicious Software: Virus and Related Threats, Virus Countermeasures. Distributed Denial of Service Attacks. Firewalls: Firewall Design Principles, Trusted Systems, Common Criteria for Information Technology Security Evaluation.



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Skill Development Activities:

1. Implement Caesar Cipher Substitution Technique for both encoding and decoding a text using Python.
2. Demonstrate RC4 and DES algorithm using Cryptool.
3. Implement a digital signature to secure an email message and verify the signature on a signed message

TEXT BOOKS

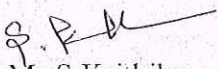
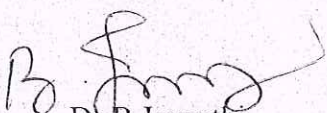
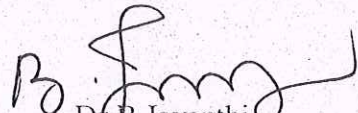
- | | |
|---|---|
| 1 | Behrouz A. Ferouzan, "Cryptography & Network Security", Tata McGraw Hill, 2007, Reprint 2015. |
| 2 | Stallings William, "Cryptography and Network Security - Principles and Practice 2017. |
| 3 | William Stallings, "Network Security Essentials Applications and Standards "Third Edition, Pearson Education, 2008. |

REFERENCE BOOKS

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|---|--|
| 1 | Charles Pfleeger, "Security In Computing", 4th Edition, Prentice Hall Of India, 2006. |
| 2 | Ulysess Black, "Internet Security Protocols", Pearson Education Asia, 2000. |
| 3 | Charlie Kaufman And Radia Perlman, Mike Speciner, "Network Security, Private Communication In Public World", Second Edition, PHI 2002. |
| 4 | Bruce Schneier And Neils Ferguson, "Practical Cryptography", First Edition, Wiley Dreamtech India Pvt Ltd, 2003. |

Web Resources

- | | |
|---|---|
| 1 | https://books.google.co.in/books?id=NmkceQPAY8C&source=gbs_book_other_versions |
| 2 | http://www.cs.vsb.cz/ochodkova/courses/kpb/cryptography-and-network-security_-principles-and-practice-7th-global-edition.pdf |
| 3 | shorturl.at/prxHS |

Course Designed By	Verified By	Approved By HOD
 Ms.S.Krithika	 Dr.B.Jayanthi	 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
CO1	S	M	L	M	M	S	L	S	L	S	M	L
CO2	M	S	S	M	M	S	S	S	S	S	S	S
CO3	S	M	S	L	L	M	S	S	S	S	M	L
CO4	S	M	S	M	S	S	S	M	S	M	M	S
CO5	S	L	S	L	M	S	S	S	S	S	M	S

S-Strong, M-Medium, L-Low




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Sem.	Course Code	Core Paper –VII		Hours Per Week	Credits
		ARTIFICIAL INTELLIGENCE & MACHINE LEARNING			
II	21PBICT203	CIA : 50	ESE :50	4	4

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

1. Enable the students to learn the basic functions of AI, Heuristic Search Techniques.
2. Provide knowledge on concepts of Representations and Mappings and Predicate Logic.
3. Introduce Machine Learning with respect Data Mining, Big Data and Cloud.
4. Study about Applications & Impact of ML.

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

CO 1	Explore various heuristics techniques	K1 - K6
CO 2	Analyze the issues in Knowledge representation	
CO 3	Apply different types of reasoning	
CO 4	Apply various algorithms for Learning	
CO 5	Understand the working pattern of ANN	

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

Unit –I :

INTRODUCTION: Definitions - Artificial Intelligence Problems - Topics of Artificial Intelligence Timelines of Artificial Intelligence - Production Systems - State Space Representation - Branches of Artificial Intelligence - Applications of Artificial Intelligence
HEURISTIC SEARCH TECHNIQUES Generate-and-Test - Hill Climbing- Search Techniques - Problem Reduction - Constraints Satisfaction - Means-ends Analysis

Unit –II :

GAME PLAYING MINIMAX Procedure - Alpha-Beta Pruning - Combined Approach
KNOWLEDGE REPRESENTATION Knowledge Management - Types of Knowledge - Knowledge Representation -Approaches to Knowledge Representation- Issues in Knowledge Representation - Knowledge Base
KNOWLEDGE REPRESENTATION STRUCTURES First-order Logic - Resolution - Frames - Conceptual Dependency- Scripts - Semantic Network

Unit –III :

REASONING: Types of Reasoning - Non-monotonic Inference Methods - Non-monotonic Reasoning - Truth Maintenance Systems - Reasoning with Fuzzy Logic - Rule-based Reasoning - Diagnosis Reasoning
LEARNING Types of Learning - Machine Learning - Intelligent Agents

Unit –IV :

ASSOCIATION LEARNING: Basics of Association- Apriori Algorithm - Eclat Algorithm - FP Growth Algorithm - Tertius Algorithm
CLUSTERING: k-means Clustering Fuzzy Clustering Hierarchical Clustering Agglomerative and Divisive Clustering (ADC) Hierarchical Agglomerative Clustering (HAC) Cluster Similarity
REINFORCEMENT LEARNING Markov Decision Problem Q-learning Temporal Difference Learning Automata



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Unit -V :

STATISTICAL LEARNING Hidden Markov Linear Classifiers Quadratic Classifiers Decision Trees Bayesian Networks ARTIFICIAL NEURAL NETS ANN Basics ANN Learning Process Types of Networks Perceptron Multilayer Perceptron Error Back-propagation Algorithm RBF Networks ANN Summary

Skill Development Activities:

1. Design the activities of home robot which is used as an assistant (for housekeeping activities) for you while you are doing online courses using Means-ends analysis.
2. Demonstrate the process to carried out while doing online purchase of a mobile phone using Scripts, conceptual dependency and semantic network
3. Develop an architecture, using k means clustering to classify the patients in a multispecialty hospital.

TEXT BOOKS

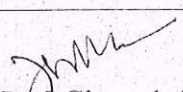
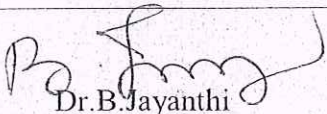
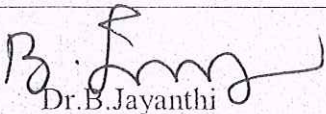
- | | |
|---|--|
| 1 | Vinod Chandra S.S. and Anand Hareendran S, ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING, PHI Learning Private Limited, Delhi, 2014 |
|---|--|

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- | | |
|---|---|
| 1 | Elaine Rich and Kevin Knight, "Artificial Intelligence", Tata McGraw Hill Publishers company Pvt Ltd, Second Edition, 1991. |
| 2 | George F Luger, "Artificial Intelligence", 4th Edition, Pearson Education Publ, 2002. |
| 3 | Andreas C. Muller, & Sarah Guido, Introduction to Machine Learning with Python A guide for data scientists, O'Reilly Publishers, 2018 |

Web Resources

- | | |
|---|---|
| 1 | https://www.routledge.com/rsc/downloads/AI_FreeBook.pdf |
|---|---|

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
CO												
CO1	S	M	L	M	M	S	L	S	L	S	M	L
CO2	M	S	M	M	M	S	S	S	S	S	S	M
CO3	M	S	L	L	L	M	S	S	S	S	S	S
CO4	S	M	S	M	S	S	S	M	S	M	S	M
CO5	M	S	M	L	M	S	S	S	S	S	S	S
S-Strong, M-Medium, L-Low												




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Sem.	Course Code	Core Paper –VIII	Total Marks:100		Hours Per Week	Credits
II	21PBICT204	PYTHON PROGRAMMING	CIA : 50	ESE :50	4	4

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

1. Acquired knowledge to design and program different tasks using Python language
2. Mastered Python objects and GUI programming

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

CO 1	Define the structure and components of a Python program	K1 – K6
CO 2	Use lists, tuples, and dictionaries in Python programs	
CO 3	Write loops and decision statements in Python	
CO 4	Design object-oriented programs with Python classes.	
CO 5	Build and package Python modules for reusability	

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

Unit –I :

Exploring Python: Interactive Execution- Bitwise Operators – Encodings – **Creating Python Programs** : Commands – Statements – Levels of Abstraction – The Software Development Process – **Defining Functions:** Testing Functions – Name Scopes – Writing a function that calls itself – Using global names inside of functions – Raising Exceptions – Functions are values – A Few words about nothing

Unit –II :

Strings, Lists, Tuples and Sets: Lists : Tuples – String Functions – Sets – Triple Quoted String, Raw strings and Escape Characters- **Dictionaries** : Combining two dictionaries with Update – Making Copies – Zip list initiation – Loops – Dynamic Programming – Persistent Variables – Internal Dictionaries

Unit –III :

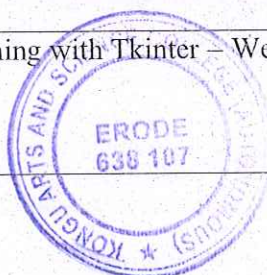
Files: Operating System Commands – Recovering from Exceptions – Standard I/O – Persistence and Pickle – Reading from a URL – **Classes:** Class Basics – Constructors – Respect Class Boundaries – Calling methods from inside other methods – Objects and References – Printing – Inheritance – Classe, Types and Tests – Class Variables – Multiple Inheritance – Classes as Dynamic Records – **Functional Programming:** The Functional Programming Paradigm – Examples – Simple Reductions – Computing Variance of a List – Combining Functional and Object-Oriented Programming – Iterating over Multiple-Lists

Unit –IV :

Object-Oriented Programming: Community – Discovering Objects – Encapsulation and properties – **Scopes, Name Spaces, and Modules:** The LEGB Rule – Qualified Names – Modules – **Advanced Features:** Keyword Arguments – Object Overloading – Regular Expressions and String Processing – Iterators and Generators – Module Reload – Documentation Strings

Unit –V :

Case Studies: GUI Programming with Tkinter – Web – Based Applications – A Simple Blog – A Wiki Web – A Sudoku Solver



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Skill Development Activities:

1. Demonstrate how to raise User-defined Exceptions
2. Is Python dictionaries better than lists and array? Construct a comparison table.
3. Demonstrate Python Regular Expression in various validation purposes.

TEXT BOOKS

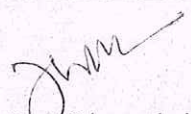
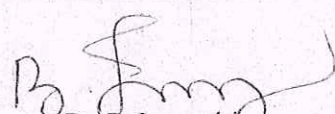
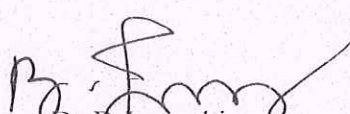
1. Exploring Python, Timothy A. Budd, McGraw Hill Edition 2003, Reprint 2018

REFERENCE BOOKS

1. Wesley J Chun, Core Python Programming, Prentice Hall PTR, 2000
2. Katie Cunningham, Python in 24 Hours, Sams Teach Yourself, Second Edition, 2013
3. Gowrishankar S, Veena A ." Introduction to Python Programming", CRC Press, 2018

Web Resources

1. <http://index-of.es/Python/Exploring%20Python.pdf>

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

QUESTION PAPER PATTERN


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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	S	L	M	M	S	L	S	L	S	M	L
CO2	S	M	L	M	M	S	S	S	S	S	M	S
CO3	M	S	L	L	L	M	S	S	S	S	S	M
CO4	M	S	M	M	S	S	S	M	S	M	S	M
CO5	M	S	M	L	M	S	S	S	S	S	S	S

S-Strong, M-Medium, L-Low




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Sem.	Course Code	Elective Paper – I	Total Marks:100		Hours Per Week	Credits
I	21PBIET205	MOBILE COMPUTING	CIA : 50	ESE :50	4	3

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

1. Understood the concepts of mobile and GPRS Technology
2. Exposed to Ad-Hoc networks
3. Understood about different mobile platforms and application development

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

CO 1	Explain the features of mobile system	K1 – K6
CO 2	Develop mobile application	
CO 3	Discuss the Mobile Ad hoc networks and its routing	
CO 4	Apply the different types of security features	
CO 5	Describe High Definition Television and Desktop Computing	

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

Unit –I :

Basics of mobile - Mobile device profiles - Middleware and gateways - Wireless Internet - Smart clients - Three-tier Architecture- Design considerations for mobile computing-- Mobility and Location based services

Unit –II :

Mobile computing through Internet - Mobile-enabled Applications - Developing Mobile GUIs – VUIs and Mobile Applications – Characteristics and benefits -Multichannel and Multi modal user interfaces – Synchronization and replication of Mobile Data - SMS architecture – GPRS – Mobile Computing through Telephony.

Unit –III :

Mobile Application Development - Android- Wi-Fi –GPS – Camera – Movement – orientation - event based programming – iOS/ windows CE - Blackberry – windows phone – M-Commerce- structure – pros & cons – Mobile payment system - J2ME

Unit –IV :

ADHOC Wireless Network - Ad Hoc Wireless Network –MAC protocol – Routing protocols - Transport Layer Protocol - QoS – Energy Management – application design – work flow – composing applications – Dynamic linking – Intents and Services – Communication via the web.

Unit –V :

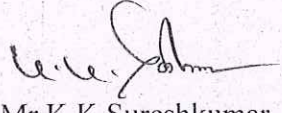
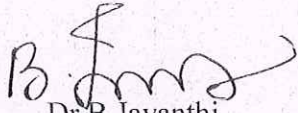
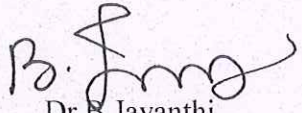
Security and Hacking - Password security – Network security – web security – Database security - Wireless Sensor Network - Architecture and Design – Medium Access Control – Routing – Transport Layer – Energy model.

Skill Development Activities:

1. Analyse how GPRS is higher than 2G.
2. Prepare a report on the mobile payment systems and payment schemes.
3. Implement the of attacks of ad hoc networks.



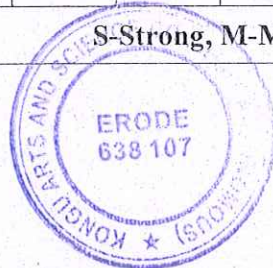
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TEXT BOOKS		
1	Jochen Schiller, Mobile Communications, Second Edition, 2012.	
2	William Stallings, "Wireless Communications & Networks", Pearson Education, 2009.	
REFERENCE BOOKS		
1	Ashok K Talukder, Roopa R Yavagal, "Mobile Computing", Tata McGraw Hill, 2005.	
2	JochenBurkhardtDr.HorstHenn, Klaus Rintdoff, ThomasSchack, "Pervasive Computing", Pearson, 2009.	
3	FeiHu, Xiaojun Cao, "Wireless Sensor Networks Principles and Practice "CRC Press, 2010.	
Web Resources		
1	https://web.uettaxila.edu.pk/CMS/SP2013/teMCTTms/tutorial%5CMobile-Communications-JochenSchiller.pdf	
2	http://59.51.24.50:8000/wxwl/Wireless Communications & Networking Stallings 2nd.pdf	
Course Designed By	Verified By	Approved By HOD
 Mr.K.K.Sureshkumar	 Dr.B.Jayanthi	 Dr.B.Jayanthi
QUESTION PAPER PATTERN		
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CO2	M	S	L	M	M	S	S	S	S	S	M	S
CO3	S	M	M	L	L	M	S	S	S	S	M	L
CO4	S	M	L	M	S	S	S	M	S	M	S	M
CO5	S	M	L	L	M	S	S	S	S	S	M	S

S-Strong, M-Medium, L-Low



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Sem.	Course Code	Elective Paper – I E-CONTENT WRITING	Total Marks:100		Hours Per Week	Credits
II	21PBIET206		CIA : 50	ESE :50	4	3

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

- 1 Understood the way of 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



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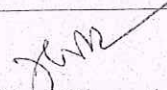
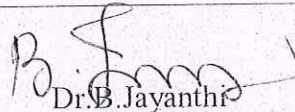
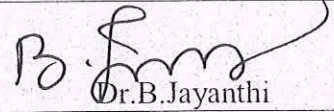
2	NP Ahuja.(2013). Dictionary of Grammar-. Anurod Publications Pvt.Ltd., New Delhi110002
3	Lynda Felder(2012) Writing for the Web, New Riders, Berkeley
4	Jancie Redish (2012). Letting, Go of the Words : Writing Web Content that Works, II Edition, Elsevier Inc., UK

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/opEN8
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

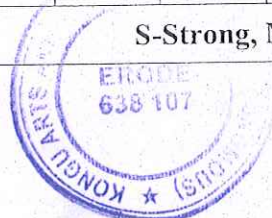
QUESTION PAPER PATTERN


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	PSO
CO												
CO1	S	M	S	M	M	S	L	S	L	S	S	L
CO2	M	S	M	M	M	S	S	S	S	S	S	M
CO3	M	S	L	L	L	M	S	S	S	S	M	S
CO4	S	M	L	M	S	S	S	M	S	M	M	S
CO5	M	S	L	L	M	S	S	S	S	S	S	M

S-Strong, M-Medium, L-Low




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Sem.	Course Code	Elective Paper – I DATA MINING	Total Marks:100		Hours Per Week	Credits
II	21PBIET207		CIA : 50	ESE :50	4	3

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

1. Understood the fundamental concepts of Data Mining Techniques and various Algorithms used for Information Retrieval from Datasets
2. Understood the concept of extracting the required data from Spatial, Multimedia, Text and Web Data set

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

CO 1	Preprocess the data for mining applications	K1 – K6
CO 2	Create the architecture of Data warehouse	
CO 3	Characterize the kinds of patterns that can be discovered by different Classification methods	
CO 4	Build model based clustering methods	
CO 5	Identify applications in data mining	

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

Unit –I :

Data Mining And Data Preprocessing: Data Mining – Motivation – Definition – Data Mining on Kind of Data –Functionalities – Classification – Data Mining Task Primitives – Major Issues in Data Mining – Data Preprocessing – Definition – Data Clearing – Integration and Transformation – Data Reduction.

Unit –II :

Data Warehousing: Multidimensional Data Model –Data Warehouse Architecture – Data Warehouse Implementation –From data Warehousing to Data Mining – On Line Analytical Processing - On Line Analytical Mining

Unit –III :

Frequent Patterns, Associations And Classification: The Apriori Algorithm – Definition of Classification and Prediction – Classification by Decision Tree Induction - Bayesian Classification – Rule Based Classification – Classification by Back Propagation – Lazy Learners – K-Nearest Neighbor – Other Classification Methods.

Unit –IV :

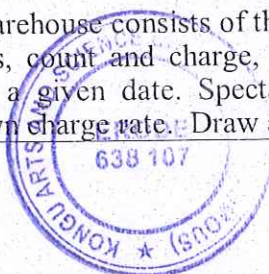
Cluster Analysis: Definition – Types of data in Cluster Analysis – Categorization of major Clustering Techniques – Partitioning Methods – Hierarchical Clustering – BIRCH - ROCK – Grid Based Methods – Model Based Clustering Methods – Outlier Analysis.

Unit –V :

Spatial, Multimedia, Text And Web Data: Spatial Data Mining – Multimedia Data Mining – Text Mining – Mining the World Wide Web – Data Mining Applications – Trends in Data Mining.

Skill Development Activities:

1. Suppose that a data warehouse consists of the four dimensions, date, spectator, location, and game, and the two measures, count and charge, where charge is the fare that a spectator pays when watching a game on a given date. Spectators may be students, adults, or seniors, with each category having its own charge rate. Draw a star schema diagram for the data warehouse.



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2. Illustrate the use of partitioning algorithm using market basket data.
3. Use the K-means algorithm to cluster the following data {2,4,10,12,3,20,30,11,25} into two clusters. Initially value assigned to $m_1 = 2$ and $m_2 = 4$.

TEXT BOOKS

1. Jiawei Han and Micheline Kamber, "Data Mining: Concepts and Techniques (The Morgan Kaufmann Series in Data Management Systems) 3rd Edition, July 6, 2011.
2. Ian H. Witten, Eibe Frank, Mark A. Hall, "Data Mining: Practical Machine Learning Tools and Techniques", Elsevier; Third edition, 2014

REFERENCE BOOKS

1. Margret H. Dunham, "Data Mining: Introductory and Advanced Topics", Pearson Education, 2003
2. Arun K. Pujari, "Data Mining Techniques", University Press, 2001
3. MJ Zaki, W Meira Jr, W Meira "Data Mining and Analysis: Fundamental Concepts and Algorithms", Cambridge University Press, 2014

Web Resources

1. shorturl.at/fqHPW
2. <https://bit.ly/3dYxTx8>

Course Designed By

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Dr. B. Jayanthi

Verified By

Dr. J. Ghayathri
Dr. J. Ghayathri

Approved By HOD

B.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

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	M	M	S	L	S	L	S	L	S
CO2	M	S	L	M	M	S	S	S	S	S	S	M
CO3	M	S	M	L	L	M	S	S	S	S	M	S
CO4	M	S	M	M	S	S	S	M	S	M	S	M
CO5	S	L	M	L	M	S	S	S	S	S	M	S

S-Strong, M-Medium, L-Low



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Sem.	Course Code	Elective Paper – I	Total Marks:100		Hours Per Week	Credits
II	21PBIET208	COMPILER DESIGN	CIA : 50	ESE :50	4	3

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

1. Understood the design principles of a Compiler
2. Understood the various parsing techniques and translation schemes
3. Understood code optimization concepts

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

CO 1	Explain the phases of a compiler	K1 – K6
CO 2	Describe the context free grammar and various parsing techniques.	
CO 3	Design a code generator and experiments the Intermediate Code Generation	
CO 4	Implement code optimization techniques	
CO 5	Implement the storage organization and allocation strategies	

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

Unit –I :

Introduction: Compilers – Analysis of source program – Phases of a compiler – Cousins of compiler – Grouping of phases – Compiler construction tools.

Lexical analysis: Introduction – Definition of lexical analyser – Input Buffering – specification of Tokens – Recognition of tokens – Regular expression to NFA – Conversion of NFA to DFA – minimization of DFA – optimization of DFA from Regular Expression.

Unit –II :

Syntax Analysis: Introduction – Role of the Parser – Writing Grammars – Grammars – Context free grammar.

Parsing: Introduction – Types of parsing – Shift-reduce parsing – Operator Precedence Parsing – LR Parsers.

Unit –III :

Intermediate Code Generation: Introduction – Generation of Intermediate Code – Declarations – Assignment statements – Boolean expression – Case statements – Backpatching – Procedure calls – Type Conversion.

Code Generation: Introduction – Issues of the Design of Code Generator – The Target Machine – Runtime Storage management – Basic Blocks and Flow Graphs – Next-Use Information – A Simple Code generator- DAG Representation of Basic Blocks – Peephole Optimization

Unit –IV :

Code Optimization: Introduction – Principal Sources of Optimization – Optimization of Basic Blocks – Introduction to Global Data-Flow Analysis.

Unit –V :

Runtime Environments: Introduction – Source language issues – Storage organization – Storage Allocation strategies – Access to Non-local names – Parameter Passing



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Skill Development Activities:

1. Consider the Grammar $G = (\{S\}, \{a, b\}, S, P)$ with the productions:

$$S \rightarrow aSb,$$

$$S \rightarrow ab$$

Find out the context free language.

2. Consider the following grammar-

$$E \rightarrow EAE \mid id$$

$$A \rightarrow + \mid x$$

Construct the operator precedence parser and parse the string $id + id \times id$.

3. Generate the three-address code for the assignment statement $A = - B*(C+D)$

TEXT BOOKS

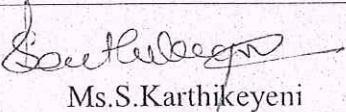
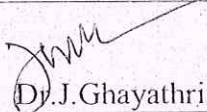

- | | |
|---|---|
| 1 | Dr. R. Venkatesh, Dr. N. Uma Maheswari and Ms. S. Jeyanthi, Compiler Design, Yes Dec Publishing Ltd, 2015 |
|---|---|

REFERENCE BOOKS

- | | |
|---|---|
| 1 | Alfred V. Aho, Ravi Sethi, Jeffery D. Ullman, Compiler Principles Techniques and Tools, Pearson Educaion, 2008. |
| 2 | Kenneth C. Louden , Compiler Construction Principles and Practice, Thomson Learning Inc, 2007 |

Web Resources

- | | |
|---|---|
| 1 | https://www.vssut.ac.in/lecture_notes/lecture1422914957.pdf |
|---|---|

Course Designed By	Verified By	Approved By HOD
 Ms.S.Karthikeyeni	 Dr.J.Ghayathri	 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	PSO5
CO1	S	S	S	M	M	S	L	S	L	S	S	S	S
CO2	S	S	S	M	M	S	S	S	S	S	S	S	L
CO3	S	S	S	L	L	M	S	S	S	S	M	M	L
CO4	S	S	S	M	S	S	S	M	S	M	M	M	M
CO5	S	S	S	L	M	S	S	S	S	S	S	S	S

S-Strong, M-Medium, L-Low




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Sem.	Course Code	Core Practical- III LINUX LAB	Total Marks:100	Hours Per Week	Credits
II	21PBICP209		CIA : 50 ESE :50	4	4

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

1. Create and develop programs using Linux platform
2. Practical knowledge to work with system software
3. Explore the advantages of open source environment


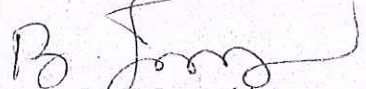

Course Outcomes (CO): On completion of the course, students should be able to

CO 1	Implement the basic set of commands and utilities in Linux/UNIX systems	K1 - K6
CO 2	Handle signals using the signal library functions	
CO 3	Implement full duplex communication between two independent processes using FIFO	
CO 4	Use thread synchronization and counting semaphore in Linux	
CO 5	Implement CPU Scheduling in Linux	


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

Program List

1. Write a shell script to change date format. Show the time taken in execution of this script.
2. Demonstrate the use of basic Unix Shell Commands: ls, mkdir, rmdir, cd, cat, banner, touch, file, wc, sort, cut, grep, dd, dfspace, du, ulimit.
3. Write a linux shell programming to findout wheter the given string is Palindrome or not
4. Implementation of simple Linux commands.
5. Virtual File System (VFS) Implementation in Linux
6. Signal Handling in Linux
7. Implementation of FIFO in Linux
8. Application to demonstrate: producer/consumer problem with counting semaphores and Mutex.
9. Deadlock Avoidance Using Semaphores
10. Implementing a CPU scheduling policy in a Linux OS.

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





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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	S	L	M	M	S	L	S	L	S	M	S
CO2	S	M	S	M	M	S	S	S	S	S	M	S
CO3	M	S	L	L	L	M	S	S	S	S	L	M
CO4	S	L	M	M	S	S	S	M	S	M	S	S
CO5	M	S	L	L	M	S	S	S	S	S	M	S

S-Strong, M-Medium, L-Low




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Sem.	Course Code	Core Practical-IV PYTHON PROGRAMMING LAB	Total Marks:100		Hours Per Week	Credits
II	21PBICP210		CIA : 50	ESE :50	4	4

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

1. Acquired programming skills in core Python

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

CO 1	Solve mathematical expression using python operators	K1 - K6
CO 2	Use lists, tuples, and dictionaries in Python programs	
CO 3	Operate files for storing, manipulating and retrieving purpose	
CO 4	Identify Python object types	
CO 5	Create user defined module as per requirement	

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

Program List

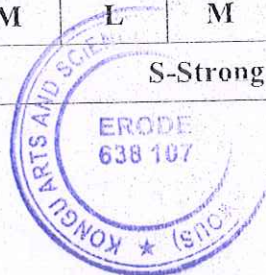
1. Write a Python program to find the roots of Quadratic Equation.
2. Write a Python program to find the grade of students.
3. Write a Python program to find the given word is palindrome or not using function.
4. Write a Python program to implement list operations
5. Write a Python program to implement tuple operations
6. Write a Python program to implement dictionary operations
7. Write a Python program to sort the lines of a file
8. Write a Python program to call the methods using class.
9. Create a own module in Python.
10. Write a python program to apply Regular expression notations.

Course Designed By <i>[Signature]</i> Dr.J.Chayathri	Verified By <i>[Signature]</i> Ms.S.Karthikeyeni	Approved By HOD <i>[Signature]</i> Dr.B.Jayanthi
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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	PSC
CO1	S	S	M	M	M	S	L	S	L	S	S	L
CO2	S	M	S	M	M	S	S	S	S	S	M	S
CO3	M	S	S	L	L	M	S	S	S	S	S	M
CO4	S	M	S	M	S	S	S	M	S	M	M	S
CO5	S	S	M	L	M	S	S	S	S	S	S	M

S-Strong, M-Medium, L-Low



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Sem.	Course Code	Core Practical- V WEB DEVELOPMENT USING ASP.NET	Total Marks:50 CIA : 25 ESE :25	Hours Per Week 2	Credits 2
II	21PBICP211				

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

1. Practical knowledge in ASP.NET

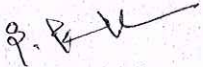
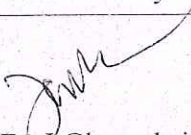
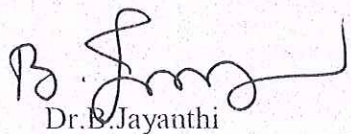
Course Outcomes (CO): On completion of the course, students should be able to

CO 1	Create simple application using standard web controls	K1 - K6
CO 2	Implement various ASP.NET controls for different applications	
CO 3	Design and debug web applications using ASP.NET	
CO 4	Create database driven ASP.NET web applications	
CO 5	Validate the inputs using ASP.NET controls	

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

Program List

1. Write a program to display a feedback form. The different options for the list box must be DOTNET, OSS, CST, DS, ADIS. When the 'Submit' Form button is clicked after entering the data, a message must be displayed as "Submission Accepted" or "Invalid. ReEnter".
2. Write a program that gets user input such as the user name, mode of payment, appropriate credit card. After the user enters the appropriate values the Validation button must validates the values entered.
3. Create an application using ad-rotator control.
4. Create a web application using ASP.NET and ADO.NET to insert 3 records inside the SQL database table having following fields (DeptId, DeptName, EmpName, Salary). Update the salary for any one employee and increment it to 25% of the present salary. Perform delete operation on a particular row of the database table.
5. Create a Login Module which adds Username and Password in the database using ASP.NET and ADO.NET and consider Username in the database should be as a primary key.

Course Designed By	Verified By	Approved By HOD
 Ms.S.Krithika	 Dr.J.Ghayathri	 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
CO1	M	S	M	M	M	M	S	L	S	L	M	S	L
CO2	M	M	S	S	M	S	S	S	S	S	S	M	S
CO3	S	M	S	L	L	M	S	S	S	S	M	S	M
CO4	M	M	L	S	S	S	S	S	M	S	M	M	L
CO5	S	M	S	L	M	S	S	S	S	S	S	S	M

S-Strong, M-Medium, L-Low




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Sem.	Course Code	CORE PAPER – IX	Total Marks: 100		Hours Per Week	Credits
III	20PBICT301	DIGITAL IMAGE PROCESSING	CIA:25	ESE:75	4	4

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

- Understood the fundamentals of Digital Image Processing, image compression and segmentation

Course Outcomes:

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

- CO1 Review the fundamental concepts of a digital image processing system.
- CO2 Analyze images in the frequency domain using various mathematical transforms.
- CO3 Evaluate the techniques for image enhancement and image restoration
- CO4 Categorize various compression techniques and Interpret Image compression standards.
- CO5 Interpret image segmentation and representation techniques

UNIT- I

Introduction: What is Digital image processing – the origin of DIP – Examples of fields that use DIP – Fundamentals steps in DIP – Components of an image processing system.

Digital Image Fundamentals: Elements of Visual perception – Light and the electromagnetic spectrum – Image sensing and acquisition – Image sampling and Quantization – Some Basic relationship between Pixels – Linear & Nonlinear operations.

UNIT- II

Image Enhancement in the spatial domain:- Background – some basic Gray level Transformations – Histogram Processing – Enhancement using Arithmetic / Logic operations – Basics of spatial filtering – Smoothing spatial filters – Sharpening spatial filters – Combining spatial enhancement methods.

UNIT- III

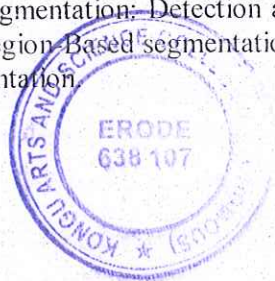
Image Restoration: A model of the Image Degradation / Restoration Process – Noise models – Restoration is the process of noise only – Spatial Filtering – Periodic Noise reduction by frequency domain filtering – Linear, Portion – Invariant Degradations – Estimating the degradation function – Inverse filtering – Minimum mean square Error Filtering – Constrained least squares filtering – Geometric mean filter – Geometric Transformations.

UNIT- IV

Image Compression: Fundamentals – Image compression models – Elements of Information Theory – Error Free compression – Lossy compression – Image compression standards.

UNIT- V

Image Segmentation: Detection and Discontinuities – Edge Linking and Boundary deduction – Threshold – Region Based segmentation – Segmentation by Morphological watersheds – The use of motion in segmentation.

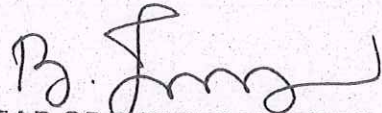


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REFERENCE BOOKS :

1. Rafael C. Gonzalez, Richard E. Woods, "Digital Image Processing", Second Edition, PHI/Pearson Education.
2. B. Chanda, D. Dutta Majumder, "Digital Image Processing and Analysis", PHI, 2003.
3. Nick Efford, "Digital Image Processing a practical introducing using Java", Pearson Education, 2004.

QUESTION PAPER PATTERN		
SECTION – A	SECTION – B	SECTION - C
10 × 1 = 10 Marks (Multiple Choice, Four options) Two questions from each unit	5 × 7 = 35 Marks (Either or choice) Two questions from each unit	3 × 10 = 30 Marks (Answer any three Questions) One question from each unit


HEAD OF THE DEPARTMENT
DEPARTMENT OF COMPUTER SCIENCE (PG)
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Sem.	Course Code	CORE PAPER -X	Total Marks: 100		Hours Per Week	Credits
III	20PBICT302	PYTHON PROGRAMMING	CIA:25	ESE:75	4	4

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

- Develop an understanding on the basic concepts of Python Programming
- To understand File operations, Classes and Objects

Course Outcomes:

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

- CO1 Select an appropriate data type while developing an application.
- CO2 Use Exceptions to handle errors
- CO3 Implement modules, packages and object oriented concepts
- CO4 Compile files in an application
- CO5 To develop web applications using Python

UNIT- I

Python: Introduction – Numbers – Strings – Variables – Lists – Tuples – Dictionaries – Sets – Comparison.

UNIT- II

Code Structures: if, elif, and else – Repeat with while – Iterate with for – Comprehensions – Functions – Generators – Decorators – Namespaces and Scope – Handle Errors with try and except – User Exceptions.

UNIT- III

Modules, Packages, and Programs: Standalone Programs – Command-Line Arguments – Modules and the import Statement – The Python Standard Library. **Objects and Classes:** Define a Class with class – Inheritance – Override a Method – Add a Method – Get Help from Parent with super – In self Defense – Get and Set Attribute Values with Properties – Name Mangling for Privacy – Method Types – Duck Typing – Special Methods – Composition

UNIT- IV

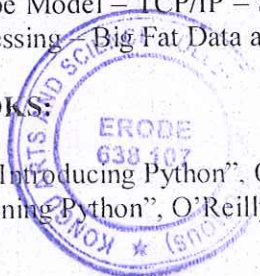
Data Types: Text Strings – Binary Data. **Storing and Retrieving Data:** File Input/Output – Structured Text Files – Structured Binary Files - Relational Databases – NoSQL Data Stores. **Web:** Web Clients – Web Servers – Web Services and Automation

UNIT- V

Systems: Files –Directories – Programs and Processes – Calendars and Clocks **Concurrency:** Queues – Processes – Threads – Green Threads and event – twisted – Redis. **Networks:** Patterns – The Publish-Subscribe Model – TCP/IP – Sockets – ZeroMQ –Internet Services – Web Services and APIs – Remote Processing – Big Fat Data and MapReduce – Working in the Clouds.

REFERENCE BOOKS:

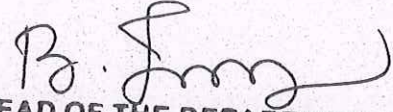
1. Bill Lubanovic, "Introducing Python", O'Reilly, First Edition-Second Release, 2014.
2. Mark Lutz, "Learning Python", O'Reilly, Fifth Edition, 2013.



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3. David M. Beazley, "Python Essential Reference". Developer's Library, Fourth Edition, 2009.
4. Sheetal Taneja, Naveen Kumar, "Python Programming-A Modular Approach". Pearson Publications.

QUESTION PAPER PATTERN		
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Sem.	Course Code	CORE PAPER –XI	Total Marks: 100		Hours Per Week	Credits
III	20PBICT303	NETWORK SECURITY AND CRYPTOGRAPHY	CIA:25	ESE:75	4	4

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

- Understood the process of implementing the cryptographic algorithms.

Course Outcomes:

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

- CO1 Explain network security services, Symmetrical and Asymmetrical cryptography
- CO2 Evaluate the authentication and hash functions
- CO3 Discuss about authentication applications
- CO4 Outline Web security, Firewalls and Password security
- CO5 Implement Cryptographic algorithms

UNIT- I

Introduction to Cryptography – Security Attacks – Security Services – Security Algorithm
- Stream cipher and Block cipher - Symmetric and Asymmetric-key Cryptosystem Symmetric Key Algorithms: Introduction – DES – Triple DES – AES – IDEA – Blowfish – RC5.

UNIT- II

Public-key Cryptosystem: Introduction to Number Theory - RSA Algorithm – Key Management - Diffie-Hell man Key exchange – Elliptic Curve Cryptography Message Authentication and Hash functions – Hash and Mac Algorithm – Digital Signatures and Authentication Protocol.

UNIT- III

Network Security Practice: Authentication Applications – Kerberos – X.509 Authentication services and Encryption Techniques. E-mail Security – PGP – S / MIME – IP Security.

UNIT- IV

Web Security - Secure Socket Layer – Secure Electronic Transaction. System Security - Intruders and Viruses – Firewalls– Password Security

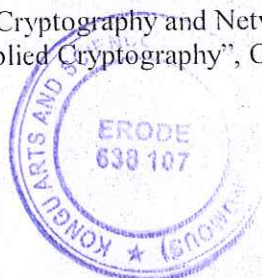
UNIT- V

Case Study: Implementation of Cryptographic Algorithms – RSA – DSA – ECC (C / JAVA Programming).

Network Forensic – Security Audit - Other Security Mechanism: Introduction to: Stenography – Quantum Cryptography – Water Marking - DNA Cryptography

REFERENCE BOOKS:

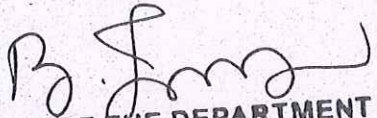
1. William Stallings, “Cryptography and Network Security”, PHI/Pearson Education
2. Bruce Schneir, “Applied Cryptography”, CRC Press.




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3. A.Menezes, P Van Oorschot and S.Vanstone, "Hand Book of Applied Cryptography", CRC Press, 1997 [Free Downloadable].
4. Ankit Fadia, "Network Security", MacMillan.

QUESTION PAPER PATTERN		
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Sem.	Course Code	CORE PAPER –XII	Total Marks: 100		Hours Per Week	Credits
III	20PBICT304	BUSINESS INTELLIGENCE	CIA:25	ESE:75	4	4

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

- Understood the process of implementing the Big data

Course Outcomes:

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

- CO1 Describe the framework for business intelligence
- CO2 Explore on Big Data applications Using Pig and Hive
- CO3 Analyze the HADOOP and Map Reduce technologies associated with big data.
- CO4 Deploy big data in the cloud.
- CO5 Apply big data analytics to a variety of domains

UNIT- I

Introduction to Business Intelligence - Changing Business Environments and Computerized Decision Support - A Framework for Business Intelligence - Intelligence Creation and Use and BI Governance - Transaction Processing Versus Analytic Processing -Successful BI Implementation - Major Tools and Techniques of Business Intelligence

UNIT- II

Big Data: Volume, Velocity, Variety in practice: cloud or in house Apache Hadoop: Core of Hadoop, Hadoop lower levels, HDFS and Map Reduce improving, Programmability: Pig and Hive

UNIT- III

Big Data: From the Technology Perspective-All about Hadoop: The history of Hadoop- Components of Hadoop- Application Development in Hadoop-Getting your data into Hadoop- Other Hadoop Components.

UNIT- IV

Hadoop- Integrated Hadoop System- Analytical Databases with Hadoop Connectivity- Hadoop- Centered Companies. Big Data in the Cloud: Iaas And Private Clouds-Platform Solutions- Big Data Cloud platforms compared.

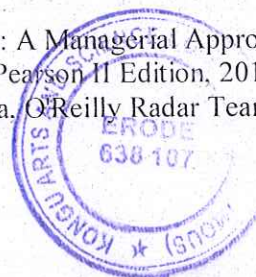
UNIT- V

Future of Big Data: More Powerful and Expressive tools for Analysis – Streaming Data Processing – Rise of Data Marketplace – Development of Data Science Workflows and Tools Increased Understanding and demand for Visualization

Case Study: Big Data Analytics in Banking Sector, Manufacturing

REFERENCE BOOKS:

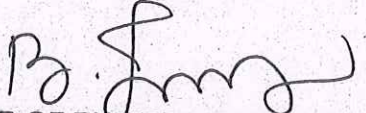
1. Business Intelligence: A Managerial Approach, Efraim Turban, Ramesh Sharda, Dursun Delen, David Kind, Pearson II Edition, 2012(Unit I)
2. Planning for Big Data. O'Reilly Radar Team, 2012.(ebook) (Unit II -V)




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3. Understanding Big Data, Analytics for Enterprise Class Hadoop and Streaming Data, Chris Eaton, Dirk Deroos, Tom Deutsch, George Lapis, Paul Zikopoulos, Tata Mc Graw Hill, 2012 Edition. (ebook) (Unit II)
4. Michael Minelli, Michele Chambers, Ambiga Dhiraj "Big Data Big Analytics", Wiley Publications, Indian Reprint 2014

QUESTION PAPER PATTERN		
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Sem.	Course Code	ELECTIVE – II MOBILE COMPUTING	Total Marks: 100		Hours Per Week	Credits
III	20PBIET305			CIA:25	ESE:75	4

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

- Understood the mobile computing applications, techniques
- Understood the mobile computing environment

Course Outcomes:

At the end of the course, the students will be able to:

- CO1 Understand the basic concept of Mobile Communication
- CO2 Describe technologies of Cellular Mobile Communications
- CO3 Illustrate Global System for Mobile Communication
- CO4 Understand the Working Principle of Mobile Internet
- CO5 Familiar with technology and generations of Mobile Communication

UNIT- I

Introduction: Advantages of Digital Information - Introduction to Telephone Systems – Mobile communication: Need for Mobile Communication – Requirements of Mobile Communication – History of Mobile Communication.

UNIT- II

Introduction to Cellular Mobile Communication – Mobile Communication Standards – Mobility Management – Frequency Management – Cordless Mobile Communication Systems.

UNIT- III

Mobile Computing: History of data networks – Classification of Mobile data networks - CDPD System – Satellites in Mobile Communication: Satellite classification – Global Satellite Communication – Changeover from one satellite to other – Global Mobile Communication – Interferences in Cellular Mobile Communication.

UNIT- IV

Important Parameters of Mobile Communication System – Mobile Internet: Working of Mobile IP – Wireless Network Security – Wireless Local Loop Architecture: Components in WLL – Problems in WLL – Modern Wireless Local Loop – Local Multipoint Distribution Service – Wireless Application Protocol.

UNIT- V

WCDMA Technology and Fibre Optic Microcellular Mobile Communication – Ad hoc Network and Bluetooth technology – Intelligent Mobile Communication system – Fourth Generation Mobile Communication systems.

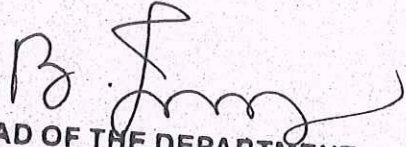


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REFERENCE BOOKS:

1. T.G. Palanivelu, R. Nakkeeran, Wireless and Mobile Communication, PHI Limited.2009
2. Jochen Schiller, Mobile Communications, Second Edition, Pearson Education.2007
- Asoke K Talukder, Hasan Ahmed, Roopa Yavagal, Mobile Computing , TMH, 2010

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Sem.	Course Code	ELECTIVE – II CLOUD COMPUTING	Total Marks: 100		Hours Per Week	Credits
III	20PBIET306			CIA:25	ESE:75	4

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

- Understood the Cloud computing architectures, applications and challenges

Course Outcomes:

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

- CO1 Understand the fundamentals concepts in cloud computing
- CO2 Analyze the uses of cloud for corporation and community.
- CO3 Explain the Collaboration on various application and its management
- CO4 Evaluate Social Networks deployed in cloud.
- CO5 Describe the storage capabilities in cloud

UNIT- I

Introduction: Cloud Computing Introduction, From, Collaboration to cloud, Working of cloud computing, pros and cons, benefits, developing cloud computing services, Cloud service development, discovering cloud services.

UNIT- II

Cloud Computing For Everyone: Centralizing email communications, cloud computing for community, collaborating on schedules, collaborating on group projects and events, cloud computing for corporation, mapping schedules managing projects, presenting on road

UNIT- III

Using Cloud Services: Collaborating on calendars, Schedules and task management, exploring on line scheduling and planning, collaborating on event management, collaborating on contact management, collaborating on project management, collaborating on word processing, spreadsheets, and databases.


UNIT- IV

Outside The Cloud: Evaluating web mail services, Evaluating instant messaging, Evaluating web conference tools, creating groups on social networks, Evaluating on line groupware, collaborating via blogs and wikis

UNIT- V

Storing And Sharing: Understanding cloud storage, evaluating on line file storage, exploring on line book marking services, exploring on line photo editing applications, exploring photo sharing communities, controlling it with web based desktops.




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REFERENCE BOOKS:

1. Michael Miller, "Cloud Computing", Pearson Education, New Delhi, 2009
2. Anthony T. Velte, Cloud Computing A Practical Approach 1st Edition, Tata Mcgraw Hill Education Private Limited (2009)

QUESTION PAPER PATTERN		
SECTION – A	SECTION - B	SECTION - C
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Sem.	Course Code	ELECTIVE – II WEB SERVICES	Total Marks: 100		Hours Per Week	Credits
III	20PBIE1307		CIA:25	ESE:75	4	4

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

- Understood the concepts of web services

Course Outcomes:

At the end of the course, the students will be able to:

- CO1 Understand the principles of Web Services
- CO2 Describe about the XML
- CO3 Apply SOAP and UDDI model to creation of web service solutions.
- CO4 Familiar with the technologies, standards and workflow of web services
- CO5 Explore the importance of Qos for web service.

UNIT- I

Introduction to web services – Overview of Distributed Computing- Evolution and importance of web services-Industry standards, Technologies and concepts underlying web services-Web services and enterprises-web services standards organization-web services platforms.

UNIT- II

XML Fundamentals – XML documents - XML Namespaces- XML Schema –Processing XML

UNIT- III

SOAP: The SOAP model- SOAP messages-SOAP encoding- WSDL: WSDL structure-interface- definitions-bindings-services-Using SOAP and WSDL-UDDI: About UDDI- UDDI registry- Specification- Core data structures-Accessing UDDI

UNIT- IV

Advanced web services technologies and standards: Conversations overview-web services conversation language-WSCL interface components.

Workflow: business process management-workflows and workflow management systems
Security: Basics-data handling and forwarding-data storage-errors-Web services security issues.

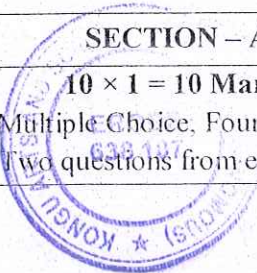
UNIT- V

Quality of Service: Importance of QoS for web services-QoS metrics-holes-design patterns-QoS enabled web services-QoS enabled applications. Web services management-web services standards and future trends.

REFERENCE BOOKS:

1. Sandeep Chatterjee, James Webber, „Developing Enterprise Web Services: An Architects Guide, Prentice Hall, Nov 2003.

QUESTION PAPER PATTERN		
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Sem.	Course Code	CORE PRACTICAL – V	Total Marks: 100		Hours Per Week	Credits
III	20PBICP308	PYTHON PROGRAMMING LAB	CIA: 40	ESE:60	4	4

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

- Acquired a practical knowledge in Python

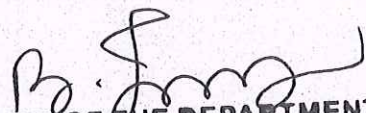
Course Outcomes:

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


- CO1 Develop a program using different data types in Python
- CO2 Implement Conditional branches, loops, functions and modules in Python
- CO3 Develop a program to throw Exceptions
- CO4 Implement Inheritance and Polymorphism concepts in Python
- CO5 Create a dynamic web pages using forms in Python

Implement the following in Python:

1. Programs using elementary data items, lists, dictionaries and tuples.
2. Programs using conditional branches.
3. Programs using loops.
4. Programs using functions
5. Programs using exception handling
6. Programs using inheritance
7. Programs using polymorphism
8. Programs to implement file operations.
9. Programs using modules.
10. Programs for creating dynamic and interactive web pages using forms.


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Sem.	Course Code	CORE PRACTICAL – VI	Total Marks: 100		Hours Per Week	Credits
III	20PBICP309	DIGITAL IMAGE PROCESSING USING MATLAB	CIA:40	ESE:60	4	4

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

- Acquired to write MATLAB Programs for image processing

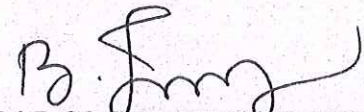
Course Outcomes:

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

- CO1 Implement image enhancement techniques and create Histogram using MATLAB
- CO2 Apply image filtering and restoration techniques
- CO3 Implement image compression techniques and use operators for edge detection
- CO4 Create an image and extract it using morphology
- CO5 Apply image segmentation techniques

Implement the following using MATLAB:

1. Implement Image enhancement Technique.
2. Histogram Equalization
3. Image Restoration.
4. Implement Image Filtering.
5. Edge detection using Operators (Roberts, Prewitts and Sobels operators)
6. Implement image compression.
7. Image Subtraction
8. Boundary Extraction using morphology.
9. Image Segmentation



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Sem.	Course Code	CORE PRACTICAL – VII WEB DESIGNING LAB	Total Marks: 100		Hours Per Week	Credits
III	20PBICP310		CIA:40	ESE:60	2	4

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

- Understood the basic components of Web Development using HTML and PHP.

Course Outcomes:

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


- CO1 Design a web page using advanced HTML tags
- CO2 Implement Bullets and Numbering and paragraph tags in HTML
- CO3 Implement Frames and Tables in web page
- CO4 Design a page using a hyperlink tag in HTML
- CO5 Design a web page using Forms and apply validation for the form using PHP

List of Programs:

1. Develop a website for your college using advanced tags of HTML.
2. Write names of several countries in a paragraph and store it as an HTML document, world.html. Each country name must be a hot text. When you click India (for example), it must open India.html and it should provide a brief introduction about India.
3. Develop a HTML document to i)display Text with Bullets / Numbers - Using Lists ii) to display the Table Format Data
4. Develop a Complete Web Page using Frames and Framesets which gives the Information about a Hospital using HTML.
5. Write a HTML document to print your Bio-Data in a neat format using several components.
6. Develop a HTML document to display a Registration Form for an inter-collegiate function.
7. Using HTML form accept Customer details like Name, City, Pin code, Phone number and Email address and validate the data and display appropriate messages for violations using PHP (Eg. Name is Mandatory field; Pin code must be 6 digits, etc.).
8. Write a program to accept two numbers n1 and n2 using HTML form and display the Prime numbers between n1 and n2 using PHP.



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Sem.	Course Code	ADVANCED LEARNERS COURSE	Total Marks: 100		Hours Per Week	Credits
III	20PBIAL311	COMPUTER SIMULATION	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

Course Outcomes:

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

- CO1 Familiar with the Simulation Languages
- CO2 Build an Applications using Simulation
- CO3 Apply the Simulation in a right way
- CO4 Develop and implement the simulation designs in real world
- CO5 Understand the Phases in implementation

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

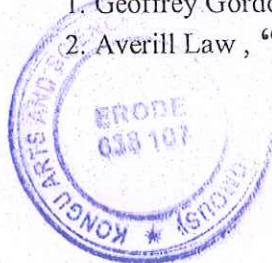
Case Study : DePorres Tours : Intelligence Phase – Maintenance Phase – Managerial Phase – Development Phase – Quality Phase – Implementation – Operations, Maintenance and Archival phase.

TEXT BOOK:

Roger McHaney, "Understanding Computer Simulation", Ventus Publishing ApS, 1st edition 2009.

REFERENCE BOOKS:

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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Sem.	Course Code	ADVANCED LEARNERS COURSE	Total Marks: 100		Hours Per Week	Credits
III	20PBIAL312	HUMAN COMPUTER INTERACTION	CIA:--	ESE:100	--	2

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

- Understand the basics of human and computational abilities and limitations.
- Understand the fundamental aspects of designing and evaluating interfaces.

Course Outcomes:

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

- CO1 Understand the fundamentals and Framework of HCI
- CO2 Apply the HCI in the Software Process
- CO3 Evaluate the design rules and implementation support for systems
- CO4 Understand basic theories, tools and techniques in HCI
- CO5 Design a User Support System

UNIT-I

The Humans: Introduction – I/O Channels – Human Memory – Reasoning and problem solving. **The Computers:** Introduction – Devices – Memory - Processing and networks. **The Interaction:** Introduction – Models of interaction - Frameworks and HCI – Ergonomics - Interaction styles - Elements of the WIMP interface - Interactivity - The context of the interaction.

UNIT-II

Paradigms: Introduction - Paradigms for interaction. Interaction design basics: Introduction – Design - The Process of design - User focus - Navigation design - Screen design and layout - Iteration and prototyping. **HCI in the software process:** Introduction - The software life cycle - Usability engineering - Iterative design and prototyping - Design rationale.

UNIT-III

Design rules: Introduction - Principles to support usability – Standards – Guidelines - Golden rules and heuristics - HCI patterns. **Implementation support:** Introduction - Elements of windowing systems - Programming the application - Using toolkits - User interface management systems.

UNIT-IV

Evaluation techniques: Definition of evaluation - Goals of evaluation - Evaluation through expert analysis - Evaluation through user participation - Choosing an evaluation method. Universal design: Introduction - Universal design principles - Multi-modal interaction - Designing for diversity.

UNIT-V

User support – Introduction - Requirements of user support - Approaches to user support - Adaptive help systems - Designing user support systems.

TEXT BOOK:

Alan Dix, Janet Finlay, Gregory .D. Abowd, Russell Beale, “Human – Computer Interaction”, Third Edition, Pearson Education, 2009

REFERENCE BOOKS:

1. Andrew Sears and Julie A. Jacko , Human - Computer Interaction Handbook , 3rd Edition, CRC Press.
2. Gerard Jounghyun Kim, Taylor & Francis, Human - Computer Interaction: Fundamentals and Practice”, CRC Press



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Sem.	Course Code	PROJECT WORK AND VIVA VOCE	Total Marks: 100		Hours Per Week	Credits
IV	20PBICV401		CIA:--	ESE:200	--	6

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

- Practical knowledge in developing a project.

Course Outcomes:

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

- CO1 Acquire practical knowledge within a area of technology
- CO2 Identify, analyze, formulate projects with a comprehensive and systematic approach
- CO3 Compare and contrast the several existing solutions
- CO4 Contribute as an individual or in a team in development of technical projects
- CO5 Develop effective communication skills for presentation of project related activities

Guidelines for Project Work & Viva-Voce

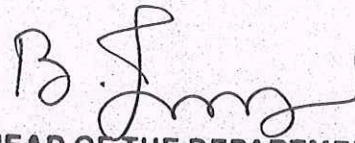
GENERAL

- Student has to take up the project work for a period of six months.
- The project may be developed using the software package that they have learned from the courses studied or implementation of any innovative idea.
- Guide will be allocated to each student and the project title should be approved by the guide.
- The project work can be done in the companies or organizations.
- Students should communicate with their guide regularly about the progress of the project.
- Review Presentation is to be given only on approval of the guide.
- No Students will be permitted to appear for viva voce without the project report.
- The impressions on the typed copies should be black in colour. The font and size should be: 'TimesNewRoman - 12 point'.
- The project report may be about 50 to 80 pages; A-4 size typed pages (excluding Program code) One and a half line spacing should be used for typing the general text and all paragraphs should be justified. The margins should be: Left - 1.25", Right - 1", Top and Bottom - 0.75".
- All page numbers should be typed in Arabic numbers and the preliminary pages should be numbered in lower case Roman numerals.
- Cover wrapper should be in Silver Grey colour.
- The specimen is annexed along with the Project guidelines.




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- The project report should be hard bound; should consist of a contents page; all pages of report should be numbered; content should be well organized in a meaningful manner; paragraph alignment should be maintained. printouts of text & screen layouts should be original and should not be photocopied.
- Students should submit one copy of fair draft report in the form of hard binding during the End Semester Examination after they are duly signed by the concerned guide and the Head of the Department.



**HEAD OF THE DEPARTMENT
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