SVKM's NarseeMonjee Institute of Management Studies
Mukesh Patel School of Technology Management & Engineering

Program: B.Tech. (Information Technology)				**Semester :** V AY 2020 - 21	
Course/Module : Elements of Biology				**Module Code :**BTIT05008	
Teaching Scheme				Evaluation Scheme	
Lecture (Hours per week)	**Practical (Hours per week)**	**Tutorial (Hours per week)**	**Credit**	**Internal Continuous Assessment (ICA) As per Institute Norms (50 marks)**	**Term EndExaminations (Theory (3 Hrs, 100 Marks)**
3	0	1	4	Scaled to 50marks	Scaled to 50 marks

Pre-requisite: Fundamental Knowledge of Physics, Chemistry and Mathematics.

Objectives:

1. To provide a basic understanding of biological mechanisms of living organisms from the perspective of engineers.
2. To encourage engineering students to think about solving biological problems with engineering tools.

Course Outcomes:

After completion of the course, students would be able to :

1. Convey that all forms of life have the same building blocks and yet the manifestations are diverse.
2. Identify DNA as a genetic material in the molecular basis of information transfer.
3. Classify enzymes and distinguish between different mechanisms of enzyme action.
4. Apply thermodynamic principles to biological systems.
5. Identify and classify microorganisms.

Detailed Syllabus: (per session plan)

Unit	**Description**	**Duration**
1.	**Introduction** Convey that Biology is as important a scientific discipline as Mathematics, Physics and Chemistry Bring out the fundamental differences between science and engineering by drawing a comparison between eye and camera, Bird flying and aircraft. Mention the most exciting aspect of biology as an independent scientific discipline. Why we need to study biology? Discuss how biological observations of 18th Century that lead to major discoveries. Examples from Brownian motion and the origin of thermodynamics by referring to the original observation of Robert Brown and Julius Mayor. These examples will highlight the fundamental importance of observations in any scientific inquiry.	**3**
2.	**Classification** Convey that classification *per se* is not what biology is all about.	**6**

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Mukesh Patel School of Technology Management & Engineering

	The underlying criterion, such as morphological, biochemical or ecological be highlighted. Hierarchy of life forms at phenomenological level. A common thread weaves this hierarchy Classification. Discuss classification based on (a) cellularity- Unicellular or multicellular (b) ultrastructure- prokaryotes or eucaryotes. (c) energy and Carbon utilization - Autotrophs, heterotrophs, lithotropes (d) Ammonia excretion – aminotelic, uricoteliec, ureotelic (e) Habitata- acquatic or terrestrial (e) Molecular taxonomy- three major kingdoms of life. A given organism can come under different category based on classification. Model organisms for the study of biology come from different groups. E.coli, S.cerevisiae, D. Melanogaster, C. elegance, A. Thaliana, M. musculus	
3.	**Genetics** Convey that "Genetics is to biology what Newton's laws are to Physical Sciences" Mendel's laws, Concept of segregation and independent assortment. Concept of allele. Gene mapping, Gene interaction, Epistasis. Meiosis and Mitosis be taught as a part of genetics. Emphasis to be give not to the mechanics of cell division nor the phases but how genetic material passes from parent to offspring. Concepts of recessiveness and dominance. Concept of mapping of phenotype to genes. Discuss about the single gene disorders in humans. Discuss the concept of complementation using human genetics.	**6**
4.	**Biomolecules** Convey that all forms of life has the same building blocks and yet the manifestations are as diverse as one can imagine Molecules of life. In this context discuss monomeric units and polymeric structures. Discuss about sugars, starch and cellulose. Amino acids and proteins. Nucleotides and DNA/RNA. Two carbon units and lipids.	**5**
5.	**Enzymes** Convey that without catalysis life would not have existed on earth Enzymology: How to monitor enzyme catalyzed reactions. How does an enzyme catalyze reactions. Enzyme classification. Mechanism of enzyme action. Discuss at least two examples. Enzyme kinetics and kinetic parameters. Why should we know these parameters to understand biology? RNA catalysis.	**5**
6.	**Information Transfer** The molecular basis of coding and decoding genetic information is universal Molecular basis of information transfer. DNA as a genetic material. Hierarchy of DNA structure- from single stranded to double helix to nucleosomes. Concept of genetic code. Universality and degeneracy of genetic code. Define gene in terms of complementation and recombination.	**6**

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Mukesh Patel School of Technology Management & Engineering

7.	**Macromolecular analysis** How to analyses biological processes at the reductionistic level Proteins- structure and function. Hierarch in protein structure. Primary secondary, tertiary and quaternary structure. Proteins as enzymes, transporters, receptors and structural elements.	**5**
8.	**Metabolism** The fundamental principles of energy transactions are the same in physical and biological world. Thermodynamics as applied to biological systems. Exothermic and endothermic versus endergonic and exergonic reactions. Concept of Keq and its relation to standard free energy. Spontaneity. ATP as an energy currency. This should include the breakdown of glucose to CO2 + H2O (Glycolysis and Krebs cycle) and synthesis of glucose from CO2 and H2O (Photosynthesis). Energy yielding and energy consuming reactions. Concept of Energy Charge.	**5**
9.	**Microbiology** Concept of single celled organisms. Concept of species and strains. Identification and classification of microorganisms. Microscopy. Ecological aspects of single celled organisms. Sterilization and media compositions. Growth kinetics.	**4**
	Total	**45**

Text Books:

1. Arthur T. Johnson (2011) ''Biology For Engineers'' *CRC Press Taylor & Francis group.*
2. Microbiology, Prescott, L.M J.P. Harley and C.A. Klein 2008, 7th edition McGraw-Hill Higher Education.

Reference Books:

1. Biology: A global approach: Campbell, N. A.; Reece, J. B.; Urry, Lisa; Cain, M, L.; Wasserman, S. A.; Minorsky, P. V.; Jackson, R. B. Pearson Education Ltd
2. Outlines of Biochemistry, Conn, E.E; Stumpf, P.K; Bruening, G; Doi, R.H., John Wiley and Sons
3. Principles of Biochemistry (V Edition), By Nelson, D. L.; and Cox, M. M.W.H. Freeman

Any other information :

Details of Internal Continuous Assessment (ICA)

Test Marks :20
Term Work Marks : 30
Details of Term work : Tutorials/Quiz/Presentation/Viva

Signature
(Prepared by Concerned Faculty/HOD)

SVKM's NarseeMonjee Institute of Management Studies
Mukesh Patel School of Technology Management & Engineering

Program: B. Tech. (Information Technology)	**Semester:**V AY 2020 - 21
Course/Module : Embedded Systems	**Module Code:**BTIT05009

Teaching Scheme				**Evaluation Scheme**	
Lecture (Hours per week)	**Practical (Hours per week)**	**Tutorial (Hours per week)**	**Credit**	**Internal Continuous Assessment (ICA) (Marks - 50)**	**Term End Examinations (TEE) (Marks- 100 in Question Paper)**
2	2	0	3	Marks Scaled to 50	Marks Scaled to 50

Prerequisite: Operating Systems, Computer Networks

Objectives:
At the end of the course, students should be able to understand how to build Embedded Systems software. Students undergoing this course will understand the hardware interfacing, sensors, memory programming with respect to popular microcontrollers.

Outcomes:
After completion of this course, students would be able to
1. Understand the embedded concepts and architecture of embedded systems
2. Understand the open source RTOS and their usage
3. Design an embedded systems application using Embedded C programming in debugging tools.

Detailed Syllabus: (per session plan)

Week	**Description**	**Duration**
1	**Introduction to Embedded Systems**: Embedded Systems, Categories, Specialties, Application areas, Recent Trends	2
2	**Architecture of Embedded Systems**: Hardware Architecture, Software Architecture, Application Software, Process of Generating Executable Image, Development / Testing Tools.	4
3	**Process of Embedded System Development**: The Development Process, Design, Implementation, Integration and Testing	4
4	**Survey of Software Architectures**: Round-Robin,Round-Robin with Interrupts, Function-Queue Scheduling Architectures, Real Time Operating System Architecture, Selecting Architecture.	6
5	**Introduction to Real-Time Operating System Concepts**: Task and Task States, Semaphores, Mutex, Mailboxes, Message Queues, Pipes, Signals, Timers, Memory Management, Priority Inversion Problem.	6
6	**Basic Design Using a Real-Time Operating System**: Overview, Principles, Encapsulating Semaphores and Queues, Hard Real-Time Scheduling Considerations, Saving Memory Space, Saving Power.	4

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Mukesh Patel School of Technology Management & Engineering

7	**Embedded System Programming**: Embedded C Programming, Operations On Bits, EEPROM Programming, Flash Programming, Programming With Sensors.	4
	Total	**30**

Text Books:

1. Dr. K.V.K.K. Prasad, "Embedded / Real-Time Systems: Concepts, Design and Programming (Black Book)", DreamTech Press, 2009.
2. Raj Kamal, "Embedded Systems Architecture, Programming & Design", TMH, 2011

Reference Books:

1. David E.Simon, "An Embedded Software Primer", Pearson Education, 2005
2. YashwantKanetkar, "Go Embedded", BPB, 2006.

Any other information :

Details of Internal Continuous Assessment (ICA)

Test Marks :20

Term Work Marks : 30

Details of Term work : Tutorials/Quiz/Presentation/Viva

Signature
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SVKM's NarseeMonjee Institute of Management Studies
Mukesh Patel School of Technology Management & Engineering

Program: B. Tech. (Information Technology)				**Semester :**V AY 2020 -21	
Course : Software Engineering				**Code :**BTIT05002	
Teaching Scheme				**Evaluation Scheme**	
Lecture (Hours per week)	**Practical (Hours per week)**	**Tutorial (Hours per week)**	**Credit**	**Internal Continuous Assessment (ICA) (Marks - 50)**	**Term End Examinations (TEE) (Marks- 100 in Question Paper)**
3	2	0	4	Marks Scaled to 50	Marks Scaled to 50

Pre-requisite : Programming for Problem Solving ,Programming Workshop

Objectives:

1. To make the students understand the principle and practice required to develop a quality software in large size with a team
2. The objective is to develop the ability and skills within a student for requirement analysis design and modelling
3. The students are exposed to software development processes, practices and standards.

Outcomes: After successfully completion of this course, students would be able to

1. Understand the characteristics of various process models used in the development of a Software project.
2. Demonstrate an understanding of various Analysis and Design models that provide a basis for the software development.
3. Apply UML concepts for modelling software functionality for given scenario.
4. Understand and apply appropriate software testing techniques and user interface to evaluate the software workingand develop quality software.

Detailed Syllabus:

Unit	Description	Duration
1.	**Importance of Software Engineering:** Role of Software, Categories of Software, Legacy Software, Software Myth.	**2**
2.	**Prescriptive Process Models:** Process Framework, Capability Maturity Model Integration , Waterfall Model, Incremental & RAD Models, Prototyping, Spiral Model, Concurrent Development Model.	**5**

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3	**Agile Process Models:** Agility, Agile Process, Extreme Programming, Adaptive Software Development, Dynamic Software Development, SCRUM, Crystal	**4**
4.	**Unified Modeling Language**:Visual modeling with UML, Use case model, Modeling with classes, Identifying classes and objects of real world problems, Defining events and attributes,process of creating class diagram, State diagram,Activity diagram.	**8**
5	**UML Modeling** :Modeling interaction and behaviour – Sequence and Collaboration Diagram,Component Diagram , Deployment Diagram , Modeling workflow.	**5**
6	**Requirement Analysis & Design:** Requirement Engineering tasks,, Elements of Analysis Model, Data Modeling Concepts, Data Flow Model, Control Flow Model, Control Specification, Process Specification Design Process & Design Quality, Design Concepts.	**4**
7	**Architectural Design:** Software Architecture, Data Design, Architectural Styles, Representing System in Context, Refining Architecture into Components, Mapping Data Flow into a Software Architecture.	**5**
8	**User Interface Design:** Golden Rules for User Interface Design, Interface Analysis & Design, Interface Design Steps.	**3**
9	**Testing Strategies & Tactics:** Test Strategies for Software, Validation Testing, System Testing.	**3**
10	**Software Quality & Metrics:** McCall's Software Quality Factors, ISO 9126 Quality Factors, Framework for Product Metrics, Function-based Matrices, Architectural Design Metrics, Process & Project Metrics, Size oriented & Function Oriented Metrics, Metrics for Software Quality, SQA Activities, CMMI	**4**
11	**Case Study :** Application of UML diagrams with a case study.	**2**
	Total	**45**

Text Books:

1. Roger Pressman, "Software Engineering Practitioner's Approach", TMH, 7th Edition,2014
2. Booch, Rumbaugh and Jacobson, "UML User Guide ", Pearson Education, Second Edition
3. Ian Sommerville. "Software Engineering", Pearson Education, 10th Edition, 2016

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Mukesh Patel School of Technology Management & Engineering

Reference Books:

1. Pankaj Jalote, "An Integrated Approach to Software Engineering", Narosa Publishers, 3rd Edition, 2010
2. Ken Schwaber**, "**Agile Project Management with Scrum", Microsoft Press, 2004

Any other information:

Details of Internal Continuous Assessment (ICA)

Test Marks :20

Term Work Marks: 30

Details of Term work : As per department and Institute norms for termwork.

Signature
(Prepared by Concerned Faculty/HOD)

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Program: B. Tech. (Information Technology)	**Semester :**V AY 2020 -21
Course/Module : Data Warehousing & Mining	**Module Code:**BTIT05010

Teaching Scheme				**Evaluation Scheme**	
Lecture (Hours per week)	**Practical (Hours per week)**	**Tutorial (Hours per week)**	**Credit**	**Internal Continuous Assessment (ICA) (Marks - 50)**	**Term End Examinations (TEE) (Marks- 100 in Question Paper)**
3	2	0	4	Marks Scaled to 50	Marks Scaled to 50

Prerequisite: Programming for Problem Solving, Database Management Systems, Data Structures and Algorithms

Objectives:

The course is designed to enable students to be familiar with the concepts of data warehouse and data mining. The data warehousing part of module aims to give students an overview of the ideas and techniques which are behind recent development in the data warehousing and online analytical processing (OLAP) fields. Data mining part of the module aims to develop skills of using recent data mining software for solving practical problems.

Outcomes:

After completion of this course, students would be able to

4. Understand the fundamentals of Data Warehouse, Data Mining and their importance in providing solutions to real world problems.
5. Understand ETL, analytical processing and information delivery in data warehouse.
6. Select and implement appropriate data mining algorithms for solving practical problems.

Detailed Syllabus: (per session plan)

Unit	Description	Duration
1.	**Introduction:**Need for Data warehousing, basic elements of DW and trends in DW, Project planning and management, collecting the requirements.	3
2.	**Architecture and Infrastructure & Data Representation:** Architectural components, infrastructure and metadata, Principles of dimensional modeling, dimensional modeling advance topics, data extraction, transformation and loading, data quality	8

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Mukesh Patel School of Technology Management & Engineering

3.	**Information access and delivery:**Matching information to classes of users, OLAP in data warehousing, data warehouse deployment	7
4.	**Introduction to Data Mining:**Basics of data mining, related concepts, data mining techniques, Classification, clustering, association rules, KDD Process.	5
5.	**Classification:**Issues in Classification, Statistical Based, Distance-Based, Decision-Based, Neural Network-Based and Rule Based Algorithms	8
6.	**Clustering and Association Rules:** Hierarchical and Partitional Algorithms. Clustering Large Databases, Basic Association Rule Algorithms	8
7.	**Applications and Advanced Topics in Data Mining:**Applications, systems products and research prototypes, additional themes in data mining, trends in data mining. Introduction to Web Mining, Spatial Mining and Temporal Mining	6
	Total	**45**

Text Books:

1. Margaret Dunham, "Data mining: Introductory and Advanced Topics", 1st Edition, Pearson Education, 2008.
2. PaulrajPonnian," Data warehousing: Fundamentals IT Professionals", 2nd Edition John Wiley India Pvt. Ltd., 2012.

Reference Books:

1. Jiawei Han and Micheline Kamber, "Data Mining Concepts and Techniques", 3rd Edition, Morgan Kauffmann, 2011
2. Alex Berson and Stephen J.Smith, ―Data Warehousing, Data Mining & OLAP‖, Tata McGraw – Hill Edition, 35th Reprint 2016.

Any other information :

Details of Internal Continuous Assessment (ICA)

Test Marks :30
Term Work Marks : 20

Details of Term work : Lab work/Assignments/Quiz/Presentation/Viva

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SVKM's NarseeMonjee Institute of Management Studies
Mukesh Patel School of Technology Management & Engineering

Program : B. Tech. (Information Technology)				**Semester :** V AY 2020-21	
Course/Module: Cost and Management Accounting for Engineers				**Module Code :** BTIT05011	
Teaching Scheme				**Evaluation Scheme**	
Lecture (Hours per week)	**Practical (Hours per week)**	**Tutorial (Hours per week)**	**Credit**	**Internal Continuous Assessment (ICA) (Marks - 50)**	**Term End Examinations (TEE) (Marks- 100 in Question Paper)**
2	0	0	2	Marks Scaled to 50	Marks Scaled to 50

Prerequisite: Nil

Objectives:

1. To provide conceptual understanding of Cost and Management Accounting principles and practices relevant for business analysis and decision making.
2. To develop the ability to understand, analyze and use cost information in day-to-day business functioning.
3. To provide an understanding of measurement of cost and tracing the costs to products and customers.
4. To explain the role of relevant costs in decision making and developing better strategies.
5. To discuss contemporary issues in Cost and Management Accounting and their practical applications.

Outcomes:

After completion of this course, students should be able to;

1. Apply concepts of accounting
2. Applying techniques for analysis.
3. Use budgetary control techniques for managerial decision making
4. Apply Activity Based Costing to generate reliable and accurate product cost data

Detailed Syllabus:

Unit	Description	Duration
1	**Conceptual framework of Accounting:** • Introduction to Financial Accounting – • Objectives, Accounting System, • Users of Financial Accounting Information, Limitations of Financial Accounting Readings: Cost accounting. 5/e, Lal. J., & Srivastava, S. (2013). New Delhi, Tata McGraw Hill – Chapter1 CO - 1	2

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2	**Conceptual framework of Accounting:** Generally Accepted Accounting Practices (GAAP) Accounting Postulates Accounting Conventions Accounting Concepts Readings: Ramanathan, S. (2014). *Accounting for Management.* New Delhi, Oxford University Press, latest reprint, chapter 2 CO 1	2
3	**Conceptual framework of Accounting:** • Introduction to Cost accounting • Cost Accounting Vs Financial Accounting • Introduction to Management Accounting • Cost Accounting and Management Accounting Readings: Cost accounting. 5/e, Lal. J., & Srivastava, S. (2013). New Delhi, Tata McGraw Hill – Chapter1	2
4	**Cost Concepts** • Classification of Costs based on Elements • Classification of Costs based on Behaviour • Classification of Costs based on Degree of Traceability to the product • Functional Classification of Costs • Costs for Decision making and planning Readings: Cost accounting. 5/e, Lal. J., & Srivastava, S. (2013). New Delhi, Tata McGraw Hill - Chapter 2 CO 1	2
5	**Job Costing - Preparation of Cost sheet** Readings: Cost accounting. 5/e, Lal. J., & Srivastava, S. (2013). New Delhi, Tata McGraw Hill - Chapter 2 CO 1	2

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6	**Preparation of Cost sheet** Readings: Cost accounting. 5/e, Lal. J., & Srivastava, S. (2013). New Delhi, Tata McGraw Hill - Chapter 1 CO 1	2
7	**Cost-Volume-Profit Analysis:** • Concept of Marginal Costing • Cost-Volume-Profit relationship – • The break-even point • Contribution margin concept • Margin of safety Readings: Cost accounting. 5/e, Lal. J., & Srivastava, S. (2013). New Delhi, Tata McGraw Hill - Chapter 16 CO 2	2
8	**Cost-Volume-Profit Analysis:** • Applying cost-volume-profit analysis – Readings: Cost accounting. 5/e, Lal. J., & Srivastava, S. (2013). New Delhi, Tata McGraw Hill - Chapter 16 CO 2	2
9	**Decisions making:** • Alternative choice decisions – • Limiting factor decisions • Add or drop products Readings: Cost accounting. 5/e, Lal. J., & Srivastava, S. (2013). New Delhi, Tata McGraw Hill - Chapter 17 CO 2	2

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10	**Decisions making:** • Make or Buy decisions • Shut down decision • Special orders Readings: Cost accounting. 5/e, Lal. J., & Srivastava, S. (2013). New Delhi, Tata McGraw Hill - Chapter 17 CO 2	2	
11	**Variance analysis-** • Direct material variances • Cost Variance • Price Variance • Usage Variance Readings: Cost accounting. 5/e, Lal. J., & Srivastava, S. (2013). New Delhi, Tata McGraw Hill - Chapter 19 CO 2	2	
12	**Variance analysis-** • Direct labour variances • Cost Variance • Rate Variance • Efficiency Variance Readings: Cost accounting. 5/e, Lal. J., & Srivastava, S. (2013). New Delhi, Tata McGraw Hill - Chapter 19 CO 2	2	
13	**Budgetary Control** • Flexible Budget • Cash Budget	2	

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	Readings: Cost accounting. 5/e, Lal. J., & Srivastava, S. (2013). New Delhi, Tata McGraw Hill - Chapter 20 CO 3	
14	**Inventory Management** • EOQ • Inventory levels- Minimum, Maximum, Re-order, Average Readings: Cost accounting. 5/e, Lal. J., & Srivastava, S. (2013). New Delhi, Tata McGraw Hill - Chapter 3 CO 2	2
15	**Activity Based Costing** • under costing and over costing- • traditional vs activity-based costing- • Evaluation of costs and benefits of implementing ABC systems • Application of Activity based costing in decision making Readings: Cost accounting. 5/e, Lal. J., & Srivastava, S. (2013). New Delhi, Tata McGraw Hill - Chapter 8 CO 4	2
	Total	**30**

Text Book:

1. Cost accounting. 5/e, Lal. J., & Srivastava, S. (2013) latest reprint . New Delhi, Tata McGraw Hill.
2. Ramanathan, S. (2014). *Accounting for Management.* New Delhi, Oxford University Press, latest reprint

Reference Books:

- Horngren, C., Datar, S. &Rajan, M. (2014). *Cost accounting: A managerial emphasis.* 15/e, New Delhi, Pearson Publication.
- Khan, M.Y., & Jain, P.K. (2007). *Management Accounting*. 7/e, New Delhi, Tata Mc-Graw Hill.
- Shah, P. (2012). *Management Accounting*. 7/e, New Delhi, Oxford University Press.
- Sanyers, J., & Jenkins, & Arora. (2012). *Managerial Accounting*. 1/e, Delhi, Cengage Learning.

Internet References:

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http://icmai.in

https://www.cimaglobal.com

Any other information:

Detail of Test: Questions based on concepts, applications and numerical

MT-01: Scope: Topics from Unit - 01 to 06 for 10 Marks
MT-02: Scope: Topics from Unit - 07 to 09 for 10 Marks

Test Marks – 20 Marks
Term Work – 30 Marks

Details of Term work: Projects/Presentations application of concepts from on Unit 01 to Unit 15.

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Mukesh Patel School of Technology Management & Engineering

Program:B.Tech. (Information Technology)				**Semester:** V AY 2020 - 21	
Course/Module : Essence of Indian Knowledge Tradition				**Module Code:** BTIT05012	
Teaching Scheme				**Evaluation Scheme**	
Lecture (Hours per week)	**Practical (Hours per week)**	**Tutorial(Hours per week)**	**Credit**	**Internal Continuous Assessment (ICA) (Marks - 50)**	**Term End Examinations (TEE) (Marks in Question Paper)**
2	0	0	0	Marks Scaled to 50	--

Pre-requisite: NIL

Objectives: This course provides introduction to Indian traditional knowledge and its relevance in the modern society.

Outcomes:

After completion of the course, students would be able to :

1. Understand the concept of Traditional knowledge and its importance
2. Apply the concept of Vedic mathematics to solve problems
3. Understand relevance of Chanakya niti in modern management

Detailed Syllabus

Unit	**Description**	**Duration**
1	**Introduction to traditional knowledge:** Define traditional knowledge, nature and characteristics, scope and importance, kinds of traditional knowledge, the physical and social contexts in which traditional knowledge develop, the historical impact of social change on traditional knowledge systems. Indigenous Knowledge (IK), characteristics, traditional knowledge vis-à-vis indigenous knowledge, traditional knowledge Vs western knowledge traditional knowledge vis-à-vis formal knowledge	5
2	**Traditional knowledge in different sectors:** Traditional knowledge and engineering, Traditional medicine system, TK and biotechnology, TK in agriculture, Traditional societies depend on it for their food and healthcare needs, Importance of conservation and sustainable development of environment, Management of biodiversity, Food security of the country and protection of TK.	5
3	**Vedic mathematics:** Introduction, subtraction, multiplication, division, linear and quadratic equations, simultaneous linear equations, factorizations	10
4	**Chanakya and modern management:** leadership, qualities of a leader, people management, strategy, teamwork	10
	Total	**30**

Text Books:

There are no text books for this course

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Reference Books:

1. D. Bathia, Vedic Mathematics Made Easy, Mumbai: Jaico Publishing House, 2014.
2. R. Pillai, Corporate Chanakya, Jaico Publishing House: Mumbai, 2012.
3. S. B. K. Tirtha and V. S. Agrawala, Vedic Mathematics, New Delhi: Motilal Banarsidass, 2004.
4. A. Jha, Traditional Knowledge System in India, New Delhi: Atlantic Publishers and Distributors (P) Ltd, 2009.
5. B. K. Mohanta and V. K. Singh, Traditional Knowledge System and Technology in India, Delhi: Pratibha Prakashan, 2012.
6. S. Bose, Vedic Mathematics, V&S Publishers: New Delhi, 2015.

Any other information :

Details of Internal Continuous Assessment (ICA)

Term Work Marks : 50
Details of Term work : As per Institute norms

Signature
(Prepared by Concerned Faculty/HOD)

SVKM's NarseeMonjee Institute of Management Studies
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Program: B. Tech. (Information Technology)				**Semester :**V AY 2020 - 21	
Course : Elective-I (Advanced Web Programming)				**Module Code :** BTIT05013	
Teaching Scheme				**Evaluation Scheme**	
Lecture (Hours per week)	**Practical (Hours per week)**	**Tutorial (Hours per week)**	**Credit**	**Internal Continuous Assessment (ICA) (Marks - 50)**	**Term End Examinations (TEE) (Marks- 100 in Question Paper)**
2	2	0	3	50	50

Prerequisite: Web programming (BTIT03010)

Objectives:

This course is designed to give students the opportunity to enhance and enrich their skills in Web programming. Students will learn to develop Web applications using advanced concepts of HTML5, CSS, and rich interactive using server side technologies.

Outcomes:

After completion of this course, students would be able to

1. Design user interface using HTML 5 and CSS 3.
2. Design responsive and interactive web pages using client side, server side technologies
3. Understand and implement front end and back end connectivity.

Detailed Syllabus:

Unit	Description	Duration
1.	**HTML5 And CSS/CSS3 Suite:**HTML5- new elements, Input Types, media, and CSS3; CSS3- Backgrounds, Text effects, 2D & 3D transforms, transitions, animations; Responsive Websites design with HTML5 and CSS3, accessible web applications	5
2.	**JSON:** Introduction, Syntax, JSON vs XML, Data Types, Parse, Stringify, objects, Arrays, JSON HTML, JSONP	2
3.	**JavaScript Development Suite:**jQuery, Ajax Development, Typescript, JavaScript micro frameworks	4
4.	**Node:** Introduction and Foundation, Node Projects, Working with shrink-wrap to lock the node modules versions, introduction to asynchronous programming, Building a HTTP Server with Node.JS using HTTP APIs, File System, Buffers, Streams, and Events, Multi-Processing in NodeJS	6

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Mukesh Patel School of Technology Management & Engineering

5.	**Angular:** Single Page Application,Angular features, Bootstrap Scaffolding, Dependency Injection and services, Directives, Pipes, Forms, HTTP, Promises, and Observables. , Creating restful APIs	5
6.	**ExpressJS:** Express JS with MongoDB, Socket.io	4
7.	**Database:**Introduction to NoSQL databases, MongoDB A Database for the Modern Web, CRUD Operations in MongoDB, Indexing and Aggregation, secure web applications	4
	Total	**30**

Text Book:

1. Ken Williamson, "Learning AugularJS – A Guide to AngularJS-Development", Oreilly Media, 1st Edition, 2015.
2. Azat Mardan, "Full Stack JavaScript: Learn Backbone.js, Node.js and MongoDB", Apress, 2nd Edition, 2015.

Reference Books:

1. Achyut Godbole, "Web Technologies", THM, 2017.
2. Joel Sklar, et. al., "The web warrior guide to web design technologies", Cengage Learning, 5th Edition, 2015.
3. Robert W. Sebesta, "Programming the World Wide Web", Pearson Education, 8th Edition, 2015.
4. Dietel & Dietel, "Internet and world wide web", Pearson Publication, 5th Edition, 2016.

Any other information :

Details of Internal Continuous Assessment (ICA)

Test Marks :20

Term Work Marks : 30

Details of Term work : Tutorials/Quiz/Presentation/Viva

Signature
(Prepared by Concerned Faculty/HOD)

SVKM's NarseeMonjee Institute of Management Studies
Mukesh Patel School of Technology Management & Engineering

Program: B. Tech. (Information Technology)	**Semester:**V AY 2020-21
Course/Module : Elective-I (Machine Learning)	**Module Code:**BTIT05014

Teaching Scheme				**Evaluation Scheme**	
Lecture (Hours per week)	**Practical (Hours per week)**	**Tutorial (Hours per week)**	**Credit**	**Internal Continuous Assessment (ICA) (Marks - 50)**	**Term End Examinations (TEE) (Marks- 100 in Question Paper)**
2	2	0	3	Marks Scaled to 50	Marks Scaled to 50

Prerequisite:

Engineering Mathematics –III& IV, Object Oriented Programming

Objectives:

This course provides a concise introduction to the fundamental concepts in machine learning from a mathematical perspective. Also it covers the different learning algorithms, paradigms and architectures used in each of the paradigms.

Outcomes:
After completion of this course, students would be able to
1.Identify machine learning techniques suitable for a given problem
2.Solve the problems using various machine learning techniques
3.Design application using machine learning techniques
4. Evaluate and interpret the results of the algorithms

Detailed Syllabus: (per session plan)

Week	**Description**	**Duration**
1	**Introduction:** Statistical Decision Theory - Regression, Statistical Decision Theory -Classification, Bias Variance	**2**
2	**Regression :**Linear Regression, Multivariate Regression, Subset Selection, Shrinkage Methods	**2**
3	**Regression :**Principal Component Regression, Logistic Regression	**2**
4	**SVM and Neural networks:** Perceptron, SVM	**2**
5	**SVM and Neural networks:**Neural Networks - Introduction, Early Models, Perceptron Learning, Neural Networks - Backpropagation,	**2**

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6	**SVM and Neural networks:**Neural Networks - Initialization, Training & Validation, Parameter Estimation	**2**
7	**Decision Trees** :Decision Trees, Regression Tree, Stopping Criterion & Pruning, Loss functions	**2**
8	**Decision Trees** :Categorical Attributes, Multiway Splits, Missing Values, Instability using Evaluation Measures	**2**
9	**Bootstrapping & Cross Validation**: Class Evaluation Measures, ROC ,AUC	**2**
10	**Ensemble Methods**:Bagging, Committee Machines and Stacking	**2**
11	**Ensemble Methods:**Boosting	**2**
12	**Ensemble Methods** :Gradient Boosting, Random Forests, Multi-class Classification	**2**
13	**Statistical Classification:** Naive Bayes, Bayesian Networks	**2**
14	**Undirected Graphical Models**: HMM, Variable elimination, belief propagation	**2**
15	**Clustering:** Partitional Clustering, Hierarchical Clustering, Birch Algorithm, CURE Algorithm, Density-based Clustering	**2**
	Total	**30**

Text Books:

3. T. Hastie, R. Tibshirani, J. Friedman. The Elements of Statistical Learning, 2e, 2008.
4. Christopher Bishop. Pattern Recognition and Machine Learning. 2e.

Reference Books:

1. An Introduction to Statistical learning with application in R . Hastie T, Robert T. (2014). Springer Science Business Media: New York
2. Hair, Black, Babin, Anderson and Tatham (2009). Multivariate Data Analysis, Pearson
3. An Introduction to Categorical Data Analysis. Agresti, A. (2012). John Wiley & sons
4. The Element of Statistical Learning, Data mining, Inference and Prediction. Hastie, T, Tibshirani, R, & Friedman, J. (2011). New York: Springer Series in Statistics.

Any other information :

Details of Internal Continuous Assessment (ICA)

Test Marks :30

Term Work Marks : 20

Details of Term work : Tutorials/Quiz/Presentation/Viva

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Mukesh Patel School of Technology Management & Engineering

Program: B. Tech. (Information Technology)	**Semester:** V AY 2020 -21
Course/Module : Elective-I **(**Database Administration)	**Module Code:**BTIT05015

Teaching Scheme				**Evaluation Scheme**	
Lecture (Hours per week)	**Practical (Hours per week)**	**Tutorial (Hours per week)**	**Credit**	**Internal Continuous Assessment (ICA) (Marks - 50)**	**Term End Examinations (TEE) (Marks- 100 in Question Paper)**
2	2	0	3	Marks Scaled to 50	Marks Scaled to 50

Prerequisite:

Objectives: This is an advance course in Databases. The course is designed to enable students to understand analyse& design the system. At the end of the semester students will be able to implement a simple DBMS &implement information systems using DBMStechnology.

Outcomes:

After completion of this course, students would be able to

7. Understand the Logical and Physical Architecture Of the system & the role of a DBA
8. Installing Oracle Software &Managing Database instances, Manage Tables
9. Understand the Network Architecture & incorporate security issues
10. Designing Database backup and recovery procedures,Take Decisions related with Database Maintenance

Detailed Syllabus: (per session plan)

Week	**Description**	**Duration**
1	**Database Overview and Architecture:** An overview of logical and physical storage structures, Database memory structures, database background processes. Explain core DBA tasks and tools, Plan adatabase installation.	**4**
2	**Managing the database Instance:** Access a database with SQL*Plus and iSQL*Plus Modify database initialization parameters Understand the stages of database startup. View the Alert log ,Use the Data Dictionary	**2**
3	**User Access and Security**: Creating and modifying use accounts, creating and using roles, granting and revoking privileges, Managing user groups with profiles managing privileges, Managing roles, querying role information	**4**
4	**Control and Redo Log Files:** Managing the control files, Maintaining and monitoring redo log files, Monitoring redo log file. Storing data (create, alter,	**4**

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	analysing, querying table information),Managing indexes, Managing constraints	
5	**Introduction to Network Administration**: Network design considerations, network responsibilities for the DBA**, N**etwork configuration, Overview of oracle Net features.Overview of oracle Net features, Oracle Net Stack Architecture. Create additional listeners ,Create Net Service aliases	**4**
6	**Backup and Recovery Overview**: Identify the types of failure that may occur in an Database .Describe ways to tune instance recovery , Identify the importance of checkpoints redo log files, and archived log files ,Configure ARCHIVELOG mode, Performing Database Backups ,Create consistent database backups	**4**
7	**Performing Database Recovery** :Recover from loss of a control file, Recover from loss of a redo log file , Automate database backups ,defining a backup and recovery strategy, Perform complete recovery following the loss of a data file, Back your database up without shutting it down, Create incremental backups	**4**
8	**Introduction to performance tuning:** brief overview of Tuning methodology, General tuning concepts. **Case Study:** Remote Databases & Virtual DBA	**4**
	Total	**30**

Text Books:

5. Database Administration: The Complete Guide to DBA Practices and Procedures : Craig S Mullins , Addison Wesley October 2012

Reference Books:

3. Oracle 11g DBA For Absolute beginners :December 2018
4. Database System Concepts : Abraham Silberschatz, Henry f Korth, S Sudarshan, Sixth Edition
5. Nader F Mir, "Computer and Communication Networks", Pearson Education, 2009.
6. Bhushan Trivedi, "Computer Networks", Oxford University Press, 2011.

Any other information :

Details of Internal Continuous Assessment (ICA)
Test Marks :20
Term Work Marks : 30

Details of Term work : Tutorials/Quiz/Presentation/Viva

Signature
(Prepared by Concerned Faculty/HOD)

SVKM's NarseeMonjee Institute of Management Studies
Mukesh Patel School of Technology Management & Engineering

Program:B. Tech. (Information Technology)	**Semester:**V AY 2020 -21
Course/Module : Elective-I (Advanced Data Structures)	**Module Code:**BTIT05016

Teaching Scheme				**Evaluation Scheme**	
Lecture (Hours per week)	**Practical (Hours per week)**	**Tutorial (Hours per week)**	**Credit**	**Internal Continuous Assessment (ICA) (Marks - 50)**	**Term End Examinations (TEE) (Marks- 100 in Question Paper)**
2	2	0	3	Marks Scaled to 50	Marks Scaled to 50

Prerequisite: Programming for Problem Solving

Objectives:

The objective of this course is to familiarize students with advanced data structures used to solve real world problems.

Outcomes:

After completion of this course, students would be able to

1. Choose appropriate data structures and algorithms, understand the ADT/libraries, and use it to design algorithms for a specific problem.
2. Understand and implement a symbol table using hashing techniques.
3. Implement and analyze algorithms for red-black trees, B-trees and Splay trees.
4. Understand and implement algorithms for text processing applications.

Detailed Syllabus: (per session plan)

Week	Description	Duration
1	**Dictionaries:** Definition, Dictionary Abstract Data Type, Implementation of Dictionaries.	3
2	**Hashing:** Review of Hashing, Hash Function, Collision Resolution Techniques in Hashing, Separate Chaining, Open Addressing, Linear Probing, Quadratic Probing, Double Hashing, Rehashing, Extendible Hashing.	8
3	**Trees:** Binary Search Trees, AVL Trees, Red Black Trees, 2-3 Trees, B-Trees, Splay Trees	5
4	**Graphs:** Introduction, search operation, Topological sorting, Bellman Ford Algorithm and Dijkstra's Single Source Shortest Path Algorithm.	4

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5	**Text Processing:** String Operations, Brute-Force Pattern Matching, The Boyer-Moore Algorithm, The Knuth-Morris-Pratt Algorithm, Standard Tries, Compressed Tries, Suffix Tries, The Huffman Coding Algorithm, The Longest Common Subsequence Problem (LCS), Applying Dynamic Programming to the LCS Problem.	**6**
6	**Design Techniques:** Divide and conquer, Greedy Algorithm; Dynamic Programming, Branch and Bound, Backtracking Techniques.	**4**
	Total	**30**

Text Books:

6. Mark Allen Weiss, "Data Structures and Algorithm Analysis in C++", 4th Edition, Pearson, 2014
7. Thomas H. Cormen, Charles E. Leiserson, R.L. Rivest. " Introduction to Algorithms", Prentice Hall of India Publications, 3rd Edition 2015.

Reference Books:

7. M T Goodrich, Roberto Tamassia, "Algorithm Design and Applications", John Wiley, 2015.
8. Alfred V. Aho, John E. Hopcroft, Jeffrey D. Ullman.. The Design and Analysis of Computer Algorithms, Pearson Education (Singapore) 2008.

Any other information :

Details of Internal Continuous Assessment (ICA)

Test Marks :30

Term Work Marks : 20

Details of Term work : Tutorials/Quiz/Presentation/Viva

Signature
(Prepared by Concerned Faculty/HOD)

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Program: B. Tech. (Information Technology)	**Semester:**V AY 2020 -21
Course/Module : Elective-I (Image Processing)	**Module Code:**BTIT05017

Teaching Scheme				**Evaluation Scheme**	
Lecture (Hours per week)	**Practical (Hours per week)**	**Tutorial (Hours per week)**	**Credit**	**Internal Continuous Assessment (ICA) (Marks - 50)**	**Term End Examinations (TEE) (Marks- 100 in Question Paper)**
2	2	0	3	Marks Scaled to 50	Marks Scaled to 50

Prerequisite: Signal and System , Engineering Maths

Objectives:

1. The course is designed to enable students to understand Image Fundamentals and different processing techniques.
2. The objective is to learn how image is acquired and transferred after processing with different compression techniques.

Outcomes:

After completion of this course, students would be able to

11. To understand of Image Fundamentals.
12. To applyImage Enhancements and Filtering concepts.
13. To apply Image segmentation and wavelets –Multi-resolution image processing.
14. To apply different Image compression techniques and Morphological Image Processing.

Detailed Syllabus:

Units	**Description**	**Duration**
1	**Introduction:** Steps in Digital Image Processing – Components – Elements of Visual Perception – Image Sensing and Acquisition – Image Sampling and Quantization – Relationships between pixels – color models.	**2**
2	**Image Enhancement in the Spatial and Frequency Domain**: Gray level transformations, Enhancement techniques, Histogram processing. Spatial filtering: Introduction, Smoothing and sharpening Spatial filters. Frequency domain filters: Introduction to Fourier Transform, Smoothing and Sharpening filters. Frequency domain filters – Ideal, Butterworth and Gaussian filters.	**4**

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3	**Image Data Compression and Morphological Image Processing:** Fundamentals, Redundancies: Coding. InterpixelPysycho-visual, fidelity criteria, Image compression models, Error free compression, Lossy compression Introduction: Dilation, Erosion, Opening, closing, Hit –or-Miss transformation Morphological algorithm operations on binary images	**4**
4	**Image compression standards**: Binary image and Continuous tone still image compression standards, Video compression standards.	**2**
5	**Image Transforms (Implementation):** Introduction to Fourier transform, DFT and 2-D DFT, Properties of 2-D DFT, FFT. Walsh transform, Hadamard transform, Discrete cosine transform, Slant transform, Optimum transform: Karhunen–Loeve (Hotelling) transform.	**6**
6	**Wavelets and Multi-resolution Processing:** Image pyramids, Series expansion, Scaling functions,Sub-band coding, Haar transform,	**6**
7	**Image Segmentation:** Detection of discontinuities, Edge linking and Boundary detection, Thresholding, Region based segmentation	**4**
8	**Application of Image processing:** In medical sciences, satellite imaging, visual effect for entertainment.	**2**
	Total	**30**

Text Books:

1. R.C.Gonsales ,R.E.Woods, "*Digital Image Processing*", fourth Edition, Pearson Education,2018
2. Anil K. Jain, "*Fundamentals of Image Processing*", PHI Second edition, 2007.

Reference Books:

1. William Pratt, "*Digital Image Processing*", John Wiley, fourth edition,2007
2. Milan Sonka,VaclavHlavac, Roger Boyle, "*Image Processing, Analysis, and Machine Vision*" Thomson Learning,2014
3. **B. Chanda, D. Dutta Majumder, "*Digital Image Processing and Analysis*", PHI, 2011**

Any other information :

Details of Internal Continuous Assessment (ICA)

Test Marks :20

Term Work Marks : 30

Details of Term work : Tutorials/Quiz/Presentation/Viva

Signature
(Prepared by Concerned Faculty/HOD)