NPR College of Engineering & Technology

NPR Nagar, Natham, Dindigul - 624401, Tamil Nadu, India.
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai.
An ISO 9001:2015 Certified Institution.
Phone No: 04544- 246 500, 246501, 246502.
Website : www.nprcolleges.org, www.nprcet.org, Email:nprcetprincipal@nprcolleges.org

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

COURSE INFORMATION SHEET

PROGRAMME: Computer Science & Engineering	**DEGREE:** B.E
COURSE: Probability and Queueing Theory	**SEMESTER: 4 CREDITS:4**
COURSE CODE: MA8402	**COURSE TYPE:** Allied
COURSE AREA/STREAM : Probability and Queueing System	**CONTACT HOURS:** 6+1 hours/Week.
CORRESPONDING LAB COURSE CODE (IF ANY):	**LAB COURSE NAME : NIL**
COURSE COORDINATOR NAME : Ms. S. Kanagalakshmi	

SYLLABUS:

MODULE	DETAILS	HOURS
I	**UNIT I - PROBABILITY AND RANDOM VARIABLES** Probability – Axioms of probability – Conditional probability – Baye's theorem – Discrete and continuous random variables – Moments – Moment generating functions – Binomial, Poisson, Geometric, Uniform, Exponential and Normal distributions.	12
II	**UNIT II - TWO DIMENSIONAL RANDOM VARIABLES** Joint distributions – Marginal and conditional distributions – Covariance – Correlation and linear regression – Transformation of random variables – Central limit theorem (for independent and identically distributed random variables).	12
III	**UNIT III - RANDOM PROCESSES** Classification – Stationary process – Markov process – Poisson process – Discrete parameter Markov chain – Chapman Kolmogorov equations – Limiting distributions.	12
IV	**UNIT IV - QUEUEING MODELS** Markovian queues – Birth and death processes – Single and multiple server queueing models – Little's formula – Queues with finite waiting rooms – Queues with impatient customers : Balking and reneging.	12
V	**UNIT V - ADVANCED QUEUEING MODELS** Finite source models – M/G/1 queue – Pollaczek Khinchin formula – M/D/1 and M/EK/1 as special cases –Series queues – Open Jackson networks.	12
	TOTAL HOURS	60

1

TEXT/REFERENCE BOOKS:

T/R	BOOK TITLE/AUTHORS/PUBLICATION
T1	Gross, D., Shortle, J.F, Thompson, J.M and Harris. C.M., —Fundamentals of Queueing Theory", Wiley Student 4th Edition, 2014. 2.
T2	Ibe, O.C., —Fundamentals of Applied Probability and Random Processes", Elsevier, 1st Indian Reprint, 2007
R1	Hwei Hsu, "Schaum's Outline of Theory and Problems of Probability, Random Variables and Random Processes", Tata McGraw Hill Edition, New Delhi, 2004.
R2	Taha, H.A., "Operations Research", 9th Edition, Pearson India Education Services, Delhi, 2016.
R3	Trivedi, K.S., "Probability and Statistics with Reliability, Queueing and Computer Science Applications", 2nd Edition, John Wiley and Sons, 2002.
R4	Yates, R.D. and Goodman. D. J., "Probability and Stochastic Processes", 2nd Edition, Wiley India Pvt. Ltd., Bangalore, 2012.

COURSE PRE-REQUISITES:

C.CODE	COURSE NAME	DESCRIPTION	SEM
C210	Probability and Queueing Theory	Detailed study of different Random variables and Queueing models	IV

COURSE OBJECTIVES:

1	To Evaluate the basic concepts of random processes which are widely used in field of Information and Technology
2	To understand the basic concepts of probability, one and two dimensional random variables and to introduce some standard distributions applicable to engineering phenomenon.
3	To understand the significance of advanced queueing models.
4	To provide the required mathematical support in real life problems and develop probabilistic models which can be used in several areas of science and engineering.

COURSE OUTCOMES:

SNO	DESCRIPTION	Level in Bloom's Taxonomy
C210.1	Identify the functions of discrete and continuous random variables, moments and moment generating function	K2
C210.2	Solve problems in marginal conditional distribution, using the concepts of correlation, regressions and transformation of two dimensional random variables.	K2

C210.3	Determine the process is either SSS or WSS, find the TPM of Markov chain and its classifications.	K2
C210.4	Analyze the concepts of queuing models	K2
C210.5	Apply non Markovian queues to open and closed networks.	K2

CORELATION BETWEEN COURSE OUTCOMES AND PROGRAMME OUTCOMES

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C210.1	2	1	1	-	-	-	-	-	1	1	-	1
C210.2	2	1	1	-	-	-	-	-	1	1	-	1
C210.3	2	1	1	-	-	-	-	-	1	-	-	-
C210.4	2	1	1	-	-	-	-	-	2	1	-	2
C210.5	3	2	2	-	-	-	-	-	1	2	-	2
C210	2	1	1	-	-	-	-	-	1	1	-	1

CORELATION BETWEEN COURSE OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

CO	PSO 1	PSO 2	PSO 3
C210.1	2	2	-
C210.2	2	2	-
C210.3	2	2	-
C210.4	2	2	-
C210.5	2	2	-
C210	2	2	-

GAPS IN THE SYLLABUS - TO MEET INDUSTRY/PROFESSION REQUIREMENTS:

SNO	DESCRIPTION	Mapping to PO	PROPOSED ACTIONS
1	Stochastic Processes and Sample moments	PO3	Assignment
2	Finite capacity single server queueing model with examples	PO1, PO2	Study material distributed.

TOPICS BEYOND SYLLABUS/ADVANCED TOPICS/DESIGN:

Sl.No	Topic	Mapping to PO
1	Applied Probability	PO1, PO3
2	Law of Total Probability	PO1, PO2, PO3
3	Jensen's Inequality	PO1, PO2, PO3
4	Bernstein Inequation	PO1, PO2

WEB SOURCE REFERENCES:

1	https://nptel.ac.in/courses/117104117/7
2	https://nptel.ac.in/courses/111/105/111105041/
3	https://nptel.ac.in/courses/111/104/111104079/
4	https://nptel.ac.in/courses/111/102/111102111/
5	https://nptel.ac.in/courses/111/102/111102096/

DELIVERY/INSTRUCTIONAL METHODOLOGIES:

✓ CHALK & TALK	✓ STUD. ASSIGNMENT	✓ WEB RESOURCES	✓ TUTORIAL
LCD/SMART BOARDS	✓ STUD. SEMINARS		

DELIVERY METHODS USED FOR EACH COURSE OUT COME

SNO	DELIVERY METHODS
C210.1	CHALK & TALK, STUD. ASSIGNMENT, TUTORIAL
C210.2	CHALK & TALK, STUD. ASSIGNMENT, TUTORIAL
C210.3	CHALK & TALK , STUD.ASSIGNMENT
C210.4	CHALK & TALK, WEB RESOURCES, TUTORIAL
C210.5	CHALK & TALK, STUD. ASSIGNMENT, WEB RESOURCES

ASSESSMENT METHODOLOGIES-DIRECT.

✓ ASSIGNMENTS	✓ STUD. SEMINARS	✓ TESTS/MODEL EXAMS	✓ UNIV. EXAMINATION

ASSESSMENT METHODOLOGIES-INDIRECT.

STUDENT FEEDBACK ON FACULTY (ONCE)	

ASSESSMENT METHODOLOGIES USED FOR EACH COURSE OUT COME

SNO	ASSESSMENT METHODOLOGIES-DIRECT	ASSESSMENT METHODOLOGIES-INDIRECT
C210.1	Assignments, Univ. Examination, Stud. Seminars, Tests/Model Exams	Student Feedback On Faculty
C210.2	Univ. Examination, Tests/Model Exams,	Student Feedback On Faculty
C210.3	Univ. Examination, Tests/Model Exams, Assignments	Student Feedback On Faculty
C210.4	Univ. Examination, Tests/Model Exams	Student Feedback On Faculty
C210.5	Assignments, Univ. Examination, Tests/Model Exams	Student Feedback On Faculty

Prepared by
(Course Coordinator)

Name and Signature
Ms. S. Kanagalakshmi

Approved by
(Programme Coordinator)

Name andSignature
Dr. T. Priya

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

COURSE INFORMATION SHEET

PROGRAMME: Computer Science & Engineering	**DEGREE:** B.E
COURSE: Computer Architecure	**SEMESTER: 4 CREDITS: 3**
COURSE CODE: CS8491 / 211	**COURSE TYPE:** CORE
COURSE AREA/STREAM : System Design	**CONTACT HOURS:** 5+1 hours/Week.
CORRESPONDING LAB COURSE CODE (IF ANY):	**LAB COURSE NAME :** NIL
COURSE COORDINATOR NAME : Mr.S.Surendar	

SYLLABUS:

MODULE	DETAILS	HOURS
I	Functional Units – Basic Operational Concepts – Performance – Instructions: Language of the Computer – Operations, Operands – Instruction representation – Logical operations – decision making – MIPS Addressing.	9
II	Addition and Subtraction – Multiplication – Division – Floating Point Representation – Floating Point Operations – Subword Parallelism	9
III	A Basic MIPS implementation – Building a Datapath – Control Implementation Scheme – Pipelining – Pipelined datapath and control – Handling Data Hazards & Control Hazards – Exceptions.	9
IV	Parallel processing challenges – Flynn's classification – SISD, MIMD, SIMD, SPMD, and Vector Architectures - Hardware multithreading – Multi-core processors and other Shared Memory Multiprocessors - Introduction to Graphics Processing Units, Clusters, Warehouse Scale Computers and other Message-Passing Multiprocessors.	9
V	Memory Hierarchy - memory technologies – cache memory – measuring and improving cache performance – virtual memory, TLB's – Accessing I/O Devices – Interrupts – Direct Memory Access – Bus structure – Bus operation – Arbitration – Interface circuits - USB.	9
	TOTAL HOURS	45

TEXT/REFERENCE BOOKS:

T/R	BOOK TITLE/AUTHORS/PUBLICATION
T1	David A. Patterson and John L. Hennessy, Computer Organization and Design: The Hardware/Software Interface, Fifth Edition, Morgan Kaufmann / Elsevier, 2014.
T2	Carl Hamacher, Zvonko Vranesic, Safwat Zaky and Naraig Manjikian, Computer Organization and Embedded Systems, Sixth Edition, Tata McGraw Hill, 2012.
R1	William Stallings, Computer Organization and Architecture – Designing for Performance, Eighth Edition, Pearson Education, 2010.
R2	John P. Hayes, Computer Architecture and Organization, Third Edition, Tata McGraw Hill, 2012.
R3	John L. Hennessey and David A. Patterson, Computer Architecture – A Quantitative Approachl, Morgan Kaufmann / Elsevier Publishers, Fifth Edition, 2012.

COURSE PRE-REQUISITES:

C.CODE	COURSE NAME	DESCRIPTION	SEM
C203	DATA STRUCTURES	Knowledge regarding data Structure	3

COURSE OBJECTIVES:

1	To learn the basic structure and operations of a computer.
2	To learn the arithmetic and logic unit and implementation of fixed-point and floating point arithmetic unit.
3	To learn the basics of pipelined execution.
4	To understand parallelism and multi-core processors.
5	To understand the memory hierarchies, cache memories and virtual memories.
6	To learn the different ways of communication with I/O devices

COURSE OUTCOMES:

SNO	DESCRIPTION	Level in Bloom's Taxonomy
C211.1	Describe the basic structures of a computer system.	K2
C211.2	Understand the various arithmetic operations for computers.	K2
C211.3	Analyze pipelined control units and the different types of hazards in the instructions.	K3
C211.4	Interpret the concepts of parallel processing architecture	K2
C211.5	Summarize the fundamentals of memory system.	K2
C211.6	Describe the concepts of I/O system	K2

CORELATION BETWEEN COURSE OUTCOMES AND PROGRAMME OUTCOMES

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C211.1	2	1	1	-	-	-	-	-	-	-	-	-
C211.2	2	1	1	-	-	-	-	-	-	-	-	-
C211.3	2	2	2	-	-	-	-	-	-	-	-	-
C211.4	2	1	1	-	-	-	-	-	-	-	-	-
C211.5	2	1	1	-	-	-	-	-	-	-	-	-
C211.6	2	1	1	-	-	-	-	-	-	-	-	-
C211	2	1	1	-	-	-	-	-	-	-	-	-

CORELATION BETWEEN COURSE OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

CO	PSO 1	PSO 2	PSO 3
C211.1	2	-	-
C211.2	2	-	-
C211.3	2	2	-
C211.4	2	-	-
C211.5	2	-	-
C211.6	2	2	-
C211	2	2	-

GAPS IN THE SYLLABUS - TO MEET INDUSTRY/PROFESSION REQUIREMENTS:

SNO	DESCRIPTION	Mapping to PO	PROPOSED ACTIONS
1	Parallel Computing	PO1	Special Lecture

TOPICS BEYOND SYLLABUS/ADVANCED TOPICS/DESIGN:

Sl.No	Topic	Mapping to P O
1	Parallel Computing, SISD, SIMD	PO1, PO2

WEB SOURCE REFERENCES:

1	en.wikipedia.org/wiki/
2	https://nptel.ac.in/courses/106/105/106105183/
3	ww.w3schools.com/
4	http://www.cs.ccsu.edu/~stan/classes/CS8491/Slides/Architecure .pdf 6
5	https://www.geeksforgeeks.org/basics-computer-Architecture/

DELIVERY/INSTRUCTIONAL METHODOLOGIES:

✓ CHALK & TALK	✓ STUD. ASSIGNMENT	✓ WEB RESOURCES	✓ TUTORIAL
✓ LCD/SMART BOARDS	✓ STUD. SEMINARS		

DELIVERY METHODS USED FOR EACH COURSE OUT COME

SNO	DELIVERY METHODS
C211.1	CHALK & TALK, STUD. ASSIGNMENT, TUTORIAL
C211.2	CHALK & TALK, STUD. ASSIGNMENT, TUTORIAL
C211.3	CHALK & TALK , STUD.ASSIGNMENT, WEB RESOURCES
C211.4	CHALK & TALK, LCD/SMART BOARDS, WEB RESOURCES, TUTORIAL
C211.5	CHALK & TALK, STUD. ASSIGNMENT, LCD/SMART BOARDS, WEB RESOURCES
C211.6	CHALK & TALK, LCD/SMART BOARDS, STUD.SEMINARS

ASSESSMENT METHODOLOGIES-DIRECT.

✓ ASSIGNMENTS	✓ STUD. SEMINARS	✓ TESTS/MODEL EXAMS	✓ UNIV. EXAMINATION

ASSESSMENT METHODOLOGIES-INDIRECT.

STUDENT FEEDBACK ON FACULTY (ONCE)	

ASSESSMENT METHODOLOGIES USED FOR EACH COURSE OUT COME

SNO	ASSESSMENT METHODOLOGIES-DIRECT	ASSESSMENT METHODOLOGIES-INDIRECT
C211.1	ASSIGNMENTS, UNIV. EXAMINATION, STUD. SEMINARS, TESTS/MODEL EXAMS	STUDENT FEEDBACK ON FACULTY
C211.2	UNIV. EXAMINATION, TESTS/MODEL EXAMS,	STUDENT FEEDBACK ON FACULTY
C211.3	UNIV. EXAMINATION, TESTS/MODEL EXAMS, ASSIGNMENTS	STUDENT FEEDBACK ON FACULTY
C211.4	UNIV. EXAMINATION, TESTS/MODEL EXAMS	STUDENT FEEDBACK ON FACULTY
C211.5	ASSIGNMENTS, UNIV. EXAMINATION, TESTS/MODEL EXAMS	STUDENT FEEDBACK ON FACULTY
C211.6	UNIV. EXAMINATION, TESTS/MODEL EXAMS, STUD SEMINARS	STUDENT FEEDBACK ON FACULTY

Prepared by
(Course Coordinator)

Mr.S.Surendar
Name and Signature

Approved by
(Programme Coordinator)

Mr.J.Viswanath
Name and Signature

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

COURSE INFORMATION SHEET

PROGRAMME: Computer Science & Engineering	**DEGREE:** B.E
COURSE: Database Management System	**SEMESTER: 4 CREDITS: 3**
COURSE CODE: CS8492 / C212	**COURSE TYPE:** CORE
COURSE AREA/STREAM : Database	**CONTACT HOURS:** 5+1 hours/Week.
CORRESPONDING LAB COURSE CODE (IF ANY): CS8481	**LAB COURSE NAME :** Database Management System Lab
COURSE COORDINATOR NAME :Mrs.V.Sujitha	

SYLLABUS:

MODULE	DETAILS	HOURS
I	Purpose of Database System – Views of data – Data Models – Database System Architecture – Introduction to relational databases – Relational Model – Keys – Relational Algebra – SQL fundamentals – Advanced SQL features – Embedded SQL– Dynamic SQL	10
II	Entity-Relationship model – E-R Diagrams – Enhanced-ER Model – ER-to-Relational Mapping – Functional Dependencies – Non-loss Decomposition – First, Second, Third Normal Forms, Dependency Preservation – Boyce/Codd Normal Form – Multi-valued Dependencies and Fourth Normal Form – Join Dependencies and Fifth Normal Form	8
III	Transaction Concepts – ACID Properties – Schedules – Serializability – Concurrency Control – Need for Concurrency – Locking Protocols – Two Phase Locking – Deadlock – Transaction Recovery - Save Points – Isolation Levels – SQL Facilities for Concurrency and Recovery.	9
IV	RAID – File Organization – Organization of Records in Files – Indexing and Hashing –Ordered Indices – B+ tree Index Files – B tree Index Files – Static Hashing – Dynamic Hashing – Query Processing Overview – Algorithms for SELECT and JOIN operations – Query optimization using Heuristics and Cost Estimation.	9
V	Distributed Databases: Architecture, Data Storage, Transaction Processing – Object-based Databases: Object Database Concepts, Object-Relational features, ODMG Object Model, ODL, OQL - XML Databases: XML Hierarchical Model, DTD, XML Schema, XQuery – Information	9

1

	Retrieval: IR Concepts, Retrieval Models, Queries in IR systems.	
	TOTAL HOURS	**45**

TEXT/REFERENCE BOOKS:

T/R	BOOK TITLE/AUTHORS/PUBLICATION
T1	Abraham Silberschatz, Henry F. Korth, S. Sudharshan, ―Database System Conceptsǁ, Sixth Edition, Tata McGraw Hill, 2011.
T2	Ramez Elmasri, Shamkant B. Navathe, ―Fundamentals of Database Systemsǁ, Sixth Edition, Pearson Education, 2011.
R1	C.J.Date, A.Kannan, S.Swamynathan, ―An Introduction to Database Systemsǁ, Eighth Edition, Pearson Education, 2006.
R2	Raghu Ramakrishnan, ―Database Management Systemsǁ, Fourth Edition, McGraw-Hill College Publications, 2015.
R3	G.K.Gupta,"Database Management Systemsǁ, Tata McGraw Hill, 2011.

COURSE PRE-REQUISITES:

C.CODE	COURSE NAME	DESCRIPTION	SEM
		NIL	

COURSE OBJECTIVES:

1	To learn the fundamentals of data models and to represent a database system using ER diagrams.
2	To study SQL and relational database design.
3	To understand the internal storage structures using different file and indexing techniques which will help in physical DB design
4	To understand the fundamental concepts of transaction processing- concurrency control techniques and recovery procedures.
5	To have an introductory knowledge about the Storage and Query processing Techniques

COURSE OUTCOMES:

SNO	DESCRIPTION	Level in Bloom's Taxonomy
C212.1	Discuss the fundamental concepts of relational database and SQL	K2
C212.2	Use ER model for Relational model mapping to perform database design effectively	K3
C212.3	Summarize the properties of transactions and concurrency control mechanisms	K2

2

C212.4	Outline the various storage and optimization techniques	K2
C212.5	Compare and contrast various indexing strategies in different database systems	K2
C212.6	Understand the different advanced databases	K2

CORELATION BETWEEN COURSE OUTCOMES AND PROGRAMME OUTCOMES

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C212.1	2	1	1	-	-	-	-	-	-	-	-	-
C212.2	3	2	2	-	-	-	-	-	-	-	-	-
C212.3	2	1	1	-	-	-	-	-	-	-	-	-
C212.4	2	1	1	-	-	-	-	-	-	-	-	-
C212.5	2	1	1	-	-	-	-	-	-	-	-	-
C212.6	2	1	1	-	-	-	-	-	-	-	-	-
C212	2	1	1	-	-	-	-	-	-	-	-	-

CORELATION BETWEEN COURSE OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

CO	PSO 1	PSO 2	PSO 3
C212.1	2	2	-
C212.2	2	3	-
C212.3	2	2	-
C212.4	2	2	-
C212.5	2	2	-
C212.6	2	2	-
C212	2	2	-

GAPS IN THE SYLLABUS - TO MEET INDUSTRY/PROFESSION REQUIREMENTS:

SNO	DESCRIPTION	Mapping to PO	PROPOSED ACTIONS
1	Data Mining and Warehousing	PO3	Guest Lecture

TOPICS BEYOND SYLLABUS/ADVANCED TOPICS/DESIGN:

Sl.No	Topic	Mapping to P O
1	Basics of Data Mining and Warehousing	PO3

WEB SOURCE REFERENCES:

1	en.wikipedia.org/wiki/
2	https://nptel.ac.in/courses/106/105/106105184/
3	ww.w3schools.com/ DBMS
4	http://www.cs.ccsu.edu/~stan/classes/CS8492/Slides/DBMS-Ch3.pdf 6
5	https://www.geeksforgeeks.org/DBMS-Topic/

DELIVERY/INSTRUCTIONAL METHODOLOGIES:

✓ CHALK & TALK	✓ STUD. ASSIGNMENT	✓ WEB RESOURCES	✓ TUTORIAL
✓ LCD/SMART BOARDS	✓ STUD. SEMINARS		

DELIVERY METHODS USED FOR EACH COURSE OUT COME

SNO	DELIVERY METHODS
C212.1	CHALK & TALK, STUD. ASSIGNMENT, TUTORIAL
C212.2	CHALK & TALK, STUD. ASSIGNMENT, TUTORIAL
C212.3	CHALK & TALK , STUD.ASSIGNMENT, WEB RESOURCES
C212.4	CHALK & TALK, LCD/SMART BOARDS, WEB RESOURCES, TUTORIAL
C212.5	CHALK & TALK, STUD. ASSIGNMENT, LCD/SMART BOARDS, WEB RESOURCES
C212.6	CHALK & TALK, LCD/SMART BOARDS, STUD.SEMINARS

ASSESSMENT METHODOLOGIES-DIRECT.

✓ ASSIGNMENTS	✓ STUD. SEMINA RS	✓ TESTS/MODEL EXAMS	✓ UNIV. EXAMINAT ION

ASSESSMENT METHODOLOGIES-INDIRECT.

STUDENT FEEDBACK ON FACULTY (ONCE)	

ASSESSMENT METHODOLOGIES USED FOR EACH COURSE OUT COME

SNO	ASSESSMENT METHODOLOGIES-DIRECT	ASSESSMENT METHODOLOGIES-INDIRECT
C212.1	ASSIGNMENTS, UNIV. EXAMINATION, STUD. SEMINARS, TESTS/MODEL EXAMS	STUDENT FEEDBACK ON FACULTY
C212.2	UNIV. EXAMINATION, TESTS/MODEL EXAMS,	STUDENT FEEDBACK ON FACULTY
C212.3	UNIV. EXAMINATION, TESTS/MODEL EXAMS, ASSIGNMENTS	STUDENT FEEDBACK ON FACULTY
C212.4	UNIV. EXAMINATION, TESTS/MODEL EXAMS	STUDENT FEEDBACK ON FACULTY
C212.5	ASSIGNMENTS, UNIV. EXAMINATION, TESTS/MODEL EXAMS	STUDENT FEEDBACK ON FACULTY
C212.6	UNIV. EXAMINATION, TESTS/MODEL EXAMS, STUD SEMINARS	STUDENT FEEDBACK ON FACULTY

Prepared by
(Course Coordinator)

Mrs.V.Sujitha
Name and Signature

Approved by
(Programme Coordinator)

Mr.J.Viswanath
Name and Signature

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

COURSE INFORMATION SHEET

PROGRAMME: Computer Science & Engineering	**DEGREE:** B.E
COURSE: Design and Analysis of Algorithm	**SEMESTER:** 4 CREDITS:3
COURSE CODE: CS8451 / C213	**COURSE TYPE:** CORE
COURSE AREA/STREAM : Design and Analysis	**CONTACT HOURS:** 5+1 hours/Week.
CORRESPONDING LAB COURSE CODE (IF ANY):	**LAB COURSE NAME : NIL**
COURSE COORDINATOR NAME : Mr. J. Dinesh	

SYLLABUS:

MODULE	DETAILS	HOURS
I	**UNIT I INTRODUCTION** Notion of an Algorithm – Fundamentals of Algorithmic Problem Solving – Important Problem Types – Fundamentals of the Analysis of Algorithmic Efficiency –Asymptotic Notations and their properties. Analysis Framework – Empirical analysis - Mathematical analysis for Recursive and Non-recursive algorithms - Visualization	9
II	**UNIT II BRUTE FORCE AND DIVIDE-AND-CONQUER** Brute Force – Computing an – String Matching - Closest-Pair and Convex-Hull Problems - Exhaustive Search - Travelling Salesman Problem - Knapsack Problem - Assignment problem. Divide and Conquer Methodology – Binary Search – Merge sort – Quick sort – Heap Sort - Multiplication of Large Integers – Closest-Pair and Convex - Hull Problems.	9
III	**UNIT III DYNAMIC PROGRAMMING AND GREEDY TECHNIQUE** Dynamic programming – Principle of optimality - Coin changing problem, Computing a Binomial Coefficient – Floyd's algorithm – Multi stage graph - Optimal Binary Search Trees - Knapsack Problem and Memory functions. Greedy Technique – Container loading problem - Prim's algorithm and Kruskal's Algorithm – 0/1 Knapsack problem, Optimal Merge pattern - Huffman Trees.	9

IV	UNIT IV ITERATIVE IMPROVEMENT The Simplex Method - The Maximum-Flow Problem – Maximum Matching in Bipartite Graphs, Stable marriage Problem.	9
V	UNIT V COPING WITH THE LIMITATIONS OF ALGORITHM POWER Lower - Bound Arguments - P, NP NP- Complete and NP Hard Problems. Backtracking – n-Queen problem - Hamiltonian Circuit Problem – Subset Sum Problem. Branch and Bound – LIFO Search and FIFO search - Assignment problem – Knapsack Problem – Travelling Salesman Problem - Approximation Algorithms for NP-Hard Problems – Travelling Salesman problem – Knapsack problem.	9
	TOTAL HOURS	45

TEXT/REFERENCE BOOKS:

T/R	BOOK TITLE/AUTHORS/PUBLICATION
T1	Anany Levitin, ―Introduction to the Design and Analysis of Algorithms‖, Third Edition, Pearson Education, 2012.
T2	Ellis Horowitz, Sartaj Sahni and Sanguthevar Rajasekaran, Computer Algorithms/ C++, Second Edition, Universities Press, 2007.
R1	Thomas H.Cormen, Charles E.Leiserson, Ronald L. Rivest and Clifford Stein, ―Introduction to Algorithms‖, Third Edition, PHI Learning Private Limited, 2012.
R2	Alfred V. Aho, John E. Hopcroft and Jeffrey D. Ullman, ―Data Structures and Algorithms‖, Pearson Education, Reprint 2006.
R3	Harsh Bhasin, ―Algorithms Design and Analysis‖, Oxford university press, 2015.

COURSE PRE-REQUISITES:

C.CODE	COURSE NAME	DESCRIPTION	SEM
C203	Data Structures and Algorithms	Detailed study of different data structures and algorithms	III

COURSE OBJECTIVES:

1	To understand and apply the algorithm analysis techniques.
2	To critically analyze the efficiency of alternative algorithmic solutions for the same problem
3	To understand different algorithm design techniques
4	To understand the limitations of Algorithmic power.

COURSE OUTCOMES:

SNO	DESCRIPTION	Level in Bloom's Taxonomy
C213.1	Discuss the fundamental concepts problem solving algorithm, its types and the parameters to analyze those algorithms	K2
C213.2	Understand the Brute Force method and Divide and Conquer method to solve computing problems.	K2
C213.3	Understand the dynamic programming and greedy techniques to solve computing problems	K2
C213.4	Describe how scientific problems can be solved using iterative method and how to cope with limitations of algorithm power	K2
C213.5	Critically analyze the different algorithm design techniques for a given problem based on its time and space complexity.	K3
C213.6	Modify existing algorithms to improve efficiency	K3

CORELATION BETWEEN COURSE OUTCOMES AND PROGRAMME OUTCOMES

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C213.1	2	1	1	-	-	-	-	-	-	-	-	-
C213.2	2	1	1	-	-	-	-	-	-	-	-	-
C213.3	2	1	1	-	-	-	-	-	-	-	-	-
C213.4	2	1	1	-	-	-	-	-	-	-	-	-
C213.5	3	2	2	-	-	-	-	-	-	-	-	-
C213.6	3	2	2	-	-	-	-	-	-	-	-	-
C213	2	1	1	-	-	-	-	-	-	-	-	-

CORELATION BETWEEN COURSE OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

CO	PSO 1	PSO 2	PSO 3
C213.1	2	2	-
C213.2	2	2	-
C213.3	2	2	-
C213.4	2	2	-
C213.5	2	2	-
C213.6	2	2	-
C213	2	2	-

GAPS IN THE SYLLABUS - TO MEET INDUSTRY/PROFESSION REQUIREMENTS:

SNO	DESCRIPTION	Mapping to PO	PROPOSED ACTIONS
1	Substitution method	PO3	Assignment
2	Simplex Method and Max flow problem	PO1, PO2	Study material distributed.

TOPICS BEYOND SYLLABUS/ADVANCED TOPICS/DESIGN:

Sl.No	Topic	Mapping to PO
1	Examples of NP Hard, NP Complete problems.	PO1, PO2,. PO3
2	Geometric Interpretation of Linear programming	PO1, PO2,. PO3
3	Decision Tree	PO1, PO2,. PO3
4	Algorithms for solving nonlinear equations	PO1, PO2,. PO3

WEB SOURCE REFERENCES:

1	https://www.cs.duke.edu/courses/fall08/cps230/Book.pdf
2	http://www.cse.iitd.ernet.in/~ssen/csl356/root.pdf
3	http://www.imsc.res.in/~vraman/pub/intro_notes.pdf
4	http://www.ics.uci.edu/~goodrich/teach/cs161/notes/
5	http://elearning.vtu.ac.in/06CS43.html

DELIVERY/INSTRUCTIONAL METHODOLOGIES:

✓ CHALK & TALK	✓ STUD. ASSIGNMENT	✓ WEB RESOURCES	✓ TUTORIAL
✓ LCD/SMART BOARDS	✓ STUD. SEMINARS		

DELIVERY METHODS USED FOR EACH COURSE OUT COME

SNO	DELIVERY METHODS

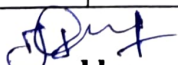| C213.1	CHALK & TALK, STUD. ASSIGNMENT, TUTORIAL
C213.2	CHALK & TALK, STUD. ASSIGNMENT, TUTORIAL
C213.3	CHALK & TALK , STUD.ASSIGNMENT, WEB RESOURCES
C213.4	CHALK & TALK, LCD/SMART BOARDS, WEB RESOURCES, TUTORIAL
C213.5	CHALK & TALK, STUD. ASSIGNMENT, LCD/SMART BOARDS, WEB RESOURCES
C213.6	CHALK & TALK, LCD/SMART BOARDS, STUD.SEMINARS

ASSESSMENT METHODOLOGIES-DIRECT.

✓ ASSIGNMENTS	✓ STUD. SEMINA RS	✓ TESTS/MODEL EXAMS	✓ UNIV. EXAMINAT ION

ASSESSMENT METHODOLOGIES-INDIRECT.

STUDENT FEEDBACK ON FACULTY (ONCE)	

ASSESSMENT METHODOLOGIES USED FOR EACH COURSE OUT COME

SNO	ASSESSMENT METHODOLOGIES-DIRECT	ASSESSMENT METHODOLOGIES-INDIRECT
C213.1	Assignments, Univ. Examination, Stud. Seminars, Tests/Model Exams	Student Feedback On Faculty
C213.2	Univ. Examination, Tests/Model Exams,	Student Feedback On Faculty
C213.3	Univ. Examination, Tests/Model Exams, Assignments	Student Feedback On Faculty
C213.4	Univ. Examination, Tests/Model Exams	Student Feedback On Faculty
C213.5	Assignments, Univ. Examination, Tests/Model Exams	Student Feedback On Faculty
C213.6	Univ. Examination, Tests/Model Exams, Stud Seminars	Student Feedback On Faculty

Prepared by

(Course Coordinator)

Mr. J. Dinesh

Name and Signature

Approved by

(Programme Coordinator)

Mr.J.Viswanath

Name and Signature

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

COURSE INFORMATION SHEET

PROGRAMME: Computer Science & Engineering	**DEGREE:** B.E
COURSE: Operating System	**SEMESTER: 4 CREDITS:** 3
COURSE CODE: CS8493 / C214	**COURSE TYPE:** CORE
COURSE AREA/STREAM : Operating System	**CONTACT HOURS:** 5+1 hours/Week.
CORRESPONDING LAB COURSE CODE (IF ANY): CS8493	**LAB COURSE NAME :** OPERATING SYSTEMS LABORATORY
COURSE COORDINATOR NAME : Mrs.P.Kaleeshwari	

SYLLABUS:

MODULE	DETAILS	HOURS
I	Computer System Overview-Basic Elements, Instruction Execution, Interrupts, Memory Hierarchy, Cache Memory, Direct Memory Access, Multiprocessor and Multicore Organization. Operating system overview-objectives and functions, Evolution of Operating System.- Computer System Organization Operating System Structure and Operations- System Calls, System Programs, OS Generation and System Boot.	7
II	Processes - Process Concept, Process Scheduling, Operations on Processes, Inter-process Communication; CPU Scheduling - Scheduling criteria, Scheduling algorithms, Multiple-processor scheduling, Real time scheduling; Threads- Overview, Multithreading models, Threading issues; Process Synchronization - The critical-section problem, Synchronization hardware, Mutex locks, Semaphores, Classic problems of synchronization, Critical regions, Monitors; Deadlock - System model, Deadlock characterization, Methods for handling deadlocks, Deadlock prevention, Deadlock avoidance, Deadlock detection, Recovery from deadlock.	11
III	Main Memory – Background, Swapping, Contiguous Memory Allocation, Paging, Segmentation, Segmentation with paging, 32 and 64 bit architecture Examples; Virtual Memory – Background, Demand Paging, Page Replacement, Allocation, Thrashing; Allocating Kernel Memory, OS Examples.	9

1

IV	Mass Storage system – Overview of Mass Storage Structure, Disk Structure, Disk Scheduling and Management, swap space management; File-System Interface - File concept, Access methods, Directory Structure, Directory organization, File system mounting, File Sharing and Protection; File System Implementation- File System Structure, Directory implementation, Allocation Methods, Free Space Management, Efficiency and Performance, Recovery; I/O Systems – I/O Hardware, Application I/O interface, Kernel I/O subsystem, Streams, Performance.	9
V	Linux System - Design Principles, Kernel Modules, Process Management, Scheduling, Memory Management, Input-Output Management, File System, Inter-process Communication; Mobile OS - iOS and Android - Architecture and SDK Framework, Media Layer, Services Layer, Core OS Layer, File System.	9
	TOTAL HOURS	45

TEXT/REFERENCE BOOKS:

T/R	BOOK TITLE/AUTHORS/PUBLICATION
T1	Abraham Silberschatz, Peter Baer Galvin and Greg Gagne, —Operating System Conceptsl, 9th Edition, John Wiley and Sons Inc., 2012.
R1	Ramaz Elmasri, A. Gil Carrick, David Levine, —Operating Systems – A Spiral Approachl, Tata McGraw Hill Edition, 2010.
R2	Achyut S.Godbole, Atul Kahate, —Operating Systemsl, McGraw Hill Education, 2016.
R3	Andrew S. Tanenbaum, —Modern Operating Systemsl, Second Edition, Pearson Education, 2004.
R4	Gary Nutt, —Operating Systemsl, Third Edition, Pearson Education, 2004.
R5	Harvey M. Deitel, —Operating Systemsl, Third Edition, Pearson Education, 2004.
R6	Daniel P Bovet and Marco Cesati, —Understanding the Linux kernell, 3rd edition, O'Reilly, 2005.
R7	Neil Smyth, —iPhone iOS 4 Development Essentials – Xcodel, Fourth Edition, Payload media, 2011.

COURSE PRE-REQUISITES:

C.CODE	COURSE NAME	DESCRIPTION	SEM
C211	COMPUTER ARCHITECTURE	Basics of computers and Knowledge in Computer Organization & Architecture	4

COURSE OBJECTIVES:

1	To understand the basic concepts and functions of operating systems.
2	To understand Processes, Threads and Deadlocks
3	To analyze Scheduling algorithms

4	To analyze memory management schemes.
5	To understand I/O management and File systems
6	To be familiar with the basics of Linux system and Mobile OS like iOS and Android.

COURSE OUTCOMES:

SNO	DESCRIPTION	Level in Bloom's Taxonomy
C214.1	Understand the overall view of the computer system and operating system	K2
C214.2	Identify various scheduling algorithm and deadlock prevention and avoidance algorithm	K2
C214.3	Compare and contrast various memorymanagement schemes and file system functionalities	K2
C214.4	Discuss the performance of the various page replacement algorithms and interpret the file system implementation, sharing and protection mechanisms.	K2
C214.5	Demonstrate administrative tasks on Linux servers and to be familiar with the basics of Mobile OS.	K3
C214.6	Make use of various algorithms to solve computing problems	K3

CORELATION BETWEEN COURSE OUTCOMES AND PROGRAMME OUTCOMES

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C214.1	2	1	1	-	-	-	-	-	-	-	-	-
C214.2	2	1	1	-	-	-	-	-	-	-	-	-
C214.3	2	1	1	-	-	-	-	-	-	-	-	-
C214.4	2	1	1	-	-	-	-	-	-	-	-	-
C214.5	3	2	2	-	-	-	-	-	-	-	-	-
C214.6	3	2	2	-	-	-	-	-	-	-	-	-
C214	2	1	1	-	-	-	-	-	-	-	-	-

CORELATION BETWEEN COURSE OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

CO	PSO 1	PSO 2	PSO 3
C214.1	2	2	-
C214.2	2	2	-
C214.3	2	2	-
C214.4	2	2	-
C214.5	2	3	-

C214.6	2	2	-
C214	2	2	-

GAPS IN THE SYLLABUS - TO MEET INDUSTRY/PROFESSION REQUIREMENTS:

SNO	DESCRIPTION	Mapping to PO	PROPOSED ACTIONS
1	Page Replacement Algorithms	PO1,PO3	Learning Material provided
2	Case Study of any OS	PO1,PO3	Learning Material provided

TOPICS BEYOND SYLLABUS/ADVANCED TOPICS/DESIGN:

Sl.No	Topic	Mapping to P O
1	Distributed Operating Systems	PO1

WEB SOURCE REFERENCES:

1	www.webopedia.com/TERM/O/operating_system.html
2	https://www.tutorialspoint.com/operatingsystem/os_overview.htm
3	www.dictionary.com/browse/operating--system

DELIVERY/INSTRUCTIONAL METHODOLOGIES:

✓ CHALK & TALK	✓ STUD. ASSIGNMENT	✓ WEB RESOURCES	✓ TUTORIAL
✓ LCD/SMART BOARDS	✓ STUD. SEMINARS		

DELIVERY METHODS USED FOR EACH COURSE OUT COME

SNO	DELIVERY METHODS
C214..1	CHALK & TALK, STUD. ASSIGNMENT, TUTORIAL
C214..2	CHALK & TALK, STUD. ASSIGNMENT, TUTORIAL

C214.3	CHALK & TALK , STUD.ASSIGNMENT, WEB RESOURCES
C214.4	CHALK & TALK, LCD/SMART BOARDS, WEB RESOURCES, TUTORIAL
C214.5	CHALK & TALK, STUD. ASSIGNMENT, LCD/SMART BOARDS, WEB RESOURCES
C214.6	CHALK & TALK, LCD/SMART BOARDS, STUD.SEMINARS

ASSESSMENT METHODOLOGIES-DIRECT.

✓ ASSIGNMENTS	✓ STUD. SEMINA RS	✓ TESTS/MODEL EXAMS	✓ UNIV. EXAMINAT ION

ASSESSMENT METHODOLOGIES-INDIRECT.

STUDENT FEEDBACK ON FACULTY (ONCE)	

ASSESSMENT METHODOLOGIES USED FOR EACH COURSE OUT COME

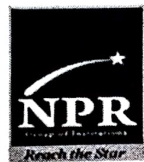| SNO	ASSESSMENT METHODOLOGIES-DIRECT	ASSESSMENT METHODOLOGIES-INDIRECT
C214.1	ASSIGNMENTS, UNIV. EXAMINATION, STUD. SEMINARS, TESTS/MODEL EXAMS	STUDENT FEEDBACK ON FACULTY
C214.2	UNIV. EXAMINATION, TESTS/MODEL EXAMS,	STUDENT FEEDBACK ON FACULTY
C214.3	UNIV. EXAMINATION, TESTS/MODEL EXAMS, ASSIGNMENTS	STUDENT FEEDBACK ON FACULTY
C214.4	UNIV. EXAMINATION, TESTS/MODEL EXAMS	STUDENT FEEDBACK ON FACULTY
C214.5	ASSIGNMENTS, UNIV. EXAMINATION, TESTS/MODEL EXAMS	STUDENT FEEDBACK ON FACULTY
C214.6	UNIV. EXAMINATION, TESTS/MODEL EXAMS, STUD SEMINARS	STUDENT FEEDBACK ON FACULTY

Prepared by
(Course Coordinator)

Mrs.P.Kaleeshwari
Name and Signature

Approved by
(Programme Coordinator)

Mr.J.Viswanath
Name and Signature

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NPR College of Engineering & Technology

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

COURSE INFORMATION SHEET

PROGRAMME: Computer Science & Engineering	**DEGREE:** B.E
COURSE: Software Engineerring	**SEMESTER:4 CREDITS:3**
COURSE CODE: CS8494 / C215	**COURSE TYPE:** CORE
COURSE AREA/STREAM : Software	**CONTACT HOURS:** 5+1 hours/Week.
CORRESPONDING LAB COURSE CODE (IF ANY): NIL	**LAB COURSE NAME :** NIL
COURSE COORDINATOR NAME : Mrs.K.Shanmugapriya	

SYLLABUS:

MODULE	DETAILS	HOURS
I	Introduction to Software Engineering, Software Process, Perspective and Specialized Process Models –Introduction to Agility-Agile process-Extreme programming-XP Process.	9
II	Software Requirements: Functional and Non-Functional, User requirements, System requirements, Software Requirements Document – Requirement Engineering Process: Feasibility Studies, Requirements elicitation and analysis, requirements validation, requirements management-Classical analysis: Structured system Analysis, Petri Nets-Data Dictionary.	9
III	Design process – Design Concepts-Design Model– Design Heuristic – Architectural Design -Architectural styles, Architectural Design, Architectural Mapping using Data Flow- User Interface Design: Interface analysis, Interface Design –Component level Design: Designing Class based components, traditional Components.	9
IV	Software testing fundamentals-Internal and external views of Testing-white box testing - basis path testing-control structure testing-black box testing- Regression Testing – Unit Testing – Integration Testing – Validation Testing – System Testing And Debugging –Software Implementation Techniques: Coding practices-Refactoring-Maintenance and Reengineering-BPR model-Reengineering process model-Reverse and Forward Engineering.	9

1

	Software Project Management: Estimation – LOC, FP Based Estimation, Make/Buy Decision COCOMO I & II Model – Project Scheduling – Scheduling, Earned Value Analysis Planning – Project Plan, Planning Process, RFP Risk Management – Identification, Projection - Risk Management-Risk Identification-RMMM Plan-CASE TOOLS	
V		9
	TOTAL HOURS	**45**

TEXT/REFERENCE BOOKS:

T/R	BOOK TITLE/AUTHORS/PUBLICATION
T1	Roger S. Pressman, ―Software Engineering – A Practitioner‟s Approach‖, Seventh Edition, Mc Graw-Hill International Edition, 2010.
T2	Ian Sommerville, ―Software Engineering‖, 9th Edition, Pearson Education Asia, 2011.
R1	Rajib Mall, ―Fundamentals of Software Engineering‖, Third Edition, PHI Learning PrivateLimited, 2009.
R2	Pankaj Jalote, ―Software Engineering, A Precise Approach‖, Wiley India, 2010.
R3	Kelkar S.A., ―Software Engineering‖, Prentice Hall of India Pvt Ltd, 2007.
R4	Stephen R.Schach, ―Software Engineering‖, Tata McGraw-Hill Publishing Company Limited,2007.

COURSE PRE-REQUISITES:

C.CODE	COURSE NAME	DESCRIPTION	SEM
		NIL	

COURSE OBJECTIVES:

1	To understand the phases in a software project
2	To understand fundamental concepts of requirements engineering and Analysis Modeling.
3	To understand the various software design methodologies
4	To learn various testing and maintenance measures

COURSE OUTCOMES:

SNO	DESCRIPTION	Level in Bloom's Taxonomy
C215.1	Identify the key activities in managing a software project and recognize different process model	K2
C215.2	Understand the concepts of requirements engineering and Analysis Modeling	K2
C215.3	Outline the systematic procedures for software design and deployment	K2

2

C215.4	Compare various testing and maintenance methods	K2
C215.5	Interpret the project schedule, estimate project cost and effort required.	K2
C215.6	Develop a software using the software engineering principles	K3

CORELATION BETWEEN COURSE OUTCOMES AND PROGRAMME OUTCOMES

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C215.1	2	1	1	-	-	-	-	-	-	-	-	-
C215.2	2	1	1	-	-	-	-	-	-	-	-	-
C215.3	3	2	2	-	-	-	-	-	-	-	-	-
C215.4	3	2	2	-	-	-	-	-	-	-	-	-
C215.5	3	2	2	-	-	-	-	-	-	-	-	-
C215.6	3	2	2	-	-	-	-	-	-	-	-	-
C215	3	2	2	-	-	-	-	-	-	-	-	-

CORELATION BETWEEN COURSE OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

CO	PSO 1	PSO 2	PSO 3
C215.1	2	2	-
C215.2	2	2	-
C215.3	2	2	-
C215.4	2	2	-
C215.5	2	3	-
C215.6	2	2	-
C215	2	2	-

GAPS IN THE SYLLABUS - TO MEET INDUSTRY/PROFESSION REQUIREMENTS:

SNO	DESCRIPTION	Mapping to PO	PROPOSED ACTIONS
1	Software Quality Assurance	PO1, PO2	Faculty shall provide materials for self-study by students
2	Human Resource Management	PO3	Faculty shall provide materials for self-study by

3

			students	

TOPICS BEYOND SYLLABUS/ADVANCED TOPICS/DESIGN:

Sl.No	Topic	Mapping to P O
1	CMMI, PCMMI	PO1, PO2

WEB SOURCE REFERENCES:

NIL

DELIVERY/INSTRUCTIONAL METHODOLOGIES:

✓ CHALK & TALK	✓ STUD. ASSIGNMENT	✓ WEB RESOURCES	✓ TUTORIAL
✓ LCD/SMART BOARDS	✓ STUD. SEMINARS		

DELIVERY METHODS USED FOR EACH COURSE OUT COME

SNO	DELIVERY METHODS
C215.1	CHALK & TALK, STUD. ASSIGNMENT, TUTORIAL
C215.2	CHALK & TALK, STUD. ASSIGNMENT, TUTORIAL
C215.3	CHALK & TALK , STUD.ASSIGNMENT, WEB RESOURCES
C215.4	CHALK & TALK, LCD/SMART BOARDS, WEB RESOURCES, TUTORIAL
C215.5	CHALK & TALK, STUD. ASSIGNMENT, LCD/SMART BOARDS, WEB RESOURCES
C215.6	CHALK & TALK, LCD/SMART BOARDS, STUD.SEMINARS

ASSESSMENT METHODOLOGIES-DIRECT.

✓ ASSIGNMENTS	✓ STUD. SEMINARS	✓ TESTS/MODEL EXAMS	✓ UNIV. EXAMINATION

ASSESSMENT METHODOLOGIES-INDIRECT.

STUDENT FEEDBACK ON FACULTY (ONCE)	

ASSESSMENT METHODOLOGIES USED FOR EACH COURSE OUT COME

SNO	ASSESSMENT METHODOLOGIES-DIRECT	ASSESSMENT METHODOLOGIES-INDIRECT
C215.1	ASSIGNMENTS, UNIV. EXAMINATION, STUD. SEMINARS, TESTS/MODEL EXAMS	STUDENT FEEDBACK ON FACULTY
C215.2	UNIV. EXAMINATION, TESTS/MODEL EXAMS,	STUDENT FEEDBACK ON FACULTY
C215.3	UNIV. EXAMINATION, TESTS/MODEL EXAMS, ASSIGNMENTS	STUDENT FEEDBACK ON FACULTY
C215.4	UNIV. EXAMINATION, TESTS/MODEL EXAMS	STUDENT FEEDBACK ON FACULTY
C215.5	ASSIGNMENTS, UNIV. EXAMINATION, TESTS/MODEL EXAMS	STUDENT FEEDBACK ON FACULTY
C215.6	UNIV. EXAMINATION, TESTS/MODEL EXAMS, STUD SEMINARS	STUDENT FEEDBACK ON FACULTY

Prepared by
(Course Coordinator)

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Name and Signature

Approved by
(Programme Coordinator)

Mr.J.Viswanath
Name and Signature

5