

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES, TIRUPATI
(AUTONOMOUS)**

**B. Tech - Artificial Intelligence & Data Science (AI & DS)
(Effective for the batches admitted from 2020-21)**

Semester IV (Second year)

Sl.	Category	Course Code	Course Title	Hour per week			Credits	CIE	SEE	TOTAL
				L	T	P				
1	PC	20APC3008	Formal Languages and Automata Theory	3	0	0	3	30	70	100
2	PC	20APC3009	Computer Networks	3	0	0	3	30	70	100
3	PC	20APC3011	Data warehousing and Mining	3	0	0	3	30	70	100
4	PC	20APC3013	Operating Systems	3	0	0	3	30	70	100
5	HS	20AHSMB01	Managerial Economics and Financial Analysis	3	0	0	3	30	70	100
6	HS	20AHS9905	Universal Human Values	3	1	0	3	30	70	100
7	PC	20APC3010	Computer Networks Lab	0	0	3	1.5	30	70	100
8	PC	20APC3012	Data warehousing and Mining Lab	0	0	3	1.5	30	70	100
9	PC	20APC3014	Operating Systems Lab	0	0	3	1.5	30	70	100
10	SOC	20ASC3002	Server Side Scripting	1	0	2	2	100	0	100
Total credits							24.5	370	630	1000
Community Service Project (Mandatory) for 6 weeks duration during summer vacation.										
(To visit the selected community to conduct survey (Socio-economic & domain survey) and conduct sensitization/awareness program/activities at the end of IV- semester before commencement of V-semester and complete immersion programme also during V-Semester and submit report in V - semester. Assessment will be done at the end of V-Semester)										
Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)				0	0	0	3	0	0	0

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES::TIRUPATI(AUTONOMOUS)

Year: II

Semester: II

Branch of Study: AI & DS

COURSE CODE	COURSE TITLE	L	T	P	CREDITS
20APC3008	Formal Languages And Automata Theory (Common to : CSE, CIC, AIM, AID)	3	0	0	3

Course Objectives:

- Understand formal definitions of machine models. Classify machines by their power to recognize languages. Understanding of formal grammars, analysis
- Understanding of hierarchical organization of problems depending on their complexity
- Understanding of the logical limits to computational capacity Understanding of undecidable problems

COURSE OUTCOMES:

- CO1:** Design finite state machines to recognize formal languages.
- CO2:** Identify different types of grammars in formal languages.
- CO3:** Construct context free grammars for context free languages
- CO4:** Find solutions to the problems using PDA.
- CO5:** Develop Turing machine for different computational problems.

UNIT - 1: Introduction to Finite Automata

Introduction: Alphabet, languages and grammars, productions and derivation, Chomsky hierarchy of languages.

Finite Automata: An Informal picture of Finite Automata, Deterministic Finite Automata (DFA), Non Deterministic Finite Automata (**NFA**), Finite Automata with Epsilon transitions (ϵ -NFA or NFA- ϵ), Finite Automata with output, Conversion of one machine to another, Minimization of Finite Automata, Myhill- Nerode Theorem.

UNIT - II: Regular Language

Regular Languages: Regular Expressions (RE), Finite Automata and Regular Expressions, Applications of Regular Expressions, Algebraic laws for Regular Expressions, The Arden's Theorem, Using Arden's theorem to construct RE from FA, Pumping Lemma for RLs, Applications of Pumping Lemma, Equivalence of Two FAs, Equivalence of Two REs, Construction of Regular Grammar from RE, Constructing FA from Regular Grammar, Closure properties of RLs, Decision problems of RLs, Applications of REs and FAs

UNIT III - Context Free Grammars and Languages

Context Free Grammars and Languages: Definition of Context Free Grammars (CFG), Derivations and Parse trees, Ambiguity in CFGs, Removing ambiguity, Left recursion and Left factoring, Simplification of CFGs, Normal Forms, Linear grammars, Closure properties for CFLs, Pumping Lemma for CFLs, Decision problems for CFLs, CFG and Regular Language..

UNIT IV - Push Down Automata

Push Down Automata (PDA): Informal introduction, The Formal Definition, Graphical notation, Instantaneous description, The Languages of a PDA, Equivalence of PDAs and CFGs, Deterministic PushDown Automata, Two Stack PDA.

UNIT V - Turing Machines and Undecidability

Turing Machines and Undecidability: Basics of Turing Machine (TM), Transitional Representation of TMs, Instantaneous description, Non Deterministic TM, Conversion of Regular Expression to TM, Two stack PDA and TM, Variations of the TM, TM as an integer function, Universal TM, Linear Bounded Automata, TM Languages, Unrestricted grammar , Properties of Recursive and Recursively enumerable languages, Undecidability, Reducibility, Undecidable problems about TMs, Post's Correspondence Problem(PCP), Modified PCP.

Text Books:

1. Introduction to Automata Theory, Formal Languages and Computation, Shyamalendu Kandar, Pearson, 2013
2. John E. Hopcroft, Rajeev Motwani and Jeffrey D. Ullman, Introduction to Automata Theory, Languages, and Computation, Pearson Education Asia.

References

1. J.P. Trembley and R. Manohar, Discrete Mathematical Structures with Applications to Computer Science, McGraw Hill Book Co.
2. Michael Sipser, Introduction to The Theory of Computation, Thomson Course Technology.
3. Harry R. Lewis and Christos H. Papadimitriou, Elements of the Theory of Computation, Pearson Education Asia. John E. Hopcroft and J.D.Ullman, Introduction to Automata Theory, Languages and Computation, Narosa Pub, 2021
4. Dexter C. Kozen, Automata and Computability, Undergraduate Texts in Computer Science, Springer.
5. Michael Sipser, Introduction to the Theory of Computation, PWS Publishing.
6. John Martin, Introduction to Languages and The Theory of Computation, Tata McGraw Hill.

Online Learning Resources:

https://www.youtube.com/channel/UCb8HLf1c_-m0MovWMWdg_bA

Mapping of course outcomes with program outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
CO 1	3	2	3	2									2	
CO 2	3	3												
CO 3	3	3												
CO 4	2	3	3										2	
CO 5	3	3	3	3									2	2

(Levels of Correlation, viz., 1-Low, 2-Moderate, 3 High)

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES::TIRUPATI(AUTONOMOUS)

Year: II

Semester: II

Branch of Study: AI & DS

COURSE CODE	COURSE TITLE	L	T	P	CREDITS
20APC3009	Computer Networks (Common to : CSE, CIC, AIM, AID)	3	0	0	3

Course Outcomes:

Student will be able to

- CO1:** Understand the basics of data communications and networking
- CO2:** Classify the functionalities of two sub layers of Data link Layer
- CO3:** Know briefly about Network Layer through algorithms and protocols
- CO4:** Distinguish the services provided by Transport Layer
- CO5:** Recognize the services offered by Application Layer to the user

Unit I

Introduction: Data Communications, Networks, Network Types, Internet History, Standards and Administration.

Network Models: Protocol Layering, TCP/IP Protocol Suite, The OSI Model

Introduction to Physical Layer: Data and Signals, Transmission Impairment, Data Rate Limits, Performance.

Transmission Media: Introduction, Guided Media, Unguided Media, Switching: Introduction, Circuit Switched Networks, Packet Switching

Unit II

The Data Link Layer: Introduction, Link layer addressing, Error detection and Correction: Cyclic codes, Checksum, Forward error correction, Data link control: DLC Services, Data link layer protocols, HDLC, Point to Point Protocol.

Media Access control: Random Access, Controlled Access, Channelization, Connecting devices and virtual LANs: Connecting Devices.

Unit III

The Network Layer: Network layer design issues, Routing algorithms, Congestion control algorithms, Quality of service, Internetworking.

The network layer in the Internet: IPV4 Addresses, IPV6, Internet Control protocol, OSPF, BGP, IP, ICMPv4, IGMP.

Unit IV

The Transport Layer: The Transport Service, Elements of Transport Protocols, Congestion Control, The internet transport protocols: UDP, TCP, Performance problems in computer networks, Network performance measurement.

Unit V

The Application Layer: Introduction, Client-Server Programming, WWW and HTTP, FTP, e-mail, TELNET, Secure Shell, Domain Name System, SNMP.

Text Books:

1. -Data communications and networking, Behrouz A. Forouzan, Mc Graw Hill Education, 5th edition, 2017.
2. -Computer Networks, Andrew S. Tanenbaum, Wetherall, Pearson, 5th edition, 2011.

References:

1. Data Communication and Networks, Bhushan Trivedi, Oxford, 2016
2. Internetworking with TCP/IP – Principles, protocols, and architecture - Volume 1, Douglas E. Comer, 5th edition, PHI, 2015
3. -Computer Networks, 5E, Peterson, Davie, Elsevier.
4. -Introduction to Computer Networks and Cyber Security, Chawan- Hwa Wu, Irwin, CRC Publications.
5. -Computer Networks and Internets with Internet Applications, Comer.

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES::TIRUPATI
(AUTONOMOUS)**

Year: II

Semester: II

Branch of Study: AI & DS

COURSE CODE	COURSE TITLE	L	T	P	CREDITS
20APC3011	Data warehousing and Mining (Common to : CSE, CIC, AIM, AID)	3	0	0	3

Course Objectives:

- To know the basic concepts and principles of data warehousing and data mining
- Learn pre-processing techniques and data mining functionalities
- Learn and create multidimensional models for data warehousing
- Study and evaluate performance of Frequent Item sets and Association Rules
- Understand and Compare different types of classification and clustering algorithms

COURSE OUTCOMES:

CO1: Understand the basic concepts of Data Warehouse and data Mining

CO2: Apply OLAP technology for Data Warehouse

CO3: Analyze and evaluate performance of Association Rules and classification algorithms

CO4: Evaluate various Clustering algorithms

CO5: Analyze advanced Data Mining techniques

UNIT-1:

Introduction: Fundamentals of data mining, Data Mining Functionalities, Classification of Data Mining systems, Data Mining Task Primitives, Integration of a Data Mining System with a Database or a Data Warehouse System, Major issues in Data Mining. **Data Preprocessing:** Need for Preprocessing the Data, Data Cleaning, Data Integration and Transformation, Data Reduction, Discretization and Concept Hierarchy Generation.

UNIT-2:

Data Warehouse and OLAP Technology for Data Mining: Data Warehouse, Multidimensional Data Model, Data Warehouse Architecture, Data Warehouse Implementation, Further Development of Data Cube Technology, From Data Warehousing to Data Mining. Data Cube Computation and **Data Generalization:** Efficient Methods for Data Cube Computation, Further Development of Data Cube and OLAP Technology, Attribute-Oriented Induction.

UNIT-3:

Mining Frequent Patterns, Associations and Correlations: Basic Concepts, Efficient and Scalable Frequent Itemset Mining Methods, Mining various kinds of Association Rules, From Association Mining to Correlation Analysis, Constraint-Based Association Mining, **Classification and Prediction:** Issues Regarding Classification and Prediction, Classification by Decision Tree Induction, Bayesian Classification, Rule-Based Classification, Classification by Back propagation, Support Vector Machines, Associative Classification, Lazy Learners, Other Classification Methods, Prediction, Accuracy and Error measures, Evaluating the accuracy of a Classifier or a Predictor, Ensemble Methods

UNIT -4:

Cluster Analysis Introduction :Types of Data in Cluster Analysis, A Categorization of Major Clustering Methods, Partitioning Methods, Hierarchical Methods, Density-Based Methods, Grid-Based Methods, Model-Based Clustering Methods, Clustering High Dimensional Data, Constraint-Based Cluster Analysis, Outlier Analysis.

UNIT-5:

Mining Streams, Time Series and Sequence Data: Mining Data Streams, Mining Time Series Data, Mining Sequence Patterns in Transactional Databases, Mining Sequence Patterns in Biological Data, Graph Mining, Social Network Analysis and Multi relational Data Mining, Mining Object, Spatial, Multimedia, **Text and Web Data:** Multidimensional Analysis and Descriptive Mining of Complex Data Objects, Spatial Data Mining, Multimedia Data Mining, Text Mining, Mining the World Wide Web.

TEXT BOOKS:

1. Data Mining: Concepts and Techniques, Jiawei Han and Micheline Kamber, Morgan Kaufmann Publishers, Elsevier, Second Edition, 2012.
2. Introduction to Data Mining – Pang-Ning Tan, Michael Steinbach and Vipin Kumar, Pearson Education, 2016.

REFERENCES:

1. Data Mining Techniques, Arun K Pujari, Second Edition, Universities Press.
2. Data Warehousing in the Real World, Sam Aanhory & Dennis Murray Pearson Edn Asia.
3. Insight into Data Mining, K.P.Soman, S.Diwakar, V.Ajay, PHI, 2008.

Mapping of course outcomes with program outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
CO 1	3	3										1	1	1
CO 2	2	3	2										1	
CO 3	2	3	2	2	3	2								2
CO 4	2	2	3	2	2	3						2	1	
CO 5	2	2	3	2	2	3						2	1	1

(Levels of Correlation, viz., 1-Low, 2-Moderate, 3 High)

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES::TIRUPATI (AUTONOMOUS)

Year: II	Semester: II	Branch of Study: AI & DS			
COURSE CODE	COURSE TITLE	L	T	P	CREDITS
20APC3013	Operating Systems (Common to : CSE, CIC, AIM, AID)	3	0	0	3

Course Objectives:

The course is designed to

- Understand basic concepts and functions of operating systems
- Understand the processes, threads and scheduling algorithms.
- Provide good insight on various memory management techniques
- Expose the students with different techniques of handling deadlocks
- Explore the concept of file-system and its implementation issues
- Familiarize with the basics of the Linux operating system
- Implement various schemes for achieving system protection and security

Course Outcomes (CO):

After completion of the course, students will be able to

- CO1:** Distinguish between the different types of operating system environments.
- CO2:** Apply the concepts of process synchronization & CPU scheduling
- CO3:** Develop solutions to deadlock and memory management
- CO4:** Analyze various disk scheduling algorithms and file system interfaces
- CO5:** Analyze the various security issues and goals of protection

UNIT - 1:

Operating Systems Overview: Operating system functions, Operating system structure, operating systems Operations, protection and security, Computing Environments, Open- Source Operating Systems

System Structures: Operating System Services, User and Operating-System Interface, systems calls, Types of System Calls, system programs, operating system structure, operating system debugging, System Boot.

Processes: Process concept, process Scheduling, Operations on processes, Inter process Communication, Examples of IPC systems.

UNIT - 2:

Threads: overview, Multicore Programming, Multithreading Models, Thread Libraries, Implicit Threading, Threading Issues.

Process Synchronization: The critical-section problem, Peterson's Solution, Synchronization Hardware, Mutex Locks, Semaphores, Classic problems of synchronization, Monitors, Synchronization examples, Alternative approaches.

CPU Scheduling: Scheduling-Criteria, Scheduling Algorithms, Thread Scheduling, Multiple-Processor Scheduling, Real-Time CPU Scheduling, Algorithm Evaluation.

UNIT - 3:

Memory Management: Swapping, contiguous memory allocation, segmentation, paging, structure of the page table.
Virtual memory: Demand paging, page-replacement, Allocation of frames, Thrashing, Memory-Mapped Files, Allocating Kernel Memory

Deadlocks: System Model, deadlock characterization, Methods of handling Deadlocks, Deadlock prevention, Detection and Avoidance, Recovery from deadlock.

UNIT - 4:

Mass-storage structure: Overview of Mass-storage structure, Disk structure, Disk attachment, Disk scheduling, Swap-space management, RAID structure, Stable-storage implementation.

File system Interface: The concept of a file, Access Methods, Directory and Disk structure, File system mounting, File sharing, Protection.

File system Implementation: File-system structure, File-system Implementation, Directory Implementation, Allocation Methods, Free-Space management.

UNIT - 5:

I/O systems: I/O Hardware, Application I/O interface, Kernel I/O subsystem, Transforming I/O requests to Hardware operations.

Protection: Goals of Protection, Principles of Protection, Domain of protection, Access Matrix, Implementation of Access Matrix, Access control, Revocation of Access Rights, Capability- Based systems,

Language – Based Protection

Security: The Security problem, Program threats, System and Network threats, Cryptography as a security tool, User authentication, Implementing security defenses, Firewalling to protect systems and networks, Computer–security classifications.

Text Books:

1. Operating System Concepts, Abraham Silberchatz, Peter B. Galvin, Greg Gagne, Wiley, EightEdition, 2018.

Reference Books:

1. Operating systems by A K Sharma, Universities Press,
2. Operating Systems, S.Haldar, A.A.Aravind, Pearson Education.
3. Operating Systems, A.S.Godbole, Second Edition, TMH.
4. An Introduction to Operating Systems, P.C.P. Bhatt, PHI.
5. Operating Systems, G.Nutt, N.Chaki and S.Neogy, Third Edition, Pearson Education.
6. Operating Systems, R.Elmasri, A,G.Carrick and D.Levine, Mc Graw Hill.
7. Principles of Operating Systems, B.L.Stuart, Cengage learning, India Edition.
8. Operating System Desgin, Douglas Comer, CRC Press, 2nd Edition.
9. Modern Operating Systems, Andrew S Tanenbaum, Second Edition, PHI.

Mapping of course outcomes with program outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2											1	1
CO2	2												1	1
CO3	3	3	3										2	2
CO4			2	2									2	2
CO5	2	2										1	2	2

(Levels of Correlation, viz., 1-Low, 2-Moderate, 3 High)

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES::TIRUPATI(AUTONOMOUS)

Year: II

Semester: II

Branch of Study: AI & DS

COURSE CODE	COURSE TITLE	L	T	P	CREDITS
20AHSMB01	Managerial Economics And Financial Analysis	3	0	0	3

COURSE OBJECTIVES:

- To understand the concepts of managerial economics and financial analysis this helps in optimal decision making in business environment.
- To be familiar with demand concepts, types of methods or techniques of demand those are used by the entrepreneur or producer.
- To have a thorough knowledge on the production theories and cost while dealing with the production and factors of production.
- To introduce the concepts of cost and significance, limitation of Break even analysis.
- To provide the optimal decisions acquiring the knowledge on financial accounting and its analysis

COURSE OUTCOMES (CO):

CO1: Understand the fundamentals of Economics and Managerial economics viz., Demand, Production, cost, revenue and markets.

CO2: Apply the Concept of Production cost and revenues for effective Business decision

CO3: Analyze how to invest their capital and maximize returns.

CO4: Evaluate the capital budgeting techniques.

CO5: Define the concepts related to financial accounting and management and able to develop the Accounting statements and evaluate the financial performance of business entity.

UNIT - 1: MANAGERIAL ECONOMICS

Introduction – meaning, nature, significance, functions, and advantages, ME and its role in other fields. Demand - Concept, Function, Law of Demand - Demand Elasticity- Types – Measurement. Demand Forecasting- Factors governing forecasting, Methods.

UNIT - 2: PRODUCTION AND COST ANALYSIS

Introduction – Nature, meaning, significance, functions and advantages. Production Function– Least- cost combination– Short run and Long run Production Function- Isoquants and Isocosts, MRTS - Cobb-Douglas Production Function - Laws of Returns - Internal and External Economies of scale. Cost & Break-Even Analysis - Cost concepts and Cost behavior- Break-Even Analysis (BEA) - Determination of Break-Even Point (Simple Problems)- Managerial significance and limitations of Break-Even Analysis.

UNIT - 3: BUSINESS ORGANIZATIONS AND MARKETS

Introduction – Nature, meaning, significance, functions and advantages. Forms of Business Organizations- Sole Proprietary - Partnership - Joint Stock Companies - Public Sector Enterprises. Types of Markets - Perfect and Imperfect Competition - Features of Perfect Competition Monopoly- Monopolistic Competition–Oligopoly-Price-Output Determination - Pricing Methods and Strategies.

UNIT - 4: CAPITAL BUDGETING

Introduction to Capital, Sources of Capital. Short-term and Long-term Capital : Working capital, types, Estimating Working capital requirements. Capital Budgeting – Features, Proposals, Time value of money. Methods and Evaluation of Projects – Pay Back Method, Accounting Rate of Return (ARR), Net Present Value (NPV), and Internal Rate Return (IRR) Method (simple problems).

UNIT - 5: FINANCIAL ACCOUNTING AND ANALYSIS

Introduction – Nature, meaning, significance, functions and advantages. Concepts and Conventions- Double-Entry Book Keeping, Journal, Ledger, Trial Balance- Final Accounts (Trading Account, Profit and Loss Account and Balance Sheet with simple adjustments). Financial Analysis - Analysis and Interpretation of Liquidity Ratios, Activity Ratios, and Capital structure Ratios and Profitability.

TEXTBOOKS:

1. Varshney & Maheswari: Managerial Economics, Sultan Chand, 2013.
2. Aryasri: Business Economics and Financial Analysis, 4/e, MGH, 2019

REFERENCES

1. Ahuja HI Managerial economics Schand,3/e,2013
2. S.A. Siddiqui and A.S. Siddiqui: Managerial Economics and Financial Analysis, New AgeInternational, 2013.
3. Joseph G. Nellis and David Parker: Principles of Business Economics, Pearson, 2/e, NewDelhi.
4. Domnick Salvatore: Managerial Economics in a Global Economy, Cengage, 2013.

Online Learning Resources:

<https://www.slideshare.net/123ps/managerial-economics-ppt>
<https://www.slideshare.net/rossanz/production-and-cost-45827016>
<https://www.slideshare.net/darkyla/business-organizations-19917607>
<https://www.slideshare.net/balarajbl/market-and-classification-of-market>
<https://www.slideshare.net/ruchi101/capital-budgeting-ppt-59565396>
<https://www.slideshare.net/ashu1983/financial-accounting>.

Mapping of course outcomes with program outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3						1				1			
CO2	1	2												
CO3	2					1								
CO4											3			
CO5				2							2			

(Levels of Correlation, viz., 1-Low, 2-Moderate, 3 High)

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES: TIRUPATI(AUTONOMOUS)

Year: II	Semester: II	Branch of Study: AI & DS			
COURSE CODE	COURSE TITLE	L	T	P	CREDITS
20AHS9905	Universal Human Values	3	1	0	3

COURSE OBJECTIVES:

- Development of a holistic perspective based on self-exploration about themselves (human being),family, society and nature/existence.
- Understanding (or developing clarity) of the harmony in the human being, family, society and nature/existence
- Strengthening of self-reflection.
- Development of commitment and courage to act.

COURSE OUTCOMES (CO):

On completion of this course, the students will be able to

- CO1:** Students are expected to become more aware of themselves, and their surroundings (family, society, nature)
- CO2:** They would become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind.
- CO3:** They would have better critical ability.
- CO4:** They would also become sensitive to their commitment towards what they have understood (human values, human relationship and human society).
- CO5:** It is hoped that they would be able to apply what they have learnt to their own self in different day-to-day settings in real life, at least a beginning would be made in this direction.

UNIT – 1: Course Introduction - Need, Basic Guidelines, Content and Process for Value Education

- Purpose and motivation for the course, recapitulation from Universal Human Values-I
- Self-Exploration–what is it? - Its content and process; ‘Natural Acceptance’ and ‘Experiential Validation’- as the process for self-exploration
- Continuous Happiness and Prosperity- A look at basic Human Aspirations
- Right understanding, Relationship and Physical Facility- the basic requirements for fulfillment of aspirations of every human being with their correct priority
- Understanding Happiness and Prosperity correctly- A critical appraisal of the current. scenario
- Method to fulfill the above human aspirations: understanding and living in harmony at various levels.

Include practice sessions to discuss natural acceptance in human being as the innate acceptance for living with responsibility (living in relationship, harmony and co-existence) rather than as arbitrariness in choice based on liking-disliking.

UNIT II: Understanding Harmony in the Human Being - Harmony in Myself!

- Understanding human being as a co-existence of the sentient ‘I’ and the material ‘Body’
- Understanding the needs of Self (‘I’) and ‘Body’ - happiness and physical facility
- Understanding the Body as an instrument of ‘I’ (I being the doer, seer and enjoyer)
- Understanding the characteristics and activities of ‘I’ and harmony in ‘I’
- Understanding the harmony of I with the Body: Sanyam and Health; correct appraisal of Physical needs, meaning of Prosperity in detail
- Programs to ensure Sanyam and Health.

Include practice sessions to discuss the role others have played in making material goods available to me. Identifying from one’s own life. Differentiate between prosperity and accumulation. Discuss program for ensuring health vs dealing with disease.

UNIT III: Understanding Harmony in the Family and Society- Harmony in Human- Human Relationship.

- Understanding values in human-human relationship; meaning of Justice (nine universal values in relationships) and program for its fulfillment to ensure mutual happiness; Trust and Respect as the foundational values of relationship
- Understanding the meaning of Trust; Difference between intention and competence
- Understanding the meaning of Respect, Difference between respect and differentiation; the other salient values in relationship
- Understanding the harmony in the society (society being an extension of family): Resolution,

Prosperity, fearlessness (trust) and co-existence as comprehensive Human Goals

- Visualizing a universal harmonious order in society- Undivided Society, Universal Order- from family to world family

Include practice sessions to reflect on relationships in family, hostel and institute as extended family, real life examples, teacher-student relationship, goal of education etc. Gratitude as a universal value in relationships. Discuss with scenarios. Elicit examples from students' lives

UNIT IV: Understanding Harmony in the Nature and Existence - Whole existence as Coexistence

- Understanding the harmony in the Nature
- Interconnectedness and mutual fulfillment among the four orders of nature recyclability and self-regulation in nature
- Understanding Existence as Co-existence of mutually interacting units in all- pervasive space
- Holistic perception of harmony at all levels of existence. Include practice sessions to discuss human being as cause of imbalance in nature (film -Home| can be used), pollution, depletion of resources and role of technology etc.

Include practice sessions to discuss human being as cause of imbalance in nature (film "Home" can be used), pollution, depletion of resources and role of technology etc.

UNIT- V: Implications of the above Holistic Understanding of Harmony on Professional Ethics.

- Natural acceptance of human values
- Definitiveness of Ethical Human Conduct
- Basis for Humanistic Education, Humanistic Constitution and Humanistic Universal Order
- Competence in professional ethics: a. Ability to utilize the professional competence for augmenting universal human order b. Ability to identify the scope and characteristics of people friendly and eco- friendly production systems, c. Ability to identify and develop appropriate technologies and management patterns for above production systems.
- Case studies of typical holistic technologies, management models and production systems
- Strategy for transition from the present state to Universal Human Order: a. At the level of individual: as socially and ecologically responsible engineers, technologists and managers b. At the level of society: as mutually enriching institutions and organizations
- Sum up.

Include practice Exercises and Case Studies will be taken up in Practice (tutorial) Sessions eg. To discuss the conduct as an engineer or scientist etc.

Course Outcomes:

On completion of this course, the students will be able to

- Students are expected to become more aware of themselves, and their surroundings (family, society,nature)
- They would become more responsible in life, and in handling problems with sustainable solutions,while keeping human relationships and human nature in mind.
- They would have better critical ability.
- They would also become sensitive to their commitment towards what they have understood (humanvalues, human relationship and human society).
- It is hoped that they would be able to apply what they have learnt to their own self in different day-to-day settings in real life, at least a beginning would be made in this direction.

TEXT BOOKS

1. R R Gaur, R Asthana, G P Bagaria, -A Foundation Course in Human Values and Professional Ethics|, 2nd Revised Edition, Excel Books, New Delhi, 2019. ISBN 978-93- 87034-47-1

2. R R Gaur, R Asthana, G P Bagaria, -Teachers' Manual for A Foundation Course in Human Values and Professional Ethics, 2nd Revised Edition, Excel Books, New Delhi, 2019. ISBN 978-93-87034-53-2

REFERENCE BOOKS

1. Jeevan Vidya: Ek Parichaya, A Nagaraj, Jeevan Vidya Prakashan, Amar kantan, 1999.
2. N. Tripathi, –Human Values, New Age Intl. Publishers, New Delhi, 2004.
3. The Story of Stuff (Book).
4. Mohandas Karamchand Gandhi –The Story of My Experiments with Truth
5. E. F.Schumacher. -Small is Beautiful
6. Slow is Beautiful –Cecile Andrews
7. J C Kumarappa -Economy of Permanence
8. Pandit Sunderlal –Bharat Mein Angreji Raj
9. Dharampal, -Rediscovering India
10. Mohandas K. Gandhi, -Hind Swaraj or Indian Home Rule
11. India Wins Freedom - Maulana Abdul Kalam Azad
12. Vivekananda - Romain Rolland(English)
13. Gandhi - Romain Rolland (English)

Mapping of course outcomes with program outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1	PO1	PO1	PSO	PSO
CO1	3	2				2				2		2		
CO2	3	2				2				2		2		
CO3	3											1		
CO4	3											1		
CO5	3	2				3				2		2		

(Levels of Correlation, viz., 1-Low, 2-Moderate, 3 High)

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES::TIRUPATI(AUTONOMOUS)

Year: II

Semester: II

Branch of Study: AI & DS

COURSE CODE	COURSE TITLE	L	T	P	CREDITS
20APC3010	Computer Networks Lab (Common to : CIC, AIM, AID)	0	0	3	1.5

Course Outcomes:

CO1: Deal with Error detection/ correction techniques

CO2: Learn about Data link layer protocols

CO3: Learn about network layer protocols

CO4: Able to get knowledge about simulator

List of Experiments

1. Implementation of Error Detection / Error Correction Techniques
2. Implementation of Stop and Wait Protocol and sliding window
3. Implementation and study of Goback-N and selective repeat protocols
4. Implementation of High Level Data Link Control
5. Write a socket Program for Echo/Ping/Talk commands.
6. To create scenario and study the performance of network with CSMA / CA protocol and comparewith CSMA/CD protocols.
7. Implementation of Link state routing algorithm
8. Implement the data link layer framing methods such as character, character-stuffing and bitstuffing.
9. Write a program to compute CRC code for the polynomials CRC-12, CRC-16 and CRC CCIP
10. Develop a simple data link layer that performs the flow control using the sliding window protocol,andloss recovery using the Go-Back-N mechanism.
11. Implement Dijkstra's algorithm to compute the shortest path through a network
12. Take an example subnet of hosts and obtain a broadcast tree for the subnet.
13. Implement distance vector routing algorithm for obtaining routing tables at each node.
14. Write a program for congestion control using Leaky bucket algorithm.
15. Do the following using NS2 Simulator
 - a. NS2 Simulator-Introduction
 - b. Simulate to Find the Number of Packets Dropped
 - c. Simulate to Find the Number of Packets Dropped by TCP/UDP
 - d. Simulate to Find the Number of Packets Dropped due to Congestion
 - e. Simulate to Compare Data Rate& Throughput.
 - f. Simulate to Plot Congestion for Different Source/Destination
 - g. Simulate to Determine the Performance with respect to Transmission of Packets

Reference Books:

1. Shivendra S.Panwar, Shiwen Mao, Jeong-dong Ryoo, and Yihan Li, -TCP/IP Essentials A Lab-Based Approach, Cambridge University Press, 2004.
2. Cisco Networking Academy, -CCNA1 and CCNA2 Companion Guidell, Cisco Networking Academy Program, 3rd edition, 2003.
3. Ns Manual, Available at: <https://www.isi.edu/nsnam/ns/ns-documentation.html>, 2011.
4. Elloitte Rusty Harold, -Java Network Programming, 3rd edition, O'REILLY, 2011.

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES::TIRUPATI(AUTONOMOUS)

Year: II

Semester: I

Branch of Study: AI & DS

COURSE CODE	COURSE TITLE	L	T	P	CREDITS
20APC3012	Data warehousing and Mining Lab (Common to : CSE, CIC, AIM, AID)	0	0	3	1.5

COURSE OUTCOMES:

Upon the completion of Data warehousing and Mining practical course, the student will be able to:

CO1: Learn how to use different data mining tools.

CO2: Learn to execute data mining tasks using a data mining toolkit (Orange data mining tool kit) and visualize the results.

CO3: Understanding linear regression model in the orange environment.

CO4: Demonstrate the working of algorithms for data mining tasks such association rule mining, classification and clustering.

CO5: Demonstrate the usage of Silhouettes.

Data Mining Experiments:

Weka Programs:

1. Create data in .csv and .arff formats to import in weka
2. Perform Data Preprocessing on a sample dataset - Discretization, Dimensionality Reduction, Data Transformation, Data Normalization
3. Perform Association Rule Mining and generate top 10 rules for supermarket.arff
4. Build a tree classifier on weather data to decide on the playing conditions.
5. Build a Naïve Bayes classifier on weather data to decide on the playing conditions.
6. Evaluate the performance of a classifier in knowledge flow environment.
7. Perform Clustering on any sample dataset on different algorithms and compare the results.
8. Using Experimenter in Simple mode, compare different classifiers with respect to the results generated for iris.arff.
9. Using Experimenter in advanced mode, demonstrate how to analyze the results from an experiment and the importance of statistical significance when interpreting results.
10. Plot Multiple ROC curves on a dataset using J48 and Random Forest Classifiers.
11. Perform training and testing of Naive Bayes incrementally. The results are sent to a TextViewer and predictions are plotted by a StripChart component.
12. Demonstrate how to Access a database using WEKA tool.
13. Use Knowledge flow canvas and develop a directed graph for C4.5 execution.

Data Warehousing Experiments:

Build Data Warehouse and Explore WEKA

A. Build a Data Warehouse/Data Mart (using open source tools like Pentaho Data Integration tool, Pentaho Business Analytics; or other data warehouse tools like Microsoft-SSIS, Informatica, Business Objects, etc.).

- (i). Identify source tables and populate sample data
- (ii). Design multi-dimensional data models namely Star, snowflake and Fact constellation schemas for any one enterprise (ex. Banking, Insurance, Finance, Healthcare, Manufacturing, Automobile, etc.).
- (iii). Write ETL scripts and implement using data warehouse tools
- (iv). Perform various OLAP operations such as slice, dice, roll up, drill up and pivot (v). Explore visualization features of the tool for analysis like identifying trends etc.

B. Explore WEKA Data Mining/Machine Learning Toolkit

- (i). Downloading and/or installation of WEKA data mining toolkit,
- (ii). Understand the features of WEKA toolkit such as Explorer, Knowledge Flow interface, Experimenter, command-line interface.
- (iii). Navigate the options available in the WEKA (ex. Select attributes panel, Preprocess panel, Classify panel, Cluster panel, Associate panel and Visualize panel)
- (iv). Study the arff file format
- (v). Explore the available data sets in WEKA.
- (vi). Load a data set (ex. Weather dataset, Iris dataset, etc.)(vii). Load each dataset and observe the following:

- i. List the attribute names and their types
- ii. Number of records in each dataset
- iii. Identify the class attribute (if any)
- iv. Plot Histogram
- v. Determine the number of records for each class.
- vi. Visualize the data in various dimensions

Perform data preprocessing tasks and Demonstrate performing association rule mining on data sets

- A. Explore various options available in Weka for preprocessing data and apply (like Discretization Filters, Resample filter, etc.) on each dataset
- B. Load each dataset into Weka and run Apriori algorithm with different support and confidence values. Study the rules generated.
- C. Apply different discretization filters on numerical attributes and run the Apriori association rule algorithm. Study the rules generated. Derive interesting insights and observe the effect of discretization in the rule generation process.

Demonstrate performing classification on data sets

- A. Load each dataset into Weka and run Id3, J48 classification algorithm. Study the classifier output. Compute entropy values, Kappa statistic.
- B. Extract if-then rules from the decision tree generated by the classifier, Observe the confusion matrix and derive Accuracy, F-measure, TPrate, FPrate, Precision and Recall values. Apply cross-validation strategy with various fold levels and compare the accuracy results.
- C. Load each dataset into Weka and perform Naïve-bayes classification and k- Nearest Neighbour classification. Interpret the results obtained.
- D. Plot RoC Curves
- E. Compare classification results of ID3, J48, Naïve-Bayes and k-NN classifiers for each dataset, and deduce which classifier is performing best and poor for each dataset and justify.

Demonstrate performing clustering on data sets

- A. Load each dataset into Weka and run simple k-means clustering algorithm with different values of k (number of desired clusters). Study the clusters formed. Observe the sum of squared errors and centroids, and derive insights.
- B. Explore other clustering techniques available in Weka.
- C. Explore visualization features of Weka to visualize the clusters. Derive interesting insights and explain.

Demonstrate performing Regression on data sets

- A. Load each dataset into Weka and build Linear Regression model. Study the clusters formed. Use Training set option. Interpret the regression model and derive patterns and conclusions from the regression results.
- B. Use options cross-validation and percentage split and repeat running the Linear Regression Model. Observe the results and derive meaningful results.
- C. Explore Simple linear regression technique that only looks at one variable

Resource Sites:

1. <http://www.pentaho.com/>
2. <http://www.cs.waikato.ac.nz/ml/weka/>

Orange Programs

Datasets to be used: (but not limited to)

1. brownselected.tab
2. heartdisease.tab
3. housing.tab
4. iris.tab
5. titanic.tab
6. zoo.tab

1. Installation of Orange Data mining Tool kit in Windows/Linux environment and creating basic workflows to read, process, and visualize the data. The visualization includes data table and scatter plots. Apply the task for all the 6 datasets and compare the results.
2. Demonstrate the usage of workflows in orange tool kit using widgets. Apply the task for all the 6 datasets and compare the results.
3. Demonstrate the visualization of widgets Box plot, Linear projection, and the data distributions by reading iris and heart disease datasets. Apply the task for all the other 4 datasets and compare the results.
4. Demonstrate the visualization of widgets scatter plot, line plot, bar plot by reading iris and heart disease datasets. Apply the task for all the other 4 datasets and compare the results.
5. Data Exploration using various widgets, understanding the data distributions and saving the results as HTML or PDF, or to a file that includes all workflows that are related to the report items and which you can later open in Orange. Apply the task for all the 6 datasets and compare the results.
6. Demonstrate the usage of loading the spreadsheets from the local computer and applying Data filtering and pre-processing to the given data. Apply the task for all the 6 datasets and compare the results.
7. Loading the spreadsheets from the local computer and applying the classification model to the given data. Apply the task for all the 6 datasets and compare the results.
8. Demonstrate the usage of classification by reading heart disease data, and predict which persons have clogged arteries and visualize the results using tree viewer. Observe the information gain, information gain ratio and gini decrease measures.
9. Load a sailing.tab dataset that records the conditions under which a friend skipper went sailing, build a tree and visualize it in the Tree Viewer.

10. Demonstrate the usage of combination of classification tree viewer and scatter plot. Identify the best visualization of iris dataset, that is the one best separates the instances from different classes, then connect the tree viewer with scatter plot and visualize the results. Apply the task for all the other datasets and compare the results.

11. Apply principal component analysis on the given dataset as a pre-processing and compare the results. Apply the task for all the 6 datasets and compare the results.

12. Understanding the quality of the models by analysing the prediction results using classification accuracy. Apply the task for all the 6 datasets and compare the results.

13. Increasing the robustness of the models by splitting the dataset using cross-validation through the Test & Score widget. Apply the task for all the 6 datasets and compare the results.

References:

1. Zupan, Demsar,: Introduction to Data Mining; Introduction to Data Mining Working notes for the hands-on course with Orange Data Mining, May 2018
2. Orange Data Mining Library Documentation Release 3 – Orange Data mining

Mapping of course outcomes with program outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
CO 1														
CO 2														
CO 3														
CO 4														
CO 5														

(Levels of Correlation, viz., 1-Low, 2-Moderate, 3 High)

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES::TIRUPATI(AUTONOMOUS)

Year: II	Semester: II	Branch of Study: AI & DS			
COURSE CODE	COURSE TITLE	L	T	P	CREDITS
20APC3014	Operating Systems Lab (Common to : CSE, CIC, AIM, AID)	0	0	3	1.5

COURSE OBJECTIVES:

- To understand the design aspects of operating system
- To solve various synchronization problems

COURSE OUTCOMES:

CO1: Ensure the development of applied skills in operating systems related areas.

CO2: Able to write software routines modules or implementing various concepts of operating system.

List of Tasks

1. Practicing of Basic UNIX Commands.
2. Write programs using the following UNIX operating system calls Fork, exec, getpid, exit, wait, close, stat, opendir and readdir
3. Simulate UNIX commands like cp, ls, grep, etc.,
4. Simulate the following CPU scheduling algorithms
 - a) Round Robin b) SJF c) FCFS d) Priority
5. Simulate all file allocation strategies
 - a) Sequential b) Indexed c) Linked
6. Simulate MVT and MFT
7. Simulate all File Organization Techniques
 - a) Single level directory b) Two level c) Hierarchical d) DAG
8. Simulate Bankers Algorithm for Dead Lock Avoidance
9. Simulate Bankers Algorithm for Dead Lock Prevention
10. Simulate all page replacement algorithms
 - a) FIFO b) LRU c) LFU Etc. ...
11. Simulate Paging Technique of memory management
12. Control the number of ports opened by the operating system with
 - a) Semaphore b) monitors
13. Simulate how parent and child processes use shared memory and address space
14. Simulate sleeping barber problem
15. Simulate dining philosopher's problem
16. Simulate producer and consumer problem using threads (use java)
17. Simulate little's formula to predict next burst time of a process for SJF scheduling algorithm.
18. Develop a code to detect a cycle in wait-for graph
19. Develop a code to convert virtual address to physical address
20. Simulate how operating system allocates frame to process
21. Simulate the prediction of deadlock in operating system when all the processes announce their resource requirement in advance.

Reference Books:

1. -Operating System Concepts, Abraham Silberchatz, Peter B. Galvin, Greg Gagne, Eighth edition, John Wiley, 2018.
2. -Operating Systems: Internals and Design Principles, Stallings, Sixth Edition- 2009, Pearson Education

3. -Modern Operating Systems, Andrew S Tanenbaum, Second Edition, PHI.
4. -Operating Systems, S.Haldar, A.A.Aravind, Pearson Education.
5. -Principles of Operating Systems, B.L.Stuart, Cengage learning, India Edition.2013-2014
6. -Operating Systems, A.S.Godbole, Second Edition, TMH.
7. -An Introduction to Operating Systems, P.C.P. Bhatt, PHI.

Online Learning Resources/Virtual Labs:

<https://www.cse.iitb.ac.in/~mythili/os/>
<http://peterindia.net/OperatingSystems.html>

Mapping of course outcomes with program outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1	PO1	PO1	PSO	PSO2
CO1	2	2	2	2									2	
CO2		3	3	3									2	

(Levels of Correlation, viz., 1-Low, 2-Moderate, 3 High)

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES::TIRUPATI(AUTONOMOUS)

Year: II

Semester: II

Branch of Study: AI & DS

COURSE CODE	COURSE TITLE	L	T	P	CREDITS
20ASC3002	Server side Scripting (Common to : CSE, CIC, AIM, AID)	1	0	2	2

COURSE OBJECTIVES:

- To learn about Java, HTML , DHTML concepts.
- To know about server side programming
- To gain the Knowledge of XML and its applications

COURSE OUTCOMES:

CO1: Learn the installation guide of MYSQL,XAMPP5,APACHE and PHP

CO2: Able to design code for simple dynamic web pages

CO3: Design PHP and SQL/MySQL Integration.

CO4: Design Basic Projects

CO5: Able to provide protection to web server

UNIT-1: Getting Up and Running, PHP Language Structure

Getting Up and Running: Installation Quick Start Guide with XAMPP5 - Installing and ConfiguringMySQL - Installing and Configuring Apache - Installing and Configuring PHP -

PHP Language Structure: The Building Blocks of PHP - Flow Control Functions in PHP - Working with Functions - Working with Arrays - Working with Objects

1. Installation of XAMPP server
2. Write PHP code to print Hello World program
3. Demonstrate 8 basic data types in PHP.
4. Demonstrate the scope of variables declared in PHP code.
5. Demonstrate Arithmetic, Comparison, Logical (or Relational), Assignment and Conditional (or ternary) Operators.
6. Demonstrate if, elseif ...else and switch statements.
7. Demonstrate for, while, do – while, and for each loop.
8. Write code to create and access numeric arrays.
9. Demonstrate the usage of associative arrays.
10. Implement Multi-dimensional arrays
11. Create a multidimensional array of movies organized by genre. This should take the form of an associative array with genres as keys, such as Science Fiction, Action, Adventure, and so forth. Each of the array's elements should be an array containing movie names, such as Alien, Terminator 3, Star Wars, and so on. After creating your arrays, loop through them, printing the name of each genre and its associated movies.
12. Create a function that accepts four string variables and returns a string that contains an HTML table element, enclosing each of the variables in its own cell.
13. Create a class called baseCalc() that stores two numbers as properties. Next, create a calculate() method that prints the numbers to the browser.
14. Create classes called addCalc(), subCalc(), mulCalc(), and divCalc() that inherit functionality from baseCalc() but override the calculate() method and print appropriate totals to the browser.

UNIT -2: Getting Involved with the Code,

Working with Strings, Dates, and Time - Working with Forms - Working with Cookies and User Sessions - Working with Files and Directories - Working with Images

1. Create a feedback form that accepts a user's full name and an email address. Use case-conversion functions to capitalize the first letter of each name the user submits and print the result back to the browser. Check that the user's email address contains the @ symbol and print a warning otherwise.
2. Create an array of doubles and integers. Loop through the array, converting each element to a floating-point number with a precision of 2. Right-align the output within a field of 20 characters.

3. Create a birthday countdown script. Given form input of month, day, and year, output a message that tells the user how many days, hours, minutes, and seconds until the big day.
4. Create a calculator script that enables the user to submit two numbers and choose an operation (addition, multiplication, division, or subtraction) to perform on them.
5. Use hidden fields with the script you created in activity 1 to store and display the number of requests that the user submitted.
6. Create a script that uses session functions to track which pages in your environment the user has visited.
7. Create a new script that will list for the user all the pages he/she has visited within your environment, and when.
8. Create a form that accepts a user's first and second name. Create a script that saves this data to a file.
9. Create a script that reads the data file you created in the first activity. In addition to writing its contents to the browser (adding a tag to each line), print a summary that includes the number of lines in the file and the file's size.
10. Draw a New Image, shapes and lines.
11. Create a New Image with Color Fills.
12. Draw A Basic Pie Chart and 3D Pie Chart
13. Creating a New Image from an Existing Image.
14. Creating an Image from User Input.
15. Creating an Image with Custom Font and Text

UNIT -3: PHP with database connectivity

Understanding the Database Design Process - Learning Basic SQL Commands - Using Transactions and Stored Procedures in MySQL - Interacting with MySQL Using PHP

1. to open and close a database connection.
2. to select a database. to select a database.
3. to create a table
4. to drop a database.
5. to drop a table
6. to insert record into employee table.
7. take input using HTML Form and insert records into table.
8. to display all the records from employee table.
9. to display all the records from employee table using mysql_fetch_assoc() function.
10. to display all the records from employee table using MYSQL_NUM argument.
11. to release cursor memory at the end of SELECT statement.
12. to display 10 records per page.
13. to take user input of employee ID and update employee salary.
14. to take user input of employee ID and delete an employee record from employee table.
15. Use SELECT INTO OUTFILE query for creating table backup.

UNIT -4: Basic Projects

Managing a Simple Mailing List - Creating an Online Address Book - Creating a Simple Discussion Forum - Creating an Online Storefront - Creating a Shopping Cart Mechanism - Creating a Simple Calendar - Restricting Access to Your Applications - Logging and Monitoring Web Server Activity - Application Localization - Working with XML and JSON

1. Common Functions in an Included File
2. Subscribe and Unsubscribe with manage.php
3. Send Mail to Your List of Subscribers
4. Modify the manage.php script to display the user's email as part of the response message for any action that is taken.
5. Modify the sendmyemail.php script to add additional form fields that will correspond to section headings in the message string itself. Remember that when the form is submitted, those strings will have to be concatenated into one message string that is sent to the mail() function.

UNIT -5: Administration and Fine-Tuning

Apache Performance Tuning and Virtual Hosting - Setting Up a Secure Web Server - Optimizing and Tuning MySQL - Performing Software Upgrades - Using Application Frameworks

Text Books:

1. Sams Teach Yourself PHP, MySQL and Apache All in One, by Julie C. Meloni, Pearson Education, Inc

© 2012.

2. Beginning PHP6, Apache, MySQL Web Development, by Timothy Boronczyk, Elizabeth Naramore,

Reference Books:

1. Jason Gerner, Yann Le Scouarnec, Jeremy Stolz, Michael K. Glass, Wiley Publishing, Inc © 2009
2. PHP 6 and MySQL 6 Bible, by Steve Suehring, Tim Converse, Joyce Park, Wiley Publishing, Inc © 2009.
3. PHP & MySQL Web Development All-in-One Desk Reference For Dummies, by Janet Valade with Tricia Ballad and Bill Ballad, Wiley Publishing, Inc © 2008.

Online Learning Resources:

www.nptelvideos.com, <https://www.tutorialspoint.com/php/>

Mapping of course outcomes with program outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1	PO1	PO1	PSO	PSO
CO	1													
CO	1													
CO	1		2		2				2	1	2	3		2
CO	1													
CO	1													

(Levels of Correlation, viz., 1-Low, 2-Moderate, 3 High)