REVISED/ RECTIFIED

(6th SEMESTER)

Course		Contact Hrs.			Marks			Credits
Code	**Name**	**L**	**T**	**P**	**Int.**	**Ext.**	**Total**	
BCSES1-601	Software Engineering	3	0	0	40	60	100	3
BCSES1-602	Computer Networks	3	1	0	40	60	100	4
BCSES1-603	Computer Network Laboratory	0	0	2	60	40	100	1
BCSES1-604	***Project-I	0	0	4	60	40	100	2
	Departmental Elective-II (Select any One)	3	0	0	40	60	100	3
BCSED1-611	Mobile Application Development							
BCSED1-612	Machine Learning							
BCSED1-613	Distributed Systems							
BCSED1-614	Signals and Systems							
	Departmental Elective-III (Select any One)	3	0	0	40	60	100	3
BCSED1-621	Data Mining							
BCSED1-622	Cloud Computing							
BCSED1-623	Parallel Processing							
BCSED1-624	Embedded Systems							
XXXX	**Open Elective****	3	0	0	40	60	100	3
Total 5 Theory &2 Lab. Courses		**-**	**-**	**-**	**320**	**380**	**700**	**19**

**** Open Elective Subject may be chosen from the list of open elective offered by other departments of university**

****Project work, seminar and internship in industry or at appropriate work place**

REVISED/ RECTIFIED

(7thSEMESTER)

Course		Contact Hrs.			Marks			Credits
Code	**Name**	**L**	**T**	**P**	**Int.**	**Ext.**	**Total**	
BCSES1-701	*Project-II	0	0	4	60	40	100	2
BCSES1-702	***Training-III	-	-	-	60	40	100	4
	Departmental Elective-IV	3	0	0	40	60	100	3
BCSED1-711	Distributed Operating System							
BCSED1712	Soft Computing							
BCSED1-713	Human Computer Interaction							
BCSED1-714	Ad-hoc & Sensor Networks							
	Departmental Elective-V	3	0	0	40	60	100	3
BCSED1-721	Bioinformatics							
BCSED1-722	Image processing							
BCSED1-723	Cryptography & Network Security							
BCSED1-724	Artificial Intelligence							
XXXX	**Open Elective***	3	0	0	40	60	100	3
BMNCC0-002	Environmental Sciences	2	0	0	100	00	100	0
Total		**-**	**-**	**-**	**340**	**260**	**600**	**15**

*Open Elective Subjects may also be chosen from the list of Open Electives-I, II and III offered by other departments of university.

****Continued from VII Semester, Project work, seminar and internship in industry or at appropriate work place

****During the summer vacation after 6th semester.

(8th SEMESTER)

Course		Contact Hrs.			Marks			Credits
Code	**Name**	**L**	**T**	**P**	**Int.**	**Ext.**	**Total**	
BCSES1-801	Project-III**	0	0	10	60	40	100	5
	Departmental Elective-VI	3	0	0	40	60	100	3
BCSED1-811	Enterprise Resource Planning							
BCSED1-812	Internet of things							
BCSED1-813	Advanced Database Management Systems							
BCSED1-814	Software Project Management							
XXXX	**Open Elective***	3	0	0	40	60	100	3
XXXX	**Open Elective***	3	0	0	40	60	100	3
	Mandatory Courses- noncredit***	2	0	0	100	00	100	0
BMNCC0-001	Constitution of India							
BMNCC0-006	Essence of Indian Knowledge Tradition							
Total		**-**	**-**	**-**	**280**	**220**	**500**	**14**

***Open Elective Subjects may also be chosen from the list of Open Electives-I, II and III offered by other departments of university.**

****Project III to be made by student during the semester.**

*****choose any one subject from mandatory Courses.**

DISTRIBUTED OPERATING SYSTEMS

Subject Code- BCSED1-711 **L T P C** **Duration – 45Hrs**
3 0 0 3

COURSE OBJECTIVE:

This course will help to understand the concepts of distributed operating systems.

COURSE OUTCOMES:

1. To learn architecture of distributed operating systems.
2. To learn resource management.
3. To learn distributed OS implementation.
4. To learn multiprocessor system.

COURSE CONTENTS:

UNIT I (12 Hrs)

Distributed operating system: Architectures, Issues in Distributed operating systems, Limitations of Distributed Systems, Lampert's logical clock, Global states, Chandy-Lampert's global state recording algorithm,Basic concepts of Distributed Mutual Exclusion ,Lampert's Algorithm, Ricart-Agrawala Algorithm; Basic concepts of Distributed deadlock detection, Distributed File system, Architecture, Design issues, SUN Network File system Basic concepts of Distributed shared memory, Basic concepts of Distributed Scheduling, Load balancing, Load sharing.

UNIT II (10 Hrs)

Distributed Resource Management: Distributed File systems, Architecture, Mechanisms, Design Issues, Distributed Shared Memory, Architecture, Algorithm, Protocols - Design Issues. Distributed Scheduling, Issues, Components, Algorithms.

UNIT III (12 Hrs)

Distributed OS Implementation: Models, Naming, Process migration, Remote Procedure Calls. Failure Recovery and Fault Tolerance: Basic Concepts-Classification of Failures, Basic

Approaches to Recovery; Recovery in Concurrent System; Synchronous and Asynchronous Checkpointing and Recovery; Check pointing in Distributed Database Systems; Fault Tolerance; Issues - Two-phase and Nonblocking Commit Protocols; Voting Protocols; Dynamic Voting Protocols

UNIT IV (11 Hrs)

Multiprocessor System: Definition, Classification, Multiprocessor Interconnections, Types, Multiprocessor OS functions & requirements; Design & Implementation Issue; Introduction to parallel programming; Multiprocessor Synchronization.

RECOMMENDED BOOKS

1. OperatingSystemsConcepts &design-MilanMilenkovic,TMH
2. OperatingSystem- H.M. Deitel,Pearsons.
3. Mukesh Singhal and N. G. Shivaratri, "Advanced Concepts in Operating Systems", McGraw- Hill, 2000
4. Abraham Silberschatz, Peter B. Galvin, G. Gagne, "Operating System Concepts", Sixth Addison n Wesley Publishing Co., 2003.
5. Andrew S. Tanenbaum, "Modern Operating Systems", Second Edition, Addison Wesley, 2001.

SOFT COMPUTING

Subject Code- BCSED1-712 **L T P C** **Duration – 45Hrs**
3 0 0 3

COURSE OBJECTIVE:

1. To introduce soft computing concepts and techniques and foster their abilities in designing appropriate technique for a given scenario.
2. To implement soft computing based solutions for real-world problems.

COURSE OUTCOMES:

1. Identify and describe soft computing techniques and their roles in building intelligent machines
2. To have knowledge of neural networks-I
3.To have knowledge of neural networks-II.
4. To learn the concepts of genetic algorithms.

COURSE CONTENTS:

UNIT-I (12 Hrs)

Introduction to Soft Computing and Neural Networks: Introduction to soft computing, soft computing constituents, difference between soft computing and hard computing,Applications of Soft Computing.

Fuzzy Logic: Basic Concepts, Fuzzy Sets and Operations, Properties of Fuzzy Sets, Fuzzy Relations, Membership Functions, Fuzzy Rules and Fuzzy Reasoning, Fuzzy Inference Systems, Defuzzification methods, Industrial applications.

UNIT-II (10 Hrs)

Neural Networks-I: (Introduction & Architecture): Biological Neuron, Machine Learning Using Neural Network, Artificial Neuron and its model, activation functions, Supervised, unsupervised and reinforcement Learning, feedforward networks and feedback networks, learning rules – Hebbian, Delta, Perceptron learning and Windrow-Hoff,winner-take-all.

UNIT-III (12 Hrs.)

Neural Networks-II: Supervised learning- Perceptron learning, single layer/multilayer perceptron, linear separability, hidden layers, back propagation algorithm, Radial Basis Function network; Unsupervised learning - Kohonen, SOM, k-means clustering, Adaptive Resonance Theory (ART), Application of neural networks.

UNIT-IV (11 Hrs)

Genetic Algorithms: Concept of Introduction to Genetic Algorithms (GA),GA operators: Encoding, Crossover, Selection, Mutation, Fitness function, population, Simple GA (SGA), other types of GA,Applications of GA .

Recommended Books:

1. Jyh: Shing Roger Jang, Chuen:Tsai Sun, EijiMizutani, 'Neuro: Fuzzy and Soft Computing17', Prentice-Hall of India, 2003.
2. George J. Klir and Bo Yuan, 'Fuzzy Sets and Fuzzy Logic: Theory and Applications17', Prentice Hall, 1995. 3. MATLAB Toolkit Manual.

HUMAN COMPUTER INTERACTION

Subject Code- BCSED1-713 **L T P C** **Duration – 45 Hrs.**
3 0 0 3

COURSE OBJECTIVE:

1. Describe and apply core theories, models and methodologies from the field of HCI
2. Discuss current research in the field of HCI

COURSE OUTCOMES:

1. To have knowledge of task centred systems design.
2. Understand the fundamental aspects of designing and evaluating interfaces
3. To understand different design principles.
4. To learn different HCI design standards.

COURSE CONTENTS:

UNIT-I (11 Hrs)

Introduction, Task-centred system design, User-centred design and prototyping: Human-Computer Interaction. Task-centred system design: Task-centered process, development of task examples, evaluation of designs through a task-centered walk-through.

User-centred design and prototyping: Assumptions, participatory design, methods for involving the user, prototyping, low fidelity prototypes, medium fidelity

UNIT-II (12 Hrs)

Methods for evaluation of interfaces with users and Psychology of everyday things: Goals of evaluation, approaches, ethics, introspection, extracting the conceptual model, direct observation, constructive interaction, interviews and questionnaires, continuous evaluation via user feedback and field studies, choosing an evaluation method.

Psychology of everyday things: Psychopathology of everyday things, examples, concepts for designing everyday things. Beyond screen design: characteristics of good representations, information visualization, Tufte's guidelines, visual variables, metaphors, direct manipulation

UNIT-III (11 Hrs)

Graphical screen design, Design principles and usability heuristics: Graphical design concepts, components of visible language, graphical design by grids. Design principles and usability heuristics: Design principles, principles to support usability, golden rules and heuristics, HCI patterns

UNIT-IV (11 Hrs)

HCI design standards, Past and future of HCI: Process-oriented standards, product-oriented standards, strengths and limitations of HCI Standards. Past and future of HCI: The past, present and future, perceptual interfaces, context-awareness and perception

Recommended Books:

1. Dix A., Finlay J., Abowd G. D. and Beale R., Human Computer Interaction, Pearson Education, 3rd edition, 2005.
2. Preece J., Rogers Y., Sharp H., Baniyon D., Holland S. and Carey T. Human Computer Interaction, Addison Wesley, 1st edition, 1994.

Ad-hoc and SENSOR NETWORKS

Subject Code- BCSED1-714 **L T P C** **3 0 0 3** **Duration – 45Hrs**

COURSE OBJECTIVE:

This course will help to learn the concepts of ad-hoc and sensor networks.

COURSE OUTCOMES:

1. To be able to learn wireless technologies.
2. To be able to learn different protocols for ad-hoc networks.
3. To learn different routing algorithms used for ad-hoc networks.
4. To learn how to synchronize network nodes.

COURSE CONTENTS:

UNIT I (12 Hrs)

Introduction: Elements of Ad hoc Wireless Networks, Issues in Ad hoc wireless networks, Example commercial applications of Ad hoc networking. Cellular architecture, co-channel interference, frequency reuse,capacity increase by cell splitting, handoff, types of handoffs, Mobile IP, Cellular IP.

Introduction to Wireless sensor networks, Single-sink single-hop WSN, Single-sink multi-hop WSN, Multi-sink multi-hop WSN, Advantages of ad-hoc/sensor networks,Node and Network Architectures of WSN.

UNIT-II (12 Hrs)

MAC protocols for Ad hoc Networks: Design issues, Classifications, Contention based protocols, MACAW, FAMA, BTMA, DBTMA, MACABI, Real-Time MAC protocol, Multichannel protocols, Power aware MAC

MAC protocols in WSN: Scheduled protocols, LEACH IEEE 802.15.4 MACprotocol, Guo protocol, TRAMA protocol, Contention-based protocols, Zhong protocol, DMAC protocol, PAMAS protocol, SMAC protocol.

UNIT-III (09 Hrs)

Routing protocols in Ad hoc Networks: Design issues, Table-driven protocols - DSDV, WRP, CGSR, On-Demand protocols - DSR, AODV, TORA, LAR, ABR, Zone Routing Protocol, ZRP, ZHLS, Power Aware Routing protocols.

UNIT-IV (12 Hrs)

Routing protocols in WSN: Issues in designing routing protocols, Classification of routing protocols, Flat routing, Flooding and gossiping, SPIN protocol, PEGASIS protocol, TEEN protocol, MECN protocol, SPAN protocol, Location-based routing protocols, GAF protocol, GEAR protocol,

Introduction to Technologies for WSNs: ZigBee technology, Ultrawide bandwidth technology, Bluetooth technology, Comparison among technologies.

RECOMMENDED BOOKS:

1. Roberto Verdone, Davide Dardari, Gianluca Mazzini and Andrea Conti, "Wireless Sensor and Actuator Networks: Technologies, Analysis and Design", Academic Press, 2008.
2. Miguel A. Labrador and Pedro M. Wightman, "Topology Control in Wireless Sensor Networks-with a companion simulation tool for teaching and research", Springer Science, 2009.
3. Edgar H. Callaway, "Wireless Sensor Networks: Architectures and Protocols", CRC Press, 2004.
4. Xian-Yang Li, "Wireless Ad Hoc and Sensor Networks: Theory and Applications", Cambridge University Press 2008.
5. Feng Zhao and Leonidas J. Guibas, "Wireless Sensor Networks: An Information Processing Approach", Morgan Kaufmann Publishers, 2008.
6. C. Siva Ram Murthy and B. S. Manoj, 'Ad Hoc Wireless Networks: Architectures and Protocols', Pearson Education, 2007.
7. C.K. Toh, 'Ad Hoc Mobile Wireless Networks: Protocols and Systems', Pearson Education, 2007.

BIOINFORMATICS

Subject Code- BCSED1-721 **L T P C** **Duration – 45Hrs**
3 0 0 3

COURSE OBJECTIVE:

The main objective of this course is to make student able to understand the basic concepts of bioinformatics and also give knowledge about the algorithms used in bioinformatics.

COURSE OUTCOMES:

1. To learn basic concepts of bioinformatics.
2. To learn different motif models.
3. To learn the concept of genomics.
4. To analyse DNA data.

COURSE CONTENTS:

UNIT- I (12 Hrs)

Introduction: Sequence similarity, homology, and alignment.

Pairwise alignment: scoring model, dynamic programming algorithms, heuristic alignment, and pairwise alignment using Hidden Markov Models.

UNIT – II (12 Hrs)

Multiple alignment: scoring model, local alignment gapped and ungapped global alignment.

Motif finding: motif models, finding occurrence of known sites, discovering new sites.

UNIT – III (09 Hrs)

Genomicsand Structural Genomics: Genes, genomes, Gene cloning, mapping and DNA sequencing.

UNIT – IV (12 Hrs)

Analysis of DNA microarray data: using hierarchical clustering, model-based clustering, expectation-maximization clustering, Bayesian model selection.

RECOMMENDED BOOKS:

1. Matthias Dehmer, Frank Emmert-Streib, Analysis of Microarray Data: A Network-Based Approach.
2. JinXiong, Essential Bioinformatics.
3. Teresa Attwood, David Parry-Smith, Introduction to Bioinformatics.
4. Pierre Baldi, G. Wesley Hatfield, DNA Microarrays and Gene Expression: From Experiments to Data Analysis and Modelling.

IMAGE PROCESSING

Subject Code- BCSED1-722 **L T P C** **Duration – 45Hrs**
3 0 0 3

COURSE OBJECTIVE:
This course will help to understand the different techniques used for image processing.

COURSE OUTCOMES:
1. To give introduction of image processing.
2. To understand image enhancement.
3. To have knowledge of image Compression Redundancy models
4. To have knowledge of Image Segmentation.

Unit-I (14 Hrs)

Digital Image Fundamentals: Simple image model, sampling and quantization, imaging geometry, digital geometry, different types of digital images, image formation, Elements of Storage, Relationships between pixels-neighbours of pixel, application of image Processing.
Bilevel Image Processing: Digital distance, distance transform, medial axis transform, component labeling, thinning, morphological processing, extension to grey scale morphology.

Unit-II (12 Hrs)

Image Enhancement: Point processing, spatial filtering, frequency domain methods, multi-spectral image enhancement, image restoration.
Color Image Processing: Color representation, laws of color matching, chromaticity diagram, color enhancement, color image segmentation, color edge detection.

Unit-III (09 Hrs)

Image Compression Redundancy models, error free compression, Lossy compression, Image compression standards.

Unit-IV (10 Hrs)

Image Segmentation Detection of Discontinuity, Edge detection, Boundary detection, Thresholding, Regional oriented segmentation, use of motion in segmentation.

RECOMMENDED BOOKS:

1. Digital Image Processing - by Rafact Gonzalez and Richard E. Woods, Pearson Education Society.
2. Digital Image Processing - by Keenneth R Castleman, Pearson Education Society.
3. A. K. Jain, ―Fundamental of Digital Image Processing‖, PHI

CRYPTOGRAPHY & NETWORK SECURITY

Subject Code- BCSED1-723 **L T P C** **Duration – 45Hrs**
3 0 0 3

COURSE OBJECTIVE:

The main objective of this course is to make student able to understand the basic concepts, services, threats and principles in network security, various security services and mechanisms in the network protocol stack.

COURSE OUTCOMES:

1. To understand security trends.
2. To implement various cryptographic algorithms.
3. To implement public key cryptography.
4. To implement IP Security.

COURSE CONTENTS:

UNIT-I (12 Hrs)

Security trends, Attacks and services, Classical crypto systems, Different types of ciphers, LFSR sequences, Basic Number theory, Congruence, Chinese Remainder theorem, Modular exponentiation, Fermat and Euler's theorem, Legendre and Jacobi symbols, Finite fields, continued fractions.

UNIT-II (09 Hrs)

Simple DES, Differential crypto analysis, DES – Modes of operation, Triple DES, AES, RC4, RSA, Attacks – Primality test – factoring.

UNIT-III (12 Hrs)

Discrete Logarithms, Computing discrete logs, Diffie-Hellman key exchange, ElGamal Public key cryptosystems, Hash functions, Secure Hash, Birthday attacks, MD5, Digital signatures, RSA, ElGamal DSA.

UNIT-IV (12 Hrs)

Authentication applications – Kerberos, X.509, PKI – Electronic Mail security – PGP, S/MIME – IP security – Web Security – SSL, TLS, SET. Intruders, Malicious software, viruses and related threats, Firewalls, Security Standards.

RECOMMENDED BOOKS:

1. Wade Trappe, Lawrence C Washington, 'Introduction to Cryptography with Coding Theory', 2nd Edn., Pearson, **2007**.

2. William Stallings, 'Cryptography and Network Security Principles and Practices', 4th Edn., Pearson/PHI, **2006**.
3. W. Mao, 'Modern Cryptography – Theory and Practice', 2nd Edn., Pearson Education, **2007**.
4. Charles P. Pfleeger, Shari Lawrence Pfleeger, 'Security in Computing', 3rd Edn., Prentice Hall of India, **2006**.
5. Behrouz Forouzan, 'Cryptography & Network Security', 2nd Edn., McGraw-Hill, **2011.**

ARTIFICIAL INTELLIGENCE

Subject Code- BCSED1-724 **L T P C** **Duration – 45Hrs**
3 0 0 3

COURSE OBJECTIVE:

1. Introduce the basic principles in artificial intelligence research.
2. Explore Areas of application such as knowledge representation, natural language processing, expert systems, vision and robotics.

COURSE OUTCOMES:

1. Understand the concept of Artificial intelligence, problem solving and various types of search strategies.
2. Understand the concept of Knowledge base, knowledge representation, AI languages & tools and various planning techniques.
3. Identify uncertainty and understand fuzzy logic concept to handle uncertainty.
4. Understand the COURSE of AI agents and various COURSE methods it also includes neural network and includes the communication of AI agents and natural language processing.

COURSE CONTENTS:

UNIT-I (12 Hrs)

Introduction: History of AI - Intelligent agents – AI and Applications - Problem spaces and search - Heuristic Search techniques – Best-first search – Informal search strategies-A* algorithm, Iterative deepening A*(IDA), small memory A*(SMA). Game Playing: Minimax search procedure - Adding alpha-beta cutoffs

UNIT-II (12 Hrs)

Knowledge Representation: Approaches and issues in knowledge representation Knowledge - Based Agent- Propositional Logic – Predicate logic –Reasoning, AI languages Prolog, Lisp.

UNIT-III (09 Hrs)

Reasoning under uncertainty: Implementation- Basic probability notation - Bayes rule – Certainty factors and rule based systems - Bayesian networks, Fuzzy Logic.

UNIT IV (12 Hrs)

Planning and COURSE: Basic representation of plans - conditional planning - Multi-Agent planning. Forms of COURSE - inductive COURSE - Reinforcement COURSE - COURSE decision trees - Neural Networks. Communication: Natural language processing, Formal Grammar, Parsing

RECOMMENDED BOOKS:

1. Elaine Rich, Kevin Knight and Shivashankar B.Nair, 'Artificial Intelligence', 3rd Edn., Tata McGraw-Hill, **2009**.

2. Stuart J. Russell and Peter Norvig, 'Artificial Intelligence: A Modern Approach', Pearson Education Asia, 2nd Edn., **2003**.
3. N.P. Padhy, 'Artificial Intelligence and Intelligent System', Oxford University Press, 2nd Edn., **2005**.
4. Rajendra Akerkar, 'Introduction to Artificial Intelligence', Prentice-Hall of India, **2005**.
5. Patrick Henry Winston, 'Artificial Intelligence', Pearson Education Inc., 3rd Edn., **2001**.
6. Eugene Charniak and Drew Mc Dermott, 'Introduction to Artificial Intelligence', Addison-Wesley, ISE Reprint, **1998**.
7. Nils J. Nilsson, 'Artificial Intelligence - A New Synthesis', Harcourt Asia Pvt. Ltd., Morgan Kaufmann, **1988**.

ENVIRONMENTAL SCIENCES

Subject Code: BMNCC0-002 **L T P C** **Duration: 30 Hrs.**

2 0 0 0

Course Objectives:

1. To identify global environmental problems arising due to various engineering/industrial and technological activities and the science behind these problems
2. To realize the importance of ecosystem and biodiversity for maintaining ecological balance.
3. To identify the major pollutants and abatement devices for environmental management and sustainable development.
4. To estimate the current world population scenario and thus calculating the economic growth, energy requirement and demand.
5. To understand the conceptual process related with the various climatologically associated problems and their plausible solutions.

. UNIT-I

1. The Multidisciplinary Nature of Environmental Studies:

Definition, scope and importance, Need for public awareness.

2. **Natural Resources**

Renewable and Non-renewable Resources: Natural resources and associated problems.

(a) Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people.

(b) Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.

(c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies.

(d) Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.

(e) Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources, case studies.

UNIT-II

Environmental Pollution: Definition

(a) Causes, effects and control measures of:

i) Air pollution

ii) Water pollution

iii) Soil pollution

iv) Marine pollution

v) Noise pollution

vi) Thermal pollution

vii) Nuclear pollution

(b) **Solid Waste Management**: Causes, effects and control measures of urban and industrial wastes.

(c) Role of an individual in prevention of pollution.

(d) Pollution Case Studies.

(e) Disaster management: floods, earthquake, cyclone and landslides.

UNIT-III

Social Issues and the Environment

(a) From unsustainable to sustainable development

(b) Urban problems and related to energy

(c) Water conservation, rain water harvesting, Watershed Management

(d) Resettlement and rehabilitation of people; its problems and concerns, Case studies.

(e) Environmental ethics: Issues and possible solutions

(f) Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, Case studies.

(g) Issues involved in enforcement of environmental legislation

UNIT-IV

Human Population and the Environment

(a) Population growth, variation among nations

(b) Population explosion – Family Welfare Programmes

(c) Environment and human health

(d) Human Rights

(e) Value Education

(f) Women and Child Welfare

(g) Role of Information Technology in Environment and Human Health

(h) Case Studies.

Environmental Science related activities:

We as human being are not an entity separate from the environment around us rather we are a constituent seamlessly integrated and co-exist with the environment around US. We are not an entity so separate from the environment that we can think of mastering and controlling it rather we must understand that each and every action of ours reflects on the environment and vice versa. Ancient wisdom drawn from Vedas about environment and its sustenance reflects these ethoses. There is a direct application of this wisdom even in modern times. Idea of an activity based course on environment protection is to sensitize the students on the above issues through following two types of activities.

(a) Awareness Activities:

i) Small group meetings about water management, promotion of recycle use, generation of less waste, avoiding electricity waste.

ii) Slogan making event

iii) Poster making event

iv) Cycle rally

v) Lectures from experts.

(b) Actual Activities:

i) Plantation

ii) Gifting a tree to see its full growth

iii) Cleanliness drive

iv) Drive for segregation of waste

v) To live some big environmentalist for a week or so to understand his work

vi) To work in kitchen garden for mess

vii) To know about the different varieties of plants

viii) Shutting down the fans and ACs of the campus for an hour or so

Recommended Books

1. Agarwal, K. C. 2001 Environment Biology, Nidi Publ. Ltd. Bikaner.
2. Jadhav, H & Bhosale, V.M. 1995. Environment Protection and Laws. Himalaya Pub House, Delhi 284p.
3. Rao M. N. & Datta A.K. 1987. Waste Water Treatment. Oxford & IBH Publ. Co. Pvt. Ltd. 345 p.
4. Principle of Environment Science by Cunninghan, W.P.
5. Essentials of Environment Science by Joseph.

ENTERPRISE RESOURCE PLANNING

Subject Code- BCSED1-811 **L T P C** **Duration – 45Hrs**
3 0 0 3

COURSE OBJECTIVE:
The course has all the required contents that are necessary for a graduate to understand the different strategies of an organization.

COURSE OUTCOMES:
1. To understand the concepts of ERP and its related technologies.
2. To understand the implementation of ERP in an organization.
3. To have a deep understanding of different business modules of an organization.
4. To have a basic understanding of applications of ERP and various ERP software's.

COURSE CONTENTS:

UNIT-I (12 Hrs)

ERP AND TECHNOLOGY: Introduction, Related Technologies, Business Intelligence, E-Commerce and E-Business, Business Process Reengineering, Data Warehousing, Data Mining, OLAP, Product life Cycle management, SCM, CRM

UNIT II (12 Hrs)

ERP IMPLEMENTATION: Implementation Challenges, Strategies, Life Cycle, Methodologies Package selection, Project Teams, Vendors and Consultants, Data Migration, Project management

UNIT-III (12 Hrs)

ERP IN ACTION & BUSINESS MODULES: Operation and Maintenance, Business Modules, Finance, Manufacturing, Human Resources, Plant maintenance, Materials Management, Quality management, Marketing, Sales, Distribution and service.

UNIT-IV (09 Hrs)

ERP Application: Enterprise Application Integration, ERP II, Total quality management
ERP CASE STUDY: SAP AG, JD Edwards.

RECOMMENDED BOOKS:

1. Alexis Leon, 'ERP DEMYSTIFIED', 2nd Edn., Tata McGraw Hill, **2008**.
2. Mary Sumner, 'Enterprise Resource Planning', Pearson Education, **2007**.
3. Jim Mazzullo, 'SAP R/3 for Everyone', 2nd Edn., Pearson, **2007**.
4. Jose Antonio Fernandz, 'The SAP R /3 Handbook', Tata McGraw Hill, **2000**.
5. Biao Fu, 'SAP BW: A Step-by-Step Guide', 1st Edn., Pearson Education, **2003**.

INTERNET OF THINGS

Subject Code- BCSED1-812 **L T P C** **Duration – 45Hrs.**
3 0 0 3

COURSE OBJECTIVE:
The purpose of this course is to impart knowledge on IoT Architecture and various protocols, study their implementations

COURSE OUTCOMES:
1. To Understand the Architectural Overview of IoT

2. To Understand Raspberry.
3. To Understand the various IoT Protocols (Datalink, Network)
4. To understand sensor applications.

COURSE CONTENTS:

UNIT I (12 hours)

OVERVIEW: Introduction to IOT, how does it work? Difference between Embedded device and IoT device, Properties of IoT device, IoT Ecosystem, IoT Decision Framework, IoT Solution Architecture Models, Major IoT Boards in Market , Privacy issues in IOT

UNIT II (11 hours)

Setting Up Raspberry Pi/Arduino to Create Solutions Explore Raspberry Pi, setting up Raspberry Pi, showing working of Raspberry Pi using Secure Shell (SSH) Client and Team Viewer, Understand Sensing actions, Understand Actuators and Micro electromechanical Systems (MEMS).

UNIT III (12 hours)

IOT DATA LINK LAYER & NETWORK LAYER PROTOCOLS: Communication Protocols used in IoT Types of wireless communication, Major wireless Short-range communication devices, properties, comparison of these devices (Bluetooth, Wireless Fidelity(WiFi), ZigBee, Low-power Wireless Personal Area Network(6LoWPAN)), Major wireless Long-range communication devices, properties, comparison of these devices (Cellular IoT, Low-Power Wide-Area Network(LPWAN))

UNIT IV (10hours)

Sensors Applications of various sensors: Google Maps, Waze, WhatsApp, Ola Positioning sensors: encoders and accelerometers, Image sensors: cameras Global positioning sensors: Global Positioning System (GPS), Global Navigation Satellite System (GLONASS), Indian Regional Navigation Satellite System (IRNSS).

RECOMMENDED BOOKS:

1. Vijay Madisetti and ArshdeepBahga, “Internet of Things (A Hands-onApproach)”, 1 st Edition, VPT, 2014.
2. Peter Waher, “Learning Internet of Things”, PACKT publishing, BIRMINGHAM – MUMBAI
3. Bernd Scholz-Reiter, Florian Michahelles, “Architecting the Internet of Things”, ISBN 978-3-642-19156-5 e-ISBN 978-3-642-19157-2, Springer
4. Daniel Minoli, “Building the Internet of Things with IPv6 and MIPv6: The Evolving World of M2M Communications”, ISBN: 978-1-118-47347-4, Willy Publications

ADVANCED DATABASE MANAGEMENT SYSTEMS

Subject Code- BCSED1-813 **L T P C** **Duration – 45Hrs.**
3 0 0 3

COURSE OBJECTIVE:

This course helps to understand the advance concepts used in database management systems.

COURSE OUTCOMES:

1. To be able to use different database analyse techniques.

2. To learn about query compiler.
3. To learn different distributed database models.
4. To learn emerging models and techniques in databases.

COURSE CONTENTS:

UNIT I (12 Hrs)

DataBase Analysis and Design Techniques: Review of basic Database Concepts, Database Design Methodologies. ER Modelling: Specialization, Generalization, Aggregation. Advanced Transaction Processing and Concurrency Control: Transaction **Concepts, Concurrency Control:** Locking Methods, Timestamping Methods, Optimistic Methods for Concurrency Control, Concurrency Control in Distributed Systems.

UNIT II (12 Hrs)

Introduction to PL/SQL: Introduction to PL/ SQL, cursors triggers

Operations: Query Evaluation: Introduction, Approaches to QE, Transformation of relational expressions in Query optimization, selection, project heuristic optimization, cost estimation for various operations, transformation rule.

UNIT III (12 Hrs)

Distributed Database, Centralized DBMS and Distributed DBMS, functions and architecture of a DDBMS, Distributed Data Storage, Transparency issues in DDBMS, Query Processing DDBMS, Distributed transaction Management and Protocols, Distributed Concurrency Control. Object Oriented Database Data Definition, ODBMS Fundamentals, issues in OODBMS, OODBMS systems.

UNIT IV (09Hrs)

Emerging Database Models, Technologies and Applications, Multimedia database-Emergence, difference from other data types, structure, deductive databases, GIS and spatial databases, Knowledge database, introduction to Digital libraries, web databases.

RECOMMENDED BOOKS:

1. Advanced database management system by RiniChkrabarti and ShibhadraDasgupta, Dreamtech.
2. Distributed Databases by Ozsu and Valduriez ,Pearson Education.
3. Fundamentals of Database Systems by RamezElmasri, ShamkantNavathe, Pearson Education
4. Database System Concepts by Abraham Silberschatz, Henry F. Korth, S. Sudarshan, Tata McGraw-Hill.

SOFTWARE PROJECT MANAGEMENT

Subject Code- BCSED1-814 **L T P C** **Duration – 45Hrs.**
3 0 0 3

COURSE OBJECTIVE:

It gives an in depth knowledge of software project management and project planning. It also covers the Step Wise framework in project planning

COURSE OUTCOMES:

1. Apply the basics of Software Project Management in order to manage and deliver qualified product and plan the activities within time schedules with CPM and PERT Analysis.
2. For managing the quality of product and managing the risk involved
3. Managing team and measuring and tracking the planning
4. To learn Configuration management and project monitoring and control

COURSE CONTENTS:

UNIT-I (12 Hrs)

Project Planning: Characteristics of a software project, Software scope and feasibility, resources, the SPM plan.

Software Project Estimation: Size/scope estimation, Decomposition techniques, WBS. Effort estimation: Sizing, Function point, LOC, FP vs LOC. Schedule estimation: GANTT Charts, Activity networks, PERT/CPM networks. Cost estimation: Models: COCOMO-I, COCOMO-II.

UNIT-II (12 Hrs)

Quality Planning: Quality control, Quality assurance, Formal Technical Reviews, The SQA Plan, ISO and CMM standards.

Risk Management: Reactive vs proactive Risk strategies, Risk projection, Risk Refinement, Risk Monitoring, Monitoring and management, RMMM plan.

UNIT-III (12 Hrs)

Measurement and Tracking Planning: Earned Value Analysis.

Team Management: Team structures: hierarchical, Egoless, chief programmer, mixed; Team software Process; Resource levelling, Building a team: Skill sets.

UNIT-IV (09 Hrs)

Configuration Management: Baselines, Configurable items, SCM repository, SCM process, version control change control, configuration audit**.**

Project Monitoring and Control: Audits and Reviews.

RECOMMENDED BOOKS:

1. Bob Hughes and Mike Cotterell, 'Software Project Management', 5th Edn., Tata McGraw Hill, **2009.**

2. Roger Pressman, 'A Practitioner's Guide to Software Engineering', 8th Edn., Tata McGraw Hill, **2014.**

3. 'Head First PMP: A Brain Friendly Guide to Passing the Project Management Professional Exam', **2013.**

CONSTITUTION OF INDIA

Subject Code- BMNCC0-001

L	T	P	C
2	0	0	0

COURSE OBJECTIVE:

The student will be able to learn different perspectives of constitution of India.

COURSE OUTCOMES:

1. To learn the meaning and historical perspective of law.
2. To have deep knowledge of fundamental rights.
3. To learn different policies implemented by Constitution of India.
4. To learn Article 19 and 21.

COURSE CONTENTS:

1. Meaning of the constitution law constitutionalism.
2. Historical perspective of the Constitution of India.
3. Salient features and characteristics of the Constitution of India.
4. Scheme of the fundamental rights.
5. The scheme of fundamental duties and its legal status.
6. The Directive principles of State Policy – Its importance and implementation.

7. Federal structure and distribution of legislative and financial powers between the Union and states.
8. Parliamentary form of Government of India- The Constitution powers and status of the President of India.
9. Amendment of Constitutional Powers and Procedure.
10. The historical perspectives of constitutional amendments in India.
11. Emergency Provisions: National Emergency, President Rule, financial emergency.
12. Local Self Government- Constitutional Scheme in India.
13. Scheme of Fundamental Right to Equality.
14. Scheme of the Fundamental Right to certain Freedom under Article 19
15. Scope of the Right to Life and Personal Liberty under Article 21

ESSENCE OF INDIAN KNOWLEDGE TRADITION

Subject Code- BMNCC0-006 **L T P C**
2 0 0 0

COURSE OBJECTIVE:
The course is introduced
1. To get a knowledge in Indian Philosophical Foundations.
2. To Know Indian Languages and Literature and the fine arts in India & Their Philosophy.
3. To explore the Science and Scientists of Medieval and Modern India

COURSE OUTCOMES:
After successful completion of the course the students will be able to
1. Understand philosophy of Indian culture.
2. Distinguish the Indian languages and literature among difference traditions.
3. Learn the philosophy of ancient, medieval and modern India.
4. Acquire the information about the fine arts in India.
5. Know the contribution of scientists of different eras.
6. The essence of Yogic Science for Inclusiveness of society.

COURSE CONTENTS:

UNIT – I

Introduction to Indian Philosophy: Basics of Indian Philosophy, culture, civilization, culture and heritage, general characteristics of culture, importance of culture in human literature, Indian culture, Ancient Indian, Medieval India, Modern India.

Indian Philosophy & Literature: Vedas Upanishads, schools of Vedanta, and other religion Philosophical Literature. Philosophical Ideas the role of Sanskrit, significance of scriptures to current society, Indian Philosophies, literature of south India.

UNIT – II

Religion and Philosophy: Religion and Philosophy in ancient India, Religion and Philosophy in Medieval India, Religious Reform Movements in Modern India (selected movements only)

UNIT – III

Indian Fine Arts & Its Philosophy(Art, Technology & Engineering): Indian Painting, Indian handicrafts, Music, divisions of Indian classic music, modern Indian music, Dance and Drama, Indian Architecture (ancient, medieval and modern), Science and Technology in Indian, development of science in ancient, medieval and modern Indian.

UNIT – IV

Education System in India: Education in ancient, medieval and modern India, aims of education, subjects, languages, Science and Scientists of Ancient India, Scientists of

Medieval India, Scientists of Modern India. The role Gurukulas in Education System, Value based Education.

RECOMMENDED BOOKS:

1. Kapil Kapoor, "Text and Interpretation: The India Tradition'', ISBN: 81246033375, 2005
2. "Science in Samskrit", Samskrita Bharti Publisher, ISBN-13:978-8187276333,2007
3. NCERT, "Position paper on Arts, Music, Dance and Theatre'', ISBN 81-7450-494-X, 2006
4. S. Narain, "Examination in Ancient India", Arya Book Depot, 1993
5. Satya Prakash, "Founders of Sciences in Ancient India", Vijay Kumar Publisher, 1989
6. M.Hiriyanna, "Essentials of Indian Philosophy", Motilal Banarsidass Publishers, ISBN-13: 978- 8120810990,2014
7. Chatterjee. S & Dutta "An Introduction to Indian Philosophy".