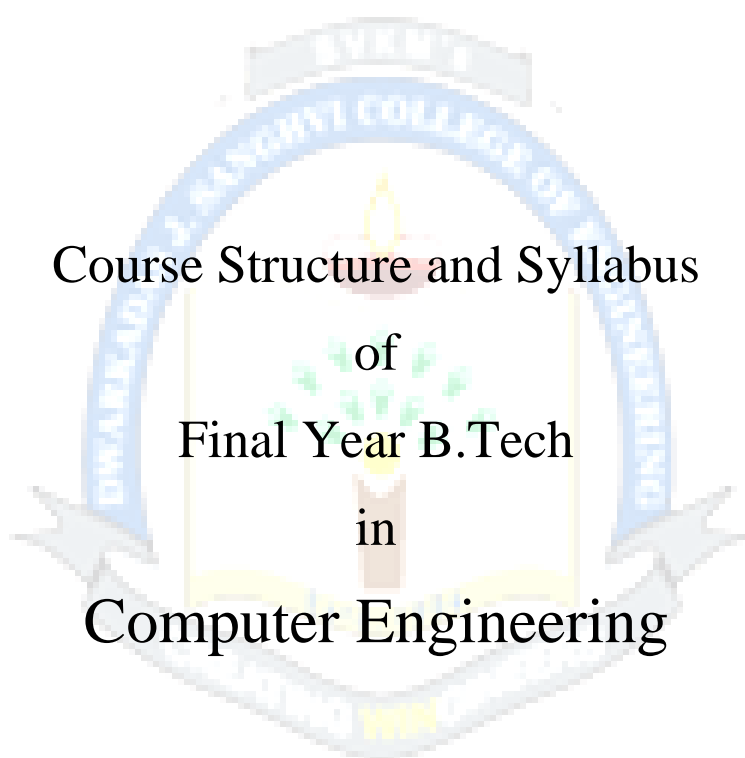




Shri Vile Parle Kelavani Mandal's

# Dwarkadas J. Sanghvi College of Engineering

*(Autonomous College Affiliated to the University of Mumbai)*



## Course Structure and Syllabus of Final Year B.Tech in Computer Engineering

Prepared by:- Board of Studies in Computer Engineering

Recommended by:- Academic Council of D. J. Sanghvi College of Engineering

Approved by:- Governing Body of D. J. Sanghvi College of Engineering

*Revision: 1 (2019)*

*With effect from the Academic Year: 2022-2023*



**Scheme for Fourth Year B.Tech. Program in Computer Engineering : Semester VIII (Autonomous)**  
(Academic Year 2022-2023)

**Semester VIII**

Sr	Course Code	Course	Teaching Scheme				Semester End Examination (A)						Continuous Assessment (B)					Aggregate (A+B)	Credits earned	
			Theory (hrs.)	Practical (hrs.)	Tutorial (hrs.)	Credits	Duration (Hrs)	Theory	Oral	Pract	Oral & Pract	End Sem Exam Total	Term Test 1 (TT1)	Term Test 2 (TT2)	Avg (TT1 & TT2)	Termwork Term Work Total	CA Total			
1	DJ19CEC801	Web Intelligence	3	--	--	3	3	75	--	--	--	75	25	25	25	--	25	100	3	4
	DJ19CEL801	Web Intelligence Laboratory	--	2	--	1	2	--	25	--	--	25	--	--	--	25	25	50	1	
2	DJ19CEC802	High Performance Computing	3	--	--	3	3	75	--	--	--	75	25	25	25	--	25	100	3	4
	DJ19CEL802	High Performance Computing Laboratory	--	2	--	1	2	--	25	--	--	25	--	--	--	25	25	50	1	
3@	DJ19CEEC8011	Natural Language Processing	3	--	--	3	3	75	--	--	--	75	25	25	25	--	25	100	3	4
	DJ19CEEL8011	Natural Language Processing Laboratory	--	2	--	1	2	--	25	--	--	25	--	--	--	25	25	50	1	
	DJ19CEEC8012	Software Architecture	3	--	--	3	3	75	--	--	--	75	25	25	25	--	25	100	3	
	DJ19CEEL8012	Software Architecture Laboratory	--	2	--	1	2	--	25	--	--	25	--	--	--	25	25	50	1	
	DJ19CEEC8013	Software Testing and Quality Assurance	3	--	--	3	3	75	--	--	--	75	25	25	25	--	25	100	3	
	DJ19CEEL8013	Software Testing and Quality Assurance Laboratory	--	2	--	1	2	--	25	--	--	25	--	--	--	25	25	50	1	
4#	DJ19ILO8021	Project Management	3	--	--	3	3	75	--	--	--	75	25	25	25	--	25	100	3	3
	DJ19ILO8022	Entrepreneurship Development and Management	3	--	--	3	3	75	--	--	--	75	25	25	25	--	25	100	3	
	DJ19ILO8023	Corporate Social Responsibility	3	--	--	3	3	75	--	--	--	75	25	25	25	--	25	100	3	
	DJ19ILO8024	Human Resource Management	3	--	--	3	3	75	--	--	--	75	25	25	25	--	25	100	3	
	DJ19ILO8025	Corporate Finance Management	3	--	--	3	3	75	--	--	--	75	25	25	25	--	25	100	3	
	DJ19ILO8026	Logistic and Supply Chain Management	3	--	--	3	3	75	--	--	--	75	25	25	25	--	25	100	3	
	DJ19ILO8027	IPR and Patenting	3	--	--	3	3	75	--	--	--	75	25	25	25	--	25	100	3	
	DJ19ILO8028	Digital Marketing Management	3	--	--	3	3	75	--	--	--	75	25	25	25	--	25	100	3	
	DJ19ILO8029	Environmental Management	3	--	--	3	3	75	--	--	--	75	25	25	25	--	25	100	3	
	DJ19ILO8030	Labour and Corporate Law	3	--	--	3	3	75	--	--	--	75	25	25	25	--	25	100	3	
5	DJ19CEP803	Project Stage - II	--	10	--	5	2	--	--	--	100	100	--	--	--	100	100	200	5	5
		<b>Total</b>	<b>12</b>	<b>16</b>	<b>0</b>	<b>20</b>	<b>20</b>	<b>300</b>	<b>75</b>	<b>0</b>	<b>100</b>	<b>475</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>175</b>	<b>275</b>	<b>750</b>	<b>20</b>	<b>20</b>

@ Any 1 Elective Course

# Any 1 Institute Professional Elective

**Prepared by:**

**Name and Signatures (with date)**

**Checked By**

**Name and Signatures (with date)**

**HoD**

**Department of Computer Engineering**

**Vice-Principal**

**Principal**

**Syllabus for Final Year B.Tech Program in Computer Engineering- Semester VIII (Autonomous)  
(Academic Year 2022-2023)**

Program: Final Year B.Tech. in Computer Engineering								Semester: VIII	
Course: Web Intelligence								Course Code: DJ19CEC801	
Course: Web Intelligence Laboratory								Course Code: DJ19CEL801	
Teaching Scheme (Hours / week)				Evaluation Scheme					
				Semester End Examination Marks (A)			Continuous Assessment Marks (B)		
Lectures	Practical	Tutorial	Total Credits	Theory			Term Test 1	Term Test 2	Avg.
				75			25	25	25
				Laboratory Examination			Term work		Total Term work
3	2	-	4	Oral	Practical	Oral &Practical	Laboratory Work	Tutorial / Mini project / presentation/ Journal	
				25	-	-	15	10	25

**Pre-requisite: Statistics, Machine Learning, Data Mining**

**Course Objectives:**

1. To gain a background in Web mining techniques
2. To extract knowledge from the social web for web analytics
3. To enable students to solve complex real-world problems for sentiment analysis and Recommendation systems.

**Outcomes:** On successful completion of course learner will be able to:

1. Interpret the terminologies and perspectives of Web Mining.
2. Perform social network analysis to identify communities and network properties in social media sites.
3. Extract and Integrate information from the web for real-world scenarios.
4. Design new solutions to opinion extraction and sentiment classification problems
5. Provide solutions to the emerging problems with social media using Recommendation systems

**Syllabus for Final Year B.Tech Program in Computer Engineering- Semester VIII (Autonomous)**  
(Academic Year 2022-2023)

<b>Detailed Syllabus: (unit wise)</b>		
<b>Unit</b>	<b>Description</b>	<b>Duration</b>
1	<b>Introduction</b>  Introduction: World Wide Web, History of the Web and the Internet, What is Data Mining? What is Web Mining? Introduction to Association Rule Mining, Supervised Learning & Unsupervised Learning. Information Retrieval and Web Search: Basic Concepts of Information Retrieval, Information Retrieval Models, Relevance Feedback, Evaluation Measures, Text and Web Page Pre-Processing, Inverted Index and Its Compression, Latent Semantic Indexing, Web Search, Meta-Search: Combining Multiple Rankings, Web Spamming.	4
2	<b>Social Network Analysis</b>  Social Network Analysis: Introduction, Co-Citation and Bibliographic Coupling, Page Rank, HITS Algorithm, Community Discovery. Web Crawling: A Basic Crawler Algorithm, Implementation Issues, Universal Crawlers, Focused Crawlers, Topical Crawlers, Evaluation, Crawler Ethics and Conflicts.	8
3	<b>Structured Data Extraction</b>  Structured Data Extraction: Wrapper Generation, Preliminaries, Wrapper Induction, Instance-Based Wrapper Learning, Automatic Wrapper Generation: Problems, String Matching and Tree Matching, Building DOM Trees, Extraction Based on a Single List Page, Extraction Based on Multiple Pages.	8
4	<b>Information Integration</b>  Information Integration: Introduction to Schema Matching, Pre-Processing for Schema Matching, Schema -Level Matching, Domain and Instance-Level Matching, Combining Similarities, Integration of Web Query Interfaces, Constructing a Unified Global Query Interface.	8
5	<b>Opinion Mining And Sentiment Analysis</b>  The Problem of Opinion Mining, Document Sentiment Classification, Sentence Subjectivity and Sentiment Classification, Opinion Lexicon Expansion, Aspect- Based Opinion Mining, Opinion Search and Retrieval, Opinion Spam Detection.	8
6	<b>Web Usage Mining</b>  Web Usage Mining: Data Collection and Pre-Processing, Data Modeling for Web Usage Mining, Discovery and Analysis of Web Usage Patterns, Recommender Systems and Collaborative Filtering, Query Log Mining, Computational Advertising.	6

**Syllabus for Final Year B.Tech Program in Computer Engineering- Semester VIII (Autonomous)**  
**(Academic Year 2022-2023)**

**Books Recommended:**

1. Web Data Exploring Hyperlinks, Contents, and Usage , Bing Liu , Springer, Second Edition

**Reference books:**

1. Data Mining: Concepts and Techniques, Second Edition Jiawei Han, Micheline Kamber (Elsevier Publications)
2. Web Mining: Applications and Techniques by Anthony Scime
3. Mining the Web: Discovering Knowledge from Hypertext Data by Soumen Chakrabarti

**Coursera Courses Recommended:**

[Introduction to Social Media Analytics | Coursera](#)

***Suggested List of Experiments:***

Sr. No.	Title of Experiments
1	Latent Semantic Indexing
2	Page rank estimation
3	Design a crawler to gather web information
4	Implement a wrapper induction technique to gather data from the web
5	Use linguistic techniques for schema matching
6	Perform Opinion spam detection
7	A) Using Google Analytics, perform Audience Analysis, Acquisition Analysis, Behaviour Analysis, Conversion Analysis
8	Apply analytics to social media activity (Using FB,twitter,Instagram or any social media dataset)

**Evaluation Scheme:**

***Semester End Examination (A):***

***Theory:***

1. Question paper based on the entire syllabus, summing up to 75 marks.
2. Total duration allotted for writing the paper is 3 hrs.

**Syllabus for Final Year B.Tech Program in Computer Engineering- Semester VIII (Autonomous)**  
**(Academic Year 2022-2023)**

***Laboratory:***

1. Oral Examination will be based on the entire syllabus including, the practical's performed during laboratory sessions.

***Continuous Assessment (B):***

***Theory:***

1. Two term tests of 25 marks each will be conducted during the semester out of which; one will be a compulsory term test (on minimum 02 Modules) and the other can either be a term test or an assignment on live problems or a course project.
2. Total duration allotted for writing each of the paper is 1 hr.
3. Average of the marks scored in both the two tests will be considered for final grading.

***Laboratory: (Term work)***

The distribution of marks for term work shall be as follows:

- i. Laboratory work (Performance of Experiments): 15 Marks
- ii. Journal Documentation (Write-up and Assignments): 10 marks

The final certification and acceptance of term work will be subject to satisfactory performance of laboratory work and upon fulfilling minimum passing criteria in the term work.

Prepared by

Checked by

Head of the Department

Principal

**Syllabus for Final Year B.Tech Program in Computer Engineering- Semester VIII (Autonomous)**  
(Academic Year 2022-2023)

Program: Final Year B.Tech. in Computer Engineering							Semester: VIII		
Course: High Performance Computing							Course Code: DJ19CEC802		
Course: High Performance Computing Laboratory							Course Code: DJ19CEL802		
Teaching Scheme  (Hours / week)				Evaluation Scheme					
				Semester End Examination Marks (A)			Continuous Assessment Marks (B)		
Lectures	Practical	Tutorial	Total Credits	Theory			Term Test 1	Term Test 2	Avg.
				75			25	25	25
				Laboratory Examination			Term work		Total Term work
3	2	-	4	Oral	Practical	Oral &Practical	Laboratory Work	Tutorial / Mini project / presentation/ Journal	
				25	-	-	15	10	25

**Pre-requisite: Operating System, Computer Organization.**

**Course Objectives:**

To learn concepts of parallel processing as it pertains to high-performance computing.

1. To design, develop and analyze parallel programs on high performance computing resources using parallel programming.
2. Learn to design parallel programs on high performance computing.

**Course Outcomes:** On successful completion of course, learner will be able to:

1. Comprehend fundamental concepts parallel processing approaches
2. Describe different parallel processing platforms involved in achieving High Performance Computing.
3. Discuss different design issues in parallel programming
4. Develop efficient and high-performance parallel programming
5. Learn parallel programming using message passing paradigm using open-source APIs and shared address space platforms.

**Syllabus for Final Year B.Tech Program in Computer Engineering- Semester VIII (Autonomous)**  
**(Academic Year 2022-2023)**

<b>Detailed Syllabus: (unit wise)</b>		
<b>Module</b>	<b>Contents</b>	<b>Hours</b>
<b>1</b>	<b>Introduction to Parallel Computing:</b> Motivating Parallelism, Scope of Parallel Computing, Levels of parallelism (instruction, transaction, task, thread, memory, function) Classification Models: Architectural Schemes (Flynn's, Shore's, Feng's, Handler's) and Memory access (Shared Memory, Distributed Memory, Hybrid Distributed Shared Memory) Parallel Architectures: Pipeline Architecture, Array Processor, Multiprocessor Architecture.	<b>06</b>
<b>2</b>	<b>Parallel Programming Platforms</b> Parallel Programming Platforms: Implicit Parallelism: Trends in Microprocessor & Architectures, Limitations of Memory System Performance, Dichotomy of Parallel Computing Platforms, Physical Organization of Parallel Platforms, Communication Costs in Parallel Machines.	<b>06</b>
<b>3</b>	<b>Parallel Algorithm Design</b> Principles of Parallel Algorithm Design: Preliminaries, Decomposition Techniques, Characteristics of Tasks and Interactions, Mapping Techniques for Load Balancing, Methods for Containing Interaction Overheads. Parallel Algorithm Models, Basic Communication operations: Broadcast and Reduction Communication types.	<b>08</b>
<b>4</b>	<b>Performance Measures</b> Performance Measures : Speedup, execution time, efficiency, cost, scalability, Effect of granularity on performance, Scalability of Parallel Systems, Amdahl's Law, Gustavson's Law, Performance Bottlenecks.	<b>08</b>
<b>5</b>	<b>Programming Using the Message-Passing Paradigm:</b> Principles of Message Passing Programming, The Building Blocks: Send and Receive Operations MPI: the Message Passing Interface, Topology and Embedding, Overlapping Communication with Computation, Collective Communication and Computation Operations.	<b>06</b>
<b>6</b>	<b>Programing Shared Address Space Platform</b> Thread Basics, The POSIX Thread API, Synchronization Primitives in Pthreads, Controlling Thread and Synchronization attributes, Thread Cancellation, OpenMP: a Standard for Directive Based Parallel Programming.	<b>08</b>



**Syllabus for Final Year B.Tech Program in Computer Engineering- Semester VIII (Autonomous)**  
**(Academic Year 2022-2023)**

**Text books:**

1. Ananth Grama, Anshul Gupta, George Karypis, Vipin Kumar, —Introduction to Parallel Computing, Pearson Education, Second Edition, 2007
2. Michael J. Quinn, —Parallel Programming in C with MPI and OpenMPI, McGraw-Hill International Editions, Computer Science Series, 2008

**Reference Books:**

1. Laurence T. Yang, MinyiGuo, —High- Performance Computing: Paradigm and Infrastructure, Wiley, 2006.
2. Georg Hager, Gerhard Wellein, —Introduction to High Performance Computing for Scientists and Engineers", Chapman & Hall / CRC Computational Science series, 2011.
3. Kai Hwang, Naresh Jotwani, —Advanced Computer Architecture: Parallelism, Scalability, Programmability, McGraw Hill, Second Edition, 2010.
- 4.

**Web Resources:**

1. Coursera Course on “ Parallel, Concurrent, and Distributed Programming in Java Specialization”.

***Suggested List of Experiments:***

Sr. No.	Title of Experiments
1	Execution of Simple Hello world program on MPI platform.
2	a. Program to send data and receive data to/from processors using MPI b. Program illustrating Broadcast of data using MPI.
3	Implement a parallel program to demonstrate the cube of N number within a set range.
4	Sorting Algorithm
5	Implement a program to demonstrate balancing of workload on MPI platform.
6	Using directives of MPI/OpenMP implement parallel programming for calculator application (add, sub, multiplication, and division).
7	Mini Project Evaluate performance enhancement of HPC for any of the following: One-Dimensional Matrix-Vector Multiplication/ Single-Source Shortest-Path/ Sample Sort/Two-Dimensional Matrix-Vector Multiplication.

**Syllabus for Final Year B.Tech Program in Computer Engineering- Semester VIII (Autonomous)**  
**(Academic Year 2022-2023)**

**Evaluation Scheme:**

***Semester End Examination (A):***

*Theory:*

1. Question paper based on the entire syllabus, summing up to 75 marks.
2. Total duration allotted for writing the paper is 3 hrs.

*Laboratory:*

1. Oral examination will be based on the entire syllabus including, the practical's performed during laboratory sessions.

***Continuous Assessment (B):***

*Theory:*

1. Two term tests of 25 marks each will be conducted during the semester out of which; one will be a compulsory term test (on minimum 02 Modules) and the other can either be a term test or an assignment on live problems or a course project.
2. Total duration allotted for writing each of the paper is 1 hr.
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Prepared by

Checked by

Head of the Department

Principal

**Syllabus for Final Year B.Tech Program in Computer Engineering- Semester VIII (Autonomous)**  
(Academic Year 2022-2023)

Program: Final Year B.Tech. in Computer Engineering							Semester: VIII		
Course: Natural Language Processing							Course Code: DJ19CEEC8011		
Course: Natural Language Processing Laboratory							Course Code: DJ19CEEL8011		
Teaching Scheme (Hours / week)				Evaluation Scheme					
				Semester End Examination Marks (A)			Continuous Assessment Marks (B)		
Lectures	Practical	Tutorial	Total Credits	Theory			Term Test 1	Term Test 2	Avg.
				75			25	25	25
				Laboratory Examination			Term work		Total Term work
3	2	-	4	Oral	Practical	Oral &Practical	Laboratory Work	Tutorial / Mini project / presentation/ Journal	
				25	-	-	15	10	

**Pre-requisite:** Finite Automata, Deep Learning, Probability Mathematics

**Course Objectives:**

1. To introduce the fundamental concepts and techniques of Natural language Processing for analyzing words based on Morphology and CORPUS.
2. To examine the NLP models and interpret algorithms for classification of NLP sentences by using both the traditional, symbolic and the more recent statistical approach.
3. To get acquainted with the algorithmic description of the main language levels that includes morphology, syntax, semantics, and pragmatics for information retrieval and machine translation applications.

**Outcomes:** On successful completion of course, learner will be able to:

1. Understand the principles and Process the Human Languages Such as English and other Indian Languages using computers.
2. Creating CORPUS linguistics based on digestive approach (Text Corpus method)
3. Demonstrate understanding of state-of-the-art algorithms and techniques for text-based processing of natural language with respect to morphology.
4. Perform POS tagging for a given natural language and select a suitable language modelling technique based on the structure of the language.
5. Check the syntactic and semantic correctness of sentences using grammars and labelling.
6. Develop Computational Methods for Real World Applications and explore deep learning based NLP

**Syllabus for Final Year B.Tech Program in Computer Engineering- Semester VIII (Autonomous)**  
**(Academic Year 2022-2023)**

<b>Detailed Syllabus: (unit wise)</b>		
<b>Module</b>	<b>Contents</b>	<b>Hours</b>
<b>1</b>	<b>Introduction:</b> History Of NLP, Generic NLP System, Levels Of NLP, Knowledge In Language Processing, Ambiguity In Natural Language, Stages In NLP, Challenges Of NLP, Applications of NLP	<b>03</b>
<b>2</b>	<b>Word Level Analysis:</b> Morphology Analysis –Survey of English Morphology, Inflectional Morphology & Derivational Morphology, Lemmatization, Regular Expression, Finite Automata, Finite State Transducers (FST), Morphological Parsing With FST, Lexicon Free FST Porter Stemmer. N –Grams, Unigrams/Bigrams Language Models, Corpora, Computing the Probability Of Word Sequence, Training and Testing. Perplexity And Entropy: Smoothing and Backup, Zipf’s Law, Add One Smoothing, Witten-Bell Discounting, Good Turing Discounting, Back Off Methods, Class Based Models, Google N-Gram Release.	<b>08</b>
<b>3</b>	<b>Syntax Analysis:</b> Part-Of-Speech Tagging (POS) - Open and Closed Words. Tag Set for English (Penn Treebank), Rule Based POS Tagging, Transformation Based Tagging, Stochastic POS Tagging and Issues –Multiple Tags & Words, Unknown Words. Hidden Markov Model (HMM), Maximum Entropy, And Conditional Random Field (CRF). CFG: Derivations, Constituency, Phrase Structure and Dependency Structure	<b>08</b>
<b>4</b>	<b>Semantic Analysis:</b> Lexical Semantics, Attachment for Fragment of English- Sentences, Noun Phrases, Verb Phrases, Prepositional Phrases, Relations Among Lexemes & Their Senses – Homonymy, Polysemy, Synonymy, Hyponymy, WordNet, Robust Word Sense Disambiguation (WSD), Lexical Disambiguation, Resolving Lexical Ambiguity, Lexical Ambiguity Resolution	<b>06</b>
<b>5</b>	<b>Pragmatics:</b> Discourse –Reference Resolution, Reference Phenomenon, Syntactic & Semantic Constraints on Co Reference	<b>06</b>
<b>6</b>	<b>Neural Models of Word Representations:</b> Problems With SVD; Intro to Word2vec, Learning Word Representations, Recurrent Neural Networks (RNNs), RNNs On POS Tagging, Statistical Machine Translation with RNNs	<b>06</b>

**Syllabus for Final Year B.Tech Program in Computer Engineering- Semester VIII (Autonomous)  
(Academic Year 2022-2023)**

<b>7</b>	<b>Applications (Preferably for Indian Regional Languages):</b>  Machine Translation, Information Retrieval, Question Answers System, Categorization, Summarization, Sentiment Analysis, Named Entity Recognition  Linguistic Modeling – Neurolinguistics Models- Psycholinguistic Models – Functional Models of Language – Research Linguistic Models- Common Features of Modern Models of Language	<b>05</b>
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**Textbook:**

1. Speech and Language Processing, *2<sup>nd</sup> Edition*, Jurafsky and Martin, Prentice Hall; (January 26, 2000), ISBN: 0130950696

**Reference Books:**

1. Manning and Schutze, "Statistical Natural Language Processing", MIT Press; 1st edition (June 18, 1999), ISBN: 0262133601
2. James Allen. Natural Language Understanding. The Benajmins/Cummings Publishing Company Inc. 1994. ISBN 0-8053-0334-0.
3. Tom Mitchell. Machine Learning. McGraw Hill, 1997. ISBN 0070428077
4. Cover, T. M. and J. A. Thomas: Elements of Information Theory. Wiley. 1991. ISBN 0-471-06259-6.
5. Charniak, E.: Statistical Language Learning. The MIT Press. 1996. ISBN 0-262-53141-0.
6. Jelinek, F.: Statistical Methods for Speech Recognition. The MIT Press. 1998. ISBN 0-262-10066-5.

***Suggested List of Experiments:***

Sr. No.	Title of Experiments
1	Preprocessing steps in NLP  Named Entity recognition & Chunking using NLTK and SPACY
2	Build a POS tagger using HMM
3	TF-IDF vectors in Natural Language Processing
4	Generate recursive set of sentences using Context Free Grammar  Identify the word senses using "synset" in NLTK
5	Similarity Detection in NLP
6	Generate recursive set of sentences using Context Free Grammar
7	Word embeddings in NLP
8	Any application of NLP : Spell Check, Autocorrect, plagiarism detection, sentiment analysis, sarcasm detection or text analytics in any domain

**Syllabus for Final Year B.Tech Program in Computer Engineering- Semester VIII (Autonomous)**  
**(Academic Year 2022-2023)**

**Evaluation Scheme:**

***Semester End Examination (A):***

*Theory:*

1. Question paper based on the entire syllabus, summing up to 75 marks.
2. Total duration allotted for writing the paper is 3 hrs.

*Laboratory:*

1. Oral examination will be based on the entire syllabus including, the practical's performed during laboratory sessions.

***Continuous Assessment (B):***

*Theory:*

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*Laboratory: (Term work)*

The distribution of marks for term work shall be as follows:

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Prepared by

Checked by

Head of the Department

Principal

**Syllabus for Final Year B.Tech Program in Computer Engineering- Semester VIII (Autonomous)**  
(Academic Year 2022-2023)

Program: Final Year B.Tech. in Computer Engineering							Semester: VIII		
Course: Software Architecture							Course Code: DJ19CEEC8012		
Course: Software Architecture Laboratory							Course Code: DJ19CEEL8012		
Teaching Scheme  (Hours / week)				Evaluation Scheme					
				Semester End Examination Marks (A)			Continuous Assessment Marks (B)		
Lectures	Practical	Tutorial	Total Credits	Theory			Term Test 1	Term Test 2	Avg.
				75			25	25	25
				Laboratory Examination			Term work		Total Term work
3	2	-	4	Oral	Practical	Oral &Practical	Laboratory Work	Tutorial / Mini project / presentation/ Journal	
				25	-	-	15	10	25

**Pre-requisite: Object Oriented Concepts, Software Engineering**

**Course Objectives:** To learn and use the Software Architecture with modern tools and techniques.

**Outcomes: students will be able to:**

1. Specify and evaluate software architectures.
2. Select and use appropriate architectural styles.
3. Select and use appropriate software design patterns.
4. Understand and perform a design review with agile project architecture.

**Syllabus for Final Year B.Tech Program in Computer Engineering- Semester VIII (Autonomous)**  
**(Academic Year 2022-2023)**

<b>Detailed Syllabus: (unit wise)</b>		
<b>Unit</b>	<b>Description</b>	<b>Duration</b>
<b>1</b>	<b>Basic Concepts:</b> Concepts of Software Architecture, Models, Processes, Stakeholders <b>Designing Architectures:</b> The Design Process, Architectural Conception. Refined Experience in Action: Styles and Architectural Patterns, Architectural Conception in Absence of Experience.	<b>05</b>
<b>2</b>	<b>Connectors:</b> Connectors in Action: A Motivating Example, Connector Foundations, Connector Roles, Connector Types and Their Variation Dimensions, Example Connectors.	<b>06</b>
<b>3</b>	<b>Modeling:</b> Modeling Concepts, Ambiguity, Accuracy, and Precision, Complex Modeling: Mixed Content and Multiple Views, Evaluating Modeling Techniques, Specific Modeling Techniques.	<b>04</b>
<b>4</b>	<b>Analysis:</b> Analysis Goals, Scope of Analysis, Architectural Concern being Analyzed, Level of Formality of Architectural Models, Type of Analysis, Analysis Techniques.	<b>08</b>
<b>5</b>	<b>Implementation and Deployment</b> Concepts, Existing Frameworks, Software Architecture and Deployment, Software Architecture and Mobility. <b>Conventional Architectural styles:</b> Pipes and Filters, Event- based, Implicit Invocation, Layered systems, Repositories, Interpreters, Process control.	<b>08</b>
<b>6</b>	<b>Agile methodology software architecture:</b> Fundamentals of Agile Architecting: Object Orientation Achieving the Vision, Shortcomings of the Models, DCI as a new Paradigm, DCI and Architecture Refactoring Software Architecture: Code Refactoring, Refactoring to Patterns Managing Software Architecture in Agile Projects.	<b>07</b>
<b>7</b>	<b>Analyzing Architectures:</b> The ATAM, The CBAM, The World Wide Web. <b>Moving from one System to Many:</b> Software Product Lines, CelsiusTech (Case Study), J2EE/EJB (Case Study), Service-Oriented Architecture (SOA) (Case Study).	<b>04</b>



**Syllabus for Final Year B.Tech Program in Computer Engineering- Semester VIII (Autonomous)**  
**(Academic Year 2022-2023)**

**Books Recommended:**

*Text Books:*

1. Software Architecture: Foundations, Theory, and Practice by Richard N. Taylor, Nenad Medvidovic, Eric Dashofy, ISBN: 978-0-470-16774-8
2. M. Shaw: Software Architecture Perspectives on an Emerging Discipline, Prentice- Hall.
3. Len Bass, Paul Clements, Rick Kazman: Software Architecture in Practice, Pearson.
4. Agile Software Architecture by Muhammad Ali Babar, Alan W. Brown, Ivan Mistrik, Publisher(s): Morgan Kaufmann, ISBN: 9780124078857

*Reference Books:*

1. Pattern Oriented Software Architecture by Frank Buchanan et al, Wiley India.
2. The Art of Software Architecture by Stephen T. Albin

***Suggested List of Experiments:***

Sr. No.	Title of Experiments
1.	Modeling using xADL
2.	Visualization using xADL 2.0
3.	Integrate software components using a middleware
4.	Use middleware to implement connectors
5.	Wrapper to connect two applications with different architectures
6.	Creating and analyzing web service
7.	Domain specific architecture development.
8.	Analysis of Architecture
9.	Case Study on Service-Oriented Architecture (SOA)

**Syllabus for Final Year B.Tech Program in Computer Engineering- Semester VIII (Autonomous)**  
**(Academic Year 2022-2023)**

**Evaluation Scheme:**

***Semester End Examination (A):***

*Theory:*

1. Question paper based on the entire syllabus, summing up to 75 marks.
2. Total duration allotted for writing the paper is 3 hrs.

*Laboratory:*

1. Oral examination will be based on the entire syllabus including, the practical's performed during laboratory sessions.

***Continuous Assessment (B):***

*Theory:*

1. Two term tests of 25 marks each will be conducted during the semester out of which; one will be a compulsory term test (on minimum 02 Modules) and the other can either be a term test or an assignment on live problems or a course project.
2. Total duration allotted for writing each of the paper is 1 hr.
3. Average marks scored in the two tests will be considered for final grading.

*Laboratory: (Term work)*

Laboratory work will be based on **DJ19CEEL8012** with a minimum of 08 experiments to be incorporated.

The distribution of marks for term work shall be as follows:

- i. Laboratory work (Performance of Experiments): 15 Marks
- ii. Journal Documentation (Write-up and Assignments): 10 marks

The final certification and acceptance of term work will be subject to satisfactory performance of laboratory work and upon fulfilling minimum passing criteria in the term work.

Prepared by

Checked by

Head of the Department

Principal

**Syllabus for Final Year B.Tech Program in Computer Engineering- Semester VIII (Autonomous)  
(Academic Year 2022-2023)**

Program: Final Year B.Tech. in Computer Engineering							Semester: VIII			
Course: Software Testing and Quality Assurance							Course Code: DJ19CEEC8013			
Course: Software Testing and Quality Assurance Laboratory							Course Code: DJ19CEEL8013			
Teaching Scheme  (Hours / week)				Evaluation Scheme						
				Semester End Examination Marks (A)			Continuous Assessment Marks (B)			Total marks = (A+ B)
Lectures	Practical	Tutorial	Total Credits	Theory			Term Test 1	Term Test 2	Avg.	
				75			25	25	25	
				Laboratory Examination			Term work		Total Term work	
3	2	-	4	Oral	Practical	Oral &Practical	Laboratory Work	Tutorial / Mini project / presentation/ Journal		
				25	-	-	15	10	25	

**Pre-requisite: Software Engineering**

**Course Objectives:** This course equips the students with a solid understanding of:

1. Practices that support the production of quality software
2. Software testing techniques and quality models
3. Life-cycle models for requirements, defects, test cases, and test results
4. Process models for units, integration, system, and acceptance testing

**Outcomes:** On successful completion of course learner will be able to:

1. Use various Software testing techniques to produce quality software.
2. Identify Learn Life-cycle models for requirements.
3. Design process models for units, integration, system, and acceptance testing
4. Identify various Quality Models.

**Syllabus for Final Year B.Tech Program in Computer Engineering- Semester VIII (Autonomous)**  
**(Academic Year 2022-2023)**

<b>Detailed Syllabus: (unit wise)</b>		
<b>Unit</b>	<b>Description</b>	<b>Duration</b>
<b>1</b>	<b>Introduction:</b> Software Quality, Role of testing, verification and validation, objectives and issues of testing, testing activities and levels, Sources of Information for Test Case Selection, Introduction to Testing techniques, Introduction to Testing strategies, Test Planning and Design, Monitoring and Measuring Test Execution, Test Tools and Automation, Test Team Organization and Management.	<b>04</b>
<b>2</b>	<b>System testing techniques and strategies:</b> <b>Unit Testing:</b> Concept of Unit Testing, Static Unit Testing, Defect Prevention, Dynamic Unit Testing, Mutation Testing, Debugging, Unit Testing in eXtreme Programming <b>System Integration Testing:</b> Concept of Integration Testing, Different Types of Interfaces and Interface Errors, Granularity of System Integration Testing, System Integration Techniques, Software and Hardware Integration, Test Plan for System Integration, Off-the-Shelf Component Integration, Off-the-Shelf Component Testing, Built-in Testing. <b>Acceptance Testing:</b> Types of Acceptance Testing, Acceptance Criteria, Selection of Acceptance Criteria, Acceptance Test Plan, Acceptance Test Execution, Acceptance Test Report, Acceptance Testing in eXtreme Programming.	<b>08</b>
<b>3</b>	<b>Control Flow Testing:</b> Outline of Control Flow Testing, Control Flow Graph, Paths in a Control Flow Graph, Path Selection Criteria, All-Path Coverage Criterion, Statement Coverage Criterion, Branch Coverage Criterion, Predicate Coverage Criterion, Generating Test Input, Examples of Test Data Selection. <b>Data Flow Testing:</b> Data Flow Anomaly, Overview of Dynamic Data Flow Testing, Data Flow Graph, Data Flow Terms, Data Flow Testing Criteria, Comparison of Data Flow Test Selection Criteria, Feasible Paths and Test Selection Criteria, Comparison of Testing Techniques.	<b>10</b>
<b>4</b>	<b>System Test Categories:</b> Basic Tests, Functionality Tests, Robustness Tests, Interoperability Tests, Performance Tests, Scalability Tests, Stress Tests, Load and Stability Tests, Reliability Tests, Regression Tests, Documentation Tests. <b>System Test Execution:</b> Preparedness to Start System Testing, Metrics for Tracking System Test, Metrics for Monitoring Test Execution, Beta Testing, First Customer Shipment, System Test Report, Product Sustaining, Measuring Test Effectiveness. <b>Functional Testing:</b> Equivalence Class Partitioning, Boundary Value Analysis, Decision Tables, Random Testing, Error Guessing, Category Partition. <b>System Test Design:</b> Test Design Factors, Requirement Identification, Characteristics of Testable Requirements, Test Design Preparedness Metrics, Test Case Design Effectiveness.	<b>10</b>

**Syllabus for Final Year B.Tech Program in Computer Engineering- Semester VIII (Autonomous)  
(Academic Year 2022-2023)**

<b>5</b>	<b>System Test Planning and Automation:</b> Structure of a System Test Plan, Introduction and Feature Description, Assumptions, Test Approach, Test Suite Structure, Test Environment, Test Execution Strategy, Test Effort Estimation, Scheduling and Test Milestones, System Test Automation, Evaluation and Selection of Test Automation Tools, Test Selection Guidelines for Automation, Characteristics of Automated Test Cases, Structure of an Automated Test Case, Test Automation Infrastructure	<b>06</b>
<b>6</b>	<b>Software Quality:</b> Five Views of Software Quality, McCall's Quality Factors and Criteria, Quality Factors Quality Criteria, Relationship between Quality Factors and Criteria, Quality Metrics, ISO 9126 Quality Characteristics, ISO 9000:2000 Software Quality Standard ISO 9000:2000 Fundamentals, ISO 9001:2000 Requirements	<b>04</b>

**Books Recommended:**

*Text books:*

1. "Software Testing and Quality Assurance: Theory and Practice", Sagar Naik, University of Waterloo, Piyu Tripathy, Wiley, 2008.
2. Roger Pressman, —Software Engineering: A Practitioners Approach", McGraw-Hill Publications, 2011

*Reference Books:*

1. "Effective methods for Software Testing "William Perry, Wiley.
2. "Software Testing - A Craftsman's Approach", Paul C. Jorgensen, CRC Press, 1995.
3. "The Art of Creative Destruction", Rajnikant Puranik, SPD.
4. "Software Testing", Srinivasan Desikan and Gopalaswamy Ramesh – Pearson Education 2006.
5. "Introducing to Software Testing", Louis Tamres, Addison Wesley Publications, First Edition.
6. "The Art of Software Testing", Glenford J. Myers, John Wiley & Sons, 1979.
7. "Testing Object-Oriented Systems: Models Patterns and Tools", Robert V. Binder, Addison Wesley, 2000.
8. "Software Testing Techniques", Boris Beizer, 2nd Edition, Van Nostrand Reinhold, 1990.
9. "Software Quality Assurance", Daniel Galin, Pearson Education.

**Syllabus for Final Year B.Tech Program in Computer Engineering- Semester VIII (Autonomous)**  
**(Academic Year 2022-2023)**

***Suggested List of Experiments:***

<b>Sr. No.</b>	<b>Title of Experiments</b>
1.	Prepare a test case verification document for a given scenario
2.	Detailed Test Plan in IEEE format for given case study
3.	White Box Testing on Units/Modules of Income Tax Calculator
4.	Black Box Testing on Units/Modules of Income Tax Calculator
6.	To design test cases for given problem statement based on Decision Table Testing method
7.	Study of Automation Software Testing with JUnit
8.	To study software Automation Testing with JMeter
9.	To study software Automation Testing tool WinRunner for Setting Up the GUI Map
10.	To study software Automation Testing tool WinRunner for Checking GUI Objects
11.	To study software Automation Testing tool WinRunner Creating Data-Driven Tests

**Evaluation Scheme:**

***Semester End Examination (A):***

*Theory:*

1. Question paper based on the entire syllabus, summing up to 75 marks.
2. Total duration allotted for writing the paper is 3 hrs.

*Laboratory:*

Oral examination will be based on the entire syllabus including, the practical's performed during laboratory sessions.

**Syllabus for Final Year B.Tech Program in Computer Engineering- Semester VIII (Autonomous)**  
**(Academic Year 2022-2023)**

***Continuous Assessment (B):***

***Theory:***

1. Two term tests of 25 marks each will be conducted during the semester out of which; one will be a compulsory term test (on minimum 02 Modules) and the other can either be a term test or an assignment on live problems or a course project.
2. Total duration allotted for writing each of the paper is 1 hr.
3. Average marks scored in the two tests will be considered for final grading.

***Laboratory: (Term work)***

Laboratory work will be based on **DJ19CEEL8013** with a minimum of 08 experiments to be incorporated.

The distribution of marks for term work shall be as follows:

- I. Laboratory work (Performance of Experiments): 15 Marks
- II. Journal Documentation (Write-up and Assignments): 10 marks

The final certification and acceptance of term work will be subject to satisfactory performance of laboratory work and upon fulfilling minimum passing criteria in the term work.

Prepared by

Checked by

Head of the Department

Principal

**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
**Semester VIII (Autonomous)**  
**(Academic Year 2022-2023)**

Program: Final Year (Common for All Programs)							Semester: VIII			
Course: Project Management							Course Code: DJ19ILO8021			
Teaching Scheme (Hours / week)				Evaluation Scheme						
				Semester End Examination Marks (A)			Continuous Assessment Marks (B)			
Lectures	Practical	Tutorial	Total Credits	Theory			Term Test 1	Term Test 2	Avg.	100
				75			25	25	25	
				Laboratory Examination			Term work			
3	--	--	3	Oral	Practical	Oral & Practical	Laboratory Work	Tutorial / Mini project / presentation/ Journal		
				--	--	--	--	--	--	

**Pre-requisites:** Basic concepts of Management.

**Objectives:**

1. To familiarize the students with the use of a structured methodology/approach for every unique project undertaken, utilizing project management concepts, tools and techniques.
2. To appraise the students with the project management life cycle and make them knowledgeable about the various phases from project initiation through closure.

**Outcomes:** On completion of the course, learner will be able to:

1. Explain project management life cycle and the various project phases as well as the role of project manager.
2. Apply selection criteria and select an appropriate project from different options.
3. Create a work break down structure for a project and develop a schedule based on it. Manage project risk strategically.
4. Use Earned value technique and determine & predict status of the project.
5. Capture lessons learned during project phases and document them for future reference.



**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
**Semester VIII (Autonomous)**  
**(Academic Year 2022-2023)**

<b>Detailed Syllabus (Unit wise)</b>		
<b>Unit</b>	<b>Description</b>	<b>Duration in Hours</b>
<b>1</b>	<b>Project Management Foundation:</b> 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, Introduction to project leadership, ethics in projects, Multicultural and virtual projects, Project management in various organization structures, PM knowledge areas as per Project Management Institute (PMI).	<b>07</b>
<b>2</b>	<b>Initiating Projects:</b> 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, Effective project team, Stages of team development & growth (forming, storming, norming & performing), team dynamics.	<b>08</b>
<b>3</b>	<b>Project Planning:</b> Work Breakdown structure (WBS) and linear responsibility chart, Project cost estimation and budgeting, Top down and bottoms up budgeting, Networking and Scheduling techniques, PERT, CPM, Crashing project time, Resource loading and levelling, Goldratt's critical chain, GANTT chart, Project Stakeholders and Communication plan, Introduction to Project Management Information System (PMIS). <b>Risk Management in projects:</b> 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.	<b>12</b>
<b>4</b>	<b>Monitoring and Controlling Projects</b> Planning monitoring and controlling cycle, Information needs and reporting, engaging with all stakeholders of the projects, communication and project meetings. Earned Value Management techniques for measuring value of work completed, using milestones for measurement, change requests and scope creep, Project audit. <b>Project Contracting</b> Project procurement management, contracting and outsourcing.	<b>08</b>
<b>5</b>	<b>Closing the Project:</b> 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.	<b>07</b>

**Books Recommended:**

*Text books:*

1. Project Management: A managerial approach, Jack Meredith & Samuel Mantel, 7th Edition, Wiley India.
2. Project Management: The Managerial Process, 6th edition, Erik Larson, Clifford Gray, McGraw Hill Education.

*Reference Books:*

1. A Guide to the Project Management Body of Knowledge (PMBOK® Guide), 5th Ed, Project Management Institute PA, USA.
2. Project Management, Gido Clements, Cengage Learning.
3. Project Management, Gopalan, Wiley India.
4. Project Management, Dennis Lock, 9th Edition, Gower Publishing England.

**Syllabus for Final Year of B.Tech. (Common for All Programs)**

**Semester VIII (Autonomous)**

**(Academic Year 2022-2023)**

**Evaluation Scheme:**

***Semester End Examination (A):***

*Theory:*

1. Question paper based on the entire syllabus will comprise of 5 questions (All compulsory, but with internal choice as appropriate), each carrying 15 marks, total summing up to 75 marks.
2. Total duration allotted for writing the paper is 3 hrs.

***Continuous Assessment (B):***

*Theory:*

1. Two term tests of 25 marks each will be conducted during the semester out of which, one will be a compulsory term test (on minimum 02 Modules) and the other can either be a term test or an assignment on live problems or a course project.
2. Total duration allotted for writing each of the paper is 1 hr.
3. Average of the marks scored in both the two tests will be considered for final grading.

**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
**Semester VIII (Autonomous)**  
**(Academic Year 2022-2023)**

Program: Final Year (Common for All Programs)							Semester: VIII			
Course: Entrepreneurship Development and Management							Course Code: DJ19ILO8022			
Teaching Scheme (Hours / week)				Evaluation Scheme						
				Semester End Examination Marks (A)			Continuous Assessment Marks (B)			Total marks (A+ B)
Lectures	Practical	Tutorial	Total Credits	Theory			Term Test 1	Term Test 2	Avg.	
				75			25	25	25	
				Laboratory Examination			Term work		Total Term work	--
3	--	--	3	Oral	Practical	Oral & Practical	Laboratory Work	Tutorial / Mini project / presentation/ Journal		
				--	--	--	--	--	--	

**Pre-requisites:** Basic concepts of Management.

**Objectives:**

1. To develop entrepreneurial abilities by providing background information about support systems, skill sets, financial and risk covering institutions.
2. To appraise the students with the fundamentals that can help them to make right decisions for starting and running an enterprise.

**Outcomes:** On completion of the course, learner will be able to:

1. Develop idea generation, creative and innovative skills
2. Prepare a Business Plan
3. Compare different entrepreneur supporting institutions
4. Correlate suitable MSME scheme for an entrepreneur
5. Interpret financial and legal aspect of a business.

**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
**Semester VIII (Autonomous)**  
**(Academic Year 2022-2023)**

<b>Detailed Syllabus (Unit wise)</b>		
<b>Unit</b>	<b>Description</b>	<b>Duration in Hours</b>
<b>1</b>	<b>Entrepreneur &amp; Entrepreneurship:</b> Meaning of entrepreneur - Evolution of the concept - Functions of an Entrepreneur - Types of Entrepreneurs - Intrapreneur- an emerging class - Concept of Entrepreneurship - Evolution of Entrepreneurship - Development of Entrepreneurship - Entrepreneurial Culture - Stages in entrepreneurial process - Develop idea generation, creative and innovative skills	<b>6</b>
<b>2</b>	<b>Business Planning Process:</b> Meaning of business plan - Business plan process - Advantages of business planning - Marketing plan - Production/operations plan - Organization plan - Financial plan - Final Project Report with Feasibility Study - Preparing a model project report for starting a new venture.	<b>10</b>
<b>3</b>	<b>Institutions Supporting Entrepreneurs:</b> Small industry financing developing countries - A brief overview of financial institutions in India - Central level and state level institutions - SIDBI - NABARD - IDBI - SIDCO - Indian Institute of Entrepreneurship - District Industries Centers - Single Window System.	<b>6</b>
<b>4</b>	<b>Micro, Small, and Medium Enterprises (MSMES)</b> MSMEs – Definition and Significance in Indian Economy; MSME Schemes, Challenges and Difficulties in availing MSME Schemes, Forms of Business; Make-In India, Start-Up India, Stand-Up India. Women Entrepreneurship; Rural Entrepreneurship; Family Business and First-Generation Entrepreneurs	<b>8</b>
<b>5</b>	<b>Finance, Account, Costing and Legal Aspect of Business</b> Funding new ventures – Conventional Source of Finance - bootstrapping, crowd sourcing- angel investors, VCs, debt financing , due diligence, Legal aspects of business (IPR, GST, Labour law)- Cost, volume, profit and break-even analysis - Margin of safety and degree of operating leverage - Capital budgeting for comparing projects or opportunities - Product costing- Product pricing- Introduction to financial statements - Profit & Loss statement - Balance sheet - Cash flow - Closure of Business	<b>12</b>

**Books Recommended:**

*Reference Books:*

1. Effective Entrepreneurial Management: Strategy, Planning, Risk Management, and Organization - by Robert D. Hisrich • Veland Ramadani, Springer Publication (2017)
2. Entrepreneurship- Theory, Process Practice –by Donald F. Kuratko, Cengage Learning (2014)
3. Entrepreneurship 6/E –by Robert D. Hisrich McGraw-Hill Education (India) (2011)
4. Entrepreneurship and small business- by Burns, P. New Jersey: Palgrave. (2001).
5. Innovation and entrepreneurship by Drucker. F. Peter, Harper business, (2006).
6. Entrepreneurship development small business enterprises, Poornima M Charantimath Pearson Publication (2013)
7. Entrepreneurial Development -Jayshree Suresh, Margham Publishers, Chennai
8. The Design of Business- by Martin Roger, Harvard Business Publishing (2009)
9. Entrepreneurship- by Roy Rajiv Oxford University Press (2011)

**Syllabus for Final Year of B.Tech. (Common for All Programs)**

**Semester VIII (Autonomous)**

**(Academic Year 2022-2023)**

**Evaluation Scheme:**

***Semester End Examination (A):***

*Theory:*

1. Question paper based on the entire syllabus will comprise of 5 questions (All compulsory, but with internal choice as appropriate), each carrying 15 marks, total summing up to 75 marks.
2. Total duration allotted for writing the paper is 3 hrs.

***Continuous Assessment (B):***

*Theory:*

1. Two term tests of 25 marks each will be conducted during the semester out of which, one will be a compulsory term test (on minimum 02 Modules) and the other can either be a term test or an assignment on live problems or a course project.
2. Total duration allotted for writing each of the paper is 1 hr.
3. Average of the marks scored in both the two tests will be considered for final grading.

**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
**Semester VIII (Autonomous)**  
**(Academic Year 2022-2023)**

Program: Final Year (Common for All Programs)							Semester: VIII			
Course: Corporate Social Responsibility							Course Code: DJ19ILO8023			
Teaching Scheme (Hours / week)				Evaluation Scheme						
				Semester End Examination Marks (A)			Continuous Assessment Marks (B)			Total marks (A+ B)
Lectures	Practical	Tutorial	Total Credits	Theory			Term Test 1	Term Test 2	Avg.	
				75			25	25	25	
				Laboratory Examination			Term work		Total Term work	--
3	--	--	3	Oral	Practical	Oral & Practical	Laboratory Work	Tutorial / Mini project / presentation/ Journal		
				--	--	--	--	--	--	

**Objectives:**

1. To make students understand the concept, theories and application of CSR for the Development of the Society.

**Outcomes:** On completion of the course, learner will be able to:

1. Understand the key characteristics of Corporate Social Responsibility (CSR) in the context of present-day management.
2. Apprise regarding business decision-making which is informed by ethical values and respect for people communities and the environment.
3. Become aware of creating a strategic plan that enables an organization to reach out to its internal and external stakeholders with consistent messages.
4. Understand critical issues of Corporate Social Responsibility (CSR) in a cross-cultural setting

**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
**Semester VIII (Autonomous)**  
**(Academic Year 2022-2023)**

<b>Detailed Syllabus (Unit wise)</b>		
<b>Unit</b>	<b>Description</b>	<b>Duration in Hours</b>
<b>1</b>	<b>Introduction to CSR</b> Meaning and Definition, History of CSR, Concepts of Charity, Corporate philanthropy, Corporate Citizenship, Sustainability and Stakeholder Management. Environmental aspect of CSR Chronological evolution and Models of CSR in India Carroll's model Major codes on CSR Initiatives in India.	<b>06</b>
<b>2</b>	<b>International framework for Corporate Social Responsibility</b> Millennium Development Goals, Sustainable Development Goals, Relationship between CSR and MDGs. United Nations (UN) Global Compact 2011. UN guiding principles on business and human rights. OECD CSR policy tool, ILO tri-partite declaration of principles on multinational enterprises and social policy.	<b>10</b>
<b>3</b>	<b>CSR-Legislation in India and the World</b> Section 135 of Companies Act 2013. Scope for CSR Activities under Schedule VII, Appointment of Independent Directors on the Board, and Computation of Net Profit's Implementing Process in India.	<b>10</b>
<b>4</b>	<b>The Drivers of CSR in India</b> Market based pressure and incentives, civil society pressure, the regulatory environment in India Counter trends, Review of current trends and opportunities in CSR, Review of successful corporate initiatives and challenges of CSR. Case Studies of Major CSR Initiatives Corporate Social Responsibility and Public-Private Partnership (PPP)	<b>08</b>
<b>5</b>	<b>Identifying key stakeholders of CSR</b> Role of Public Sector in Corporate, government programs, Nonprofit and Local Self Governance in implementing CSR, Global Compact Self-Assessment Tool, National Voluntary Guidelines by Govt. of India, Roles and responsibilities of corporate foundations.	<b>08</b>

**Books Recommended:**

*Text Books:*

1. Corporate Social Responsibility in India, Sanjay K Agarwal, Sage Publications, 2008
2. Corporate Social Responsibility in India, Bidyut Chakrabarty, Routledge, New Delhi, 2015.

*Reference Books:*

1. Corporate Social Responsibility: An Ethical Approach, Mark S. Schwartz, Broadview Press, 2011
2. Attaining Sustainable Growth through Corporate Social Responsibility, George Pohle and Jeff Hittner, IBA Global Business Services, 2008
3. Strategic Corporate Social Responsibility: Stakeholders in a Global Environment, William B. Werther Jr. and David Chandler, 2<sup>nd</sup> Edition, Sage Publications, 2011

**Syllabus for Final Year of B.Tech. (Common for All Programs)**

**Semester VIII (Autonomous)**

**(Academic Year 2022-2023)**

**Evaluation Scheme:**

***Semester End Examination (A):***

*Theory:*

1. Question paper based on the entire syllabus will comprise of 5 questions (All compulsory, but with internal choice as appropriate), each carrying 15 marks, total summing up to 75 marks.
2. Total duration allotted for writing the paper is 3 hrs.

***Continuous Assessment (B):***

*Theory:*

1. Two term tests of 25 marks each will be conducted during the semester out of which, one will be a compulsory term test (on minimum 02 Modules) and the other can either be a term test or an assignment on live problems or a course project.
2. Total duration allotted for writing each of the paper is 1 hr.
3. Average of the marks scored in both the two tests will be considered for final grading.



**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
**Semester VIII (Autonomous)**  
**(Academic Year 2022-2023)**

Program: Final Year (Common for All Programs)							Semester: VIII			
Course: Human Resource Management							Course Code: DJ19ILO8024			
Teaching Scheme (Hours / week)				Evaluation Scheme						
				Semester End Examination Marks (A)			Continuous Assessment Marks (B)			
Lectures	Practical	Tutorial	Total Credits	Theory			Term Test 1	Term Test 2	Avg.	100
				75			25	25	25	
				Laboratory Examination			Term work			
3	--	--	3	Oral	Practical	Oral & Practical	Laboratory Work	Tutorial / Mini project / presentation/ Journal		
				--	--	--	--	--	--	

**Objectives:**

1. To introduce the students with basic concepts, techniques and practices of the human resource management.
2. To provide opportunity of learning Human resource management (HRM) processes, related with the functions, and challenges in the emerging perspective of today's organizations.
3. To familiarize the students about the latest developments, trends & different aspects of HRM.
4. To acquaint the student with the importance of inter-personal & inter-group behavioral skills in an organizational setting required for future stable engineers, leaders and managers.

**Outcomes:** On completion of the course, learner will be able to:

1. Understand the concepts, aspects, techniques and practices of the human resource management.
2. Understand the Human resource management (HRM) processes, functions, changes and challenges in today's emerging organizational perspective.
3. Gain knowledge about the latest developments and trends in HRM.
4. Apply the knowledge of behavioral skills learnt and integrate it with in inter personal and intergroup environment emerging as future stable engineers and managers.

**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
**Semester VIII (Autonomous)**  
**(Academic Year 2022-2023)**

<b>Detailed Syllabus (Unit wise)</b>		
<b>Unit</b>	<b>Description</b>	<b>Duration in Hours</b>
<b>1</b>	<b>Introduction to HR</b> 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.	<b>07</b>
<b>2</b>	<b>Organizational Behaviour (OB)</b> 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 and informal groups and stages of group development, Team Effectiveness: High performing teams, Team Roles, cross functional and self-directed team. Case study.	<b>08</b>
<b>3</b>	<b>Organizational Structure &amp; Design</b> 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.	<b>08</b>
<b>4</b>	<b>Human resource Planning</b> Recruitment and Selection process, Job-enrichment, Empowerment – Job Satisfaction, employee morale. Performance Appraisal Systems: Traditional & modern methods, Performance Counselling, Career Planning. Training & Development: Identification of Training Needs, Training Methods. <b>Strategic HRM:</b> 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.	<b>09</b>
<b>5</b>	<b>Labor Laws &amp; Industrial Relations:</b> Evolution of IR, IR issues in organizations, Overview of Labor Laws in India; Industrial Disputes Act, Trade Unions Act, Shops and Establishments Act. <b>Emerging Trends in HR</b> Organizational development; Business Process Re-engineering (BPR), BPR as a tool for organizational development, managing processes & transformation in HR. Organizational Change, Culture, Environment.	<b>10</b>

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	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.	
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**Books Recommended:**

*Reference Books:*

1. Stephen Robbins, Organizational Behavior, 16th Ed, 2013
2. V S P Rao, Human Resource Management, 3rd Ed, 2010, Excel publishing
3. Aswathapa, Human resource management: Text & cases, 6th edition, 2011
4. C. B. Mamoria and S V Gankar, Dynamics of Industrial Relations in India, 15th Ed, 2015, Himalaya Publishing, 15th edition, 2015
5. P. Subba Rao, Essentials of Human Resource management and Industrial relations, 5th Ed, 2013, Himalaya Publishing
6. Laurie Mullins, Management & Organizational Behavior, Latest Ed, 2016, Pearson Publications

**Evaluation Scheme:**

***Semester End Examination (A):***

*Theory:*

1. Question paper based on the entire syllabus will comprise of 5 questions (All compulsory, but with internal choice as appropriate), each carrying 15 marks, total summing up to 75 marks.
2. Total duration allotted for writing the paper is 3 hrs.

***Continuous Assessment (B):***

*Theory:*

1. Two term tests of 25 marks each will be conducted during the semester out of which, one will be a compulsory term test (on minimum 02 Modules) and the other can either be a term test or an assignment on live problems or a course project.
2. Total duration allotted for writing each of the paper is 1 hr.
3. Average of the marks scored in both the two tests will be considered for final grading.

**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
**Semester VIII (Autonomous)**  
**(Academic Year 2022-2023)**

Program: Final Year (Common for All Programs)							Semester: VIII			
Course: Corporate Finance Management							Course Code: DJ19ILO8025			
Teaching Scheme (Hours / week)				Evaluation Scheme						
				Semester End Examination Marks (A)			Continuous Assessment Marks (B)			
Lectures	Practical	Tutorial	Total Credits	Theory			Term Test 1	Term Test 2	Avg.	100
				75			25	25	25	
				Laboratory Examination			Term work			
3	--	--	3	Oral	Practical	Oral & Practical	Laboratory Work	Tutorial / Mini project / presentation/ Journal		
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**Objectives:**

1. Overview of Indian financial system, instruments and market.
2. Basic concepts of value of money, returns and risks, corporate finance, working capital and its management.
3. Knowledge about sources of finance, capital structure, dividend policy.

**Outcomes:** On completion of the course, learner will be able to:

1. Understand Indian finance system.
2. Apply concepts of time value money and risk returns to product, services and business.
3. Understand corporate finance; evaluate and compare performance of multiple firms.
4. Take Investment, finance as well as dividend decisions.

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<b>Detailed Syllabus (Unit wise)</b>		
<b>Unit</b>	<b>Description</b>	<b>Duration in Hours</b>
<b>1</b>	<b>Overview of Indian Financial System:</b> 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	<b>07</b>
<b>2</b>	<b>Overview of Corporate Finance:</b> Objectives of Corporate Finance; Functions of Corporate Finance—Investment Decision, Financing Decision, and Dividend Decision. Financial Ratio Analysis: <b>Overview of Financial Statements:</b> -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	<b>09</b>
<b>3</b>	<b>Concepts of Returns and Risks:</b> 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. <b>Time Value of Money:</b> 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.	<b>07</b>
<b>4</b>	<b>Working Capital Management:</b> 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; and Management of Cash and Marketable Securities. <b>Capital Budgeting:</b> 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)	<b>10</b>
<b>5</b>	<b>Capital Structure:</b> Factors Affecting an Entity's Capital Structure; Overview of Capital Structure Theories and Approaches— Net Income Approach, Net Operating Income Approach; Traditional Approach, and Modigliani-Miller Approach. Relation between Capital Structure and Corporate Value; Concept of Optimal Capital Structure <b>Dividend Policy:</b> 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, and Modigliani-Miller Approach	<b>09</b>

**Books Recommended:**

*Reference Books:*

1. Fundamentals of Financial Management, 13th Edition (2015) by Eugene F. Brigham and Joel F. Houston; Publisher: Cengage Publications, New Delhi.
2. Analysis for Financial Management, 10th Edition (2013) by Robert C. Higgins; Publishers: McGraw Hill Education, New Delhi.

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3. Indian Financial System, 9th Edition (2015) by M. Y. Khan; Publisher: McGraw Hill Education, New Delhi.
4. Financial Management, 11th Edition (2015) by I. M. Pandey; Publisher: S. Chand (G/L) & Company Limited, New Delhi.
5. Financial Management, Theory & Practice 8th Edition (2011), by Prasanna Chandra: Tata McGraw Hill Education Private Limited, New Delhi.

**Evaluation Scheme:**

***Semester End Examination (A):***

*Theory:*

1. Question paper based on the entire syllabus will comprise of 5 questions (All compulsory, but with internal choice as appropriate), each carrying 15 marks, total summing up to 75 marks.
2. Total duration allotted for writing the paper is 3 hrs.

***Continuous Assessment (B):***

*Theory:*

1. Consisting **One Class Tests for 25 marks** based on approximately 50% of contents and One case study with presentations for 25 Marks.
2. Total duration allotted for writing test paper is 1 hr.
3. Average of the marks scored in the tests and case study will be considered for final grading.

**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
**Semester VIII (Autonomous)**  
**(Academic Year 2022-2023)**

Program: Final Year (Common for All Programs)							Semester: VIII			
Course: Logistic and Supply Chain Management							Course Code: DJ19ILO8026			
Teaching Scheme (Hours / week)				Evaluation Scheme						
				Semester End Examination Marks (A)			Continuous Assessment Marks (B)			Total marks (A+ B)
Lectures	Practical	Tutorial	Total Credits	Theory			Term Test 1	Term Test 2	Avg.	
				75			25	25	25	100
				Laboratory Examination			Term work		Total Term work	--
3	--	--	3	Oral	Practical	Oral & Practical	Laboratory Work	Tutorial / Mini project / presentation/ Journal		
				--	--	--	--	--	--	

**Objectives:**

1. To acquaint with the concept of key drivers of supply chain performance and their inter-relationships with strategy.
2. To acquaint with the design problems and develop an understanding of information technology in supply chain optimization.
3. To acquaint with the complexity of inter-firm and intra-firm coordination in implementing programs such as e-collaboration, quick response, jointly managed inventories and strategic alliances.

**Outcomes:** On completion of the course, learner will be able to:

1. Demonstrate the functional strategy map of supply chain management.
2. Analyze the determinants of Supply Chain and Transportation networks design.
3. Demonstrate the need of coordination and sourcing decisions in supply chain.
4. Understand pricing, revenue management and role of IT in supply chain.
5. Understand various sustainability aspects of a supply chain.

**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
**Semester VIII (Autonomous)**  
**(Academic Year 2022-2023)**

<b>Detailed Syllabus (Unit wise)</b>		
<b>Unit</b>	<b>Description</b>	<b>Duration in Hours</b>
<b>1</b>	<p><b>Understanding the Supply Chain:</b> Objective, Importance, Decision Phases, Process Views.</p> <p><b>Achieving Strategic Fit and Scope:</b> Competitive and Supply Chain Strategies, Achieving Strategic Fit, Expanding Strategic Scope, Challenges to Achieving and Maintaining Strategic Fit.</p> <p><b>Supply Chain Drivers and Metrics:</b> Financial Measures of Performance, Drivers of Supply Chain Performance, Framework for Structuring Drivers, Facilities, Inventory, Transportation, Information, Sourcing, Pricing.</p> <p><b>Creating the Responsive Supply Chain:</b> Product push versus demand pull, The Japanese philosophy, The foundations of agility, A route-map to responsiveness.</p>	<b>08</b>
<b>2</b>	<p><b>Designing the Supply Chain and Transportation Networks</b></p> <p><b>Designing Distribution Networks:</b> The Role of Distribution in the Supply Chain, Factors Influencing Distribution Network Design, Design Options for a Distribution Network.</p> <p><b>Network Design in the Supply Chain:</b> The Role of Network Design in the Supply Chain, Factors Influencing Network Design Decisions, Framework for Network Design Decisions, Models for Facility Location and Capacity Allocation.</p> <p><b>Designing Global Supply Chain Networks:</b> The Impact of Globalization on Supply Chain Networks, The Offshoring Decision: Total Cost, Risk Management in Global Supply Chains, Discounted Cash Flows, Evaluating Network Design Decisions Using Decision Trees.</p> <p><b>Transportation in a Supply Chain:</b> The Role of Transportation in a Supply Chain, Modes of Transportation and their Performance Characteristics, Design Options for a Transportation Network, Trade-Offs in Transportation Design, Tailored Transportation.</p>	<b>14</b>
<b>3</b>	<p><b>Coordination in a Supply Chain:</b> Lack of Supply Chain Coordination and the Bullwhip Effect, The Effect on Performance of Lack of Coordination, Obstacles to Coordination in a Supply Chain, Managerial Levers to Achieve Coordination, Continuous Replenishment and Vendor-Managed Inventories, Collaborative Planning, Forecasting, and Replenishment.</p> <p><b>Sourcing Decisions in a Supply Chain:</b> The Role of Sourcing in a Supply Chain, In-House or Outsource, Third- and Fourth-Party Logistics Providers, Using Total Cost to Score and Assess Suppliers, Supplier Selection—Auctions and Negotiations, Contracts, Risk Sharing and Supply Chain Performance, Design Collaboration, The Procurement Process.</p>	<b>07</b>



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<b>4</b>	<b>Pricing and Revenue Management in a Supply Chain:</b> The Role of Pricing and Revenue Management in a Supply Chain, Pricing and Revenue Management for Multiple Customer Segments, Pricing and Revenue Management for Perishable Assets, Pricing and Revenue Management for Seasonal Demand, Pricing and Revenue Management for Bulk and Spot Contracts. <b>Information Technology in a Supply Chain:</b> The Role of IT in a Supply Chain, The Supply Chain IT Framework, Customer Relationship Management, Internal Supply Chain Management, Supplier Relationship Management, The Transaction Management Foundation, Managing the supply chain as a network, Seven major business transformations, From 3PL to 4PL. The Future of IT in the Supply Chain.	<b>08</b>
<b>5</b>	<b>Creating a Sustainable Supply Chain:</b> The Role of Triple Bottom Line, Key Metrics for Sustainability, Greenhouse gases and the supply chain, Reducing the transport-intensity of supply chains, Beyond the carbon footprint, Reduce, reuse, recycle, Sustainability and Supply Chain Drivers. <b>Introduction to the Supply Chain of the Future:</b> Emerging Megatrends.	<b>05</b>

**Books Recommended:**

*Reference Books:*

1. Logistics & Supply Chain Management, Martin Christopher, Pearson Education Limited, 2016.
2. Supply Chain Management Strategy, Planning, and Operation, Sunil Chopra and Peter Meindl, Pearson, 2016.
3. Essentials of Supply Chain Management, Michael H. Hugos, Wiley, 2018.
4. Supply Chain Management For Dummies, Daniel Stanton, Wiley, 2020.
5. Global Supply Chain and Operations Management A Decision-Oriented Introduction to the Creation of Value, Dmitry Ivanov, Alexander Tsipoulanis and Jörn Schönberger, Springer International Publishing, 2016.
6. Supply Chain Management, Sinha, McGraw-Hill Education (India) Pvt Limited, 2012.

**Evaluation Scheme:**

**Semester End Examination (A):**

*Theory:*

1. Question paper based on the entire syllabus will comprise of 5 questions (All compulsory, but with internal choice as appropriate), each carrying 15 marks, total summing up to 75 marks.
2. Total duration allotted for writing the paper is 3 hrs.

**Continuous Assessment (B):**

*Theory:*

1. Two term tests of 25 marks each will be conducted during the semester out of which, one will be a compulsory term test (on minimum 02 Modules) and the other can either be a term test or an assignment on live problems or a course project.
2. Total duration allotted for writing each of the paper is 1 hr.
3. Average of the marks scored in both the two tests will be considered for final grading.

**Syllabus for Final Year of B.Tech. (Common for All Programs)****Semester VIII (Autonomous)****(Academic Year 2022-2023)**

Program: Final Year (Common for All Programs)							Semester: VIII			
Course: IPR and Patenting							Course Code: DJ19ILO8027			
Teaching Scheme (Hours / week)				Evaluation Scheme						
				Semester End Examination Marks (A)			Continuous Assessment Marks (B)			Total marks (A+ B)
Lectures	Practical	Tutorial	Total Credits	Theory			Term Test 1	Term Test 2	Avg.	
				75			25	25	25	100
				Laboratory Examination			Term work		Total Term work	--
3	--	--	3	Oral	Practical	Oral & Practical	Laboratory Work	Tutorial / Mini project / presentation/ Journal		
				--	--	--	--	--	--	

**Objectives:**

1. Understanding, defining and differentiating different types of intellectual properties (IPs)
2. Assessing different IP management (IPM) approaches
3. Exposure to the Legal management of IP and understanding of real life practice of IPM.

**Outcomes:** On completion of the course, learner will be able to:

1. Recognize the crucial role of IP for the purposes of product and technology development.
2. Understand how and when to file a patent
3. Apply the knowledge to understand the entire ecosystem
4. Derive value from IP and leverage its value in new product and service development

**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
**Semester VIII (Autonomous)**  
**(Academic Year 2022-2023)**

<b>Detailed Syllabus (Unit wise)</b>		
<b>Unit</b>	<b>Description</b>	<b>Duration in Hours</b>
<b>1</b>	<b>Concept of Intellectual Property Law</b> Idea/Expression dichotomy, Introduction and the need for intellectual property right (IPR), Intellectual Property laws, IPR in India: Genesis and development, IPR abroad, Major International Instruments concerning Intellectual Property Rights: Paris Convention, the Berne Convention, the Universal Copyright Convention, the WIPO Convention, the Patent Cooperation Treaty, the TRIPS Agreement, incentive theory, types of IPR, India's New National IP Policy, 2016, Govt. Schemes in IPR IP	<b>06</b>
<b>2</b>	<b>Patents and Trademarks</b> Elements of Patentability: Novelty, Non Obviousness, Industrial Application, Non Patentable Subject Matter, Registration Procedure, Rights and Duties of Patentee, Assignment and licence, Restoration of lapsed Patents, Surrender and Revocation of Patents, Infringement, Remedies & Penalties, Patent office and Appellate Board, Case study of existing patents related to software, healthcare, devices Concept of Trademarks, Different kinds of marks (brand names, logos, signatures, symbols, well known marks, certification marks and service marks), Non Registrable Trademarks, Registration of Trademarks, Rights of holder and assignment and licensing of marks, Infringement, Remedies & Penalties, Trademarks registry and appellate board	<b>12</b>
<b>3</b>	<b>Copyrights and Design</b> Copyrights: Nature, Subject matter: original literary, dramatic, musical, artistic works, cinematograph films and sound recordings, Registration Procedure, Term of protection, Ownership of copyright, Assignment and licence of copyright, Infringement, Remedies & Penalties, Related Rights, distinction between related rights and copyrights Design: meaning and concept of novel and original, procedure for registration, effect of registration and term of protection	<b>10</b>
<b>4</b>	<b>GI, PVP and LDP</b> Geographical indication: meaning, difference between GI and trademarks, procedure for registration, effect of registration and term of protection Plant variety protection: meaning, benefit sharing, farmers' rights, procedure for registration, effect of registration and term of protection Layout Design protection: meaning, procedure for registration, effect of registration, term of protection	<b>08</b>
<b>5</b>	<b>Beyond IP</b> Introduction to Competition Law: concept of competition, relationship and Interaction between IPR and competition law, IP and competition issues, Technology transfer agreements. EU experience with IP and Competition Law, Indian Competition Act and IPR protection, IPR issues in merger and acquisition, harmonization of IP protection and competition Law in India	<b>06</b>

**Books Recommended:**

*Reference Books:*

1. Feroz Ali, The Law of Patents, LexisNexis
2. Ronald D. Slusky, Invention Analysis and Claiming – A Patent Lawyer's Guide, Second Edition, American Bar Association, 2012.
3. Feroz Ali, The Touchstone Effect – The Impact of Pre-grant Opposition on Patents, LexisNexis, 2009.

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**Semester VIII (Autonomous)**

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4. Innovation and entrepreneurship by Drucker. F. Peter, Harper business, (2006).
5. Intellectual Property Rights, Deborah. E. Bouchoux, Cengage Learning.
6. Intellectual Property Rights– Unleashmy The Knowledge Economy, Prabuddha Ganguli, Tate Mc Graw Hill Publishing Company Ltd.,
7. The Design of Business- by Martin Roger, Harvard Business Publishing (2009)

**Evaluation Scheme:**

***Semester End Examination (A):***

*Theory:*

1. Question paper based on the entire syllabus will comprise of 5 questions (All compulsory, but with internal choice as appropriate), each carrying 15 marks, total summing up to 75 marks.
2. Total duration allotted for writing the paper is 3 hrs.

***Continuous Assessment (B):***

*Theory:*

1. Two term tests of 25 marks each will be conducted during the semester out of which, one will be a compulsory term test (on minimum 02 Modules) and the other can either be a term test or an assignment on live problems or a course project.
2. Total duration allotted for writing each of the paper is 1 hr.
3. Average of the marks scored in both the two tests will be considered for final grading.

**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
**Semester VIII (Autonomous)**  
**(Academic Year 2022-2023)**

Program: Final Year (Common for All Programs)							Semester: VIII			
Course: Digital Marketing Management							Course Code: DJ19ILO8028			
Teaching Scheme (Hours / week)				Evaluation Scheme						
				Semester End Examination Marks (A)			Continuous Assessment Marks (B)			Total marks (A+ B)
Lectures	Practical	Tutorial	Total Credits	Theory			Term Test 1	Term Test 2	Avg.	
				75			25	25	25	
				Laboratory Examination			Term work		Total Term work	--
3	--	--	3	Oral	Practical	Oral & Practical	Laboratory Work	Tutorial / Mini project / presentation/ Journal		
				--	--	--	--	--	--	

**Objectives:**

1. To explain the evolution of digital marketing and outline the underlying technology and frameworks within which digital marketing operates.
2. To understand digital marketing business models elucidating on the six core digital value elements and how they can be used to generate customer value.
3. To understand the key concepts of developing strategy for digital business and the emerging business structures.
4. To plan the digital marketing strategy roadmap, its four key stages and their elements and understand the 6S Digital Marketing Implementation Stages.
5. To understand digital marketing planning & operations setup.
6. To explain the implementation of search campaigns which include Search Engine Marketing (SEM) and Search Engine Optimization (SEO) concepts.
7. To explain upcoming digital marketing concepts including Big Data and Internet of Things (IoT), Small and Medium Businesses (SMB), B2B marketing and Social, Local and Mobile (SoLoMo) concept.

**Outcomes:** On completion of the course, learner will be able to:

1. Understand the digital marketing framework & model and consumer behaviour.
2. Develop digital marketing strategy roadmap.
3. Explain the terminology and concepts for developing web-specific media plans.
4. Understand concepts related to digital campaign management and revenue generation models.
5. Get a perspective on global digital marketing technology/tools and future trends.

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<b>Detailed Syllabus (Unit wise)</b>		
<b>Unit</b>	<b>Description</b>	<b>Duration in Hours</b>
<b>1</b>	<p><b>Introduction to Digital Marketing</b>  Emergence of Digital Marketing as a tool, media consumption drivers for new marketing environment, applications and benefits of digital marketing.</p> <p><b>Digital Marketing Framework</b>  Delivering enhanced customer value, market opportunity analysis and digital services development, ASCOR framework, critical success factors for digital marketing.</p> <p><b>Digital Marketing Models Creation</b>  Factors impacting digital marketplace, value chain digitization, business models.</p> <p><b>The Consumer for Digital Marketing</b>  Consumer behavior on the internet, evolution of consumer behavior models, managing consumer demand, integrated marketing communications (IMC), impact of digital channels on IMC.</p>	<b>08</b>
<b>2</b>	<p><b>Digital marketing Strategy Development</b>  Elements of assessment phase, macro-micro environmental analysis, marketing situation analysis.</p> <p><b>Digital Marketing Internal Assessment and Objectives Planning</b>  Analyzing present offerings mix, marketing mix, core competencies analysis and internal resource mapping. Digital presence analysis, digital marketing objectives development and review.</p> <p><b>Digital Marketing Strategy Definition</b>  Understanding digital business strategy and structures, consumer development strategy, offering mix for Digital, digital pricing models, managing promotional channels and developing the extended Ps- People, process, programs and performance.</p> <p><b>Digital marketing Strategy Roadmap</b>  Developing digital marketing strategy roadmap, the 6s digital marketing implementation strategy, marketing across the product life cycle.</p>	<b>13</b>
<b>3</b>	<p><b>Digital Marketing Planning and Setup</b>  Understanding digital media planning terminology and stages, steps to creating marketing communications strategy, introduction to search marketing, display marketing, social media marketing.</p> <p><b>Digital Marketing Operations Setup</b>  Basics of lead generation and conversion marketing, website content development and management, elements of user experience, web usability and evaluation.</p>	<b>08</b>
<b>4</b>	<p><b>Digital marketing Execution</b>  Basic elements of digital campaign management, search execution, display execution, social media execution, content marketing.</p> <p><b>Digital marketing Execution Elements</b>  Digital revenue generation models, managing service delivery and payments, managing digital implementation challenges like e commerce, internal &amp; external and consumer specific challenges.</p>	<b>08</b>

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<b>5</b>	<b>Digital Business – Present and Future</b> Digital Marketing – Global Landscape, digital marketing overview – global spend, advertising spend, and technology/tools landscape. Data technologies (Big data and IOT) impacting marketing, segment based digital marketing and SoLoMo – the next level of hyperlocal marketing.	<b>05</b>
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**Books Recommended:**

*Reference Books:*

1. Fundamentals of Digital Marketing by Puneet Singh Bhatia, Pearson Education Limited,
2. Digital Marketing by Seema Gupta- McGraw Hill Education.
3. Digital Marketing Excellence: Planning, Optimizing and Integrating Online Marketing by Dave Chaffey and P. R. Smith, 5<sup>th</sup> edition, Taylor & Francis.
4. Digital Marketing: Strategy, Implementation and Practice- 6<sup>th</sup> edition by Dave Chaffey Fiona Ellis-Chadwick, Pearson Education Limited,
5. Digital marketing by Vandana Ahuja, Oxford University Press.
6. The Art of Digital Marketing by Ian Dodson, John Wiley & Sons.

**Evaluation Scheme:**

***Semester End Examination (A):***

*Theory:*

1. Question paper based on the entire syllabus will comprise of 5 questions (All compulsory, but with internal choice as appropriate), each carrying 15 marks, total summing up to 75 marks.
2. Total duration allotted for writing the paper is 3 hrs.

***Continuous Assessment (B):***

*Theory:*

1. Two term tests of 25 marks each will be conducted during the semester out of which, one will be a compulsory term test (on minimum 02 Modules) and the other can either be a term test or an assignment on live problems or a course project.
2. Total duration allotted for writing each of the paper is 1 hr.
3. Average of the marks scored in both the two tests will be considered for final grading.

**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
**Semester VIII (Autonomous)**  
**(Academic Year 2022-2023)**

Program: Final Year (Common for All Programs)							Semester: VIII			
Course: Environmental Management							Course Code: DJ19ILO8029			
Teaching Scheme (Hours / week)				Evaluation Scheme						
				Semester End Examination Marks (A)			Continuous Assessment Marks (B)			
Lectures	Practical	Tutorial	Total Credits	Theory			Term Test 1	Term Test 2	Avg.	100
				75			25	25	25	
				Laboratory Examination			Term work			
3	--	--	3	Oral	Practical	Oral & Practical	Laboratory Work	Tutorial / Mini project / presentation/ Journal		
				--	--	--	--	--	--	

**Pre-requisite:** Knowledge of environmental science.

**Objectives:**

1. Understand and identify environmental issues relevant to India and global concerns
2. Learn concepts of ecology
3. Familiarise environment related legislations
4. Understand Environmental Auditing Procedures.

**Outcomes:** On completion of the course, learner will be able to:

1. Identify Environmental issues and get familiarized to the concept of Ecosystem and environmental management.
2. Know policies and legal aspects and understand EM system standards.
3. Understand Environment Impact assessment.
4. Understand Environment Auditing procedures.
5. Describe Environmental management Techniques



**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
**Semester VIII (Autonomous)**  
**(Academic Year 2022-2023)**

<b>Detailed Syllabus (Unit wise)</b>		
<b>Unit</b>	<b>Description</b>	<b>Duration in Hours</b>
<b>1</b>	<b>Principles of Environmental management (EM):</b> Introduction of EM, Definition, Ecosystem concept, Participants in EM, Ethics and the environment, International Environmental Movement, Environmental issues relevant to India.	<b>08</b>
<b>2</b>	<b>Policy and Legal Aspects of EM:</b> - Introduction to various Environmental Policies, Indian and International Environmental laws and legislation. <b>EM system Standards:</b> - Core Elements, Benefits, Certification Body Assessment & Documentation for EMS, ISO- 14000 Standards.	<b>10</b>
<b>3</b>	<b>Environmental Impact Assessment (EIA) :-</b> Purpose, steps, hierarchy of EIA, Environmental Impact Statement and Impact Indicators, Evolution of IA in India and worldwide. Preliminary stages of EIA, Impact, Prediction, Evaluation and Mitigation.	<b>10</b>
<b>4</b>	<b>Environmental Auditing (EA):-</b> Objectives, Scope and Types of EA, Audit Methodology, Elements of Audit Process, Auditing of EMS.	<b>06</b>
<b>5</b>	<b>Environmental Management Techniques:</b> - Environmental Monitoring and Modelling, Environmental technology Assessment and Environmental Risk Assessment, Eco-mapping.	<b>08</b>

**Books Recommended:**

*Text Books:*

1. Environmental Management, T V Ramachandra and Vijay Kulkarni, TERI Press
2. Environmental Management: Principles and Practice, C J Barrow, Routledge Publishers London, 1999

*Reference Books:*

1. A Handbook of Environmental Management Edited by Jon C. Lovett and David G. Ockwell, Edward Elgar Publishing
2. Indian Standard Environmental Management Systems — Requirements with Guidance for Use, Bureau Of Indian Standards, February 2005
3. Environmental Management: An Indian Perspective, S N Chary and Vinod Vyasulu, Macmillan India, 2000
4. Introduction to Environmental Management, Mary K Theodore and Louise Theodore, CRC Press
5. Environment and Ecology, Majid Hussain, 3<sup>rd</sup> Ed. Access Publishing.2015

**Evaluation Scheme:**

**Semester End Examination (A):**

*Theory:*

1. Question paper based on the entire syllabus will comprise of 5 questions (All compulsory, but with internal choice as appropriate), each carrying 15 marks, total summing up to 75 marks.
2. Total duration allotted for writing the paper is 3 hrs.

**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
**Semester VIII (Autonomous)**  
**(Academic Year 2022-2023)**

***Continuous Assessment (B):***

***Theory:***

1. Two term tests of 25 marks each will be conducted during the semester out of which, one will be a compulsory term test (on minimum 02 Modules) and the other can either be a term test or an assignment on live problems or a course project.
2. Total duration allotted for writing each of the paper is 1 hr.
3. Average of the marks scored in both the two tests will be considered for final grading.

**Syllabus for Final Year of B.Tech. (Common for All Programs)****Semester VIII (Autonomous)****(Academic Year 2022-2023)**

Program: Final Year (Common for All Programs)							Semester: VIII			
Course: Labour and Corporate Law							Course Code: DJ19ILO8030			
Teaching Scheme (Hours / week)				Evaluation Scheme						
				Semester End Examination Marks (A)			Continuous Assessment Marks (B)			Total marks (A+ B)
Lectures	Practical	Tutorial	Total Credits	Theory			Term Test 1	Term Test 2	Avg.	
				75			25	25	25	
				Laboratory Examination			Term work		Total Term work	--
3	--	--	3	Oral	Practical	Oral & Practical	Laboratory Work	Tutorial / Mini project / presentation/ Journal		
				--	--	--	--	--	--	

**Objectives:**

1. To understand the development and judicial setup of Labour Laws.
2. To learn the laws relating to Industrial Disputes, Social Security and Working conditions.
3. To analyse the laws related to corporate governance in different settings.
4. To develop awareness of legal principles involved in economic relationships and business transactions.
5. To develop an understanding of free enterprise system and legal safeguards of the same.

**Outcomes:** On completion of the course, learner will be able to:

1. Illustrate the role of trade union in the industrial setup.
2. Understand the important causes, impact of industrial disputes and settlement procedures.
3. To provide in-depth understanding of corporate social responsibility.
4. Apply concepts, principles and theories to understand simple business laws.
5. Analyse the principle of international business and strategies adopted by firms to expand globally

**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
**Semester VIII (Autonomous)**  
**(Academic Year 2022-2023)**

<b>Detailed Syllabus (Unit wise)</b>		
<b>Unit</b>	<b>Description</b>	<b>Duration in Hours</b>
<b>1</b>	<b>Trade Unions and Collective Bargaining:</b> Trade Unionism in India, Definition of Trade Union and Trade Dispute, General and Political Funds of Trade Union, Civil and Criminal Immunities of Registered Trade Unions, Recognition of Trade Union, Collective Bargaining	9
<b>2</b>	<b>Industrial Dispute and Instruments of Economic Coercion:</b> Industrial Dispute and Individual Dispute, Settlement of Industrial Dispute. Concept of strike – Gherao, Bandh and Lock-out, Types of Strike Rights to Strike and Lock-out	8
<b>3</b>	<b>Formation of a Company and Corporate governance:</b> Company and Other Forms of Business Organizations, Different Kinds of Company: One Person Company, Foreign Company. Kinds of Company Meetings and Procedure Powers, Duties and Kinds of Director: Independent Director, Women Director Different Prevention of Oppression and Mismanagement Investor Protection, Insider Trading, Corporate Fraud.	9
<b>4</b>	<b>Corporate Social Responsibility and Corporate Liquidation:</b> Evolution of Corporate Social Responsibility, Corporate Criminal liability, Corporate Environmental Liability Different Types of Winding up of Company, Role of Courts in Winding up of Company Merger and Acquisition of Company, Cross Border Merger, Takeover Code: Role of SEBI	8
<b>5</b>	<b>Case Studies on</b> A) Labour law B) Labour relations C) Corporate laws D) Securities laws	8

**Books Recommended:**

*Reference Books:*

1. Surya Narayan Misra, An Introduction to Labour and Industrial Law, Allahabad Law Agency, 1978
2. Indian Law Institute, Cases and Materials on Labour Law and Labour Relations
3. P.L. Malik, Industrial Law, Eastern Book Company, 2013
4. S.C. Srivastava, Industrial Relations and Labour Law, Vikas Publishing House, New Delhi
5. C.A. Kamal Garg, Bharat's Corporate and Allied Laws, 2013.
6. Institute of Company Secretaries of India, Companies Act 2013, CCH Wolter Kluwer Business, 2013
7. Saleem Sheikh & William Rees, Corporate Governance & Corporate Control, Cavendish Publishing Ltd., 1995
8. Taxmann, A Comparative Study of Companies Act 2013 and Companies Act 1956

**Evaluation Scheme:**

**Semester End Examination (A):**

*Theory:*

1. Question paper based on the entire syllabus will comprise of 5 questions (All compulsory, but with internal choice as appropriate), each carrying 15 marks, total summing up to 75 marks.

**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
**Semester VIII (Autonomous)**  
**(Academic Year 2022-2023)**

2. Total duration allotted for writing the paper is 3 hrs.

***Continuous Assessment (B):***

***Theory:***

1. Two term tests of 25 marks each will be conducted during the semester out of which, one will be a compulsory term test (on minimum 02 Modules) and the other can either be a term test or an assignment on live problems or a course project.
2. Total duration allotted for writing each of the paper is 1 hr.
3. Average of the marks scored in both the two tests will be considered for final grading.

**Syllabus for Final Year B.Tech Program in Computer Engineering- Semester VIII (Autonomous)  
(Academic Year 2022-2023)**

Program: Final Year B.Tech. in Computer Engineering							Semester: VIII			
Course: Project Stage – II							Course Code: DJ19CEP803			
Teaching Scheme  (Hours / week)				Evaluation Scheme						
				Semester End Examination Marks (A)			Continuous Assessment Marks (B)			Total marks (A+ B)
Lecture s	Practica l	Tutorial	Total Credit s	Theory			Term Test 1	Term Test 2	Avg.	
				-			-	-	-	-
				Laboratory Examination			Term work		Total Ter m work	200
-	10	-	5	Oral	Practical	Oral &Pract ical	Laborator y Work	Tutorial / Mini project / presentation/ Journal		
				-	-	100	-	-	100	

**Course Objectives:**

The primary objective is to meet the milestones formed in the overall project plan decided in Project -I. The idea presented in Project -I should be implemented in Project -II with results, conclusion and future work. The project will culminate in the production of a thesis by each individual student.

**Guidelines:**

Project Report Format: At the end of semester a student need to prepare a project report as per the guidelines. Along with project report a storage drive containing: project documentation, Implementation code, required utilities, Softwares and user manuals need to be attached.

**Evaluation Scheme:**

***Semester End Examination (A):***

***Laboratory:***

- Oral examination of Project stage-II should be conducted by Internal and External examiners.
- Students have to give presentation and demonstration on the project

**Syllabus for Final Year B.Tech Program in Computer Engineering- Semester VIII (Autonomous)**  
**(Academic Year 2022-2023)**

***Continuous Assessment (B):***

***Laboratory: (Term work)***

The distribution of marks for term work shall be as follows:

1. Weekly Attendance on Project Day
2. Project work contribute
3. Mid-Sem Review
4. Project Report
5. Term End Presentation
6. Technical Paper/Patent publication

The final certification and acceptance of term work will be subject to satisfactory performance of laboratory work and upon fulfilling minimum passing criteria in the term work.

Prepared by

Checked by

Head of the Department

Principal