B.E. Semester –VIII
Choice Based Credit Grading Scheme with Holistic Student Development (CBCGS-H 2019)
Proposed Syllabus under Autonomy Scheme

B.E.(Information Technology)							B.E.(SEM : VIII)			
Course Name : Big Data Analytics							Course Code : ITC801			
Teaching Scheme (Program Specific)							Examination Scheme (Formative/ Summative)			
Modes of Teaching / Learning / Weightage							Modes of Continuous Assessment / Evaluation			
Hours Per Week					Theory (100)		Practical/Oral (25)	Term Work (25)	Total
Theory	Tutorial	Practical	Contact Hours	Credits	IA	ESE	OR	TW	
4	-	2	6	5	20	80	25	25	150

IA: In-Semester Assessment- Paper Duration – **1Hours**
ESE : End Semester Examination- Paper Duration - **3 Hours**
Total weightage of marks for continuous evaluation of Term work/Report: Formative (40%), Timely Completion of Practical (40%) and Attendance /Learning Attitude (20%).

Prerequisite: Database Management System, Data Mining & Business Intelligence

Course Objective: The course intends to provide an overview of an exciting growing field of big data analytics and equip the students with programming skills to solve complex real world problems using big data technologies.

Course Outcomes: Upon completion of the course student will be able to:

S. No.	Course Outcomes	Cognitive levels of attainment as per Bloom's Taxonomy
1	Explain the motivation for big data systems and identify the main sources of Big Data in the real world.	L1, L2
2	Demonstrate an ability to use frameworks like Hadoop, NOSQL to efficiently store retrieve and process Big Data for Analytics.	L2,L3
3	Implement several Data Intensive tasks using the Map Reduce Paradigm	L4,L5
4	Apply several newer algorithms for Clustering Classifying and finding associations in Big Data	L4,L5
5	Design algorithms to analyze Big data like streams, Web Graphs and Social Media data.	L5,L6
6	Design and implement successful Recommendation engines for enterprises.	L5,L6

Detailed Syllabus:

Module No.	Topics	Hrs.	Cognitive levels of attainment as per Bloom's Taxonomy
1	**Introduction to Big Data** Introduction to Big Data, Big Data characteristics, types of Big Traditional vs. Big Data business approach,Big Data Challenges, Examples of Big Data in Real Life, Big Data Applications	03	L1, L2

2	**Introduction to Big Data Frameworks: Hadoop, NOSQL** What is Hadoop? Core Hadoop Components; Hadoop Ecosystem; Overview of : Apache Spark, Pig, Hive, Hbase, Sqoop What is NoSQL? NoSQL data architecture patterns: Key-value stores, Graph stores, Column family (Bigtable) stores, Document stores, Mongo DB.	09	L2,L3
3	**MapReduce Paradigm** MapReduce: The Map Tasks, Grouping by Key, The Reduce Tasks, Combiners, Details of Map Reduce Execution, Coping With Node Failures. Algorithms Using MapReduce: Matrix-Vector Multiplication by MapReduce , Relational-Algebra Operations, Computing Selections By MapReduce, Computing Projections by MapReduce, Union, Intersection, and Difference by MapReduce, Computing Natural Join by MapReduce, Grouping and Aggregation by MapReduce, Matrix Multiplication, Matrix Multiplication with One MapReduce Step. Illustrating use of MapReduce with use of real life databases and Applications. .	09	L4,L5
4	**Mining Big Data Streams** Stream-Management System, Examples of Stream Sources, Stream Queries, Issues in Stream Processing. Sampling Data in a Stream: Sampling Techniques. Filtering Streams: The Bloom Filter. **Counting Distinct Elements in a Stream:** The Count-Distinct Problem, The Flajolet-Martin Algorithm, Combining Estimates, Space Requirements. Counting Ones in a Window: The Cost of Exact Counts, The Datar-Gionis-Indyk- Motwani Algorithm, Query Answering in the DGIM Algorithm.	07	L4,L5
5	**Big Data Mining Algorithms** **Frequent Pattern Mining**: Handling Larger Datasets in Main Memory Basic Algorithm of Park, Chen, and Yu. The SON Algorithm and MapReduce. **Clustering Algorithms**: CURE Algorithm. Canopy Clustering, Clustering with MapReduce **Classification Algorithms:** Parallel Decision trees, Overview SVM classifiers, Parallel SVM, K- Nearest Neighbour classifications for Big Data, One Nearest Neighbour.	10	L5,L6
6	**Big Data Analytics Applications** **Link Analysis** : PageRank Definition, Structure of the web, dead ends, Using Page rank in search engine, Efficient computation of Page Rank: PageRank Iteration Using MapReduce, Topic sensitive Page Rank, link Spam, Hubs and Authorities, HITS Algorithm. **Mining Social- Network Graphs** : Social Networks as Graphs, Types , Clustering of Social Network Graphs, Direct Discovery Communities, and Counting triangles using Map-Reduce. **Recommendation Engines**: Model for Recommendation Systems, Content-Based Recommendations, Collaborative Filtering.	10	L5,L6
	Total Hr.	48	

List of Practical/ Experiment:

Practical No.	Type of Experiment	Practical/Experiment topic	Hrs	Cognitive levels of attainment as per Bloom's Taxonomy
1	**Basic experiment**	Assignment on Study of Hadoop ecosystem	02	L1, L2
2		Programming exercises on Hadoop Using Hive, Pig, Hbase Sqoop NOSQL, MongoDB	04	L3,L4
3		Implementing simple algorithms in Map-Reduce Matrix multiplication, Aggregates, joins, sorting, searching etc.	04	L3,L4
4	**Design Experiment**	Develop clustering algorithm K-means/CURE using MapReduce	02	L4,L5
5		Implementing Frequent Item set Mining	02	L4,L5
6		Develop DGIM algorithm/ Bloom Filter using any programming language	02	L5,L6
7		Develop PageRank algorithm	02	L5,L6
8		Implementing recommendation Engines	02	L5,L6
09	**Group Activity/ Case study**	Identify research topics in Big data analytics and write a research paper	04	L5,L6
10		Mini Project: One real life large data application to be implemented (Use standard Datasets available on the web) a) Twitter data analysis b) Fraud Detection c) Text Mining d) Recommendation Engines (list of datasets also given in the text book)	06	L5,L6
		Total Hrs.	**30**	

Books and References:

S. No.	Title	Authors	Publisher	Edition	Year
1.	Big Data Analytics	Radha Shankarmani, M Vijayalakshmi,	Wiley Publications	3rd	2016
2.	Mining of Massive Datasets	Anand Rajaraman and Jeff Ullman	Cambridge University Press	1st	2012
3.	Hadoop in Practice	Alex Holmes	Alex Holmes	2nd	2015
4.	Big Data Analytics with R and Hadoop	Vignesh Prajapati	Packt Publishing Limited	1st	2016

Online Recourses:

S. No.	Website Name	URL	Modules covered
1	www.mmds.org	http://www.mmds.org	M1-M6
2	www.guru99.com	https://www.guru99.com/	M1,M2
3	www.edureka.co	https://www.edureka.co/blog/hadoop-tutorial/	M1, M2
4	www.tutorailride.com	https://www.tutorialride.com/big-data-analytics	M1-M6

B.E. Semester –VIII

Choice Based Credit Grading Scheme with Holistic Student Development (CBCGS-H 2019)
Proposed Syllabus under Autonomy Scheme

B.E.(Information Technology)							B.E.(SEM : VIII)			
Course Name : Internet of Everything							Course Code : ITC802			
Teaching Scheme (Program Specific)							Examination Scheme (Formative/ Summative)			
Modes of Teaching / Learning / Weightage							Modes of Continuous Assessment / Evaluation			
Hours Per Week						Theory (100)		Practical/Oral (25)	Term Work (25)	Total
Theory	Tutorial	Practical	Contact Hours	Credits	IA	ESE		OR	TW	
4	-	2	6	5	20	80		25	25	150
IA: In-Semester Assessment- Paper Duration – **1Hours** **ESE :** End Semester Examination- Paper Duration - **3 Hours** **Total weightage of marks for continuous evaluation of Term work/Report:** Formative (40%), Completion of Practical (40%) and Attendance /Learning Attitude (20%).										Timely
Prerequisite: IOT Lab, Sensor Lab, Wireless Network										

Course Objective: The course intends to deliver the fundamentals of IOT concepts used for smart city development, IoT technologies, applications, protocols, and analytics of data in IOT

Course Outcomes: Upon completion of the course student will be able to:

S.No.	Course Outcomes	Cognitive levels of attainment as per Bloom's Taxonomy
1	Apply the concepts of IOT	L1, L2,L3
2	Identify the different technology	L1, L2,L3
3	Apply IOT to different applications	L1, L2,L3
4	Analysis and evaluate protocols used in IOT	L1, L2,L3,L4
5	Design and develop smart city in IOT	L1, L2,L3,L4, L5,L6
6	Analysis and evaluate the data received through sensors in IOT	L1, L2,L3,L4,L5

Detailed Syllabus:

Module No.	Topics	Hrs.	Cognitive levels of attainment as per Bloom's Taxonomy
0	**Prerequisite** What are sensors, Sensor family, Architecture of single node sensor?	02	L1
1	**Introduction** Introduction, History of IOT, Objects in IOT, Identifier in IOT, Technologies in IOT	03	L1, L2
2	**RFID Technology** Introduction, Principle of RFID, Components of RFID system, RFID tag, reader, RFID Middleware, Issues etc.	08	L1,L2,L3

3	**RFID Applications**	09	L1,L2,L3,L4
	Introduction, Concepts and Technology: RFID, transponder, RFID architecture, RFID applications, Logistics and Supply chain , Production, Monitoring and Maintenance, product safety, quality and information, access control and tracking and tracing of individuals, payment, loyality, household etc. Hardware, Hardware issues, protocols : pure aloha, slotted aloha, frame slotted aloha, tree protocols, tree splitting algorithms, binary search algorithms, bitwise arbitration protocols. Main query tree protocols.		
4	**Wireless Sensor Networks**	09	L1,L2,L3,L4
	History and context, Node, Connecting Nodes, Networking Nodes, Securing Communication, Standards and Fora. Networking and Internet – IP Addressing, Protocols-MQTT, CoAP, REST Transferring data..		
5	**Mobility and Settings**	10	L1,L2,L3,L4,L5
	Introduction, localization, mobility management, localization and handover management, technology considerations, performance evaluation, simulation setup, performance results. Identification of IOT (Data formats, IPv6, identifiers and locaters, tag etc.)		
6	**Data Analysis for IOE**	11	L1,L2,L3,L4,L5
	Introduction, Apache, Hadoop, Using Hadoop MapReduce for Batch Data Analysis, Apache Oozie, Apache Spark, Apache Storm, Using Apache Storm for Real-time Data Analysis, Structural Health Monitoring Case Study, Tools for IOT:- Chef, Chef Case studies, Puppet, Puppet Case Study – Multi-tier Deployment, NETCONE-YANG Case Studies, IoT Code Generator.		
	Total Hr.	52	

Guidelines for Internet of Everything Lab.

Prerequisite: Basics of Java and Python Programming

1. The mini project work is to be conducted by a group of three students

2. Each group will be associated with a subject Incharge/ mini project mentor. The group should meet with the concerned faculty during Laboratory hours and the progress of work discussed must be documented.

3. The students must understand the

    a. Concept, b. Importance, c. Interdisciplinary, d. Challenges , e. Various applications/smart objects
    f. Major Players/Industry, Standards.

4. The students must understand the IoT Architecture:

    a. Node Structure: Sensing, Processing, Communication, Powering
    b. Networking: Topologies, Layer/Stack architecture
    c. Communication Technologies: Introduction to ZigBee, BLE, WiFi, LTE, IEEE 802.11ah, Discuss data rate, range, power, computations/bandwidth, QoS
    d. Smartness - Signal Processing/Analytics: Impact on Power/Energy savings, dynamic networks, simple case studies
    e. IoT Fabricator: Introduction to Embedded electronics, fabricating electronics, Communication Network requirements, Data processing challenges – recreation, IP/security, Challenges
    f. Hands-on in IoT: Projects based on some Hardware (Raspberry pi, Arduino, Intel, IITH Mote, Smartphones), Software (Contiki, TinyOS, Android), IoT Fabricator etc. can be used.

5. The students may do will visit different websites to identify their IOT topic for the mini project.

6. The students may do survey for different application using different types of sensors for their mini project.

7. Each group will identify the Hardware (Motes from different Motes families) & sensor configuration and software requirement for their mini project problem statement.

8. Design your own circuit board using multiple sensors etc.

9. Installation, configure and manage your sensors in such away so that they can communicate with each other.

10. Work with operating system, emulator like contiki cooja and do coding to for input devices on sensors.

11. Each group will identify the Hardware and software requirement for their mini project problem statement.

12. Create and interface using Mobile/Web to publish or remotely access the data on Internet.

13. Each group along with the concerned faculty shall identify a potential problem statement, on which the study and implementation is to be conducted.

14. Each group may present their work in various project competitions and paper presentations.

15. A detailed report is to be prepared as per guidelines given by the concerned faculty.

Books and References:

S. No.	Title	Authors	Publisher	Edition	Year
1.	Internet of Things connecting objects to the web	Hakima Chaouchi	Wiley	1st	2010
2.	Internet of Things (A Hands-on Approach)	Arshdeep Bhaga and Vijay Madisetti.	--	---	2014
3.	The Internet of Things	Samuel Greengard	MIT Press	2nd	2015
4.	RFID and the Internet of Things	Herve chabanne	Wiley	1st	2013
5.	Fundamentals of Sensor Network Programming: Applications and Technology	S. Sitharama Iyengar, Nandan Parameshwaran, Vir V. Phoha, N. Balakrishnan, Chuka D. Okoye	John Wiley & Sons	1st	2010
6.	Building the internet of things with ipv6 and mipv6, The Evolving World of M2M Communications	Daniel Minoli	John Wiley & Sons	1st	2013
7.	6LoWPAN: The Wireless Embedded Internet	Zach Shelby, Carsten Bormann	Wiley	1st	2009
8.	Interconnecting Smart Objects with IP: The Next Internet	Jean-Philippe Vasseur, Adam Dunkels, Morgan Kuffmann	Elsevier	1st	2010
9.	Designing the Internet of Things	Adrian McEwen (Author), Hakim Cassimally	John Wiley & Sons	1st	2013
10.	Internet of Things: Converging Technologies for Smart Environments and Integrated Ecosystems	Dr. Ovidiu Vermesan, Dr. Peter Friess	River Publishers	1st	2013
11.	Internet of Things (A Hands-on-Approach)	Vijay Madisetti , Arshdeep Bahga	John Wiley & Sons	1st	2014

Online Recourses:

S. No.	Website Name	URL	Modules covered
1.	https://www.nptel.ac.in	https://nptel.ac.in/courses/106105166/	M1,M2,M3, M4,M5,M6
2.	https://www.tutorialspoint.com	https://www.tutorialspoint.com/internet_of_things/internet_of_things_pdf	M1,M2,M3, M6
3.	http://www.listingtec.com	http://www.listingtec.com/nptel-iot-assignment-8-answers-introduction-to-internet-of-things/	M1,M4,M5, M6

B.E. Semester –VIII

Choice Based Credit Grading Scheme with Holistic Student Development (CBCGS-H 2019)
Proposed Syllabus under Autonomy Scheme

B.E.(Information Technology)							B.E.(SEM : VIII)		
Course Name : User Interaction Design							Course Code ITDLO8041		
Teaching Scheme (Program Specific)						Examination Scheme (Formative/ Summative)			
Modes of Teaching / Learning / Weightage						Modes of Continuous Assessment / Evaluation			
Hours Per Week					Theory (100)		Practical/Oral	Term Work	Total
Theory	Tutorial	Practical	Contact Hours	Credits	IA	ESE	PR	TW	
4	-	-	4	4	20	80	--	--	100
IA: In-Semester Assessment- Paper Duration – **1Hours** **ESE : End Semester Examination-** Paper Duration - **3 Hours** **Total weightage of marks for continuous evaluation of Term work/Report:** Formative (40%), Timely Completion of Practical (40%) and Attendance /Learning Attitude (20%).									
Prerequisite: Software Engineering Concepts , Programming language									

Course Objective: The course intends to deliver the importance of good interface design, understand the importance of human psychology as well as social and emotional aspect in designing good interfaces, learn the techniques of data gathering, establishing requirements, analysis, data interpretation and techniques for prototyping and evaluating user experiences and bring out the creativity in each student – build innovative applications that are usable, effective and efficient for intended users.

Course Outcomes: Upon completion of the course student will be able to:

S.No.	Course Outcomes	Cognitive levels of attainment as per Bloom's Taxonomy
1	Identify and criticize bad features of interface designs.	L1, L2
2	Predict good features of interface designs.	L1, L2,L3
3	Illustrate and analyze user needs and formulate user design specifications.	L1, L2,L3
4	Interpret and evaluate the data collected during the process.	L1, L2,L3,L4
5	Evaluate designs based on theoretical frameworks and methodological approaches.	L1, L2,L3, L4,L5
6	Produce/show better techniques to improve the user interaction design interfaces.	L1, L2,L3 L4,L5

Detailed Syllabus:

Module No.	Topics	Hrs.	Cognitive levels of attainment as per Bloom's Taxonomy
1	Introduction to Interaction Design Good and Poor Design, What is Interaction Design, The Process Of Interaction Design, Goal of Interaction Design and Usability.	09	L1, L2
2	Understanding and Conceptualizing Interaction Cognitive aspects and Social, Emotional Interaction Understanding the Problem Space and Conceptualizing Design, Conceptual Model, Interface Types Cognitive aspects, Social Interaction and the Emerging Social Phenomena, Emotions and the User Experience, Expressive and Frustrating Interfaces, Persuasive Technologies .	09	L1, L2,L3
3	Data Gathering, Establishing Requirements, Analysis, Interpretation and Presentation Establishing Requirements, Five Key Issues, Techniques for Data Gathering, Data Analysis Interpretation and Presentation, Task Description and Task Analysis	09	L1, L2,L3
4	Process of Interaction Design, Prototyping, Construction, Interaction Design Process, Prototyping and Conceptual Design, Interface Metaphors and Analogies	08	L1, L2,L3,L4
5	Design rules and Industry standards Design principles, Principles to support Usability, Standards and Guidelines, Golden rules and Heuristics, ISO/IEC standards	07	L1, L2,L3,L4,L5
6	Evaluation Techniques and Framework The Why, What, Where and When of Evaluation, Types of Evaluation, case studies, DECIDE Framework, Usability Testing, conducting experiments, Field Studies, Heuristic Evaluation and walkthroughs, Predictive models.	06	L1, L2,L3,L4,L5
	Total Hr.	48	

Books and References:

S. No.	Title	Authors	Publisher	Edition	Year
1.	Interaction Design	J. Preece, Y. Rogers and H. Sharp	John Wiley & Sons		2002
2.	Human Computer Interaction	Alan Dix, Janet Finlay, Gregory D Abowd, Russell Beale	Pearson	Third	2009
3.	About Face3: Essentials of Interaction design	Alan Cooper, Robert Reimann, David Cronin	Wiley publication.		2007
4.	An Introduction to GUI Design Principles and Techniques	Wilbert O. Galitz	Wiley Computer Publishing	Second	2002
5.	The Design of Everyday Things	Don Norman	Basic Books		2013

Online Resourses:

S. No.	Website Name	URL	Modules covered
1.	www.interaction-design.org	https://www.interaction-design.org/literature/topics/ui-design	M1
2.	www.interaction-design.org	https://www.interaction-design.org/literature/article/what-is-interaction-design	M2
3.	www.studocu.com	https://www.studocu.com/en/document/university-of-southampton/interaction-design/lecture-notes/lecture-notes-lectures-1-9-interaction-design/691675/view	M3
4.	ocw.mit.edu	https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-831-user-interface-design-and-implementation-spring-2011/lecture-notes/	M4
5.	www.toptal.com	https://www.toptal.com/designers/interactive/interaction-design-principles	M5
6.	theblog.adobe.com	https://theblog.adobe.com/15-rules-every-ux-designer-know/	M6

B.E. Semester –VIII

Choice Based Credit Grading Scheme with Holistic Student Development (CBCGS-H 2019)
Proposed Syllabus under Autonomy Scheme

B.E.(Information Technology)							B.E.(SEM : VIII)			
Course Name : Information Retrieval System							**Course Code : ITDLO8042**			
Teaching Scheme (Program Specific)							**Examination Scheme (Formative/ Summative)**			
Modes of Teaching / Learning / Weightage							**Modes of Continuous Assessment / Evaluation**			
Hours Per Week					**Theory (100)**		**Practical/Oral**	**Term Work**	**Total**	
Theory	Tutorial	Practical	Contact Hours	Credits	IA	ESE	PR	TW		
4	-	-	4	4	20	80	--	--	**100**	
IA: In-Semester Assessment- Paper Duration – **1 Hours** **ESE : End Semester Examination-** Paper Duration - **3 Hours** **Total weightage of marks for continuous evaluation of Term work/Report:** Formative (40%), Timely Completion of Practical (40%) and Attendance /Learning Attitude (20%).										
Prerequisite: Data structures and algorithms										

Course Objective: The course intends to provide Fundamentals of information retrieval system with classification of various retrieval models. Course also focuses on query languages, indexing and developing user interface for information retrieval.

Course Outcomes: Upon completion of the course student will be able to:

S. No.	Course Outcomes	Cognitive levels of attainment as per Bloom's Taxonomy
1	Define and describe the objectives the basic concepts of Information retrieval system	L1, L2
2	Evaluate the taxonomy of different information retrieval models.	L2,L3
3	Solve and process text and multimedia retrieval queries and their operations	L4,L5
4	Evaluate text processing techniques and operations in information retrieval system.	L4,L5
5	Demonstrate and evaluate various indexing and searching techniques.	L5,L6
6	Design the user interface for an information retrieval system.	L5,L6

Detailed Syllabus:

Module No.	Topics	Hrs.	Cognitive levels of attainment as per Bloom's Taxonomy
1	**Introduction to Information Retrieval Systems**	**05**	L1, L2
	Motivation, Basic Concepts, The retrieval Process, Information System: Components, parts and types on information system; Definition and objectives on information retrieval system		
2	**Information Retrieval Models**	**09**	L2,L3
	Modeling: Taxonomy of Information Retrieval Models, Retrieval: Adhoc and filtering, Formal Characteristics of IR models, Classic Information Retrieval, Alternative Set Theoretic models, Probabilistic Models, Structured text retrieval Models, models for Browsing; Multimedia IR models: Data Modeling		
3	**Query processing and operations**	**10**	L4,L5
	Query Languages: Keyword based Querying, Pattern Matching, Structural Queries, Query Protocols; Query Operations: User relevance feedback, Automatic local analysis, Automatic global analysis, Multimedia IR Query Languages .		
4	**Text processing**	**10**	L4,L5
	Text and Multimedia languages and properties: Metadata, Markup Languages, Multimedia; Text Operations: Document Preprocessing, Document Clustering, Text Compression, Comparing Text Comparison Technique		
5	**Indexing and Searching**	**11**	L5,L6
	Inverted files, Other indices for text, Boolean Queries, Sequential Searching, Pattern Matching, Structural Queries, Compression; Multimedia IR: Indexing and Searching:- Spatial Access Methods, A Generic Multimedia indexing approach, One-dimensional time series, Two dimensional color images, Automatic Feature extraction; Searching Web: Challenges, Characterizing the web, Search Engines. Browsing, Meta searches, Searching needle in haystack, Searching using Hyperlinks		
6	**User interface and visualization**	**05**	L5,L6
	Human Computer interaction, the information access process, starting points, query specifications, context, using relevance judgments, interface support for the search process		
	Total Hr.	**50**	

Books and References:

S. No.	Title	Authors	Publisher	Edition	Year
1.	Modern Information Retrieval	Ricardo Baeza-Yates,berthier Ribeiro- Neto	ACM Press-Addison Wesley	3rd	2016
2.	Information Retrieval Systems: Theory and Implementation	Gerald Kowaski	Kluwer Academic Publisher	1st	2012
3.	Storage Network Management and Retrieval	Dr. Vaishali Khairnar, Nilima Dongre	Wiley India	2nd	2015

Online Recourses:

S. No.	Website Name	URL	Modules covered
1.	EMC2	www.emc.org	M1-M6
2.	NPTEL	https://www.youtube.com/watch?v=fFxpSmyICwI	M1,M2
3.	Pathshala	https://www.youtube.com/watch?v=T0g-GAFtXNY	M1, M2
4.	NPTEL	https://www.youtube.com/watch?v=m0oiAOgSQFw	M1-M6

Choice Based Credit Grading Scheme with Holistic Student Development (CBCGS-H 2019)
Proposed Syllabus under Autonomy Scheme

BE (Information Technology)							B.E.(SEM : VIII)		
Course Name : Knowledge Management							Course Code : ITDLO8043		
Teaching Scheme (Program Specific)					Examination Scheme (Formative/ Summative)				
Modes of Teaching / Learning / Weightage					Modes of Continuous Assessment / Evaluation				
Hours Per Week					Theory (100)		Practical/Oral	Term Work	Total
Theory	Tutorial	Practical	Contact Hours	Credits	IA	ESE	PR	TW	100
4	-	-	4	4	20	80	-	-	
IAT: Mid Semester Examination - Paper Duration – **1 Hours** **ESE :** Semester End Examination Paper Duration - **3 Hours** **Total weightage of marks for continuous evaluation of Term work/Report:** Formative (40%), Timely Completion of Practical (40%) and Attendance (20%).									
Prerequisite: An introductory course in IT/ IS									

Course Objective: The course intends to expose the students to the concepts of Knowledge Management while emphasizing on its importance to individuals and organization. The course lays emphasis on data acquisition, storage and dissemination of knowledge.

Course Outcomes: Upon completion of the course student will be able to:

SN	Course Outcomes	Cognitive levels as per bloom's taxonomy
1	Discuss KM, learning organizations, intellectual capital and related terminologies in clear terms and understand the role of knowledge management in organizations.	L1,L2
2	Demonstrate an understanding of the history, concepts, and the antecedents of management of knowledge and describe several successful knowledge management systems	L1,L2,L3
3	Evaluate the impact of technology including telecommunications, networks, and Internet/intranet role in managing knowledge.	L1,L2,L3,L4
4	Discuss new jobs, roles and responsibilities resulting from the New or Knowledge Economy Ponder KM's current and future impact on individuals, organizations and society at large	L1,L2,L3,L4,L5
5	Identify technologies that are most useful for capturing/acquiring, organizing, distributing, and sharing knowledge within an enterprise	L1,L2,L3
6	Analyze issues related to management practices and knowledge management. Impact	L1,L2,L3,L4

Detailed Syllabus:

Module No.	Topics	Hrs.	Cognitive levels as per bloom's taxonomy
1	**Introduction to Knowledge Management**	6	L1,L2
	Meaning of data, information, knowledge and expertise Meaning of epistemology, Types of Knowledge -Subjective & Objective views of knowledge, procedural Vs. Declarative, tacit Vs. explicit, general Vs. specific. What is Knowledge? Types of expertise – associational, motor skill, theoretical Characteristics of knowledge –explicitness, codifiability, teachability, specificity Reservoirs of knowledge, Meaning of Knowledge Management, Forces Driving Organizational issues in KM, KM Systems & their role Relevance of KM in today's dynamic & complex environment Future of Knowledge Management		
2	**Introduction to Knowledge Management**	6	L1,L2
	Challenges in Building KM Systems – Conventional versus KM System Life Cycle (KMSLS)– Knowledge Creation and Knowledge Architecture –Nonaka's Model of Knowledge Creation and Transformation. Knowledge Architecture.		
3	**KM Solutions for capture, sharing & applications**	6	L1,L2,L3
	KM Processes, KM Systems, Mechanisms &Technologies ,Knowledge Capturing Techniques: Brain Storming –Protocol Analysis – Consensus Decision Making –Repertory Grid- Concept Mapping – Blackboarding, Nominal Group Technique, Delphi method,		
4	**Knowledge Codification**	9	L1,L2,L3
	Modes of Knowledge Conversion – Codification Tools and Procedures – Knowledge Developer's Skill Sets –System Testing and Deployment – Knowledge Testing –Approaches to Logical Testing, User Acceptance Testing – KM System Deployment Issues – User Training – Post implementation.		
5	**Knowledge transfer and sharing**	9	L1,L2,L3
	Transfer Methods – Role of the Internet – Knowledge Transfer in e-world – KM System Tools – Neural Network – Association Rules – Classification Trees – Data Mining and Business Intelligence – Decision Making Architecture – Data Management – Knowledge Management Protocols – Managing Knowledge Workers.		
6	**KM Impact**		L1,L2,L3,L4
	Dimensions of KM Impact – People, Processes, Products & Organizational Performance Factors ,influencing impact – universalistic & contingency views Assessment of KM Impact – Qualitative & quantitative measures Identification of appropriate KM solutions, Ethical Legal and Managerial Issues	9	
	Total Hrs:	45	

Books and References:

Sr. No	Title	Authors	Publisher	Edition	Year
1	Knowledge Management Challenges, Solutions, and Technologies ..	Irma Becerra-Fernandez, Avelino Gonzalez, Rajiv Sabherwal	Prentice Hall	ISBN: 0-13-109931-0.	2004
2	Knowledge Management.	Elias M. Awad, Hassan M. Ghaziri	Prentice Hall.	ISBN: 0-13-034820-1	2004

3	Knowledge Management in Organizations,	Donald Hislop,,	Oxford	2nd Edition.	2002
4	Knowledge Management,	Shelda Debowski,	Wiley India Edition	1st	2007
5	Knowledge Management Tools and Techniques: Practitioners and Experts Evaluate KM Solutions	Madanmohan Rao	Butterworth-Heinemann.	1st ISBN: 0750678186.	2004
6	Knowledge Management Systems Theory and Practice.	Stuart Barnes	Thomson Learning	-	2002
7	Knowledge Management in Theory and Practice,	Kimiz Dalkir,	Elsevier, Butterworth Hinemann	3rd Edition	2013
8	Applying Knowledge Management: Techniques for Building Corporate Memories.	Ian D. Watson and Ian Watson	Morgan Kaufmann	. ISBN: 1558607609.	2003

Online References:

S. No.	Website Name	URL	Modules Covered
1.	KM Tools	http://www.knowledge-management-tools.net/	M1 & M2
2.	NCMT	https://www.nccmt.ca/knowledge-repositories/search/111	M2
3.	KM Best practices	http://www.kmbestpractices.com/km-resources.html	M3 & M5
4.	Elcom	https://www.elcom.com.au/resources/blog/what-is-knowledge-management-and-why-its-important	M4
5.	KM World	http://www.kmworld.com/Articles/Editorial/Features/Is-knowledge-management-the-future-of-HR-9093.aspx	M5 & M6
6.	KM World KM Consortium	http://www.kmworld.com/ http://www.kmci.org/	M6

TCET

DEPARTMENT OF INFORMATION TECHNOLOGY (IT)
[Accredited by NBA for 3 years, 3rd Cycle Accreditation w.e.f. 1st July 2019]
Choice Based Credit Grading System with Holistic Student Development [CBCGS - H 2019]
Under TCET-Autonomy Scheme - 2019

Semester –VIII
Choice Based Credit Grading Scheme with Holistic Student Development (CBCGS-H 2019)
Proposed Syllabus under Autonomy Scheme

B.E. (Information Technology)							B.E.SEM :VIII		
Course Name :Robotics							Course Code : ITDLO8044		
Teaching Scheme (Program Specific)						Examination Scheme (Formative/ Summative)			
Modes of Teaching / Learning / Weightage						Modes of Continuous Assessment / Evaluation			
Hours Per Week						Theory (100)		Practical/Oral	Term Work	Total
Theory	Tutorial	Practical	Contact Hours	Credits	IA	ESE	PR	TW	
4	-	-	4	4	20	80	--	-	100
IA: In-Semester Exam- Paper Duration –1 Hours **ESE : End Semester Exam- Paper Duration - 3 Hours** **Total weightage of marks for continuous evaluation of Term work/Report:** Formative (40%), Timely Completion of Practical (40%) and Attendance/Learning Attitude (20%).									

Prerequisite: Computer networks, Wireless Network

Course Objective: The course intends to deliver the fundamentals concepts of Robots, Kinematics of Robotics. Motions, velocities and dynamic analysis of force, Motion planning, Trajectory Planning, Potential Functions, Visibility Graphs and Coverage Planning

Course Outcomes: Upon completion of the course Students will be able to:

S.No.	Course Outcomes	Cognitive levels of attainment as per bloom's Taxonomy
1	Apply the basic concepts of Robots.	L1,L2
2	Apply and evaluate the concepts of Kinematics of Robotics.	L1,L2
3	Apply the Motions, velocities and dynamic analysis of force.	L1,L2,L3
4	Apply and evaluate Motion planning.	L1,L2,L3
5	Apply the concepts of Trajectory Planning	L1,L2,L3,L4
6	Apply the concepts of Potential Functions, Visibility Graphs and Coverage Planning	L1,L2,L3,L4

Detailed Syllabus:

Module No.	Topics	Hrs.	Cognitive levels of attainment as per bloom's Taxonomy
	Prerequisite Basics of Electrical Engineering	02	-
1	**Fundamentals** Robot classification, Robot components, Degree of freedom, Joints, Coordinates, Coordinate frames, workspace, applications.	06	L1,L2,L3,L4
2	**Kinetics of Robotics** Homogeneous transformation matrices, Inverse transformation matrices, Forward and inverse kinematic equations – position and orientation, Denavit-Hatenberg representation of forward kinematics, Inverse kinematic solutions, Case studies	09	L1,L2,L3

3	**Motions, Velocities and dynamic analysis of force**		09	L1,L2,L3,L4,L5,L6
	Differential relationship, Jacobian, Differential motion of a frame and robot, Inverse Jacobian. Lagrangian mechanics, Moments of Inertia, Dynamic equations of robots, Transformation of forces and moment between coordinate frames.			
4	**Trajectory Planning**		9	L1,L2,L3,L4,L5,L6
	Trajectory planning, Joint-space trajectory planning, Cartesian-space trajectories			
5	**Motion Planning**		9	L1,L2,L3,L4,L5,L6
	Concept of motion planning, Bug Algorithms – Bug1, Bug2, Tangent Bug			
6	**Potential Functions, Visibility Graphs and Coverage Planning**		6	L1,L2,L3,L4
	Attractive/Repulsive potential, Gradient descent, wave-front planner, navigation potential functions, Visibility map, Generalized Voronoi diagrams and graphs, Silhouette methods, Cell. Decomposition, Localization and Mapping.			
	Total Hrs.		**50**	

Books and References:

Sr. No	Title	Authors	Publisher	Edition	Year
1.	Introduction to Robotics – Analysis, Control, Applications	Saeed Benjamin Niku	Wiley India Pvt. Ltd.	2nd	2011
2.	Principles of Robot Motion –Theory, Algorithms and Implementations	Howie Choset, Kevin M. Lynch, Seth Hutchinson, George Kantor, Wolfram Burgard, Lydia E. Kavraki and Sebastian Thrun	Prentice-Hall of India	-	2005
3.	Robot Dynamics & Control	Mark W. Spong & M. Vidyasagar	Wiley India Pvt. Ltd	2nd	2004
4.	Introduction to Robotics – Mechanics & Control	John J. Craig	Pearson Education, India	-	2009
5.	Learning ROS for Robotics Programming	Aaron Martinez & Enrique Fernandez	Shroff Publishers	1st	2013

Online References:

Sr. No.	Website Name	URL	Modules covered
1	www.robotictutorials.com	http://www.robotictutorials.com/tutorials/robots/	M1
2	http://www.ciscopress.com	http://www.ciscopress.com/articles/article.asp?p=1073230	M2
3	https://www.oreilly.com https://www.cisco.com	https://www.oreilly.com/library/view/authorized-self-study-guide/9781587052729/ch04.html#ch04lev1sec1 https://www.cisco.com/c/dam/global/ro_ro/assets/ciscoexpo/2010/src/docs/presentations/12.pdf	M3
4	http://www.ciscopress.com	http://www.ciscopress.com/articles/article.asp?p=1743279	M4
5	http://www.ciscopress.com	http://www.ciscopress.com/articles/article.asp?p=174107	M5
6	https://www.cisco.com	https://www.cisco.com/c/en/us/td/docs/solutions/Enterprise/Data_Center/VMDC/SDN/SDN.html	M6

B.E. Semester –VIII

Choice Based Credit Grading Scheme with Holistic Student Development (CBCGS-H 2019)
Proposed Syllabus under Autonomy Scheme

B.E.(Information Technology)							B.E.(SEM : VIII)			
Course Name : Enterprise Resource Planning							Course Code : ITDLO8045			
Teaching Scheme (Program Specific)						Examination Scheme (Formative/ Summative)				
Modes of Teaching / Learning / Weightage						Modes of Continuous Assessment / Evaluation				
Hours Per Week					Theory (100)		Practical/Oral	Term Work	Total	
Theory	Tutorial	Practical	Contact Hours	Credits	IA	ESE	PR	TW		
4	-	-	4	4	20	80	--	--	100	

IA: In-Semester Assessment- Paper Duration – **1Hours**
ESE : End Semester Examination- Paper Duration - **3 Hours**
Total weightage of marks for continuous evaluation of Term work/Report: Formative (40%), Timely Completion of Practical (40%) and Attendance /Learning Attitude (20%).

Prerequisite: Basic Programming, Software Engineering

Course Objective: The course intends to deliver the fundamentals of ERP, different technologies used in ERP, the concepts of ERP Manufacturing Perspective and ERP Modules, what are the benefits of ERP, understand the ERP life cycle, the different tools used in ERP.

Course Outcomes: Upon completion of the course student will be able to:

S.No.	Course Outcomes	Cognitive levels of attainment as per Bloom's Taxonomy
1	Understand the basic concepts of ERP.	L1, L2
2	Identify different technologies used in ERP.	L1, L2
3	Understand and apply the concepts of ERP Manufacturing Perspective and ERP Modules.	L1, L2,L3
4	Discuss the benefits of ERP	L1, L2
5	Understand and implement the ERP life cycle.	L1, L2,L3
6	Apply different tools used in ERP.	L1, L2,L3

Detailed Syllabus:

Module No.	Topics	Hrs.	Cognitive levels of attainment as per Bloom's Taxonomy
1	**Introduction to ERP** Enterprise – An Overview Integrated Management Information, Business Modeling, Integrated Data Model	**04**	L1, L2
2	**ERP Technologies** Business Processing Reengineering(BPR), Data Warehousing, Data Mining, On-line Analytical Processing(OLAP), Supply Chain Management (SCM), Customer Relationship Management(CRM), MIS Management Information System, DSS - Decision Support System, EIS – Executive Information System	**06**	L1, L2
3	**ERP Manufacturing Perspective and ERP Modules** MRP - Material Requirement Planning, BOM - Bill Of Material, MRP – Manufacturing Resource Planning, DRP – Distributed Requirement Planning, PDM - Product Data Management. Finance, Plant Maintenance, Quality Management, Materials Management.	**10**	L1, L2,L3
4	**Benefits of ERP** Reduction of Lead-Time, On-time Shipment, Reduction in Cycle Time, Improved Resource Utilization, Better Customer Satisfaction, Improved Supplier Performance, Increased Flexibility, Reduced Quality, Costs, Improved Information Accuracy and Design- making Capability	**08**	L1, L2
5	**ERP Life cycle** Pre-evaluation Screening, Package Evaluation, Project Planning Phase, Gap Analysis, Reengineering, Configuration, Implementation Team Training, Testing, Going Live, End-user Training, Post-implementation (Maintenance mode).	**06**	L1, L2,L3
6	**E-Commerce to E-business** E-Business structural transformation, Flexible Business Design, Customer Experience, Create the new techo enterprise, New generation e-business leaders, memo to CEO, Empower your customer, Integrate Sales and Service, Integrated Enterprise applications. Enterprise resource planning the E-business Backbone Enterprise architecture, planning, ERP usage in Real world, ERP Implementation, Future of ERP applications, memo to CEO ,E- Procurement, E-Governance, Developing the E-Business Design. JD Edwards-Enterprise One. Microsoft Dynamics-CRM Module.	**12**	L1, L2,L3
	Total Hr.	**48**	

Books and References:

S. No.	Title	Authors	Publisher	Edition	Year
1.	Enterprise Resource Planning	Alexis Leon	Tata McGraw Hill	2nd	2008
2.	Enterprise Resource Planning	Demystified by Alexis Leon	Tata McGraw Hill		
3.	Enterprise Resource Planning	Ravi Shankar & S. Jaiswal	Galgotia		1999

S. No.					1997
4.	Guide to Planning ERP Application	Annetta Clewwto and Dane Franklin	McGRaw-Hill		1997
5.	The SAP R/3 Handbook	Jose Antonio	McGraw – Hill		
6.	E-Business Network Resource planning using SAP R/3 Baan and Peoplesoft : A Practical Roadmap For Success	Dr. Ravi Kalakota			

Online Recourses:

S. No.	Website Name	URL	Modules covered
1.	www.tutorialspoint.com	https://www.tutorialspoint.com/sap/sap_introduction.htm	M1
2.	www.tutorialspoint.com	https://www.tutorialspoint.com/sap/sap_introduction.htm	M2
3.	www.tutorialspoint.com	https://www.tutorialspoint.com/sap/sap_introduction.htm	M3
4.	www.tutorialspoint.com	https://www.tutorialspoint.com/sap/sap_introduction.htm	M4
5.	www.tutorialspoint.com	https://www.tutorialspoint.com/sap/sap_introduction.htm	M5
6.	www.tutorialspoint.com	https://www.tutorialspoint.com/sap/sap_introduction.htm	M6

B.E. Semester-VIII
Choice Based Credit Grading Scheme with Holistic Student Development (CBCGS-H 2019))
Proposed Syllabus under Autonomy Scheme

BE (Information Technology)					B.E. (SEM: VIII)				
Course Name: Project Management					**Course Code:** ILO8021				
Teaching Scheme (Program Specific)					**Examination Scheme (Formative/ Summative)**				
Modes of Teaching / Learning / Weightage					**Modes of Continuous Assessment / Evaluation**				
Hours Per Week					**Theory**		**Practical/Oral**	**Term Work**	**Total**
Theory	**Tutorial**	**Practical**	**Contact Hours**	**Credits**	**IA**	**ESE**	**PR**	**TW**	
3	-	-	3	3	20	80	-	-	**100**
IA: In-Semester Assessment - Paper Duration – 1 Hours **ESE: End Semester Examination - Paper Duration - 3 Hours** **The weightage of marks for continuous evaluation of Term work/Report:** Formative (40%), Timely completion of practical (40%) and Attendance / Learning Attitude (20%)									
Prerequisite: Basic Probability & Statistics Basic Operations									

Course Objective: This course intends to familiarize the students with the use of a structured methodology/approach for each and every unique project undertaken, including utilizing project management concepts, tools and techniques and also appraise the students with the project management life cycle and make them knowledgeable about the various phases from project initiation through closure

Course Outcomes: **Upon completion of the course students will be able to:**

SN	Course Outcomes	Cognitive levels of attainment as per Bloom's Taxonomy
1	Apply selection criteria and select an appropriate project from different options.	L1,L2,L3
2	Write work break down structure for a project and develop a schedule based on it.	L1,L2,L3
3	Identify opportunities and threats to the project and decide an approach to deal with them strategically.	L1,L2,L3,L4,L5
4	Use Earned value technique and determine & predict status of the project.	L1,L2,L3,L4,L5
5	Capture lessons learned during project phases and document them for future reference.	L1,L2,L3,L4,L5,L6

Detailed Syllabus:

Module No.	Topics	Hrs.	Cognitive levels of attainment as per Bloom's Taxonomy
1	**Project Management Foundation** Definition of a project, Project Vs Operations, Necessity of project management, Triple constraints, Project life cycles (typical & atypical) Project phases and stage gate process. Role of project manager, Negotiations and resolving conflicts, Project management in various organization structures, PM knowledge areas as per Project Management Institute (PMI).	06	L1,L2,L3

2	Initiating Projects		
	How to get a project started, selecting project strategically, Project selection models (Numeric /Scoring Models and Non-numeric models), Project portfolio process, Project sponsor and creating charter; Project proposal. Effective project team, Stages of team development & growth (forming, storming, norming &performing team dynamics.	06	L1,L2,L3
3	Project Planning and Scheduling		
	Work Breakdown structure (WBS) and linear responsibility chart, Interface Co-ordination and concurrent engineering, Project cost estimation and budgeting, Top down and bottoms up budgeting, Networking and Scheduling techniques. PERT, CPM, GANTT chart, Introduction to Project Management Information System (PMIS).	08	L1,L2,L3,L4
4	Planning Projects		
	Crashing project time, Resource loading and levelling, Goldratt's critical chain, Project Stakeholders and Communication plan Risk Management in projects: Risk management planning, Risk identification and risk register, Qualitative and quantitative risk assessment, Probability and impact matrix. Risk response strategies for positive and negative risks	05	L1,L2,L3,L4
5	Executing and Monitoring and Controlling Projects		
	Executing Projects: Planning monitoring and controlling cycle, Information needs and reporting, engaging with all stakeholders of the projects, Team management, communication and project meetings. Monitoring and Controlling Projects: Earned Value Management techniques for measuring value of work completed; Using milestones for measurement; change requests and scope creep, Project audit. Project Contracting: Project procurement management, contracting and outsourcing.	10	L1,L2,L3,L4,L5
6	Closing the Project		
	Project Leadership and Ethics: Introduction to project leadership, ethics in projects, Multicultural and virtual projects. Closing the Project: Customer acceptance; Reasons of project termination, Various types of project terminations (Extinction, Addition, Integration, Starvation), Process of project termination, completing a final report; doing a lessons learned analysis; acknowledging successes and failures; Project management templates and other resources; Managing without authority; Areas of further study.	10	L1,L2,L3,L4,L5,L6
	Total	45	

Books and References:

SN	Title	Authors	Publisher	Edition	Year
1	Project Management: A managerial approach	Jack Meredith & Samuel Mantel	Wiley India.	7th	2008
2	A Guide to the Project Management Body of Knowledge (PMBOK® Guide)	Project Management Institute	Project Management Institute PA, USA	5th	2017
3	Successful Project Management	Gido, Clements, Baker	Cengage Learning	7th	2017
4	Project Management	Gopalan,	Wiley India	2nd	2014
5	Project Management	Dennis Lock	Gower Publishing England	9th	2007

Online References:

SN	Website	Name URL	Modules Covered
1	www.nptel.ac.in	https://nptel.ac.in/courses/110104073/	M1-M6
2	www.nptel.ac.in	https://nptel.ac.in/courses/110107081/	M1-M6
3	www.nptel.ac.in	https://nptel.ac.in/courses/112102106/	M1-M6

B.E. Semester –VIII
Choice Based Credit Grading Scheme with Holistic Student Development (CBCGS- H 2019)
Proposed Syllabus under Autonomy Scheme

B.E. (Information Technology)							B.E.(SEM: VIII)			
Course Name: Finance Management							**Course Code:** ILO8022			
Teaching Scheme (Program Specific)						**Examination Scheme Formative/Summative)**				
Modes of Teaching / Learning / Weightage						**Modes of Continuous Assessment / Evaluation**				
Hours Per Week					**Theory**		**Practical/Oral**	**Term Work**	**Total**	
Theory	**Tutorial**	**Practical**	**Contact Hours**	**Credit**	**IA**	**ESE**	**PR**	**TW**	**100**	
3	-	-	3	3	20	80	-	-		
IA : **In-Semester Assessment - Paper Duration – 1 Hour** **ESE: End Semester Examination - Paper Duration - 3 Hours** **The weightage of marks for continuous evaluation of Term work/Report:** Formative (40%), Timely completion of practical (40%) and Attendance/Learning Attitude (20%)										
Prerequisite: Basics of Finance and Accounting.										

Course Objective: The course intends to give an understanding of Indian financial system, instruments and market. The course also aims to deliver basic concepts of value of money, returns and risks, corporate finance, working capital and its management.

Course Outcomes: Upon completion of the course students will be able to:

SN	Course Outcomes	Cognitive levels of attainment as per Bloom's Taxonomy
1	Understand Indian finance system and corporate finance	L1, L2
2	Take investment, finance as well as dividend decisions	L1, L2, L3, L4
3	Understand concepts of Returns and Risks	L1, L2, L3, L4
4	Demonstrate Financial Ratio Analysis	L1, L2, L3, L4, L5

Detailed Syllabus:

Module No.	Topics	Hrs.	Cognitive levels of attainment as per Bloom's Taxonomy
1	**Overview of Indian Financial System** Characteristics, Components and Functions of Financial System Financial Instruments: Meaning, Characteristics and Classification of Basic Financial Instruments Equity Shares, Preference Shares, Bonds-Debentures Certificates of Deposit and Treasury Bills, Financial Markets: Meaning Characteristics and Classification of Financial Markets Capital Market Money Market and Foreign Currency Market Financial Institutions: Meaning Characteristics and Classification of Financial Institutions, Commercial Banks , Investment Merchant Banks and Stock Exchanges	6	L1,L2

2	**Concepts of Returns and Risks** Measurement of Historical Returns and Expected Returns of a Single Security and a Two-security Portfolio Measurement of Historical Risk and Expected Risk of a Single Security and a Two-security Portfolio Time Value of Money Future Value of a Lump Sum Ordinary Annuity and Annuity Due Present Value of a Lump Sum, Ordinary Annuity and Annuity Due, Continuous Compounding and Continuous Discounting	06	L1, L2, L3
3	**Overview of Corporate Finance** Objectives of Corporate Finance, Functions of Corporate Finance Investment Decision, Financing Decision and Dividend Decision Financial Ratio Analysis: Overview of Financial Statements Balance Sheet, Profit and Loss Account and Cash Flow Statement Purpose of Financial Ratio Analysis , Liquidity Ratios Efficiency or Activity Ratios , Profitability Ratios , Capital Structure Ratios , Stock, Market Ratios , Limitations of Ratio Analysis	09	L1, L2, L3, L4
4	**Capital Budgeting** Meaning and Importance of Capital Budgeting Inputs for Capital Budgeting Decisions , Investment Appraisal Criterion—Accounting Rate of Return , Payback Period Discounted, Payback Period , Net Present Value(NPV) Profitability Index, Internal Rate of Return (IRR) and Modified Internal Rate of Return, (MIRR) Working Capital Management: Concepts of Meaning Working Capital , Importance of Working Capital Management Factors, Affecting an Entity's Working Capital Needs Estimation of Working, Capital Requirements, Management of Inventories, Management of Receivables , Management of Cash and Marketable Securities	10	L1, L2, L3, L4
5	**Sources of Finance** Long Term Sources—Equity, Debt, and Hybrids Mezzanine Finance, Sources of Short Term Finance—Trade Credit, Bank Finance, Commercial Paper; Project Finance. Capital Structure: Factors Affecting an Entity's Capital Structure Overview of Capital Structure Theories and Approaches Net Income Approach , Net Operating Income Approach Traditional Approach, Modigliani-Miller Approach. Relation between Capital Structure and Corporate Value , Concept of Optimal Capital Structure	05	L1, L2, L3, L4
6	**Dividend Policy** Meaning and Importance of Dividend Policy Factors Affecting an Entity's Dividend Decision, Overview of Dividend Policy Theories and Approaches, Gordon's Approach, Walter's Approach , Modigliani-Miller Approach	03	L1, L2, L3
	Total	39	

Books & References:

SN	Title	Authors	Publisher	Edition	Year
1	Fundamentals of Financial Management	Eugene F. Brigham and Joel F. Houston	Cengage Publications, New Delhi	13th Edition	2015
2	Analysis for Financial Management	Robert C. Higgins	McGraw Hill Education, New Delhi.	10th Edition	2013
3	Indian Financial System	M. Y. Khan	McGraw Hill Education, New Delhi	9th Edition	2015
4	Financial Management	I. M. Pandey	S. Chand (G/L) & Company Limited, New Delhi	11th Edition	2015

Online References:

S. No.	Website Name	URL	Modules Covered
1	www.nptel.ac.in	https://nptel.ac.in/courses/110105121/	M1- M6
2	www.nptel.ac.in	https://nptel.ac.in/courses/110106043/	M1-M6

B.E. Semester –VIII
Choice Based Credit Grading Scheme with Holistic Student Development (CBCGS- H 2019)
Proposed Syllabus under Autonomy Scheme

BE (Information Technology)								B.E.(SEM: VIII)	
Course Name: Entrepreneurship Development and Management								**Course Code:** ILO8023	
Teaching Scheme (Program Specific)						**Examination Scheme Formative/Summative**			
Modes of Teaching / Learning / Weightage						**Modes of Continuous Assessment / Evaluation**			
Hours Per Week					**Theory (100)**		**Practical/Oral (25)**	**Term Work (25)**	**Total**
Theory	**Tutorial**	**Practical**	**Contact Hours**	**Credit**	**IA**	**ESE**	**PR**	**TW**	**100**
3	-	-	3	3	20	80	-	-	
IA: In-Semester Assessment - Paper Duration – 1 Hours **ESE: End Semester Examination - Paper Duration - 3 Hours** **The weightage of marks for continuous evaluation of Term work/Report:** Formative (40%), Timely completion of practical (40%) and Attendance/Learning Attitude (20%)									
Pre-requisite: The course does not have any pre-requisites.									

Course Objective:

The course intends to acquaint the student with entrepreneurship, management of business and understand Indian environment for entrepreneurship with an idea of EDP, MSME.

Course Outcomes: Upon completion of the course students will be able to:

SN	Course Outcomes	Cognitive levels of attainment as per Bloom's Taxonomy
1	Understand the concept of business plan and ownerships	L1, L2
2	Interpret key regulations and legal aspects of entrepreneurship in India	L1, L2, L3, L4
3	Understand government policies for entrepreneurs	L1, L2, L3, L4, L5, L6

Detailed Syllabus:

Module No.	Topics	Hrs.	Cognitive levels of attainment as per Bloom's Taxonomy
1	**Overview Of Entrepreneurship**:	04	
	Definitions, Roles and Functions/Values of Entrepreneurship, History of Entrepreneurship Development, Role of Entrepreneurship in the National Economy, Functions of an Entrepreneur, Entrepreneurship and Forms of Business Ownership Role of Money and Capital Markets in Entrepreneurial Development: Contribution of Government Agencies in Sourcing information for Entrepreneurship		L1, L2, L3, L4
2	**Concepts of Returns and Risks**:	09	
	Measurement of Historical Returns and Expected Returns of a Single Security and a Two-security Portfolio; Measurement of Historical Risk and Expected Risk of a Single Security and a Two-security Portfolio. **Time Value of Money**: Future Value of a Lump Sum, Ordinary Annuity, and Annuity Due; Present Value of a Lump Sum, Ordinary Annuity, and Annuity Due; Continuous Compounding and Continuous Discounting.		L1, L2, L3, L4
3	**Women's Entrepreneurship Development**:	05	
	Social entrepreneurship role and need, EDP cell, role of sustainability and sustainable development for SMEs, case studies, exercises		L1, L2, L3, L4

4	**Indian Environment for Entrepreneurship**:	08	
	key regulations and legal aspects , MSMED Act 2006 and its implications, schemes and policies of the Ministry of MSME, role and responsibilities of various government organizations, departments, banks etc., Role of State governments in terms of infrastructure developments and support etc., Public private partnerships, National Skill development Mission, Credit Guarantee Fund, PMEGP, discussions, group exercises etc		L1, L2, L3, L4
5	**Effective Management of Business**:	08	
	Issues and problems faced by micro and small enterprises and effective management of M and S enterprises (risk management, credit availability, technology innovation, supply chain management, linkage with large industries), exercises, e-Marketing.		L1, L2, L3, L4
6	**Achieving Success In The Small Business**:	05	
	Stages of the small business life cycle, four types of firm-level growth strategies, Options – harvesting or closing small business Critical Success factors of small business		L1, L2, L3, L4
	Total	39	

Books & References:

SN	Title	Authors	Publisher	Edition	Year
1	A Shapherd, Entrepreneurship	Robert D Hisrich, Michael P Peters	The McGrawHill	Third Edition	1998
2	Entrepreneurship Development	T N Chhabra	Sun India Publications	Fourth Edition	2014
3	Small and Medium Enterprises in Global Perspective	C N Prasad	New Century Publications	First Edition	2004
4	The Dynamics of Entrepreneurial development and management	Vasant Desai	Himalaya Publishing House	Second Edition	2011
5	Entrepreneurship	Maddhurima Lall, Shikah Sahai	Excel Books	Second Edition	2008
6	Entrepreneurship development-Small Business Enterprise	Poornima Charantimath	Pearson Edition	Fifth Edition	2009
7	STAY hungry STAY foolish	Rashmi Bansal	IIM Ahmadabad	First Edition	2012
8	Law and Practice relating to Micro, Small and Medium enterprises	Indian Institute of Banking & Finance	Taxmann Publication Ltd.	First Edition	2017
9	Entrepreneurship-Theory-Process -Practice	Donald Kurakto	Cengage Learning	Ninth Edition	2008

Online References:

S. No.	Website Name	URL	Modules Covered
1	Laghu Udyog Samachar	https://dcmsme.gov.in/Laghu_Udyog_Samachar.html	M1-M6
2	www.msme.gov.in	https://msmeregistrar.org/?gclid=EAIaIQobChMIqpSWt-S5QIV1BqPCh2W2w4FEAAYASAAEgJWkfD_BwE	M1-M6
3	www.dcmesme.gov.in	https://dcmsme.gov.in/	M1-M6
4	www.msmetraining.gov.in	www.msmetraining.gov.in	M1-M6

B.E. Semester –VIII
Choice Based Credit Grading Scheme with Holistic Student Development (CBCGS-H 2019)
Proposed Syllabus under Autonomy Scheme

BE (Information Technology)								B.E. (SEM : VIII)		
Course Name: Human Resource Management								**Course Code:** ILO8024		
Teaching Scheme (Program Specific)						**Examination Scheme Formative/Summative**				
Modes of Teaching / Learning / Weightage						**Modes of Continuous Assessment / Evaluation**				
Hours Per Week					**Theory (100)**		**Practical/Oral (25)**	**Term Work (25)**		**Total**
Theory	**Tutorial**	**Practical**	**Contact Hours**	**Credit**	**IA**	**ESE**	**PR**	**TW**		**100**
3	-	-	3	3	20	80	-	-	-	-
IA: In-Semester Assessment - Paper Duration – 1 Hours										
ESE: End Semester Examination - Paper Duration - 3 Hours										
The weightage of marks for continuous evaluation of Term work/Report: Formative (40%), Timely completion of practical (40%) and Attendance / Learning Attitude (20%)										
Pre-requisite: The course does not have any pre-requisites.										

Course Objective: The course intends to deliver basic concept, techniques and practices of the human resource Management. The course also gives opportunity of learning Human resource management (HRM) processes, related with the functions, and challenges in the emerging perspective of today's organizations, also helps student to acquaint the importance of inter-personal & inter-group behavioral skills in an organizational setting required for future stable engineers, leaders and managers.

Course Outcomes: Upon Completion of Course student will be able to:

SN	Course Outcomes	Cognitive levels of attainment
1	Understand the concepts, aspects, techniques and practices of the human resource management.	L1,L2
2	Understand the Human resource management (HRM) processes, functions, changes and challenges in today's emerging organizational perspective.	L1,L2
3	Gain knowledge about the latest developments and trends in HRM.	L1,L2,L3
4	Understand the Training and development process in HRM	L1,L2,L3
5	Applying Leadership and Decision Making qualities	L1,L2,L3,L4
6	Apply the knowledge of behavioral skills learnt and integrate it with in inter personal and Inter group environment emerging as future stable engineers and managers.	L1,L2,L3,L4

Detailed Syllabus:

Module No.	Topics	Hrs.	Cognitive levels of attainment
1	**Human Resource Management development**	05	L1,L2
	Human Resource Management- Concept, Scope and Importance, Interdisciplinary Approach Relationship with other Sciences, Competencies of HR Manager, HRM functions. **Human resource development (HRD):** changing role of HRM – Human resource Planning, Technological change, Restructuring and rightsizing, Empowerment, TQM, Managing ethical issues.		
2	**Organizational Behaviour (OB)**	06	L1,L2
	Introduction to OB Origin, Nature and Scope of Organizational Behaviour, Relevance to Organizational Effectiveness and Contemporary issues. **Personality**: Meaning and Determinants of Personality, Personality development, Personality Types, Assessment of Personality Traits for Increasing Self Awareness. **Perception**: Attitude and Value, Effect of perception on Individual Decision-making,		

	Attitude and Behaviour. **Motivation**: Theories of Motivation and their Applications for Behavioural Change (Maslow, Herzberg, McGregor). Group Behaviour and Group Dynamics: Work groups formal andinformal groups and stages of group development, Team Effectiveness: High performing teams, Team Roles, cross functional and self-directed team. Case study.			
3	**Organizational Structure & Design**	06	L1,L2,L3
	Structure, size, technology, Environment of organization; Organizational Roles & conflicts: Concept of roles; role dynamics; role conflicts and stress. **Leadership**: Concepts and skills of leadership, Leadership and managerial roles, Leadership styles and contemporary issues in leadership. **Power and Politics**: Sources and uses of power; Politics at workplace, Tactics and strategies.		
4	**Human resource Planning**	06	L1,L2,L3
	Recruitment and Selection process, Job-enrichment, Empowerment - Job-Satisfaction, employee morale. **Performance Appraisal Systems**: Traditional & modern methods, Performance Counseling, Career Planning. Training & Development: Identification of Training Needs, Training Methods.		
5	**Emerging Trends in HR**	07	L1,L2,L3,L4
	Organizational development; Business Process Re-engineering (BPR), BPR as a tool for organizational development , managing processes & transformation in HR. Organizational Change, Culture, Environment. **Cross Cultural Leadership and Decision Making**: Cross Cultural Communication and diversity at work, Causes of diversity, managing diversity with special reference to handicapped, women and ageing people, intra company cultural difference in employee motivation.		
6	**HR&MS**	9	L1,L2,L3,L4
	HR & MIS: Need, purpose, objective and role of information system in HR, Applications in HRD in various industries (e.g. manufacturing R&D, Public Transport, Hospitals, Hotels and service industries. **Strategic HRM**: Role of Strategic HRM in the modern business world, Concept of Strategy, Strategic Management Process, Approaches to Strategic Decision Making; Strategic Intent – Corporate Mission, Vision, Objectives and Goals. **Labor Laws & Industrial Relations:** Evolution of IR, IR issues in organizations, Overview of Labor Laws in India; Industrial Disputes Act, Trade Unions Act, Shops and Establishments Act.		
	Total	39	

Books & References:

Sr. No	Title	Authors	Publisher	Edition	Year
1	Organizational Behavior	Stephen Robbins,	Excel publishing	16th Ed	2013
2	Human Resource Management	V S P Rao,	Excel publishing	3rd Ed	2010
3	Human resource management	Aswathapa,	Text & cases	6th Ed,	2011
4	Dynamics of Industrial Relations in India	C. B. Mamoria and S V Gankar,	Himalaya Publishing,	15th Ed	2015
5	Essentials of Human Resource management and Industrial relations	P. Subba Rao,	Himalaya Publishing,	5th Ed	2013
6	Management & Organizational Behavior	Laurie Mullins	Himalaya Publishing,	Latest Ed	2016

Online References:

S. No	Website Name	URL	Modules Covered
1	NPTEL	https://nptel.ac.in/courses/110105069/	M1,M2,M3
2	COURSE ERA	https://www.coursera.org/specializations/human-resource-management	M4,M5
3	SWAYAM	https://swayam.gov.in/nd1_noc19_mg51/preview	M1,M2,M5,M6

S. No	Website Name	URL	Modules Covered
1	NPTEL	https://nptel.ac.in/courses/110105069/	M1,M2,M3
2	COURSE ERA	https://www.coursera.org/specializations/human-resource-management	M4,M5
3	SWAYAM	https://swayam.gov.in/nd1_noc19_mg51/preview	M1,M2,M5,M6

B.E. Semester-VIII
Choice Based Credit Grading Scheme with Holistic Student Development (CBCGS-H 2019)
Proposed Syllabus under Autonomy Scheme

BE (Information Technology)					B.E. (SEM: VIII)			
Course Name: Professional Ethics and CSR					**Course Code:** ILO8025			
Teaching Scheme (Program Specific)					**Examination Scheme (Formative/ Summative)**			
Modes of Teaching / Learning / Weightage					**Modes of Continuous Assessment / Evaluation**			
Hours Per Week					**Theory**		**Practical/Oral**	**Term Work**	**Total**
Theory	**Tutorial**	**Practical**	**Contact Hours**	**Credits**	**IA**	**ESE**	**PR**	**TW**	
3	-	-	3	3	20	80	-	-	**100**
IA: In-Semester Assessment - Paper Duration – 1 Hours **ESE: End Semester Examination - Paper Duration - 3 Hours** **The weightage of marks for continuous evaluation of Term work/Report:** Formative (40%), Timely completion of practical (40%) and Attendance / Learning Attitude (20%)									
Prerequisite: - Nil									

Course Objective:

This course intends to deliver knowledge about professional ethics in business develop and recognize corporate social responsibility

Course Outcomes: **Upon completion of the course students will be able to:**

SN	Course Outcomes	Cognitive levels of attainment as per Bloom's Taxonomy
1	Understand rights and duties of business	L1,L2
2	Distinguish different aspects of corporate social responsibility	L1,L2,L3
3	Demonstrate professional ethics	L1,L2,L3
4	Understand legal aspects of corporate social responsibility	L1,L2

Detailed Syllabus:

Module No.	Topics	Hrs.	Cognitive levels of attainment as per Bloom's Taxonomy
1	**Professional Ethics and Business** The Nature of Business Ethics; Ethical Issues in Business; Moral Responsibility and Blame; Utilitarianism: Weighing Social Costs and Benefits; Rights and Duties of Business	06	L1,L2
2	**Professional Ethics in the Marketplace:** Professional Ethics in the Marketplace: Perfect Competition; Monopoly Competition; Oligopolistic Competition; Oligopolies and Public Policy Professional Ethics and the Environment: Dimensions of Pollution and Resource Depletion; Ethics of Pollution Control; Ethics of Conserving Depletable Resources	06	L1,L2,L3

3	**Professional Ethics of Consumer Protection** Professional Ethics of Consumer Protection: Markets and Consumer Protection; Contract View of Business Firm's Duties to Consumers; Due Care Theory; Advertising Ethics; Consumer Privacy Professional Ethics of Job Discrimination: Nature of Job Discrimination; Extent of Discrimination; Reservation of Jobs .	08	L1,L2,L3
4	**Introduction to Corporate Social Responsibility** Potential Business Benefits—Triple bottom line, Human resources, Risk management, Supplier relations; Criticisms and concerns—Nature of business; Motives; Misdirection. Trajectory of Corporate Social Responsibility in India	05	L1,L2
5	**Corporate Social Responsibility** Articulation of Gandhian Trusteeship Corporate Social Responsibility and Small and Medium Enterprises (SMEs) in India, Corporate Social Responsibility and Public-Private Partnership (PPP) in India	10	L1,L2
6	**Corporate Social Responsibility in Globalizing India** Corporate Social Responsibility Voluntary Guidelines, 2009 issued by the Ministry of Corporate Affairs, Government of India, Legal Aspects of Corporate Social Responsibility—Companies Act, 2013.	10	L1,L2,L3
Total		**45**	

Books and References:

SN	Title	Authors	Publisher	Edition	Year
1	Project Management: A managerial approach	Ananda Das Gupta	Springer	-	2013
2	Corporate Social Responsibility: Readings and Cases in a Global Context	Andrew Crane, Dirk Matten, Laura Spence	Routledge	2nd	2014
3	Business Ethics: Concepts and Cases	Manuel G. Velasquez	Pearson, New Delhi	7th	2011
4	Corporate Social Responsibility in India	Bidyut Chakrabarty	Routledge, New Delhi.	2nd	2015

Online References:

SN	Website	Name URL	Modules Covered
1	www.nptel.ac.in	https://nptel.ac.in/courses/110105081/	M1-M6
2	www.nptel.ac.in	https://swayam.gov.in/nd1_noc19_mg56/preview	M1-M6

B.E. Semester-VIII
Choice Based Credit Grading Scheme with Holistic Student Development (CBCGS-H 2019)
Proposed Syllabus under Autonomy Scheme

BE (Information Technology)							B.E. (SEM : VIII)		
Course Name : Research Methodology							**Course Code :** ILO8026		
Teaching Scheme (Program Specific)						**Examination Scheme (Formative/ Summative)**			
Modes of Teaching / Learning / Weightage						**Modes of Continuous Assessment / Evaluation**			
Hours Per Week					**Theory**		**Practical/Oral**	**Term Work**	**Total**
Theory	**Tutorial**	**Practical**	**Contact Hours**	**Credits**	**IA**	**ESE**	**PR**	**TW**	
3	-	-	3	3	20	80	-	-	**100**
IA: In-Semester Assessment - Paper Duration – 1 Hours **ESE: End Semester Examination - Paper Duration - 3 Hours** **The weightage of marks for continuous evaluation of Term work/Report:** Formative (40%), Timely completion of practical (40%) and Attendance / Learning Attitude (20%)									
Prerequisite: Research Aptitude									

Course Objective:
This course intends to provide students with fundamental knowledge of research and enable researchers, irrespective of their discipline, in developing the most appropriate methodology for their research studies; and to make them familiar with the art of using different research methods and techniques. Topics to be covered include Introduction and Basic Research Concepts, Types of Research, Research Design and Sample Design, Research Methodology, Formulating Research Problem, Outcome of Research.
Course Outcomes: **Upon completion of the course students will be able to**:

SN	Course Outcomes	Cognitive levels of attainment as per Bloom's Taxonomy
1	Explain to understand Research and Research Process	L1,L2
2	Describe the meaning of Research Design and Sample Design	L1,L2
3	Explain different data link layer services and elementary data link protocols.	L1,L2
4	Explain meaning of Research Methodology and Stages in Scientific Research Process.	L1,L2
5	Explain Formulation of Research Problem	L1,L2
6	Explain the process of Preparation of the report on conclusion reached	L1,L2

Detailed Syllabus:

Module No.	Topics	Hrs.	Cognitive levels of attainment as per Bloom's Taxonomy
1	**Introduction and Basic Research Concepts** Research – Definition; Concept of Construct, Postulate, Proposition, Thesis, Hypothesis, Law, Principle. Research methods vs Methodology Need of Research in Business and Social Sciences, Objectives of Research, Issues and Problems in Research, Characteristics of Research: Systematic, Valid, Verifiable, Empirical and Critical.	06	L1,L2
2	**Types of Research** Basic Research, Applied Research, Descriptive Research, Analytical Research, Empirical Research, Qualitative & Quantitative Approaches	06	L1,L2

3	**Research Design and Sample Design**		
	Research Design – Meaning, Types and Significance, 3.2 Sample Design – Meaning and Significance Essentials of a good, sampling Stages in Sample Design Sampling methods/techniques, Sampling Errors	08	L1,L2
4	**Research Methodology**		
	Meaning of Research Methodology, Stages in Scientific Research Process: a. Identification and Selection of Research Problem b. Formulation of Research Problem c. Review of Literature d. Formulation of Hypothesis e. Formulation of research Design f. Sample Design g. Data Collection h. Data Analysis i. Hypothesis testing and Interpretation of Data j. Preparation of Research Report	05	L1,L2
5	**Formulating Research Problem**		
	Considerations: Relevance, Interest, Data Availability, Choice of data, Analysis of data, Generalization and Interpretation of analysis Replacement.	10	L1,L2
6	**Outcome of Research**		
	Preparation of the report on conclusion reached Validity Testing & Ethical Issues, Suggestions and Recommendation	10	L1,L2
	Total	45	

Books and References:

SN	Title	Authors	Publisher	Edition	Year
1	Practical Research Methods	Dawson, Catherine	UBS Publishers Distributors.	2nd	2002
2	Research Methodology-Methods and Techniques	Kothari, C. R	Wiley Eastern Limited.	Special Indian	1985
3	TCP/IP Protocol Suite	Kumar, Ranjit	Singapore, earson Education	2nd ed	2005

Online References:

SN	Website	Name URL	Modules Covered
1	www.nptel.ac.in	https://nptel.ac.in/courses/121106007/	M1-M6
2	www.nptel.ac.in	https://nptel.ac.in/courses/107108011/	M1-M6
3	Swayam Protal	https://swayam.gov.in/nd1_noc19_ge21/preview	M1-M6

B.E. Semester – VIII
Choice Based Credit Grading Scheme with Holistic Student Development (CBCGS- H 2019)
Proposed Syllabus under Autonomy Scheme

BE (Information Technology)							B.E.(SEM: VIII)		
Course Name: IPR and Patenting							**Course Code:** ILO8027		
Teaching Scheme (Program Specific)						**Examination Scheme Formative/Summative)**			
Modes of Teaching / Learning / Weightage						**Modes of Continuous Assessment / Evaluation**			
Hours Per Week						**Theory**	**Practical/Oral**	**Term Work**	**Total**
Theory	**Tutorial**	**Practical**	**Contact Hours**	**Credit**	**IA**	**ESE**	**PR**	**TW**	**100**
3	-	-	3	3	20	80	-	-	
IA : In-Semester Assessment - Paper Duration – 1 Hour **ESE: End Semester Examination - Paper Duration - 3 Hours** **The weightage of marks for continuous evaluation of Term work/Report:** Formative (40%), Timely completion of practical (40%) and Attendance/Learning Attitude (20%)									
Prerequisite: Not Applicable									

Course Objective:

The course intends to deliver knowledge on intellectual property rights protection system, promote knowledge of Intellectual Property Laws of India as well as International treaty procedures and to get acquaintance with Patent search and patent filing procedure and applications.

Course Outcomes: **Upon completion of the course students will be able to:**

SN	Course Outcomes	Cognitive levels of attainment as per Bloom's Taxonomy
1	Understand Intellectual Property assets	L1, L2
2	Assist individuals and organizations in capacity building	L1, L2, L3, L4
3	Work for development, promotion, protection, compliance, and enforcement of Intellectual Property and Patenting	L1, L2, L3, L4,

Detailed Syllabus:

Module No.	Topics	Hrs.	Cognitive levels of attainment as per Bloom's Taxonomy
1	**Introduction to Intellectual Property Rights (IPR):**	06	L1, L2, L3,
	IPR, Different category of IPR instruments - Patents, Trademarks, Copyrights, Industrial Designs, Plant variety protection, Geographical indications, Transfer of technology etc. Importance of IPR in Modern Global Economic Environment: Theories of IPR, Philosophical aspects of IPR laws, Need for IPR, IPR as an instrument of development		

2	**Enforcement of Intellectual Property Rights:** Magnitude of problem, Factors that create and sustain counterfeiting/piracy, International agreements, International organizations (e.g. WIPO, WTO) active in IPR enforcement Indian Scenario of IPR: Introduction, History of IPR in India, Overview of IP laws in India, Indian IPR, Administrative Machinery, Major international treaties signed by India, Procedure for submitting patent and Enforcement of IPR at national level etc.	07	L1, L2, L3,
3	**Emerging Issues in IPR:** Challenges for IP in digital economy, ecommerce, human genome, biodiversity and traditional knowledge etc.	05	L1, L2, L3, L4
4	**Basics of Patents:** Definition of Patents, Conditions of patentability, Patentable and non-patentable inventions, Types of patent applications (e.g. Patent of addition etc), Process Patent and Product Patent, Precautions while patenting, Patent specification Patent claims, Disclosures and non-disclosures, Patent rights and infringement, Method of getting a patent	07	L1, L2, L3, L4
5	**Patent Rules:** Indian patent act, European scenario, US scenario, Australia scenario, Japan scenario, Chinese scenario, Multilateral treaties where India is a member (TRIPS agreement, Paris convention etc.)	07	L1,L2
6	**Procedure for Filing a Patent (National and International):** Legislation and Salient Features, Patent Search, Drafting and Filing Patent Applications, Processing of patent, Patent Litigation, Patent Publication, Time frame and cost, Patent Licensing, Patent Infringement Patent databases: Important websites, Searching international databases	07	L1
Total		39	

Books &References:

SN	Title	Authors	Publisher	Edition	Year
1	A Handbook on Laws Relating to Intellectual Property Rights in India	Rajkumar S. Adukia	The Institute of Chartered Accountants of India	-	2007
2	Patent system and related issues at a glance	Keayla B K	Published by National Working Group on Patent Laws	-	2008
3	Intellectual Property Law in India	T Sengupta, 2011	Kluwer Law International	-	2011
4	Intellectual Property and Human Development: Current Trends and Future Scenario	Tzen Wong and Graham Dutfield	Cambridge University Press	-	2010
5	Intellectual Property: Patents, Copyrights, Trade Marks and Allied Right	Cornish, William Rodolph & Llewelyn, David	Sweet & Maxwell	7th Edition	2010

Online References:

S. No.	Website Name	URL	Modules Covered
1	NPTEL	https://nptel.ac.in/courses/110106081/	M1-M6

B.E. Semester –VIII
Choice Based Credit Grading Scheme with Holistic Student Development (CBCGS- H 2019)
Proposed Syllabus under Autonomy Scheme

BE (Information Technology)							B.E. (SEM : VIII)			
Course Name : Digital Business Management							Course Code : ILO8028			
Teaching Scheme (Program Specific)							Examination Scheme (Formative/ Summative)			
Modes of Teaching / Learning / Weightage							Modes of Continuous Assessment / Evaluation			
Hours Per Week						Theory		Practical/Oral/ Presentation	Term Work	Total
Theory	Tutorial	Practical	Contact Hours	Credits	IA	ESE		PR	TW	
3	-	-	3	3	20	80		--	--	**100**
IA: Internal Assessment - Paper Duration – 1 Hour ESE: End Semester Examination - Paper Duration - 3 Hours **The weightage of marks for continuous evaluation of Term work/Report:** Formative (40%), Timely completion of practical (40%) and Attendance/Learning Attitude (20%)										
Prerequisite: E-Commerce and digital business services										

Course Objective: The course intends to deliver the fundamental knowledge to understand concepts of E-Commerce, digital business concept and insights into E-business and its strategies.

Course Outcomes: Upon completion of the course student will be able to:

SN	Course Outcomes	Cognitive Level as per Bloom's Taxonomy
1	Identify drivers of digital business	L1,L2,L3
2	Illustrate various approaches and techniques for E-business and management	L1,L2,L3,L4
3	Prepare E-business plan	L1,L2,L3,L4,L5
4	Prepare plan for Managing E-Business	L1,L2,L3,L4
5	Prepare E-Business Strategy	L1,L2,L3,L4
6	Prepare Business Plan	L1,L2,L3,L4,L5

Detailed Syllabus:

Module No.	Topics	Hrs.	Cognitive Level as per Bloom's Taxonomy
1	**Introduction to Digital Business-** Introduction, Background and current status, E-market places, structures, mechanisms, economics and impacts Difference between physical economy and digital economy, **Drivers of digital business-** Big Data & Analytics, Mobile, Cloud Computing, Social media, BYOD, and Internet of Things(digitally intelligent machines/services) Opportunities and Challenges in Digital Business	6	L1,L2,L3

2	**Overview of E-Commerce** **E-Commerce-** Meaning, Retailing in e-commerce-products and services, consumer behavior, market research and advertisement B2B-E-commerce-selling and buying in private e-markets, public B2B exchanges and support services, e-supply chains, Collaborative Commerce, Intra business EC and Corporate portals Other E-C models and applications, innovative EC System-From E government and learning to C2C, mobile commerce and pervasive computing EC Strategy and Implementation-EC strategy and global EC ,Economics and Justification of EC, Using Affiliate marketing to promote your e-commerce business, Launching a successful online business and EC project, Legal, Ethics and Societal impacts of EC	6	L1,L2,L3,L4
3	**Digital Business Support services:** ERP as e –business backbone, knowledge Tope Apps, Information and referral system **Application Development:** Building Digital business Applications and Infrastructure	6	L1,L2,L3,L4,L5
4	**Managing E-Business**-Managing Knowledge, Management skills for e-business, Managing Risks in e –business Security Threats to e-business -Security Overview, Electronic Commerce Threats, Encryption, Cryptography, Public Key and Private Key Cryptography, Digital Signatures, Digital Certificates, Security Protocols over Public Networks: HTTP, SSL, Firewall as Security Control, Public Key Infrastructure (PKI) for Security, Prominent Cryptographic Applications, Monopulse tracking , Conical scan and sequential lobbing , Limitation of tracking accuracy , Low angle tracking	7	L2
5	**E-Business Strategy**-E-business Strategic formulation- Analysis of Company's Internal and external environment, Selection of strategy, E-business strategy into Action, challenges and E-Transition (Process of Digital Transformation)	7	L2
6	**Materializing e-business:** From Idea to Realization-Business plan preparation, **Case Studies and presentations**	7	L2
	Total	39	

Books and References:

S.N	Title	Authors	Publisher	Edition	Year
1	A textbook on E-commerce	Er Arunrajan Mishra, Dr W K Sarwade	Neha Publishers & Distributors	3rd Edition,	2011
2	E-commerce from vision to fulfilment	Elias M. Awad	PHI Restricted	4th Edition	2002
3	Digital Business and E-Commerce Management	Dave Chaffey	Artech House	6th Ed	August 2014
4	. Introduction to E-business-Management and Strategy	Colin Combe	John Wiley and Sons	ELSVIER	2006
5	Digital Business Concepts and Strategy	Eloise Coupey	Pearson.	2nd Edition	-
6	Trend and Challenges in Digital Business Innovation	Vinocenzo Morabito	-	Springer	-
7	Digital Business Discourse	Erika Darics	-	Palgrave Macmillan	April 2015
8	E-Governance-Challenges and Opportunities	-	-	-	Proceedings in 2nd International Conference theory and practice of Electronic Governance
9	Perspectives the Digital Enterprise	-	TCS consulting journal Vol.5	-	A framework for Transformation
10	Measuring Digital Economy-A new perspective	-	OECD Publishing	-	DoI:10.1787

Online References:

S. No.	Website Name	URL	Modules Covered
1	Coursera	https://www.coursera.org/specializations/digital-marketing	M1,M2,M3
2	getsmarter	https://www.getsmarter.com/courses/us/mit-digital-business-strategy-online-short-course	M4,M5

S. No.	Website Name	URL	Modules Covered
1	Coursera	https://www.coursera.org/specializations/digital-marketing	M1,M2,M3
2	getsmarter	https://www.getsmarter.com/courses/us/mit-digital-business-strategy-online-short-course	M4,M5

TCET

DEPARTMENT OF INFORMATION TECHNOLOGY (IT)
[Accredited by NBA for 3 years, 3rd Cycle Accreditation w.e.f. 1st July 2019]
Choice Based Credit Grading System with Holistic Student Development [CBCGS - H 2019]
Under TCET-Autonomy Scheme - 2019

B.E. Semester –VIII
Choice Based Holistic Credit Grading Scheme (CBHCGS-2019)
Proposed Syllabus under Autonomy Scheme

BE (Information Technology)							B.E. (SEM : VIII)		
Course Name : Environmental Management							**Course Code :** ILO8029		
Teaching Scheme (Program Specific)						**Examination Scheme (Formative/ Summative)**			
Modes of Teaching / Learning / Weightage						**Modes of Continuous Assessment / Evaluation**			
Hours Per Week					**Theory**		**Practical/Oral**	**Term Work**	**Total**
Theory	**Tutorial**	**Practical**	**Contact Hours**	**Credits**	**IA**	**ESE**	**PR**	**TW**	
3	_	_	3	3	20	80	_	_	**100**
IA: Internal Assessment - Paper Duration – 1 Hour **ESE: End Semester Examination - Paper Duration - 3 Hours** **The weightage of marks for continuous evaluation of Term work/Report:** Formative (40%), Timely completion of practical (40%) and Attendance/Learning Attitude (20%)									
Prerequisite: Fundamentals of Chemistry and biology									

Course Objective:
The course intends to give an understanding of environmental issues relevant to India and global concerns. The course also aims to make the students to learn concept of ecology. Apart from these the course also familiarizes environment related legislations.

Course Outcomes: Upon completion of the course student will be able to:

SN	Course Outcomes	Cognitive levels of attainment as per Bloom's Taxonomy
1	Understand the concept of environmental management	L2, L4
2	Understand ecosystem and interdependence, food chain etc.	L2, L3, L4
3	Understand and interpret environment related legislations	L2, L3

Detailed Syllabus:

Module No.	Topics	Hrs.	Cognitive levels of attainment as per Bloom's Taxonomy
1	**Introduction and Definition of Environment** Significance of Environment Management for contemporary managers, Career opportunities, Environmental issues relevant to India, Sustainable Development, the Energy scenario.	5	L2, L3
2	**Global Environmental concerns** Global Warming, Acid Rain, Ozone Depletion, Hazardous Wastes, Endangered life-species, Loss of Biodiversity, Industrial/Man-made disasters, Atomic/Biomedical hazards, etc.	6	L3, L4,
3	**Concepts of Ecology** Ecosystems and interdependence between living organisms, habitats, limiting factors, carrying capacity, food chain, etc.	7	L2

4	**Scope of Environment Management**	7	L2, L4
	Role and functions of Government as a planning and regulating agency Environment Quality Management and Corporate Environmental Responsibility.		
5	**Total Quality Environmental Management**	7	L2
	ISO-14000, EMS certification.		
6	**General overview of major legislations**	7	L2, L4
	Environment Protection Act, Air (P & CP) Act, Water (P & CP) Act, Wildlife Protection Act, Forest Act, Factories Act, etc.		
	Total	39	

Books and References:

Sr.No.	Title	Author	Publisher	Edition	Year
1	Environmental Management: Principles and Practice	C J Barrow	Routledge Publishers	------------	1999
2	A Handbook of Environmental Management	John C. Lovett and David G. Ockwell	Edward Elgar Publishing	------------	2010
3	Environmental Management	V Ramachandra and Vijay Kulkarni	TERI Press	------------	2006
4	Indian Standard Environmental Management Systems — Requirements With Guidance For Use	Bureau Of Indian Standards	------------	------------	2005
5	Environmental Management: An Indian Perspective	S N Chary and Vinod Vyasulu	Macmillan India	-------------	2000
6	Introduction to Environmental Management	Mary K Theodore and Louise Theodore	CRC Press	-------------	2009
7	Environment and Ecology	Majid Hussain	Access Publishing	3rd	2015

Online References:

Sr. No.	Website Name	URL	Modules
1	Alison	https://alison.com/course/introduction-to-ecology	3
2	ISO	https://www.iso.org/iso-14001-environmental-management.html	5
3	Certified Environment Law Analyst	https://www.vskills.in/certification/legal/environment-law-certification	6

B.E. Semester –VIII
Choice Based Credit Grading Scheme with Holistic Student Development (CBCGS-H 2019)
Proposed Syllabus under Autonomy Scheme

B.E.(Information Technology)							B.E.(SEM : VIII)			
Course Name : Devops Lab							Course Code : ITL 803			
Teaching Scheme (Program Specific)							Examination Scheme (Formative/ Summative)			
Modes of Teaching / Learning / Weightage							Modes of Continuous Assessment / Evaluation			
Hours Per Week					Theory (100)		Practical/Oral (25)	Term Work (25)	Total	
Theory	Tutorial	Practical	Contact Hours	Credits	IA	ESE	OR	TW		
--	-	02	02	01	--	--	25	25	50	
IA: In-Semester Assessment- Paper Duration – **1Hours** **ESE : End Semester Examination-** Paper Duration - **3 Hours** **Total weightage of marks for continuous evaluation of Term work/Report:** Formative (40%), Timely Completion of Practical (40%) and Attendance /Learning Attitude (20%).										
Prerequisite: Operating System, Virtualization, Cloud Computing, Java and Web Programming, and Software Engineering										

Lab Objectives: Course intends to deliver the concept of DevOps with associated technologies and methodologies which provide them with an in-demand skill-set, in both the research and business environments. Also to demonstrate usage of different tools like GIT, CVS or Mercurial, Docker, Puppet, Chef, Ansible or Saltstack.

Lab Outcomes: Upon completion of the course student will be able to:

SN	Course outcomes	Cognitive levels of attainment as per Bloom's Taxonomy
1.	Remember the importance of DevOps tools used in software development life cycle	L1,L2
2.	Understand the importance of Jenkins to Build, Deploy and Test Software Applications	L1,L2,L3,L4
3.	Examine the different Version Control strategies	L1,L2,L3,L4
4.	Analyze & Illustrate the Containerization of OS images and deployment of applications over Docker	L1,L2,L3,L4
5.	Summarize the importance of Software Configuration Management in DevOps	L1,L2,L3,L4.L5
6.	Synthesize the provisioning using Chef/Puppet/Ansible or Saltstack.	L1,L2,L3,L4,L5

Hardware & Software Requirements:

Hardware Requirements	Software Requirements	Other Requirements
PC With following configuration		
Intel Core i3/i5/i7 Processor with Intel VT-X Support 4 GB RAM 500 GB Harddisk Gigabit Ethernet (GbE) network interface card(NIC)	Windows or Linux Desktop OS CentOS/Fedora/Ubuntu/Redhat Server OS for One Server JDK 1.8 or higherNetbeans or EclipseOpenSSH	Internet Connection for each PC with at least 2 MBPS bandwidth.

List of Practical/ Experiment:

Practical No.	Type of Experiment	Practical/Experiment topic	Hrs	Cognitive levels of attainment as per Bloom's Taxonomy
1	**Basic experiment**	To Understand the Concept of DevOps with related technologies	2	L1, L2
2		To understand the concept of Cloud Computing	2	L1, L2
3	**Design Based Experiment**	To Install and Configure Jenkins to test, and deploy Java or Web Applications using Netbeans or eclipse.	4	L1, L2
4		To Perform version control using GITS	2	L1, L2,L3
5		To Install and Configure Docker for creating Containers of different Operating System Images	4	L1, L2,L3,L4
6		To Build, deploy and manage web or Java application on Docker	4	L1, L2,L3,L4
7		To install and configure Software Configuration Management using Chef/ Puppet	4	L1, L2,L3,L5,L6
8		To Perform Software Configuration Management and provisioning using Chef/Puppet	4	L1, L2,L3,L5,L6
9		To perform monitoring of system using Nagios/Splunk	2	L1, L2,L3,L5,L6
10	**Group Activity/ Case study**	Study of Linux command in terms of DEVOPS	2	L1,L2
		Total Hrs.	30	

Books and References:

S. No.	Title	Authors	Publisher	Edition	Year
1	Docker: Up and Running	Karl Matthias & Sean P. Kane	O Reilly Publications	2nd Edition	2018
2	DevOps, A Software Architects Perspective	Len Bass,Ingo Weber,Liming Zhu	Addison-Wesley-Pearson Publication	1st	May-2015
3	Jenkins, The Definitive Guide	John Ferguson Smart	O'Reilly Publication	Creative Commons Edition	-
4	DevOps for Dummies	Sanjeev Sharma and Bernie Coyne	Wiley Publication	IBM Limited	-
5	DevOps for Developers	Httermann, Michael	Apress Publication	1st	2012
6	Practical DevOps	Joakim Verona	Pack publication	-	2016

Online Recourses:

S. No.	Website Name	URL	Modules covered
1	https://aws.amazon.com/devops/what-is-devops/	https://aws.amazon.com/devops/what-is-devops/	--

Choice Based Credit Grading Scheme with Holistic Student Development (CBCGS-H 2019)
Proposed Syllabus under Autonomy Scheme

B.E.(Information Technology)							B.E.(SEM : VIII)		
Course Name : R Programming Lab							Course Code : ITL804		
Teaching Scheme (Program Specific)							Examination Scheme (Formative/ Summative)		
Modes of Teaching / Learning / Weightage							Modes of Continuous Assessment / Evaluation		
Hours Per Week						Theory (100)	Practical/Oral (25)	Term Work (25)	Total
Theory	Tutorial	Practical	Contact Hours	Credits	IA	ESE	OR	TW	
--	-	02	02	01	--	--	25	25	**50**
IA: In-Semester Assessment- Paper Duration – **1Hours** **ESE :** End Semester Examination- Paper Duration - **3 Hours** **Total weightage of marks for continuous evaluation of Term work/Report:** Formative (40%), Timely Completion of Practical (40%) and Attendance /Learning Attitude (20%).									
Prerequisite: Any object oriented programming language, Data mining concepts									

Lab Objectives: Course intends to deliver the fundamentals of R programming environment and related eco-system and thus provide them with an in-demand skill-set, in both the research and business environments. Also to introduce the extended R ecosystem of libraries and packages. Also to demonstrate usage of as standard Programming Language and to familiarize students with how various statistics like mean median etc. can be collected for data exploration in R.

Lab Outcomes: Upon completion of the course student will be able to:

Sr. No.	Course Outcomes	Cognitive levels of attainment as per Bloom's Taxonomy
1	Install and use R for simple programming tasks.	L1, L2
2	Extend the functionality of R by using add-on packages	L2
3	Extract data from files and other sources and perform various data manipulation tasks on them.	L2, L3
5	Use R Graphics and Tables to visualize results of various statistical operations on data .	L2, L3, L4
6	Apply the knowledge of R gained to data Analytics for real life applications.	L3, L4, L6

Hardware/software requirements:

1. The R statistical software program. Available from: https://www.r-project.org/

2. RStudio an Integrated Development Environment (IDE) for R.
Available from: https://www.rstudio.com/

List of Practical/ Experiment:

Practical No.	Type of Experiment	Practical/Experiment topic	Hrs	Cognitive levels of attainment as per Bloom's Taxonomy
1	**Basic experiment**	Write a R program to take input from the user (name and age) and display the values	2	L1, L2
2		Write a R program to find the maximum and the minimum value of a given vector.	2	L2, L3
3		Write a R program to get the unique elements of a given string and unique numbers of vector.	2	L2, L3
4	**Design Experiment**	Write a R program to list containing a vector, a matrix and a list and give names to the elements in the list.	2	L2, L3
5		Write a R program to create a data frame from four given vectors.	2	L2, L3
6		Write a R program to perform data analysis.	2	L2, L3
7		Perform data visualization in R Programming.	2	L2, L3, L4
8		Perform Regression in R programming using any dataset.	2	L2, L3,L4
9		Perform decision tree classification in R Programming.	2	L2, L3, L4
10		Perform co-relation analysis in R programming.	4	L2, L3, L4,L5
11	**Group Activity/ Case study**	Machine learning in R programming.	6	L2, L3, L4,L5
		Total Hrs.	**30**	

Books and References:

S. No.	Title	Authors	Publisher	Edition	Year
1	R Cookbook Paperback – 2011	Teetor Paul	O Reilly Publications	First	2011
2	Beginning R: The Statistical Programming Language	Dr. Mark Gardener	Wiley Publications	First	2018
3	R Programming For Dummies	Joris Meys Andrie de Vries	Wiley Publications	Second	2018

Online Recourses:

S. No.	Website Name	URL	Modules covered
1	https://cran.r-project.org	https://cran.r-project.org/doc/manuals/r-release/R-intro.pdf (Online Resources)	--

B.E. Semester –VIII
Choice Based Credit Grading Scheme with Holistic Student Development (CBCGS-H 2019)
Proposed Syllabus under Autonomy Scheme

B.E.(Information Technology)					B.E.(SEM : VIII)				
Course Name : Project-II					Course Code : ITM805				
Teaching Scheme (Program Specific)					Examination Scheme (Formative/ Summative)				
Modes of Teaching / Learning / Weightage					Modes of Continuous Assessment / Evaluation				
Hours Per Week					Theory		Practical/Oral	Term Work	Total
Theory	Tutorial	Practical	Contact Hours	Credits	IA	ESE	OR	TW	
--	-	16	16	08	--	--	50	100	**150**

IA: In-Semester Assessment
ESE : End Semester Examination
Total weightage of marks for continuous evaluation of Term work/Report: Formative (40%),
Timely Completion of Practical (40%) and Attendance /Learning Attitude (20%).

Prerequisite: Knowledge of Software development lifecycle

Course Objectives: The course intends to deliver the fundamentals of problems and challenges that need IT based solutions. Students will be introduced to the vast array of literature available of the various research challenges in the field of IT. Also To create awareness among the students of the characteristics of several domain areas where IT can be effectively used and to improve the team building, communication and management skills of the students.

Course Outcomes: Upon completion of the course students will be able to:

Sr. No.	Course Outcomes	Cognitive levels of attainment as per Bloom's Taxonomy
1	Discover potential research areas in the field of IT	L1, L2, L3,L4
2	Conduct a survey of several available literature in the preferred field of study	L1, L2, L3
3	Compare and contrast the several existing solutions for research challenge	L1, L2, L3,L4,L5
4	Demonstrate an ability to work in teams and manage the conduct of the research study	L1, L2, L3,L4
5	Formulate and propose a plan for creating a solution for the research plan identified	L1, L2, L3,L4
6	To report and present the findings of the study conducted in the preferred domain	L1, L2, L3,L4

Guidelines:

1. The project work is to be conducted by a group of three students

2. Each group will be associated with a project mentor/guide. The group should meet with the project mentor/guide periodically and record of the meetings and work discussed, must be documented.

3. Department has to allocate 1 day in VII semester and 2 day in VIII semester every week.

4. Students will do literature survey in Sem VI or Sem VII.

5. Students will do design, implementation and coding in Sem VII.

6. Each group along with its guide/mentor shall identify a potential research area/problem domain, on which the study to be conducted.

7. Each team will do a rigorous literature survey of the problem domain by reading and understanding at least 3-5 research papers from current good quality national/international journals/conferences. (Papers selected must be indexed by Scopus/IEEE/Springer/ACM etc.). The list of papers surveyed must be clearly documented.

8. The project assessment for term work will be done at least two times at department level by giving presentation to panel members, which consist of at least three (3) members as internal examiners (including the project guide/mentor) appointed by the Head of the department of respective programme.

9. A report is to be prepared summarizing the findings of the literature survey. A comparative evaluation of the different techniques surveyed is also to be done.

10. Students will do testing and analyze in semester VIII

11. Teams must analyze all the results obtained by comparing with other standard techniques.

12. Every team must publish their work in national / international conference/journals (if possible publish in Scopus indexed journals).

B.E. Semester –VIII

B.E.(All Branches)					B.E.(SEM : VIII)		
Course Name : Research Based Learning IV					**Course Code : ITRBL801**		
Teaching Scheme (Program Specific)					**Examination Scheme (Formative/ Summative)**		
Modes of Teaching / Learning / Weightage					**Modes of Continuous Assessment / Evaluation**		
Hours Per Week					**Presentation**	**Report**	**Term Work**
Theory	Tutorial	Practical	Contact Hours	Credits	AC	AC	TW
-	-	2	2	2	25	25	50
Audit course evaluated by Teacher Guardian							
Mid Semester Assessment for Term work will be on continuous basis							
Prerequisite: Subject knowledge, Domain knowledge							

Course Objective: The course intends to create awareness about Intellectual Property Rights, provides an opportunity to interact with industry and helps the students in publishing papers in Conferences and Journals and encourages them to take part in consultancy projects.

Course Outcomes: **Upon completion of the course student will be able to:**

S. No.	Course Outcomes	Cognitive levels of attainment as per Bloom's Taxonomy
1	Understand Intellectual Property Rights and its process in details	L1, L2
2	Interact with industry experts regarding their projects and analyse their projects from industry view point	L1, L2,L3
3	Evaluate their projects by publishing their project research in Conferences and Journals	L1, L2, L3, L4,L5
4	Write a research paper and understand technical writing.	L1, L2, L3,L4,l5

Detailed Syllabus:

Module No.	Topics	Contact Hrs.	Self-Study Hrs.	Cognitive levels of attainment as per Bloom's Taxonomy
1	**Intellectual Property Rights (IPR) awareness seminar** Seminar to be conducted by an industry expert who can guide and motivate students to file IPR.	02	00	L1, L2
2	**Industry linkage / visit related to product and domain/Establish start up** To understand the usability of their respective project students can visit an Industry and conduct a survey and generate a suitable report.	02	04	L1,L2,L3

3	**IPR filing/ Technology transfer to industry/Testing of product in real environment** Once the product is ready, it needs to be tested first in the real environment where it will be deployed and used by the end user. Once the product is tested ok, it can be deployed in the industry in a large scale. IPR/Patent can be suitably filed for the said product.	06	10	L1, L2, L3,L4,L5
4	**Publish paper at institute /national level conference /participate in competition /participate in funded project/consultancy projects** The completed project with results can be converted into a research paper and the same can be published in a conference or journal. Students can participate in project competitions at institute and university level. Also they can participate in funded projects and consultancy projects.	02	04	L1, L2, L3, L4,L5
	Total Hrs.	12	18	

Books and References:

S. No.	Title	Authors	Publisher	Edition	Year
1.	Blue Ocean Strategy	W Chan Kim and Renee Mauborgne	Harward Business School Press	1st	2005
2.	The E-Myth Revisited	Michael E. Gerber	Harper-Collins Publications	1st	2012
3.	Intellectual Property Rights	Neeraj Pandey and Kushdeep Dharni	Prentice Hall India	2nd	2014

Online Resources:

S. No.	Website Name	URL	Modules covered
1.	NPTEL	https://nptel.ac.in/courses/110105139/	M1,M3
2.	IPTSE	https://iptse.com/future-of-intellectual-property-rights-in-india/	M1, M3
3.	NPTEL	https://nptel.ac.in/courses/127105007/	M2

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