Learning Outcomes based Curriculum Framework (LOCF)

For

Bachelor of Technology
Computer Science & Engineering
(Artificial Intelligence & Machine Learning)
Four-Year Graduate Programme

Curriculum for 3rd Year onwards
For 2022-23 Batch Only

Department of Computer Science & Engineering
Faculty of Engineering and Technology
Chaudhary Devi Lal University
Sirsa-125055

Program Specific Outcomes (PSOs)

PSO1 **Developing Computational Systems:** Use principles of various programming languages, data structures, database management systems, computer algorithms, theory of computation, networking and software engineering for designing and implementing computational systems.

PSO2 **Designing Intelligent Machine Learning Systems:** Utilize the principles and tools of artificial intelligence, soft computing, data mining and machine learning, data analytics, robotics, IoT, augmented reality etc. for designing and working with intelligent systems that learn from their environment.

Course Code	Definition/ Category
HSMC	Humanities, Social Sciences and Management Courses
BSC	Basic Science Courses
ESC	Engineering Science Courses
PC	Program Core Courses (Branch specific)
PE	Professional Elective Courses (Branch specific)
OE	Open Elective Courses (from Humanities, Technical Emerging or other Subjects)
EEC	Employability Enhancement Courses (Project work/ Summer Training/ Industrial Training/ Practical Training/ Internship/Seminar, etc.)
AU	Audit Courses [Environmental Sciences, Indian Constitution]

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SEMESTER-V

Course Codes	Nomenclature of the Courses	Workload/Credit				Marks		
		L	T	P	Total	Internal	External	Total
PC/CSEAIML/11-T	Machine Learning with Python Programming	3/3	-	-	3/3	30	70	100
PC/CSEAIML/12-T	Theory of Computation	3/3	-	-	3/3	30	70	100
PC/CSEAIML/13-T	Software Engineering	3/3	-	-	3/3	30	70	100
PC/CSEAIML/14-T	Android Application Development	3/3	-	-	3/3	30	70	100
PC/CSEAIML/11-P	Lab- Machine Learning with Python Programming	-	-	4/2	4/2	25	25	50
PC/CSEAIML/14-P	Lab- Android Development	-	-	4/2	4/2	25	25	50
HSMC/3-T	Company Law	4/4	-	-	4/4	30	70	100
OEC1	Open Elective Course	3/3	-	-	3/3	-	-	-
EEC/CSEAIML/2	Seminar	2/2	-	-	2/2	50	-	50
	Total	21/21		8/4	29/25	250	400	650

SEMESTER-VI

Course Codes	Nomenclature of the Courses	Workload/Credits				Marks		
		L	T	P	Total	Internal	External	Total
EEC/CSEAIML/3	Industry/Research Lab/Internship	-	-	-	18/18	100	350	450
Internship Option		-	-	-	18/18			
Within India or Abroad (Any other aligned with GOI schemes). To enhance hands-on skills (As per NEP 2020)								

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SEMESTER VII

Course Codes	Nomenclature of the Courses		Workload/Credits				Marks		
			L	T	P	Total	Internal	External	Marks
PC/CSEAIML/15-T	Internet of Things		4/4	-	-	4/4	30	70	100
PE/CSEAIML/1-T	Professional Elective-I		4/4	-	-	4/4	30	70	100
PC/CSEAIML/15-P	Lab- Internet of Things		-	-	4/2	4/2	25	25	50
OEC2	Open Elective Course		3/3	-	-	3/3	-	-	--
EEC/CSEAIML/4	Project 1	Project Documentation	-	-	2/2	2/2	-	50	50
		Project Viva	-	-	4/4	4/4	-	100	100
		Internal Assessment	-	-	2/2	2/2	50	-	50
	Total		11/11	-	12/10	23/21	135	315	450

Note: A 4-6 weeks industrial training/internship is mandatory after the completion of the VIIth semester.

SEMESTER VIII

Course Codes	Nomenclature of the Courses		Workload/Credits				Marks		
			L	T	P	Total	Internal	External	Total
PE/CSEAIML/2-T	Professional Elective-II		4/4	-	-	4/4	30	70	100
PE/CSEAIML/3-T	Professional Elective-III		4/4	-	-	4/4	30	70	100
PE/CSEAIML/2-P	Lab- Professional Elective-III		-	-	4/2	4/2	25	25	50
OEC2	Open Elective Course		3/3	-	-	3/3	-	-	--
EEC/CSEAIML/5	Project 1	Project Documentation	-	-	2/2	2/2		50	50
		Project Viva	-	-	4/4	4/4		100	100
		Internal Assessment	-	-	2/2	2/2	50	-	50
	Total		11/11	-	12/10	23/21	135	315	450

Note: A 4-6 weeks industrial training/internship is mandatory after the completion of the VIIIth semester.

List of Electives for VII and VIII Semester

1. Deep Learning
2. Natural Language Processing
3. Embedded System
4. Robotics
5. Quantum Computing
6. Cyber Security

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SEMESTER V

PC/CSEAIML/11-T: Machine Learning with Python Programming								
Course Type	Course Credit	Contact Hours/ Week	Delivery Mode	Maximum Marks			Exam Duration	Assessment Methods
				External	Internal			
Program Core	03	03	Lecture	70	30		3 Hours	TEE/MTE/ Assignment/ Attendance
					20	5 5		

Instructions to paper setter for Final-Term Examination: The Final-Term examination shall cover the whole content of the course. The total number of questions shall be nine. Question number one will be compulsory and will be consisting of short/objective-type questions from the complete syllabus. In addition to the compulsory first question, there shall be four units in the question paper each consisting of two questions. The student will attempt one question from each unit in addition to the compulsory question. All questions will carry equal marks.

Course Objectives: The objective of this course is to make the students familiar with the topics of python programming for machine learning, predictive models, supervised learning. Unsupervised learning.

Course Outcomes	At the end of this course, the student will be able to
CO1	define: the terms of machine learning: types of machine learning, data preprocessing, classification, regression, and neurons.
CO2	explain: learning types, data preprocessing and architecture of ANN.
CO3	apply: training and testing data using data preprocessing and model selection techniques and classification, regression, clustering techniques according to their problem.
CO4	Classify: data preprocessing, model selection, regression, classification, and unsupervised learning techniques.
CO5	compare: Data Preprocessing techniques, Supervised and unsupervised learning.
CO6	Design: predictive model using python programming.

CO-PO Mapping Matrix for Course PC/CSEAIML/11-T

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	3	1	1	1	-	3	1	-	2	-	-
CO2	2	1	1	3	1	-	3	2	-	2	-	-
CO3	3	1	1	3	3	-	3	3	-	2	-	-
CO4	2	1	1	3	1	-	3	3	-	2	-	-
CO5	2	1	3	1	3	-	3	3	-	2	-	-
CO6	3	3	1	2	3	-	3	3	-	2	-	-
Average	2.1	1.4	1.4	2.2	1.8	-	3	2.4	-	2	-	-

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Course Content PC/CSEAIML/11-T: Machine Learning with Python Programming	
Unit I	Basic of Python: introduction, data types (tuple, list, sets, dictionary), operators (arithmetic, comparison, logical, bitwise, assignment, membership), conditional statements (if-else, nested if, if-elif-else, ternary), loops (for, while, loops controls), functions (*args,**kwargs, lembda). Object Oriented concepts: class, object, polymorphism, inheritance, abstract, encapsulation.
Unit II	Numpy: introduction, array indexing, slicing, join, search, split. Pandas: introduction, series, data-frame, read csv files, correlation. Data Visualization: introduction of matplotlib and seaborn, box plot, histogram, subplot, scatter plot, bar chart, pie chart, qqplot. Data Preprocessing: introduction, types of data in machine learning, data pre-processing (missing values treatment, outlier treatment, dimension reduction and feature subset selection).
Unit III	Basics of Machine Learning: introduction, types of machine learning and its comparisons, applications of machine learning. Linear Regression: Introduction, steps in building model, regression models (linear regression, multiple linear regression), linear regression model diagnostics (Co-efficient of Determination), bias-variance trade-off, k-fold cross-validation, regularization, regression assumptions (multi-collinearity, VIF), residuals analysis.
Unit IV	Classification Problems: classification overview, feature encoding, classification models (using logistic regression, random forest, support vector machine, decision tree), confusion matrix. Unsupervised Learning: Introduction and its applications, techniques in unsupervised learning (clustering, K-means).

Recommended Books

1. Manaranjan Pradhan, U Dinesh Kumar, Machine Learning using Python, WILEY ed. 2019.
2. Anuradha Srinivasaraghavan, Vincy Joseph, Machine Learning, WILEY ed. 2019
3. Stephen Marsland, Machine Learning: An Algorithmic Perspective, CRC Press.
4. Peter Flach, Machine Learning: The Art and Science of Algorithms that Make Sense of Data, Cambridge University Press.
5. Peter Harrington, Machine Learning in Action, Manning
6. ShaiShalevShwartz and Shai Ben David, Understanding Machine Learning From Theory to Algorithms, Cambridge University Press.

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BOS

PC/CSEAIML/12-T: Theory of Computation								
Course Type	Course Credit	Contact Hours/ Week	Delivery Mode	Maximum Marks			Exam Duration	Assessment Methods
				External	Internal			
Program Core	03	03	Lecture	70	30		3 Hours	TEE/MTE/ Assignment/ Attendance
					20	5 5		

Instructions to paper setter for Final-Term Examination: The Final-Term examination shall cover the whole content of the course. The total number of questions shall be nine. Question number one will be compulsory and will be consisting of short/objective-type questions from the complete syllabus. In addition to the compulsory first question, there shall be four units in the question paper each consisting of two questions. The student will attempt one question from each unit in addition to the compulsory question. All questions will carry equal marks.

Course Objectives: to understand fundamental concepts of finite automata, regular grammar, mealy and Moore machine, context free language and grammar their properties, context free language and grammar.

Course Outcomes	By the end of this course, the student will be able to
CO1	define: fundamental concept of finite automata, pushdown automata, Linear bound automata, Turing machine, context free language & grammar, context sensitive language & grammar.
CO2	discuss: concept of context free language and grammar, pushdown automata, equivalence of deterministic and non-deterministic finite automata, ambiguity in grammars and languages, concept of Turing machine.
CO3	use: Pumping lemma to check language is not regular, pushdown automata to check context free language, Turing machine to solve basic calculation.
CO4	classify: finite automata, regular grammar, context free grammar, context free language, context sensitive grammar, normal forms, pushdown automata, Turing machine.
CO5	Compare and contrast: NFA & DFA, mealy and Moore machine, CNF& GNF, languages, grammars, different automata's, Turing machine.

CO-PO Mapping Matrix for Course PC/CSEAIML/12-T

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	3	1	1	1	-	3	-	-	-	-	-
CO2	2	1	1	3	1	-	3	-	-	-	-	-
CO3	3	1	1	3	3	-	3	-	-	-	-	-
CO4	2	1	1	3	1	-	3	-	-	-	-	-
CO5	2	1	3	1	3	-	3	-	-	-	-	-
Average	2	1.4	1.4	2.2	1.8	-	3	-	-	-	-	-

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BOS

Course Content PC/CSEAIML/12-T: Theory of Computation	
Unit I	Finite Automata: Deterministic and non-deterministic finite automata, applications of finite automata, equivalence of deterministic and non-deterministic finite automata, state minimization of DFA, Kleen's characterization theory for sets accepted by finite automata, regular grammar, mealy and Moore machine.
Unit II	Context Free Language and Grammar: Context free grammar, parse tree, application of context free grammars, ambiguity in grammars and languages. Pushdown Automata: Deterministic pushdown automata and non-deterministic pushdown automata, language of pushdown automata, equivalence of PDA's and CFG's.
Unit III	Properties of Context-Free Languages: Normal form of context free grammars, pumping lemma for context-free grammars, closure properties of context-free languages, decision properties of context free languages. Context Sensitive Language and Grammar: Introduction, closure properties of CSL.
Unit IV	Turing machine: Construction of Turing machine, programming techniques for Turing machine, extensions to the basic Turing machine (multi-tape Turing machine, equivalence of one-tape and multi-tape Turing machine, Non-Deterministic Turing machine), restricted Turing machine (multi-stack machines, counter machines).

Recommended Books

1. John C. Martin, Introduction to Languages and the Theory of Computation, McGraw Hill.
2. Peter Linz, An introduction to formal language & automata, Jones & Bartlett publications.
3. Hopcroft J. E. & Ullman J. D, Formal languages and their relation to Automata, Pearson Education.
4. Lewis, H.R. & Papadimitrious, C. H., Elements of the theory of computation, PHI Learning.
5. Michael Sipser, Introduction to the Theory of Computation, Cengage Learning.

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PC/CSEAIML/13-T: Software Engineering								
Course Type	Course Credit	Contact Hours/ Week	Delivery Mode	Maximum Marks			Exam Duration	Assessment Methods
				External	Internal			
Program Core	03	03	Lecture	70	30		3 Hours	TEE/MTE/ Assignment/ Attendance
					20	5 5		

Instructions to paper setter for Final-Term Examination: The Final-Term examination shall cover the whole content of the course. The total number of questions shall be nine. Question number one will be compulsory and will be consisting of short/objective-type questions from the complete syllabus. In addition to the compulsory first question, there shall be four units in the question paper each consisting of two questions. The student will attempt one question from each unit in addition to the compulsory question. All questions will carry equal marks.

Course Objectives: The objective of this course is to make the students familiar with the topics of software crisis, software engineering paradigms, software configuration management, design, coding, testing and maintenance.

Course Outcomes	At the end of this course, the student will be able to:
CO1	enumerate/define the concepts of: software and software engineering, software development paradigms, phases of software development, methods of assessing quality and reliability.
CO2	describe and summarize: phases of software development process, testing techniques, relationship between reliability and quality.
CO3	illustrate various techniques of: requirement analysis, design, coding, testing and maintenance, quality and reliability.
CO4	analyze and classify: software engineering paradigms, cost estimation models, design methodologies, testing techniques, maintenance process, reliability and quality models.
CO5	compare and select from amongst candidate: software engineering paradigms, cost estimation models, design methodologies, testing techniques, maintenance process, reliability and quality models.

CO-PO Mapping Matrix for Course PC/CSEAIML/13-T

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	3	1	1	1	-	3	2	1	-	2	-
CO2	2	1	1	3	1	-	3	2	1	-	2	-
CO3	3	1	1	3	3	-	3	2	1	-	2	-
CO4	2	1	1	3	1	-	3	2	1	-	2	-
CO5	2	1	3	1	3	-	3	2	1	-	2	-
Average	2	1.4	1.4	2.2	1.8	-	3	2	1	-	2	-

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BOS

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Course Content PC/CSEAIML/13-T: Software Engineering	
Unit I	Software and software engineering, software characteristics, software crisis, software engineering paradigms, planning a software project, software cost estimation, project scheduling, personnel planning, team structure.
Unit II	Software requirement analysis: structured analysis, object-oriented analysis and data modelling, software requirement specification, validation. Software configuration management, quality assurance, project monitoring, risk management.
Unit III	Design and implementation of software: software design fundamentals, structured design methodology and object-oriented design, design verification, monitoring and control, coding. Software Reliability: metric and specification, fault avoidance and tolerance, exception handling, defensive programming.
Unit IV	Testing: testing fundamentals, white box and black box testing, software testing strategies: unit testing, integration testing, validation testing, system testing, debugging. Software maintenance: maintenance characteristics, maintainability, maintenance tasks, maintenance side effects. CASE tools. agile development.
Recommended Books	
1. Mall, Rajib, Fundamentals of Software Engineering, PHI Learning Pvt. Ltd 2. Aggarwal, K.K, and Singh, Yogesh, Software Engineering, New Age International 3. Jalote, Pankaj, An Integrated Approach to Software Engineering, Narosa Publishing House. 4. Pressman, S. Roger, Software Engineering, Tata McGraw-Hill.	

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BOS

PC/CSEAIML/14-T: Android Software Development								
Course Type	Course Credit	Contact Hours/ Week	Delivery Mode	Maximum Marks			Exam Duration	Assessment Methods
				External	Internal			
Program Core	03	03	Lecture	70	30		3 Hours	TEE/MTE/ Assignment/ Attendance
					20	5 5		

Instructions to paper setter for Final-Term Examination: The Final-Term examination shall cover the whole content of the course. The total number of questions shall be nine. Question number one will be compulsory and will be consisting of short/objective-type questions from the complete syllabus. In addition to the compulsory first question, there shall be four units in the question paper each consisting of two questions. The student will attempt one question from each unit in addition to the compulsory question. All questions will carry equal marks.

Course Objectives: The objective of this course is to provide in-depth coverage of various concepts of android application development.

Course Outcomes	At the end of this course, the student will able to:
CO1	define: android, features, development environment, architecture, software development platform and the framework related to android applications.
CO2	explain: versions of android, architecture, software development platform, JAVA SE, the Dalvik virtual machine and various android services.
CO3	demonstrate: android SDK, IDE, AVDs, project configuration settings, directory structure of android project, activities and services of android.
CO4	illustrate: android versions, features, system requirements, applications, directory structures, resource folders, android services, screen sizes and android framework.
CO5	compare and contrast: android versions with their functions, types of android applications, development platforms, layout of android applications, activities associated with android and user interfaces.
CO6	create: android applications using different types of resources and development platforms.

CO-PO Mapping Matrix for Course PC/CSEAIML/14-T

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	3	1	1	1	-	3	2	1	-	2	-
CO2	2	1	1	3	1	-	3	2	1	-	2	-
CO3	3	1	1	3	3	-	3	2	1	-	2	-
CO4	2	1	1	3	1	-	3	2	1	-	2	-
CO5	2	1	3	1	3	-	3	2	1	-	2	-
CO6	3	3	3	1	3	-	3	2	1	-	2	-
Average	2	1.4	1.4	2.2	1.8	-	3	2	1	-	2	-

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BOS

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Course Content PC/CSEAIML/14-T: Android Software Development	
Unit I	Introduction: Android, Android versions and its feature, The Android market application store. Android Development Environment: system requirements, Android SDK, installing Java, and ADT bundle, eclipse integrated development environment (IDE), creating Android Virtual Devices (AVDs).
Unit II	Android Architecture Overview, creating a new Android project, defining the project name and SDK settings, project configuration settings, configuring the launcher icon, creating an activity, running the application in the AVD, stopping a running application, modifying the example application, reviewing the layout and resource files.
Unit III	Android software development platform, understanding Java SE and the Dalvik Virtual Machine, the directory structure of an Android project, common default resources folders, screen sizes, launching your application.
Unit IV	Android Framework overview, Android application components, Android activities: defining the UI, Android services: processing in the background, Android Manifest XML: declaring your components, understanding Android views, view groups and layouts, Graphical User Interface screen with views, displaying pictures, files, content providers, and databases.
Recommended Books	
1. Burton Michael, Android App Development for Dummies, Wiley, 2015. 2. Wei-Meng Lee, Beginning Android 4 Application Development, Wiley 3. India (Wrox), 2013. 4. John Horton, Android Programming for Beginners, Packet Publishing, 2015. 5. Ian F. Darwin, Android CookbookProblems and Solutions for Android Developers, 2e, O'Reilly,2017.	

SC

BOS

PC/CSEAIML/11-P: Soft Lab – Machine Learning with Python Programming							
Course Type	Course Credit	Contact Hours/ Week	Delivery Mode	Maximum Marks		Exam Duration	Assessment Methods
				External	Internal		
Program Core	02	04	Practical	25	25	3 Hours	TEE/MTE/ Assignment/ Attendance

Instructions to paper setter for Final-Term Examination: The Final-Term examination will be conducted by a panel of internal and external examiners. Examinees will be evaluated based on practical file, performance in practical exam and a viva voce exam.

Course Objectives: The objective of this course is to make the students familiar with the topics of python programming for machine learning, predictive models, supervised learning. Unsupervised learning.

Course Outcomes	At the end of this course, the student will able to:
CO1	define: the terms of machine learning: types of machine learning, data preprocessing, classification, regression, and neurons.
CO2	explain: learning types, data preprocessing and architecture of ANN.
CO3	apply: training and testing data using data preprocessing and model selection techniques and classification, regression, clustering techniques according to their problem.
CO4	Classify: data preprocessing, model selection, regression, classification, and unsupervised learning techniques.
CO5	compare: Data Preprocessing techniques, Supervised and unsupervised learning.
CO6	create: machine learning applications using different types of resources and development platforms.

CO-PO Mapping Matrix for Course PC/CSEAIML/11-P

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	3	1	1	1	-	3	2	1	-	2	-
CO2	2	1	1	3	1	-	3	2	1	-	2	-
CO3	3	1	1	3	3	-	3	2	1	-	2	-
CO4	2	1	1	3	1	-	3	2	1	-	2	-
CO5	2	1	3	1	3	-	3	2	1	-	2	-
CO6	3	3	1	1	3	-	3	2	1	-	2	-
Average	2	1.4	1.4	2.2	1.8	-	3	2	1	-	2	-

SC

BOS

PC/CSEAIML/14-P: Soft Lab - Android Software Development							
Course Type	Course Credit	Contact Hours/ Week	Delivery Mode	Maximum Marks		Exam Duration	Assessment Methods
				External	Internal		
Program Core	02	04	Practical	25	25	3 Hours	TEE/MTE/ Assignment/ Attendance

Instructions to paper setter for Final-Term Examination: The Final-Term examination will be conducted by a panel of internal and external examiners. Examinees will be evaluated based on practical file, performance in practical exam and a viva voce exam.

Course Objectives: The objective of this course is to provide in-depth coverage of various concepts of android application development. This course will help the students in learning to develop and publish their own android applications.

Course Outcomes	At the end of this course, the student will able to:
CO1	define: android, features, development environment, architecture, software development platform
CO2	explain: versions of android, architecture, software development platform, JAVA SE,
CO3	demonstrate: android SDK, IDE, AVDs, project configuration settings, directory structure of android project, activities and services of android.
CO4	illustrate: android versions, features, system requirements, applications, directory structures, resource folders, android services, screen sizes and android framework.
CO5	compare and contrast: android versions with their functions, types of android applications, development platforms, layout of android applications, activities associated with android and user interfaces.
CO6	create: android applications using different types of resources and development platforms.

CO-PO Mapping Matrix for Course PC/CSEAIML/14-P

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	3	1	1	1	-	3	2	1	-	2	-
CO2	2	1	1	3	1	-	3	2	1	-	2	-
CO3	3	1	1	3	3	-	3	2	1	-	2	-
CO4	2	1	1	3	1	-	3	2	1	-	2	-
CO5	2	1	3	1	3	-	3	2	1	-	2	-
CO6	3	3	1	3	3	-	2	1	1	-	2	-
Average	2	1.4	1.4	2.2	1.8	-	3	2	1	-	2	-

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BOS

HSMC/3-T: Company Law								
Course Type	Course Credit	Contact Hours/Week	Delivery Mode	Maximum Marks			Exam Duration	Assessment Methods
				External	Internal			
Humanities and Social Sciences including Management	04	04	Lecture	70	30		3 Hours	TEE/MTE/ Assignment / Attendance
					20	5 5		

Instructions to paper setter for Final-Term Examination: Final-Term examination shall cover the whole content of the course. Total number of questions shall be nine. Question number one will be compulsory and will be consisting of short/objective type questions from complete syllabus. In addition to compulsory first question there shall be four units in the question paper each consisting of two questions. Student will attempt one question from each unit in addition to compulsory question. All questions will carry equal marks.

Course Objectives: The course aims to develop and comprehend business and its processes in accordance with the provisions of the Companies Act, 2013 while analysing case laws.

Course Outcomes	At the end of this course, the student will be able to:
CO1	Analyse the regulatory aspects and the broader procedural aspects involved in different types of companies covering the Companies Act, 2013 and Rules.
CO2	Prepare the basic legal documents required for formation of a company.
CO3	Analyse the process and documents required for raising capital for the company.
CO4	Analyse the managerial composition of companies and examine the process of company meetings.
CO5	Evaluate the framework of dividend distribution and develop understanding of the winding up process including Insolvency Resolution.

CO-PO Mapping Matrix for Course HSMC/3-T

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	-	-	-	1	-	-	-	-	-	-	-
CO2	2	2	-	-	2	-	-	-	-	-	-	-
CO3	2	2	-	-	3	-	-	-	-	-	-	-
CO4	2	2	-	-	3	-	-		-	-	-	-
CO5	2	3	-	2	3	-	-	-	-	-	-	-
Average	2	1.4	1.4	2.2	1.5	-	3	-	-	2	-	-

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BOS

Course Content HSMC/3-T: Company Law	
Unit I	History of Company Law in India and England, Nature Definition and characteristics of Company, Lifting of the corporate Veil, Kinds of Companies, Formation and incorporation of a Company, Promoter-status, position, function and remuneration
Unit II	Memorandum of association, its alteration, Doctrine of Ultravires, Article of Association, binding force, alteration, its relationship with memorandum of association, Doctrine of Constructive notice, Doctrine of Indoor management and its exceptions, Meeting: meaning, kinds, resolutions, quorum, and voting
Unit III	Directors: position, appointment, qualifications, vacation of office, Removal, Resignation, Powers and duties of Directors, remuneration of directors, Role of nominee directors, Compensation for loss of Office, Managing Director and other managerial personnel, Secretary: definition, qualification, position, appointment duties and qualities. Share: its kind, different aspects, Debentures and its kind, different aspects
Unit IV	Majority rules and minority protection, Prevention of Oppression and mismanagement. Winding up: types, grounds, who can apply, procedure, Powers of Liquidator, consequences of winding up order, Members and Creditors winding up, Liability of past members-payment of liabilities, Preferential payment, Winding up of unregistered company, Receiver, power, appointment, duties and liabilities.
Recommended Books	
1. Taxmann's(A.K Majumdor, Dr. G.K. Kapoor, Company Law and Practice 2. L.C.B Gower, Priciples of Modern Company Law 3. Dr. Avtar Singh, Indian Company Law 4. Dr. N.D. Kapoor, Company Law 5. A. Ramayya, A Guide to Companies Act	

SC

BoS

EEC/CSEAIML/2: Seminar							
Course Type	Course Credit	Contact Hours/Week	Delivery Mode	Maximum Marks		Exam Duration	Assessment Methods
				External	Internal		
Employment Enhancement Courses	02	02	Presentation	--	50	1 Hours	Report Writing / Presentation

Instructions: Evaluation is based on work done, quality of report, performance in viva-voce, presentation etc

Course Objectives: This is a mandatory course to enhance the knowledge, skills and attitude of the graduating engineers to the environment. By studying this course students will understand our natural environment and its relationship with human activities.

BOS

SEMESTER VI

EEC/CSEAIML/3: Industry/ Research Lab/ Internship							
Course Type	Course Credit	Contact Hours/Week	Delivery Mode	Maximum Marks		Exam Duration	Assessment Methods
				External	Internal		
Employment Enhancement Courses	18	18	Presentation	350	100	3 Hours	Report Writing / Viva-Voce

Instructions: Evaluation is based on work done, quality of report, performance in viva-voce, presentation etc
An internal evaluation is done by internal examiner/(s) appointed by the Chairperson.
Significance and originality of the problem addressed, and the solution provided: 20
Knowledge of the problem domain and tool used (VIVA-VOCE):25
Report Writing: 20
Judgement of the skill learnt, and system developed: 20
Level of ethics followed: 15

Course Objectives: Students will do an Industrial Training of 4 to 6 weeks after Vth semester. They are expected to learn novel skills and develop some software application during the training period.

Staff. council

20/5/24

BOS.