E.G.S. PILLAY ENGINEERING COLLEGE

(Autonomous)

Approved by AICTE, New Delhi | Affiliated to Anna University, Chennai Accredited by NAAC with „A" Grade | Accredited by NBA

NAGAPATTINAM – 611002

M.E. COMPUTER SCIENCE AND ENGINEERING

REGULATION -2021

First Year – Second Semester

Course Category	Course Code	Course Name	L	T	P	C	Maximum Marks		
							CA	ES	Total
Theory Course									
PCC	2102CP201	Machine Learning Techniques	3	0	0	3	40	60	100
PCC	2102CP202	Compiler Optimization Techniques	3	0	0	3	40	60	100
PCC	2102CP203	Software Project Management and Testing	3	0	0	3	40	60	100
PEC	2103CP010	Program Elective – III(Advanced Database Technology)	3	0	0	3	40	60	100
PEC	2103CP015	Program Elective – IV(Cloud Computing)	3	0	0	3	40	60	100
AC		Audit Course – II	2	0	0	0	100	00	100
Laboratory Course									
PCC	2102CP204	Machine Learning Techniques Laboratory	0	0	4	2	50	50	100
PCC	2102CP205	Database Technology Laboratory	0	0	4	2	50	50	100
EEC	2104CP206	Mini Project with Seminar	0	0	4	2	50	50	100
Total			**17**	**0**	**12**	**21**	**450**	**450**	**900**

2102CP201	MACHINE LEARNING TECHNIQUES	L	T	P	C
		3	0	0	3

COURSE OBJECTIVE

1. To understand the concepts of Machine Learning.
2. To appreciate supervised learning and their applications.
3. To appreciate the concepts and algorithms of unsupervised learning.
4. To understand the theoretical and practical aspects of Probabilistic Graphical Models.
5. To appreciate the concepts and algorithms of advanced learning.

MODULE 1 INTRODUCTION 9 HOURS

Machine Learning–Types of Machine Learning –Machine Learning process- preliminaries, testing Machine Learning algorithms, turning data into Probabilities, and Statistics for Machine Learning- Probability theory – Probability Distributions – Decision Theory

MODULE 2 SUPERVISED LEARNING 9 HOURS

Linear Models for Regression – Linear Models for Classification- Discriminant Functions, Probabilistic Generative Models, Probabilistic Discriminative Models – Decision Tree Learning – Bayesian Learning, Naïve Bayes – Ensemble Methods, Bagging, Boosting, Neural Networks, Multi-layer Perceptron, Feed- forward Network, Error Back propagation - Support Vector Machines

MODULE 3 UNSUPERVISED LEARNING 9 HOURS

Clustering- K-means – EM Algorithm- Mixtures of Gaussians –Dimensionality Reduction, Linear Discriminant Analysis, Factor Analysis, Principal Components Analysis, Independent Components Analysis.

MODULE 4 PROBABILISTIC GRAPHICAL MODELS 9 HOURS

Graphical Models – Undirected Graphical Models – Markov Random Fields – Directed Graphical Models – Bayesian Networks – Conditional Independence properties – Markov Random Fields- Hidden Markov Models – Conditional Random Fields(CRFs).

MODULE 5 ADVANCED LEARNING 9 HOURS

Sampling-Basic Sampling methods, Monte Carlo, Gibbs Sampling – Computational Learning Theory – Mistake Bound Analysis – Reinforcement learning – Markov Decision processes, Deterministic and Non-deterministic Rewards and Actions, Temporal Difference Learning Exploration.

OUTCOME

1. Design a learning model appropriate to the application.
2. Design a Neural Network for an application of your choice.
3. Use a tool to implement typicalClustering algorithms for different types of applications.
4. Design and implement an HMM for a Sequence Model type ofapplication.
5. Identify applications suitable for different types of Machine Learningwith suitable justification.

REFERENCES

1. Christopher Bishop, “Pattern Recognition and Machine Learning” Springer,2007.
2. Stephen Marsland, “Machine Learning – An Algorithmic Perspective”, ChapmanandHall, CRC Press, Second Edition,2014.
3. Kevin P. Murphy, “Machine Learning: A Probabilistic Perspective”, MIT Press, 2012.
4. Ethem Alpaydin, “Introduction to Machine Learning”, MIT Press, Third

2102CP202	COMPILER OPTIMIZATION TECHNIQUES	L	T	P	C
		3	0	0	3

COURSE OBJECTIVE

- To understand different forms of intermediate languages and analyzing programs.
- To understand optimizations techniques for single program blocks. To apply optimizationson procedures and low level code.
- To explore and enhance inter procedural optimizations. To enhance resource utilization.

MODULE 1	INTERMEDIATE REPRESENTATION OF PROGRAMS AND ANALYSIS	9 HOURS

Structure of an Optimizing Compiler – Compiler Construction tools – LIR, MIR, HIR, DAG, Syntax Tree and Postfix. Analysis: Control Flow Analysis, Iterative Data Flow Analysis, Static Single Assignment – A Linear Time Algorithm for Placing φ-Nodes, Basic Block

Dependence, Alias Analysis. Introduction to LLVM – Compiling a language

MODULE 2	LOCAL AND LOOP OPTIMIZATIONS	9 HOURS

Early Optimizations: Constant-Expression Evaluation – Scalar Replacement of Aggregates – Algebraic Simplifications and Re-association – Value Numbering – Copy Propagation – Sparse Conditional Constant Propagation. Redundancy Elimination: Common – Sub expression Elimination – Loop-Invariant Code Motion – Partial-Redundancy Elimination – Redundancy Elimination and Association – Code Hoisting. Loop Optimizations: Induction Variable Optimizations – Unnecessary Bounds Checking Elimination. LLVM pass –LLVM

Test Infrastructure.

MODULE 3	PROCEDURE OPTIMIZATION AND SCHEDULING	9 HOURS

Procedure Optimizations: Tail-Call Optimization and Tail-Recursion Elimination – Procedure Integration – In-Line Expansion – Leaf- Routine Optimization and Shrink Wrapping. Code Scheduling: Instruction Scheduling – Speculative Loads and Boosting – Speculative Scheduling – Software Pipelining – Trace Scheduling – Percolation Scheduling. Control-Flow and Low- Level Optimizations: Unreachable-Code Elimination – Straightening – If Simplifications – Loop Simplifications –Loop Inversion Un-switching – Branch Optimizations – Tail Merging or Cross Jumping – Conditional Moves – Dead-Code Elimination – Branch Prediction – Machine Idioms and Instruction Combining. LLVM API procedure optimization

MODULE 4	INTER PROCEDURAL OPTIMIZATION	9 HOURS

Symbol table Runtime Support – Interprocedural Analysis and Optimization: Interprocedural Control- Flow Analysis – The Call Graph – Interprocedural Data-Flow Analysis – Interprocedural Constant Propagation – Interprocedural Alias Analysis – Interprocedural Optimizations – Interprocedural Register Allocation – Aggregation of Global References. LLVM

– Interprocedural Analyses.

MODULE 5	OPTIMIZING FOR MEMORY	9 HOURS

Register Allocation: Register Allocation and Assignment – Local Methods – Graph Coloring Priority Based Graph Coloring. Computations on Iteration Spaces- Optimization for the Memory Hierarchy: Impact of Data and Instruction Caches – Instruction-Cache Optimization – Scalar Replacement of Array Elements – Data-Cache Optimization – Scalar vs. Memory-Oriented Optimizations. Software Prefetching – Parallelization – Instruction Level Parallelism –Automatic Parallelization.

OUTCOME

- Identify the different optimization techniques that are possible for a sequence of code.
- Design performance enhancing optimization techniques.
- Manage procedures with optimal overheads.
- Understand modern programming language features and constructs.
- Learn to work on a larger software project.

REFERENCES

1. Steven.S. Muchnick, Advanced Compiler Design and Implementation, Morgan Kaufman Publishers,1997.
2. Alfred V. Aho, Monica S. Lam, Ravi Sethi, Jeffrey D. Ullman, "Compilers: Principles, Techniques, andTools", Addison Wesley, Second Edition, 2007.
3. Y.N.Srikant, Priti Shankar, "The Compiler Design Handbook – Optimizations and Machine
4. Code Generation", CRC Press, Second Edition, 2008.
5. Andrew W. Appel, Jens Palsberg, "Modern Compiler Implementation in Java", Cambridge UniversityPress, Second Edition, 2002.
6. Keith Cooper, Linda Torczon, "Engineering a Compiler", Morgan Kaufmann, Second Edition, 2011.
7. Randy Allen and Ken Kennedy, Optimizing Compilers for Modern Architectures: A Dependence basedApproach, Morgan Kaufman, 2001.

2102CP203	SOFTWARE PROJECT MANAGEMENT AND TESTING	L	T	P	C
		3	0	0	3

COURSE OBJECTIVE

1. To provide a strong foundation on the concept of software project development
2. To learn the concepts on project management and evaluation.
3. Tostudy the various test design strategies.
4. To understand the levels of testing and defect classes.

MODULE 1	PROJECT EVALUATION AND PROJECT LIFE CYCLE	9 HOURS

Understanding software projects –Project management vs. product management –stages of project management –Software project life cycle -Managerial issues.

MODULE 2	ACTIVITY PLANNING AND RISK MANAGEMENT	9 HOURS

Project initiation –Identifying project –Developing project character –Identifying stack holders –Requirement analysis –Gathering requirements –Requirements types –Project scope planning –Resource breakdown structure (RBS) –Manpower planning –Quality planning – Time and Cost estimates –Risk management planning –Procurements for the project.

MODULE 3	COST ESTIMATION TECHNIQUES	9 HOURS

Software effort estimation techniques: KLOC/SLOC estimation, expert opinion, top-down and bottom-up approach, use-case point estimates, object point estimates, Delphi technique – Project test plan –Software quality assurance (SQA) –Software quality control (SQC) –cost of quality –Software quality Metrics –SEI-CMMi model.

MODULE 4	INTRODUCTION - SOFTWARE TESTING	9 HOURS

Software testing fundamentals–Minimizing Risks –Writing a policy –Building a structured approach –Developing a test strategy –Building the software testing process –Software testing guidelines –Customizing the software testing process.

MODULE 5	ORGANIZATION AND DEVELOPMENT OF TESTING APPROACH	9 HOURS

Overview of the software testing process –Organizing for testing –Developing Test plan – Profile the software project – Understand project risk –Testing technique –Unit testing and analysis –Build andInspect Test Plan.

OUTCOME

1. Explain the concept of software project life cycle
2. Describe planning and Risk management
3. Explore cost estimation techniques
4. Explain various types of testing

REFERENCES

1. William E Perry, Effective Methods for Software Testing, John Wiley & Sons, USA, 2008
2. Watts S. Humphrey, Managing the software process, Addison Wesley, 2011
3. Ian Somerville, Software Engineering,, Addison-Wesley, 8thedition, 2006.
4. Steve McConnell, Code Complete, Second Edition, Microsoft Press. 5.Richard E. Fairley,Software Engineering Concepts, McGraw-Hill, 1985

2103CP010	ADVANCED DATABASE TECHNOLOGY	L	T	P	C
		3	0	0	3

COURSE OBJECTIVE

- Exemplify the data models and to conceptualize a database system using ERdiagrams.
- Interpret the concepts of parallel and distributed databases. Understand the emergingdatabase technologies

MODULE 1	DATABASE SYSTEM CONCEPTS	9 HOURS

Purpose of Database systems - Data Storage and Querying - Database architecture – Data models: Relational model - Entity relationship model: Constraints - Removing redundant attributes in entity sets- Entity-relationship diagrams - Reduction to relational schemas - Entity relationship design issue- Extended E-R features - Alternative notations for modeling Data - Normalization and database design: First normal form, second normal form, third normal form- Boyce codd normal form.

MODULE 2	PARALLEL AND DISTRIBUTED DATABASES	9 HOURS

Parallel databases: I/O parallelism - Inter and intra query parallelism - Inter and intra operation parallelism - Distributed databases: Homogeneous and Heterogeneous databases - Distributed data storage - Distributed transactions - Commit protocols - Concurrency control-Distributed query processing.

MODULE 3	OBJECT AND OBJECT RELATIONAL DATABASES	9 HOURS

Concepts for object databases: Object identity - Object structure- Type constructors- Encapsulation of operations - Methods - Persistence- Type and class hierarchies-Inheritance-Complex objects- Object database standards, languages and design: ODMG model- ODL- OQL- Object relational and extended - Relational systems: Object relational features in SQL / Oracle.

MODULE 4	INTELLIGENT DATABASES	9 HOURS

Active database concepts and triggers-Temporal databases -Spatial databases- Multimedia Databases - Deductive databases- XML databases: structure of XML data - XML Document Schema - Querying and Transformation - Geographic information systems-Genome data management

MODULE 5	EMERGING DATABASE TECHNOLOGIES	9 HOURS

Cloud based databases- Mobile Database system - Location and handoff management - Effect of mobility on data management- Location dependent data distribution- Execution Model based on ACID Transaction Framework - Pre-write transaction execution model-Mobile transaction models - Concurrency control - Information retrieval

COURSE OUTCOME

Formulate and find optimal solution in the real life optimizing/allocation/assignment problems involving conditions and resource constraints. Simulate appropriate application/distribution problems. Obtain the value of the point estimators using the method of moments and method of maximum likelihood. Apply the concept of various test statistics used in hypothesis testing for mean and variances of large and small samples. Get exposure to the principal component analysis of random vectors and matrices.

REFERENCES

1. Jay L.Devore, "Probability and Statistics for Engineering and theSciences", Cengage Learning, 9th Edition, Boston, 2016.
2. Johnson, R.A, Irwin Miller and John Freund., "Miller and Freund"s Probability and Statisticsfor Engineers", Pearson Education, 9th Edition, New York, 2016.
3. Johnson, R.A., and Wichern, D.W., "Applied Multivariate Statistical Analysis", PearsonEducation, Sixth Edition, New Delhi, 2013.
4. Ross. S.M., "Probability Models for Computer Science", Academic Press, SanDiego, 2002.
5. Taha H.A.,, "Operations Research: An Introduction", Prentice Hall of India Pvt. Ltd. 10 Edition,New Delhi, 2017.
6. Winston, W.L., "Operations Research", Thomson – Brooks/Cole, Fourth Edition, Belmont,2003.

2103CP015	CLOUD COMPUTING	L	T	P	C
		3	0	0	3

COURSE OBJECTIVE

- To understand the concept of cloud and utility computing. To understand the various issuesin cloud computing.
- To familiarize themselves with the lead players in cloud.
- To appreciate the emergence of cloud as the next generation computing paradigm. To beable to set up a private cloud.

MODULE 1	INTRODUCTION	9 HOURS

Introduction- Historical Development – Cloud Computing Architecture – The Cloud Reference Model– Cloud Characteristics –Cloud Deployment Models: Public, Private, Community, Hybrid Clouds- Cloud Delivery Models: IaaS, PaaS, SaaS – Open Source Private Cloud Software: Eucalyptus, Open Nebula, OpenStack.

MODULE 2	VIRTUALIZATION	9 HOURS

Data Center Technology – Virtualization – Characteristics of Virtualized Environments - Taxonomy of Virtualization Techniques – Virtualization and Cloud Computing –Pros and Cons of Virtualization – Implementation Levels of Virtualization – Tools and Mechanisms: Xen, VMWare, Microsoft Hyper-V, KVM, Virtual Box.

MODULE 3	CLOUD COMPUTING MECHANISM	9 HOURS

Cloud Infrastructure Mechanism: Cloud Storage, Cloud Usage Monitor, Resource Replication – Specialized Cloud Mechanism: Load Balancer, SLA Monitor, Pay-per-use Monitor, Audit Monitor, Failover System, Hypervisor, Resource Cluster, Multi Device Broker, State Management Database – Cloud Management Mechanism: Remote Administration System, Resource Management System, SLA Management System, Billing Management System.

MODULE 4	HADOOP AND MAP REDUCE	9 HOURS

Apache Hadoop – Hadoop Map Reduce –Hadoop Distributed File System- Hadoop I/O- Developing a Map Reduce Application – Map Reduce Types and Formats – Map Reduce Features– Hadoop Cluster Setup – Administering Hadoop.

MODULE 5	SECURITY IN THE CLOUD	9 HOURS

Basic Terms and Concepts – Threat Agents – Cloud Security Threats –Cloud Security Mechanism: Encryption, Hashing, Digital Signature, Public Key Infrastructure, Identity and Access Management, Single Sign-on, Cloud Based Security Groups, Hardened Virtual Server Images.

COURSE OUTCOME

- Articulate the main concepts, key technologies, strengths and limitations of cloudcomputing.
- Identify the architecture, infrastructure and delivery models of cloud computing.
- Explain the core issues of cloud computing such as security, privacy and interoperability.Choose the appropriate technologies, algorithms and approaches for the related issues.
- Facilitate Service Level Agreements (SLA).

REFERENCES

1. Thomas Erl, Zaigham Mahood, Ricardo Puttini, “Cloud Computing, Concept, Technology& Architecture”, Prentice Hall, 2013.
2. Rajkumar Buyya, Christian Vecchiola, S. Thamarai Selvi, “Mastering Cloud Computing”,Tata McGraw-Hill,2013.
3. Toby Velte, Anthony Velte, Robert C. Elsenpeter, “Cloud Computing, A PracticalApproach”,Tata McGraw-Hill Edition, 2010.
4. Arshdeep Bahga, Vijay Madisetti, “Cloud Computing: A Hands-On Approach”,Universities Press(India) Private Limited, 2014.
5. Tom White, “Hadoop: The Definitive Guide”, O‘Reilly Media, 4th Edition, 2015.
6. John Rittinghouse& James Ransome, “Cloud Computing, Implementation, Managementand Strategy”, CRC Press, 2010.

2102CP204	MACHINE LEARNING TECHNIQUES LABORATORY	L	T	P	C
		0	0	4	2

Course Objectives:

- To apply the concepts of Machine Learning to solve real-world problems
- To implement basic algorithms in clustering & classification applied to text &numeric data
- To implement algorithms emphasizing the importance of bagging & boosting inclassification & regression
- To implement algorithms related to dimensionality reduction
- To apply machine learning algorithms for Natural Language Processing applications

List of Experiments:

EXPERIMENT 1
Solving Regression & Classification using Decision Trees
EXPERIMENT 2
Root Node Attribute Selection for Decision Trees using Information Gain
EXPERIMENT 3
Bayesian Inference in Gene Expression Analysis
EXPERIMENT 4
Pattern Recognition Application using Bayesian Inference
EXPERIMENT 5
Bagging in Classification
EXPERIMENT 6
Bagging, Boosting applications using Regression Trees
EXPERIMENT 7
Data & Text Classification using Neural Networks
EXPERIMENT 8
Using Weka tool for SVM classification for chosen domain application
EXPERIMENT 9
Data & Text Clustering using K-means algorithm
EXPERIMENT 10
Data & Text Clustering using Gaussian Mixture Models
EXPERIMENT 11
Dimensionality Reduction Algorithms in Image Processing applications
EXPERIMENT 12
Application of CRFs in Natural Language Processing

OUTCOME

- To learn to use Weka tool for implementing machine learning algorithmsrelated to numeric data
- To learn the application of machine learning algorithms for text data
- To use dimensionality reduction algorithms for image processing applicationsTo apply CRFs in text processing applications
- To use fundamental and advanced neural network algorithms for solving real-world data

2104CP205	DATABASE TECHNOLOGY LABORATORY	L	T	P	C
		0	0	4	2

Course Objectives:

- To study and implement the basic SQL commands
- To implement the database design in PL/SQL
- To implement distributed database, active databases and parallel databases

List of Experiments:

EXPERIMENT 1

Working basic SQL commands (DDL, DML, DCL, and TCL)

EXPERIMENT 2

Executing Single Row and Group functions

EXPERIMENT 3

Running SQL queries on Join and Integrity constraints

EXPERIMENT 4

Implement Simple programs using PL/SQL blocks

EXPERIMENT 5

Apply the concepts of Exception handling in PL/SQL block

EXPERIMENT 6

Create Cursors and package in PL/SQL block

EXPERIMENT 7

Use the concept of Procedures and Function in PL/SQL block

EXPERIMENT 8

Implement Distributed Database for Bookstore

EXPERIMENT 9

Active Database -Implementation of Triggers and Assertions for Bank Database

EXPERIMENT 10

Implement Parallel Database of University Counseling for Engineeringcolleges

OUTCOME

- Execute the basic SQL commands in ORACLE DevelopPL/SQL programs in ORACE
- Implement intelligent databases in MYSQL and ORACLE

AUDIT COURSES

2101AU001	ENGLISH FOR RESEARCH PAPER WRITING	L	T	P	C
		2	0	0	0

COURSE OBJECTIVES:

1. Teach how to improve writing skills and level of readability
2. Tell about what to write in each section
3. Summarize the skills needed when writing a Title
4. Infer the skills needed when writing the Conclusion
5. Ensure the quality of paper at very first-time submission

MODULE I	INTRODUCTION TO RESEARCH PAPER WRITING	6 Hours

Planning and Preparation, Word Order, Breaking up long sentences, Structuring Paragraphs and Sentences, Being Concise and Removing Redundancy, Avoiding Ambiguity and Vagueness

MODULE II	PRESENTATION SKILLS	6 Hours

Clarifying Who Did What, Highlighting Your Findings, Hedging and Criticizing, Paraphrasing and Plagiarism, Sections of a Paper, Abstracts, Introduction

MODULE III	TITLE WRITING SKILLS	6 Hours

Key skills are needed when writing a Title, key skills are needed when writing an Abstract, key skills are needed when writing an Introduction, skills needed when writing a Review of the Literature, Methods, Results, Discussion, Conclusions, The Final Check

MODULE IV	RESULT WRITING SKILLS	6 Hours

Skills are needed when writing the Methods, skills needed when writing the Results, skills are needed when writing the Discussion, skills are needed when writing the Conclusions

MODULE V	VERIFICATION SKILLS	6 Hours

Useful phrases, checking Plagiarism, how to ensure paper is as good as it could possibly be the first- time submission

Total:	30 Hours

COURSE OUTCOMES:

CO1	Understand that how to improve your writing skills and level of readability
CO2	Learn about what to write in each section
CO3	Understand the skills needed when writing a Title
CO4	Understand the skills needed when writing the Conclusion
CO5	Ensure the good quality of paper at very first-time submission

REFERENCES:

1. R. Nishith, Singh AK, "Disaster Management in India: Perspectives, issues and strategies ""New Royal book Company.
2. Sahni, Pardeep Et. Al. (Eds.)," Disaster Mitigation Experiences And Reflections", Prentice Hall Of India, New Delhi.
3. Goel S. L. , Disaster Administration And Management Text And Case Studies" ,Deep &Deep Publication Pvt. Ltd., New Delhi.

2101AU002	DISASTER MANAGEMENT	L	T	P	C
		2	0	0	0

Course Objectives:

1. Summarize basics of disaster
2. Explain a critical understanding of key concepts in disaster risk reduction and humanitarianresponse.
3. Illustrate disaster risk reduction and humanitarian response policy and practice from multiple perspectives.
4. Describe an understanding of standards of humanitarian response and practicalrelevance in specific types of disasters and conflict situations.
5. Develop the strengths and weaknesses of disaster management approaches

MODULE I	INTRODUCTION	6 Hours

Disaster: Definition, Factors and Significance; Difference between Hazard And Disaster; Natural and Manmade Disasters: Difference, Nature, Types and Magnitude

MODULE II	REPERCUSSIONS OF DISASTERS AND HAZARDS	6 Hours

Economic Damage, Loss of Human and Animal Life, Destruction Of Ecosystem. Natural Disasters: Earthquakes, Volcanisms, Cyclones, Tsunamis, Floods, Droughts And Famines, Landslides And Avalanches, Man-made disaster: Nuclear Reactor Meltdown, Industrial Accidents, Oil Slicks And Spills, Outbreaks Of Disease And Epidemics, War And Conflicts.

MODULE III	DISASTER PRONE AREAS IN INDIA	6 Hours

Study of Seismic Zones; Areas Prone To Floods and Droughts, Landslides And Avalanches; Areas Prone To Cyclonic and Coastal Hazards with Special Reference To Tsunami; Post-Disaster Diseases and Epidemics

MODULE IV	DISASTER PREPAREDNESS AND MANAGEMENT	6 Hours

Preparedness: Monitoring Of Phenomena Triggering a Disaster or Hazard; Evaluation of Risk: Application of Remote Sensing, Data from Meteorological And Other Agencies, Media Reports: Governmental and Common MODULE y Preparedness.

MODULE V	RISK ASSESSMENT	6 Hours

Disaster Risk: Concept and Elements, Disaster Risk Reduction, Global and National Disaster Risk Situation. Techniques of Risk Assessment, Global Co-Operation in Risk Assessment and Warning, People‟s Participation in Risk Assessment. Strategies for Survival

	Total:	30 Hours

COURSE OUTCOMES:

CO1 Ability to summarize basics of disaster

CO2 Ability to explain a critical understanding of key concepts in disaster risk reduction and humanitarian response.

CO3 Ability to illustrate disaster risk reduction and humanitarian response policy and practice frommultiple perspectives.

CO4 Ability to describe an understanding of standards of humanitarian response and practical relevance in specific type of disasters and conflict situations.

CO5 Ability to develop the strengths and weaknesses of disaster management approaches

REFERENCES:

1. Goel S. L., Disaster Administration And Management Text And Case Studies”,Deep & Deep Publication Pvt. Ltd., New Delhi,2009.

2. NishithaRai, Singh AK, “Disaster Management in India: Perspectives, issues and strategies ““NewRoyal book Company,2007.

3. Sahni, PardeepEt.Al. ,” Disaster Mitigation Experiences And Reflections”, Prentice Hall OfIndia, New Delhi,2001.

2101AU003	SANSKRIT FOR TECHNICAL KNOWLEDGE	L	T	P	C
		2	0	0	0

COURSE OBJECTIVES:

1. Illustrate the basic sanskrit language
2. Recognize sanskrit, the scientific language in the world.
3. Appraise learning of sanskrit to improve brain functioning.
4. Relate sanskrit to develop the logic in mathematics, science & other subjects enhancing the memory power.
5. Extract huge knowledge from ancient literature.

MODULE I	**ALPHABETS**	**6 Hours**
Alphabets in Sanskrit		
MODULE II	**TENSES AND SENTENCES**	**6 Hours**
Past/Present/Future Tense - Simple Sentences		
MODULE III	**ORDER AND ROOTS**	**6 Hours**
Order - Introduction of roots		
MODULE IV	**SANSKRIT LITERATURE**	**6 Hours**
Technical information about Sanskrit Literature		
MODULE V	**TECHNICAL CONCEPTS OF ENGINEERING**	**6 Hours**
Technical concepts of Engineering-Electrical, Mechanical, Architecture, Mathematics		
	Total:	**30 Hours**

COURSE OUTCOMES:

CO1 Understanding basic Sanskrit language
CO2 Write sentences
CO3 Know the order and roots of Sanskrit.
CO4 Know about technical information about Sanskrit literature
CO5 Understand the technical concepts of Engineering

REFERENCES:

1. "Abhyaspustakam" – Dr. Vishwas, Samskrita-Bharti Publication, New Delhi
2. "Teach Yourself Sanskrit" Prathama Deeksha-Vempati Kutumbshastri, Rashtriya SanskritSansthanam, New Delhi Publication
3. "India‟s Glorious Scientific Tradition" Suresh Soni, Ocean books (P) Ltd., New Delhi, 2017.

2101AU004	VALUE EDUCATION	L	T	P	C
		2	0	0	0

COURSE OBJECTIVES:

1. Understand value of education and self-development
2. Imbibe good values in students
3. Let the should know about the importance of character

MODULE I	6 Hours

Values and self-development–Social values and individual attitudes. Work ethics, Indian vision of humanism. Moral and non-moral valuation. Standards and principles. Value judgements

MODULE II	8 Hours

Importance of cultivation of values. Sense of duty. Devotion, Self-reliance. Confidence, Concentration. Truthfulness, Cleanliness. Honesty, Humanity. Power of faith, Nationaly Patriotism. Love for nature, Discipline

MODULE III	8 Hours

Personality and Behavior Development-Soul and Scientific attitude. Positive Thinking. Integrity and discipline. Punctuality, Love and Kindness. Avoid fault Thinking. Free from anger, Dignity of labour. Universal brother hood and religious tolerance. True friendship. Happiness Vs suffering, love for truth. Aware of self-destructive habits. Association and Cooperation. Doing best for saving nature

MODULE IV	8 Hours

Character and Competence–Holy books vs Blind faith. Self-management and Good health. Science of reincarnation. Equality, Nonviolence, Humility, Role of Women. All religions and same message. Mind your Mind, Self-control. Honesty, Studying effectively.

Total:	30 Hours

COURSE OUTCOMES:

CO1 Knowledge of self-development
CO2 Learn the importance of Human values
CO3 Developing the overall personality.

REFERENCES:

1. Chakroborty, S.K."Values and Ethics for organizations Theory and practice", Oxford University Press, New Delhi

2101AU005	CONSTITUTION OF INDIA	L	T	P	C
		2	0	0	0

COURSE OBJECTIVES:

1. Understand the premises informing the twin themes of liberty and freedom from a civil rights perspective
2. To address the growth of Indian opinion regarding modern Indian intellectuals" constitutional
3. Role and entitlement to civil and economic rights as well as the emergence nation hood in the early years of Indian nationalism.
4. To address the role of socialism in India after the commencement of the Bolshevik Revolutionin1917and its impact on the initial drafting of the Indian Constitution.

MODULE I	**HISTORY OF MAKING OF THE INDIAN CONSTITUTION:**	**5 Hours**
History, Drafting Committee, (Composition & Working)		
MODULE II	**PHILOSOPHY OF THE INDIAN CONSTITUTION:**	**5 Hours**
Preamble, Salient Features		
MODULE III	**CONTOURS OF CONSTITUTIONAL RIGHTS AND DUTIES:**	**5 Hours**
Fundamental Rights, Right to Equality, Right to Freedom, Right against Exploitation, Right to Freedom of Religion, Culturaland Educational Rights, Right to Constitutional Remedies, Directive Principles of State Policy, Fundamental Duties.		
MODULE IV	**ORGANS OF GOVERNANCE:**	**5 Hours**
Parliament, Composition, Qualifications and Disqualifications, Powers and Functions, Executive, President, Governor, Councilof Ministers, Judiciary, Appointment and Transfer of Judges, Qualifications, Powers and Functions.		
MODULE V	**LOCAL ADMINISTRATION:**	**5 Hours**
District's Administration head: Role and Importance Municipalities: Introduction, Mayor and role of Elected Representative, CEO, Municipal Corporation. Pachayati raj: Introduction, PRI: Zila Pachayat. Elected officials and their roles, CEO Zila Pachayat: Position and role. Block level: Organizational Hierarchy (Different departments), Villagelevel:Role of Elected and Appointed officials, Importance of grass root democracy.		
MODULE VI	**ELECTION COMMISSION:**	**5 Hours**
Election Commission: Role and Functioning. Chief Election Commissioner and Election Commissioners - Institute and Bodies for the welfare of SC/ST/OBC and women.		
	Total:	**30 Hours**

COURSE OUTCOMES:

CO1	Discuss the growth of the demand for civil rights in India for the bulk of Indians before the arrival of Gandhi in Indian politics.
CO2	Discuss the intellectual origins of the framework of argument thatinformed the conceptualization
CO3	of social reforms leading to revolution in India.
CO4	Discuss the circumstances surrounding the foundation of the Congress Socialist Party[CSP] under the leadership of Jawaharlal Nehru and the eventual failure of the proposal of direct elections through adult suffrage in the Indian Constitution.
CO5	Discuss the passage of the Hindu Code Bill of 1956.

REFERENCES:

1. The Constitution of India,1950 (Bare Act),Government Publication.
2. Dr.S.N.Busi, Dr.B. R.Ambedkar framing of Indian Constitution,1st Edition, 2015.
3. M.P. Jain, Indian Constitution Law, 7th Edn., Lexis Nexis,2014.
4. D.D. Basu, Introduction to the Constitution of India, Lexis Nexis, 2015.

2101AU006	PEDAGOGY STUDIES	L	T	P	C
		2	0	0	0

COURSE OBJECTIVES:

1. Review existing evidence on there view topic to inform programmed design and policy
2. Making under taken by the DfID, other agencies and researchers.
3. Identify critical evidence gaps to guide the development.

MODULE I	INTRODUCTION AND METHODOLOGY	6 Hours

Aims and rationale, Policy background, Conceptual framework and terminology - Theories of learning, Curriculum, Teacher education - Conceptual framework, Research questions - Overview of methodology and Searching.

MODULE II	THEMATIC OVERVIEW	6 Hours

Pedagogical practices are being used by teachers in formal and informal classrooms in developing countries - Curriculum, Teacher education.

MODULE III	EVIDENCE ON THE EFFECTIVENESS OF PEDAGOGICAL PRACTICES	6 Hours

Methodology for the in depth stage: quality assessment of included studies - How can teacher education (curriculum and practicum) and the school curriculum and guidance materials best support effective pedagogy? - Theory of change - Strength and nature of the body **of** evidence for effective pedagogical practices - Pedagogic theory and pedagogical approaches - Teachers‟ attitudes and beliefs and Pedagogic strategies.

MODULE IV	PROFESSIONAL DEVELOPMENT	6 Hours

Professional development: alignment with classroom practices and follow up support - Peer support - Support from the head teacher and the commMODULEy - Curriculum and assessment - Barriers to learning: limited resources and large class sizes

MODULE V	RESEARCH GAPS AND FUTURE DIRECTIONS	6 Hours

Research design – Contexts – Pedagogy - Teacher education - Curriculum and assessment - Dissemination and research impact.

Total:	30 Hours

COURSE OUTCOMES:

CO1 What pedagogical practices are being used by teachers informal and informal classrooms indeveloping countries?

CO2 What is the evidence on the effectiveness of these pedagogical practices, in what conditions, and withwhat population of learners?

CO3 How can teacher education (curriculum and practicum) and the school curriculum and guidance materials best support effective pedagogy?

REFERENCES:

1. Ackers J, HardmanF (2001) Classroom interaction in Kenyan primary schools, Compare, 31(2): 245-261.
2. Agrawal M (2004)Curricular reform in schools: The importance of evaluation, Journal of Curriculum Studies, 36(3):361-379.
3. Akyeampong K (2003) Teacher training in Ghana-does it count? Multi-site teacher education research project (MUSTER) country report 1.London:DFID.
4. Akyeampong K, Lussier K, Pryor J, Westbrook J (2013) Improving teaching and learning of basic maths and reading in Africa: Does teacher preparation count? International Journal Educational Development, 33(3): 272–282.
5. Alexander RJ(2001) Culture and pedagogy: International comparisons in primary education. Oxford and Boston: Blackwell.
6. Chavan M(2003) Read India: Amass scale, rapid, „learning to read‟ campaign.
7. www.pratham.org/images/resource%20working%20paper%202.pdf

2101AU007	STRESS MANAGEMENT BY YOGA	L	T	P	C
		2	0	0	0

COURSE OBJECTIVES:

1. To achieve overall health of body and mind
2. To overcome stress

MODULE I	10 Hours
Eight parts of yoga.(Ashtanga)	
MODULE II	**10 Hours**
Yam and Niyam - Do`s and Don"t"s in life - i) Ahinsa, satya, astheya, bramhacharya and aparigraha,	
MODULE III	**10 Hours**
Asan and Pranayam - Various yog poses and their benefits for mind & body - Regularization ofbreathing techniques and its effects-Types of pranayam	
Total:	**30 Hours**

COURSE OUTCOMES:

CO1 Develop healthy mind in a healthy body thus improving social health also
CO2 Improve efficiency

REFERENCES:

1. Yogic Asanas for Group Tarining-Part-I":Janardan Swami Yoga bhyasi Mandal, Nagpur
2. Rajayoga or conquering the Internal Nature" by Swami Vivekananda, Advaita Ashrama (Publication Department), Kolkata

2101AU008	PERSONALITY DEVELOPMENT THROUGH LIFE ENLIGHTENMENT SKILLS	L	T	P	C
		2	0	0	0

Course Objectives:

1. To learn to achieve the highest goal happily
2. To become a person with stable mind, pleasing personality and determination
3. To awaken wisdom in students

MODULE I		10 Hours

Neetisatakam-holistic development of personality - Verses- 19,20,21,22 (wisdom) - Verses- 29,31,32 (pride & heroism) – Verses- 26,28,63,65 (virtue) - Verses- 52,53,59 (dontʺs) - Verses- 71,73,75,78 (d0ʺs)

MODULE II		10 Hours

Approach to day to day work and duties - Shrimad Bhagwad Geeta: Chapter 2-Verses 41, 47,48 - Chapter 3- Verses 13, 21, 27, 35 Chapter 6-Verses 5,13,17,23, 35 - Chapter 18-Verses 45, 46, 48.

MODULE III		10 Hours

Statements of basic knowledge - Shrimad Bhagwad Geeta: Chapter2-Verses 56, 62, 68 Chapter 12 -Verses 13, 14, 15, 16,17, 18 - Personality of role model - shrimad bhagwad geeta - Chapter2-Verses 17, Chapter 3-Verses 36,37,42 -Chapter 4-Verses 18, 38,39 Chapter18 – Verses 37,38,63

	Total:	30 Hours

COURSE OUTCOMES:

CO1	Study of Shrimad-Bhagwad-Geeta will help the student in developing his personality and achieve the highest goal in life
CO2	The person who has studied Geeta will lead the nation and mankind to peace and prosperity
CO3	Study of Neet is hatakam will help in developing versatile personality of students.

REFERENCES:

1. Gopinath, Rashtriya Sanskrit Sansthanam P, Bhartrihariʺs Three Satakam, Niti- sringar-vairagya, New Delhi,2010
2. Swami Swarupananda , Srimad Bhagavad Gita, Advaita Ashram, Publication Department,Kolkata, 2016.

2101AU009	UNNAT BHARAT ABHIYAN	L	T	P	C
		2	0	0	0

COURSE OBJECTIVES:

1. Unnat Bharat Abhiyan is inspired by the vision of transformational change in rural development processes by leveraging knowledge institutions to help build the architecture of anInclusive India.
2. The Mission of Unnat Bharat Abhiyan is to enable higher educational institutions to work with the people of rural India in identifying development challenges and evolvingappropriate solutions for accelerating sustainable growth.
3. It also aims to create a virtuous cycle between society and an inclusive academic system by providing knowledge and practices for emerging professions and to upgrade the capabilities ofboth the public and the private sectors in responding to the development needs of rural India

MODULE 1 **10 Hours**

Introduction. Holistic development of a village – Economic, Social, Human, Governance, Basic Amenities, Environmental aspects. Vision and mission of UBA. Activities of Unnat Bharat Abhiyan. Expediting the process of indigenous sustainable rural development with effective support from professional institutes of higher education. Building capacity in institutes of Higher Education for research, training and development of technologies relevant to national needs, especially those of rural India. Creating the Requisite Structure to Cope with the Challenge.

MODULE 2 **10 Hours**

National Steering Committee for UBA (NSC - UBA). The Coordinating Institution for UBA (CI-UBA) and its Responsibilities. Identification and Role of Mentoring Institutions (MI - UBA). Identification and Role of Subject Expert Groups (SEG - UBA). UBA Participating Institutions in General (PIs - UBA).

MODULE 3 **10 Hours**

Methodology of Intervention and Monitoring. Expected outcomes from UBA. Mechanism for Providing the Base-level funding from MHRD. Various Sources of Funding for the Actual Cluster Development Work. Status of Steps Already Completed towards Setting up the Structural Network of UBA. Major activities so far. Action Plans.

Total: 30 Hours

REFERENCES:

1. https://www.rcisgbau.in/pdf/UBA_concept_note.pdf
2. https://unnatbharatabhiyan.gov.in/documents
3. https://unnatbharatabhiyan.gov.in:8443/introduction
4. https://unnatbharatabhiyan.gov.in:8443/new-website/https://unnatbharatabhiyan.gov.in:8443/app/webroot/files/general-documents/Unnat%20Bharat%20Abhiyan-%20Brochure%202016.pdf

		L	T	P	C
2104CP206	**Mini Project with Seminar**	**0**	**0**	**4**	**2**

Course Objective

1.To develop knowledge to formulate a real world problem and project's goals

2.To identify the various tasks of the project to determine standard procedures

3.To identify and learn new tools, algorithms and techniques

4.To understand the various procedures for validation of the product and analysis the cost effectiveness

5.To understand the guideline to Prepare report for oral demonstrations

Guidelines

A Mini Project shall be undertaken by the students individually in consultation with the respective faculty and Head of the Department, as specified in the curriculum. Periodically four reviews are conducted and are evaluated by the faculty in charge. A student is expected to make a presentation about the mini-project during the final evaluation and submit the project report.

Course Outcome

After completion of the course, Student will be able to

1. Self-learning various topics.

2. Survey the literature such as books, national/international refereed journals and contact resource persons for the selected topic of research.

3. Write technical reports.

4. Develop oral and written communication skills to present and defend their work in-front of technically qualified audience.