MVJCE CURRICULUM

FOR

COMPUTER SCIENCE & ENGINEERING (Scheme 2019)

V SEMESTER

Course Title	**TECHNICAL MANAGEMENT &** ENTREPRENEURSHIP	Semester	05
Course Code	MVJ19TIM51	CIE	50

Total No. of Contact Hours	40	SEE	50
No. of Contact Hours/week	3 (L : T : P :: 3 : 0 : 0)	Total	100
Credits	3	**Exam. Duration**	3 Hours

Course objective is to:

- Describe the importance of management and functions of a manager.
- Explain the process of planning and organizing.
- Explain the requirements of direction, supervision and the methods of establishing control.
- Identify the role of entrepreneurs in the economic development of the nation and recognize the barriers of entrepreneurship.
- Explain the importance of Intellectual property protection.

Module–1	L1,L2, L3	**Hours 8**

Management: importance of management, definition, management functions, roles of a manager, levels of management, managerial skills, management and administration, management a science or art, management a profession, professional management v/s family management. Development of management thought; Early classical approaches, Neo classical approaches, modern approaches.

Application: Enterprises

Video Link: https://www.youtube.com/watch?v=mub7Z8Fl3ZU

Module–2	L1,L2, L3	**Hours 8**

Planning: Nature, Importance of planning, forms, types of plans, steps in planning, limitations of planning, making planning effective, planning skills, strategic planning in Indian industry.

Organizing: Organization Meaning, process of organizing, span of management principles of organizing, Departmentation, organization structure, committees, teams.

Application: Industry

Video Link: https://www.youtube.com/watch?v=pCUs3UKwYpc

Module–3	L1,L2, L3	**Hours 8**

Direction and supervision: Requirements of effective direction, giving orders, motivation, job satisfaction, morale , organizational commitment, first level supervision or front line supervision.

Controlling: Meaning and steps in controlling , Essential of a sound control system , Methods of establishing control

Application: Industry

Video Link: https://www.youtube.com/watch?v=MufenDklR8E

Module–4	L1,L2, L3	**Hours 8**

Entrepreneurship: Meaning of Entrepreneur; Evolution of the Concept, Functions of an Entrepreneur, Types of Entrepreneur, Entrepreneur an emerging Class. Concept of Entrepreneurship Evolution of

Entrepreneurship, Development of Entrepreneurship, Stages in entrepreneurial process; Role of entrepreneurs in Economic Development; Entrepreneurship in India; Entrepreneurship its Barriers.

Application: Industry

Video Link:https://www.youtube.com/watch?v=aozlwC3XwfY

Module–5	L1,L2, L3	**Hours 8**

Introduction to IPR, origin and concepts of IPR, Concept of property, Forms of IP protection: Patents, copyrights, trademarks, designs, Trade secrets, Traditional knowledge, Geographical indications. Basic concepts and historical background of patent system and law– National and international scenario (American & European Patent Regimes).

Internat **ional Treaties/Conventions on IPR:** Paris Convention, Berne convention, Madrid agreement, Rome convention, World Intellectual Property Organization (WIPO), World Trade Organization, TRIPS Agreement, Patent Co–operation Treaty

Application: Industry

Video Link: https://www.youtube.com/watch?v=hHQWCFE0J84

Practical Experiments:

Case study on Enterprises:

- Case study(Microsoft),
- Case study (Captain G R Gopinath),
- Case study(NR Narayana Murthy& Infosys)

Practical Sessions:

- Idea Generation and Opportunity Recognition
- Strategy and Business Model Analysis
- Formulation of Project

Course Outcomes:

CO1	Describe the importance of management and functions of a manager.
CO2	Explain the process of planning and principles of organizing
CO3	Identify the role of entrepreneurs in the economic development of the nation.
CO4	Compare the different leadership styles.
CO5	Apply the ethical principles related to the intellectual property protection

Text Books:

1	Management and Entrepreneurship , N V R Naidu ,T Krishna Rao 4th reprint.
2	Law relating to Intellectual Property rights , B. L. Wadhera, 5th edition,Universal Law Publishing, 2011

Reference Books:

1	Principles of Management, P C Tripathi, P N Reddy, 5th edition, TataMcGraw Hill, 2012

2	Dynamics of Entrepreneurial Development & Management, Vasant Desai, Himalaya publishing house, 2009

CIE Assessment:

CIE is based on quizzes, tests, assignments/seminars and any other form of evaluation. Generally, there will be: Three Internal Assessment (IA) tests during the semester (30 marks each), the final IA marks to be awarded will be the average of three tests

- Quizzes/mini tests (4 marks)
- Mini Project / Case Studies (8 Marks)
- Activities/Experimentations related to courses (8 Marks)

SEE Assessment:

i. Question paper for the SEE consists two parts i.e. Part A and Part B. Part A is compulsory and consists of objective type or short answer type questions of 1 or 2 marks each for total of 20 marks covering the whole syllabus.

ii. Part B also covers the entire syllabus consisting of five questions having choices and may contain sub–divisions, each carrying 16 marks. Students have to answer five full questions.

iii. One question must be set from each unit. The duration of examination is 3 hours.

CO–**PO/PSO Mapping**														
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	-	-	-	-	2	2	-	-	-	2	-	-	-
CO2	2	-	-	-	-	2	2	-	-	-	2	-	-	-
CO3	2	-	-	-	-	2	2	-	-	-	2	-	-	2
CO4	2	-	-	-	-	2	-	-	2	-	2	-	-	-
CO5	2	-	-	-	-	2	-	2	-	-	2	-	1	-

High–3, Medium–2, Low–1

Course Title	**DATABASE MANAGEMENT SYSTEM**	Semester	05
Course Code	MVJ19CS52	CIE	50
Total No. of Contact Hours	50	SEE	50
No. of Contact Hours/week	4 (L : T : P :: 3 : 2 : 0)	Total	100
Credits	4	**Exam. Duration**	3 Hours

Course objective is to: ***This course will enable students to***

- Provide a strong foundation in database concepts, technology, and practice.
- Practice SQL programming through a variety of database problems.
- Demonstrate the use of concurrency and transactions in database.
- Design and build database applications for real world problems.

Module–1	L1,L2, L3	**Hours 10**

Introduction to Databases: Introduction; An example; characteristics of the database approach; actors on the scene; workers behind the scene; advantages of using the DBMS approach; A brief history of database Applications; when Not to use a DBMS.

Overview of Database Languages and Architectures: Data Models, Schemas, and Instances. Three schema architecture and data independence, database languages, and interfaces, The Database System environment.

Modelling using Entities and Relationships: Entity types, Entity sets, attributes, roles, and structural constraints, Weak entity types, ER diagrams, examples.

Laboratory Sessions/ Experimental learning: Draw ER diagram for database applications (logical database design).

Applications: Library Management system, Banking, Universities and colleges, credit card transactions, social media sites, Telecommunications, Finance, Military, online shopping, Human Resource Management, Manufacturing, Airline Reservation systems.

Video link / Additional online information (related to module if any):

- https://nptel.ac.in/courses/106106093/
- https://nptel.ac.in/courses/106105175/
- https://www.youtube.com/watch?v=WSNqcYqByFk

Module–2	L1,L2, L3	**Hours 10**

Relational Model: Relational Model Concepts, Relational Model Constraints and relational database schemas, Update operations, dealing with constraint violations.

Relational Algebra: Unary and Binary relational operations, additional relational operations (aggregate, grouping, etc.) Examples of Queries in relational algebra.

Mapping Conceptual Design into a Logical Design: Relational Database Design using ER–to–Relational mapping.

SQL: SQL data definition and data types, specifying constraints in SQL, retrieval queries in SQL, INSERT, DELETE, and UPDATE statements in SQL.

Laboratory Sessions/ Experimental learning: programs to perform set operations, arithmetic operations, joins, selection, projection, create tables for real world db applications and insert values to it.

Applications: RDBMS, enterprise level software solution(except light weight web applications)

Video link / Additional online information (related to module if any):

- https://nptel.ac.in/courses/106106093/
- https://nptel.ac.in/courses/106105175/

Module–3	L1,L2, L3	**Hours 10**

SQL: Advances Queries: More complex SQL retrieval queries, Specifying constraints as assertions and action triggers, Views in SQL, Schema change

statements in SQL.

Database Application Development: Accessing databases from applications, An introduction to JDBC, JDBC classes and interfaces, SQLJ, Stored procedures, Embedded SQL**.**

Laboratory Sessions/ Experimental learning: Mini–projects to develop connections between front end and backend(database) using JDBC. Write SQL queries for the given schema.

Applications: Java Programming, In Server to reduce network traffic and to provide security(Stored procedure)

Video link / Additional online information (related to module if any):

- https://www.youtube.com/watch?v=64szTfLNu3o
- https://www.digimat.in/nptel/courses/video/106105175/L11.html

Module–4	L1,L2, L3	**Hours 10**

Normalization: Database Design Theory Introduction to Normalization using Functional and Multivalued Dependencies: Informal design guidelines for relation schema, Functional Dependencies, Normal Forms based on Primary Keys, Second and Third Normal Forms, Boyce–Codd Normal Form, Multivalued Dependency and Fourth Normal Form, Join Dependencies and Fifth Normal Form. Dependency theory – functional dependencies, Armstrong's axioms for FD's, closure of a set of FD's, minimal covers.

Laboratory Sessions/ Experimental learning: Draw schema diagram which satisfy all forms of normalization for all db real world application

Applications: to optimize database design

Video link / Additional online information (related to module if any):

- https://nptel.ac.in/courses/106106093/
- https://nptel.ac.in/courses/106105175/
- https://www.youtube.com/watch?v=YD8dhOmuVnY

Module–5	L1,L2, L3	**Hours 10**

Transaction Processing: Introduction to Transaction Processing, Transaction and System concepts, Desirable properties of Transactions, Characterizing schedules based on recoverability, Characterizing schedules based on Serializability, Transaction support in SQL.

Concurrency Control in Databases: Two–phase locking techniques for Concurrency control,

Concurrency control based on Timestamp ordering.

File Organizations and Indexes: Introduction, Hashing techniques, Indexing, Structures for Files.

Laboratory Sessions/ Experimental learning: Develop banking and other financial applications.

Applications: systems that manage sales order entry, airline reservations, payroll, employee records, manufacturing, and shipping. Operating system(deadlock)

Video link / Additional online information (related to module if any):

- https://nptel.ac.in/courses/106106093/
- https://nptel.ac.in/courses/106105175/
- https://www.youtube.com/watch?v=5ammL5KU4mo

Course Outcomes:	
CO1	Identify, analyse and define database objects, enforce integrity constraints on a database using RDBMS.
CO2	Use Structured Query Language (SQL) for database manipulation.
CO3	Design and build simple database systems.
CO4	Apply the concepts of Normalization and design database which possess no anomalies.
CO5	Develop application to interact with databases.

Text Books:	
1	Fundamentals of Database Systems, Ramez Elmasri and Shamkant B. Navathe, 7th Edition, 2017, Pearson
2	Database management systems, Ramakrishnan, and Gehrke, 3rd Edition, 2014, McGraw Hill

Reference Books:	
1	Silberschatz Korth and Sudharshan, Database System Concepts, 6th Edition, McGrawHill, 2013.
2	Database Principles Fundamentals of Design, Implementation and Management, Cengage Learning 2012.

CIE Assessment:

CIE is based on quizzes, tests, assignments/seminars and any other form of evaluation. Generally, there will be: Three Internal Assessment (IA) tests during the semester (30 marks each), the final IA marks to be awarded will be the average of three tests

- Quizzes/mini tests (4 marks)
- Mini Project / Case Studies (8 Marks)
- Activities/Experimentations related to courses (8 Marks)

SEE Assessment:

i. Question paper for the SEE consists two parts i.e. Part A and Part B. Part A is compulsory and consists of objective type or short answer type questions of 1 or 2 marks each for total of 20 marks covering the whole syllabus.

ii. Part B also covers the entire syllabus consisting of five questions having choices and may contain sub–divisions, each carrying 16 marks. Students have to answer five full questions.

iii. One question must be set from each unit. The duration of examination is 3 hours.

CO–**PO/PSO Mapping**														
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1	3	3	2	3	-	-	-	1	-	-	2	2	-
CO2	3	3	3	2	2	-	-	-	1	-	-	2	1	-
CO3	3	3	3	2	2	-	-	-	1	-	-	2	2	2
CO4	2	3	3	2	2	-	-	-	1	-	-	2	2	3
CO5	2	3	3	3	3	-	-	-	2	-	-	2	-	1

High–3, Medium–2, Low–1

Course Title	**COMPUTER NETWORKS**	Semester	05
Course Code	MVJ19CS53	CIE	50
Total No. of Contact Hours	50	SEE	50
No. of Contact Hours/week	4 (L : T : P :: 3 : 2 : 0)	Total	100
Credits	4	**Exam. Duration**	3 Hours

Course objective is to: ***This course will enable students***

- Understand the protocol layering and physical level communication.
- Analyze the performance of a network.
- Understand the various components required to build different networks.
- Learn the functions of network layer and the various routing protocols.

- Familiarize the functions and protocols of the Transport layer.

Module–**1**	L1,L2, L3	**Hours 10**

INTRODUCTION AND PHYSICAL LAYER : Networks Network Types Protocol Layering TCP/IP Protocol suite OSI Model Physical Layer: Performance Transmission media Switching Circuit–switched Networks Packet Switching.

Video link / Additional online information (related to module if any):

- http://www.nptelvideos.in/2012/11/computer-networks.html

Module–2	L1,L2, L3	**Hours 10**

DATA–**LINK LAYER & MEDIA ACCESS**: Introduction Link–Layer Addressing DLC Services Data–Link Layer Protocols HDLC PPP – Media Access Control – Wired LANs: Ethernet – Wireless LANs Introduction IEEE 802.11, Bluetooth Connecting Devices.

Video link / Additional online information (related to module if any):

- http://www.nptelvideos.in/2012/11/computer-networks.html

Module–**3**	L1,L2, L3	**Hours 10**

NETWORK LAYER : Network Layer Services Packet switching Performance IPV4 Addresses Forwarding of IP Packets – Network Layer Protocols: IP, ICMP v4 Unicast Routing Algorithms Protocols Multicasting Basics IPV6 Addressing IPV6 Protocol.

Video link / Additional online information (related to module if any):

- http://www.nptelvideos.in/2012/11/computer-networks.html

Module–**4**	L1,L2, L3	**Hours 10**

TRANSPORT LAYER : Introduction Transport Layer Protocols Services Port Numbers User Datagram Protocol Transmission Control Protocol SCTP.

- **Video link:** http://www.nptelvideos.in/2012/11/computer-networks.html

Module–**5**	L1,L2, L3	**Hours 10**

APPLICATION LAYER : WWW and HTTP FTP Email Telnet SSH DNS SNMP.

- **Video link:**http://www.nptelvideos.in/2012/11/computer-networks.html

Course Outcomes:

CO1	Understand the basic layers and its functions in computer networks.
CO2	Evaluate the performance of a network.
CO3	Understand the basics of how data flows from one node to another.
CO4	Analyze and design routing algorithms.

CO5	Design protocols for various functions in the network and Understand the working of various application layer protocols.

Text Books:	
1	Behrouz A. Forouzan, Data Communications and Networking, Fifth Edition TMH, 2013.
2	Larry L. Peterson, Bruce S. Davie, Computer Networks: A Systems Approach, Fifth Edition, Morgan Kaufmann Publishers Inc., 2012.
3	William Stallings, Data and Computer Communications, Tenth Edition, Pearson Education, 2013.

Reference Books:	
1	Nader F. Mir, Computer and Communication Networks, Second Edition, Prentice Hall, 2014.
2	Ying–Dar Lin, Ren–Hung Hwang and Fred Baker, Computer Networks: An Open Source Approach, McGraw Hill Publisher, 2011.
3	James F. Kurose, Keith W. Ross, Computer Networking, A Top–Down Approach Featuring the Internet, Sixth Edition, Pearson Education, 2013.

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- Quizzes/mini tests (4 marks)
- Mini Project / Case Studies (8 Marks)
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CO–**PO/PSO Mapping**														
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	-	-	-	1	-	-	-	-	-	-	2	-	-

CO2	3	3	3	-	-	-	-	-	1	-	1	2	1	-
CO3	2	2	2	1	3	-	-	-	-	-	1	3	-	1
CO4	3	2	3	-	-	-	-	-	-	2	3	2	-	-
CO5	3	2	3	-	-	-	-	-	-	2	3	2	2	-

High–3, Medium–2, Low–1

Course Title	**WEB PROGRAMMING**	Semester	05
Course Code	MVJ19CS54	CIE	50
Total No. of Contact Hours	40	SEE	50
No. of Contact Hours/week	3 (L : T : P :: 3 : 0 : 0)	Total	100
Credits	3	**Exam. Duration**	3 Hours

Course objective is to: ***This course will enable students to***

- Understand different kind of Internet Technologies.
- Learn java–specific web services architecture
- understand the SQL and JDBC
- Learn the AJAX and JSON.

Module–1	L1,L2, L3	**Hours 8**

Website Basics, HTML5, CSS 3, Web 2.0: Web Essentials: Clients, Servers and Communication, The Internet, Basic Internet protocols, World wide web, HTTP Request Message , HTTP Response Message, Web Clients, Web Servers, HTML5 : Tables, Lists, Image, HTML5 control elements , Semantic elements , Drag and Drop, Audio, Video controls, CSS3: Inline, embedded and external style sheets, Rule cascading, Inheritance, Backgrounds, Border Images, Colours, Shadows, Text, Transformations.

Laboratory Sessions/ Experimental learning:

Create a simple website with following effects on Text and images

1. Add Background image/s
2. Colors effect.
3. Shadows and transformation.

Real Time Applications: Animation website

Video link / Additional online information (related to module if any):

- https://youtu.be/FPtLsZ62pdA
- https://nptel.ac.in/courses/106/106/106106222/
- https://youtu.be/vCo6p7zrbt4
- https://nptel.ac.in/courses/106/106/106106223

Module–2	L1,L2, L3	**Hours 8**

Client side Programming: An Introduction to java Script, JavaScript DOM Model, Date and Object, Regular Expression, Exception Handling, Validation, Built–in Objects, Event Handling, DHTML with JavaScript, JSON introduction, Syntax, Function Files, Http Request, SQL.

Laboratory Sessions/ Experimental learning:

- SQL and DOM model creation in website as created in module 1.

Real Time Applications: Students results / Application form in online

Video link / Additional online information (related to module if any):

- https://nptel.ac.in/courses/106/105/106105084/
- https://youtu.be/uUhOEj4z8Fo (NPTEL)
- https://youtu.be/3uxp7mqUlfk (NPTEL)
- https://youtu.be/tfPfwDrfSP8 (NPTEL)

Module–3	L1,L2, L3	**Hours 8**

Server Side Programming: Java Servlet Architecture, Servlet Life Cycle, Form GET and POST actions, Session handling, Installing and Configuring Apache Tomcat Web Server, Database Connectivity: JDBC perspectives, JDBC Program Example, JSP: Understanding Java server page, JSP Standard Tag Library (JSTL), Creating HTML form using JSP Code.

Laboratory Sessions/ Experimental learning:

Write a servlet program to display a message "Welcome to Java World" and deploy the process using GET and POST actions.

Real Time Applications: Online ordering using any E-Commerce site.

Video link / Additional online information (related to module if any):

- https://nptel.ac.in/courses/106/105/106105224/
- https://youtu.be/J6qfWtQ54Ig
- https://nptel.ac.in/courses/106/105/106105084/

Module-4	L1,L2, L3	**Hours 8**

PHP and XML: Introduction to PHP, PHP using PHP, Variables, Program Control, Built-in Functions, Form Validation, Basic command with PHP examples, Connection to server, creating Database, Selecting Database, Listing Database, listing table names Creating a table, Inserting data, deleting data and tables, altering tables. XML: Document type definition, XML Schema DOM and presenting XML, XML Parser and Validations, XSL and XSLT Transformation.

Laboratory Sessions/ Experimental learning:

Design, Develop and Implement a student/Employee table and perform the following operations using PHP.

1. Insert a row
2. Delete a row
3. Alter the table.

Video link:

- https://youtu.be/XlryaovT_3k
- http://www.digimat.in/nptel/courses/video/106106127/L49.html
- http://www.nptelvideos.in/2012/11/internet-technologies.html

Module-5	L1,L2, L3	**Hours 8**

AJAX and Web Services: AJAX: Ajax client server architecture, Xml HTTP request object, Call back methods. Advanced JavaScript and jQuery, JavaScript Pseudo-Classes, jQuery Foundations, Web Services: Introduction, Java web services Basics, Creating, Publishing, Testing and Describing a web services, Database driven web service from an application, SOAP.

Laboratory Sessions/ Experimental learning:

- jQuery process and AJAX services.

Video link/Lecturer/Tutorials:

- https://www.w3schools.com/xml/ajax_intro.asp (Practical examples)
- https://youtu.be/jMdHE4qInU4
- https://youtu.be/FBDHe5T7quI

Course Outcomes:

CO1	Learn web essentials, HTML5 and CSS3.
CO2	Understand about Client side programming, DHTML and JSON

CO3	Comprehend server side programming and JSP.
CO4	Learn PHP, functions, and XML.
CO5	Analyse the concepts of AJAX and web servies.

Text Books:	
1	Jean–Paul Tremblay & Paul G. Sor Deitel and Deitel and Nieto,Internet and World Wide Web,How to Program, Prentice Hall, 5th Edition, 2011.
2	Randy Connolly, Ricardo Hoar, "Fundamentals of Web Development",1stEdition, Pearson Education India. (ISBN:978–9332575271)
3	Robert W. Sebesta, Programming the World Wide Web, 8thEdition, University of Colorado, Colorado Springs. ©2015 |Pearson

Reference Books:	
1	Stephen Wynkoop and John Burke Running a Perfect Website ,‖QUE, 2nd Edition,1999.
2	Chris Bates, Web Programming Building Intranet Applications, 3rd Edition, Wiley publications, 2009.
3	Jeffrey C and Jackson, Web Technologies A Computer Science Perspective‖, Pearson Education, 2011.
4	UttamK.Roy, Web Technologies‖, Oxford University Press, 2011
5	Gopalan N.P. and Akilandeswari J., Web Technology, Prentice Hall of India, 2011.

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CO3	2	2	2	1	3	-	-	-	-	-	1	3	-	-
CO4	3	2	3	-	2	-	-	-	-	2	3	2	1	-
CO5	3	2	3	-	3	-	-	-	-	2	3	2	3	2

High–3, Medium–2, Low–1

Course Title	**THEORY OF COMPUTATION**	Semester	05
Course Code	MVJ19CS551	CIE	50
Total No. of Contact Hours	40	SEE	50
No. of Contact Hours/week	3 (L : T : P :: 3 : 0 : 0)	Total	100
Credits	3	**Exam. Duration**	3 Hours

Course objective is: ***This course will enable students***

- To have a knowledge of regular languages and context free languages.
- To have an understanding of finite state and pushdown automata.
- To make a study of the programming capabilities of Turing machines.

Module–1	L1,L2, L3	**Hours 8**

Finite Automata: Mathematical preliminaries and notations – Central concepts of automata theory – Finite automata –Deterministic Finite Automata – Nondeterministic Finite Automata – Equivalence of DFA and NFA – Finite Automata with Epsilon transitions – Application of FA

Video link / Additional online information (related to module if any):

- https://nptel.ac.in/courses/106/105/106105196/

Module–2	L2 ,L3	**Hours 8**

Regular Expressions: Regular languages: Regular Expressions – Finite Automata and Regular Expressions –

Applications of Regular Expressions – Regular Grammars. **Video link / Additional online information (related to module if any):** • https://www.youtube.com/watch?v=OA8EY3HKZoc		
Module–3	L1,L2, L3	**Hours 8**
Regular Languages: Properties of regular languages: Pumping lemma for regular languages Closure properties of regular languages Equivalence and Minimization of Finite Automata. C **Video link / Additional online information (related to module if any):** • https://www.youtube.com/watch?v=ganHwe4DU7A		
Module–4	L1,L2, L3	**Hours 8**
Context Free Grammar: Context Free languages: Context Free Grammars Parse Trees – Ambiguity in Grammars and languages Applications of Context Free Grammars Pushdown automata (PDA) Languages of a PDA Equivalence of PDA's and CFG's **Video link / Additional online information (related to module if any):** • https://www.youtube.com/watch?v=FjGrU7vczyg • https://www.youtube.com/watch?v=b3OPl5wS4AQ		
Module–5	L1,L2, L3	**Hours 8**
Context Free Languages: Properties of Context Free Languages: Normal Forms (CNF, GNF) for Context Free Grammars – Pumping lemma for CFL's – Closure properties of CFL **Turing Machines:** Turing Machines– Simple examples. **Video link / Additional online information (related to module if any):** • https://www.youtube.com/watch?v=IhyEGNn-7Uo		

Course Outcomes:	
CO1	Design Finite automata for different Problems
CO2	Understand about Regular Expressions
CO3	Apply pumping lemma to Regular languages and Context Free languages
CO4	Design Push down automata and write CFG for different problems
CO5	Analyze the properties of Context free languages and Turing Machine

Text Books:	
1	J.E.Hopcroft, R.Motwani and J.D Ullman," Introduction to Automata Theory, Languages Computations", 3rd Edition, Pearson Education, 2011
2	J.Martin, "Introduction to Languages and the Theory of Computation", 3rd Edition, TMH, 2007.

Reference Books:	
1	H.R.Lewis and C.H.Papadimitriou, "Elements of the theory of Computation", 2nd Edition, Pea

	Education/PHI, 2003
2	Micheal Sipser, —Theory and Computatio, 7th Edition, Thomson Course Technology, 2008
3	http://nptel.iitm.ac.in

CIE Assessment:

CIE is based on quizzes, tests, assignments/seminars and any other form of evaluation. Generally, there will be: Three Internal Assessment (IA) tests during the semester (30 marks each), the final IA marks to be awarded will be the average of three tests

- Quizzes/mini tests (4 marks)
- Mini Project / Case Studies (8 Marks)
- Activities/Experimentations related to courses (8 Marks)

SEE Assessment:

i. Question paper for the SEE consists two parts i.e. Part A and Part B. Part A is compulsory and consists of objective type or short answer type questions of 1 or 2 marks each for total of 20 marks covering the whole syllabus.

ii. Part B also covers the entire syllabus consisting of five questions having choices and may contain sub–divisions, each carrying 16 marks. Students have to answer five full questions.

iii. One question must be set from each unit. The duration of examination is 3 hours.

CO–PO/PSO Mapping

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	1	-	-	1	-	-	-	-	-	-	1	2
CO2	3	3	1	-	-	1	-	-	-	-	-	-	2	-
CO3	3	3	1	-	-	1	-	-	-	-	-	-	2	-
CO4	3	3	1	-	-	1	-	-	-	-	-	-	-	-
CO5	3	3	1	-	-	1	-	-	-	-	-	-	2	-

High–3, Medium–2, Low–1

Course Title	**SOFTWARE TESTING**	Semester	05
Course Code	MVJ19CS552	CIE	50
Total No. of Contact Hours	40	SEE	50
No. of Contact Hours/week	3 (L : T : P :: 3 : 0 : 0)	Total	100
Credits	3	**Exam. Duration**	3 Hours

Course objective is to: ***This course will enable students to***

- Introduce Testing Concepts and Evolution.
- Explain Testing Strategies and their usage.
- Discuss the levels of testing.
- Introduce Organizational features and Policies of Testing.
- Discuss the Quality related issue.

Module–1	L1,L2, L3	**Hours 8**

Introduction: Basic definitions–software testing principles– Role of tester– testing as a process– Overview of Testing maturity model– Defects –Hypothesis and tests.

Laboratory Sessions/ Experimental learning: Study Experiment for automated Testing Tool– Selenium

Applications: ATM, Banking Applications

Video link / Additional online information :

What is Software Testing & Why Testing is important?

- https://www.youtube.com/watch?v=Y7Wg4508tHo

Roles and Responsibilities of a Software Tester.

- https://www.youtube.com/watch?v=t5jJ4bNJ4kw

Module–2	L1,L2, L3	**Hours 8**

Strategies and Methods for Test Case Design I : Introduction to Testing Design Strategies– The Smart Tester– Test Case Design Strategies– Using the Black Box Approach to Test Case Design – Random Testing– Equivalence Class Partitioning– Boundary Value Analysis (BVA) – An Example of the Application of Equivalence Class Partitioning and Boundary Value Analysis– Other Black Box Test Design Approaches: Cause–and–Effect Graphing– State Transition Testing – Error Guessing– Black Box Testing and Commercial Off–the–Shelf Components (COTS)– Black Box Methods and TMM Level 2 Maturity Goals

Laboratory Sessions/ Experimental learning:

Design and develop a program in a language of your choice to solve the triangle problem defined as follows: Accept three integers which are supposed to be the three sides of triangle and determine if the three values represent an equilateral triangle, isosceles triangle, scalene triangle, or they do not form a triangle at all. Derive test cases for your program based on boundary value analysis, execute the test cases and discuss the results.

Generate test cases using Black box testing technique to Calculate Standard Deduction on Taxable Income. The standard deduction is higher for tax payers who are 65 or older or blind. Use the method given below to calculate tax.

The first factor that determines the standard deduction is the filing status. The basic standard deduction for the various filing status are: Single $4,750 Married, filing a joint return $9,500 Married, filing a separate return $7,000

If a married couple is filing separate returns and one spouse is not taking standard Deduction, the other spouse also is not eligible for standard deduction.

An additional $1,000 is allowed as standard deduction, if either the filer is 65 yrs or the spouse is 65 yrs or older (the latter case applicable when the filing status is "Married" and filing "joint").

An additional $1,000 is allowed as standard deduction, if either the filer is blind or the spouse is blind (the latter case applicable when the filing status is "married" and filing "joint").

Applications: Mobile Applications , Health Care devices such as Glucose meter

Video link / Additional online information :

Black Box Testing Techniques

- https://www.youtube.com/watch?v=7T4DGEXht40
- https://www.softwaretestinghelp.com/black-box-testing/

Equivalence Partitioning with real time example

- https://www.youtube.com/watch?v=A9oBq8ZYv9A

Boundary Value Analysis with real time example

- https://www.youtube.com/watch?v=21wOCNHsSU4

State Transition Testing

- https://www.youtube.com/watch?v=4ie2C12LBXg

Error Guessing

- https://www.javatpoint.com/error-guessing-technique-in-black-box-testing

Module-3	L1,L2, L3	**Hours 8**

Strategies and Methods for Test Case Design II: Using the White Box Approach to Test Design- Test Adequacy Criteria -Coverage and Control Flow Graphs - Covering Code Logic - Paths: Their Role in White Box Based Test Design - Additional White Box Test Design Approaches : Data Flow and White Box Test Design -Loop Testing - Mutation Testing - Evaluating Test Adequacy Criteria - White Box Testing Methods and the TMM

Laboratory Sessions/ Experimental learning:

- Study Experiment for White Box Testing Tools

Applications: Automobile Industry,Air Craft Manufacturing

Video link / Additional online information :

White Box testing

- https://www.youtube.com/watch?v=3bJcvBLJViQ&feature=emb_logo
- https://www.geeksforgeeks.org/software-engineering-white-box-testing/

Control Flow Testing

- https://www.youtube.com/watch?v=1uklXlRovX4

Basis Path Testing NPTEL Video

- https://www.youtube.com/watch?v=TAFhCV721tY

Data Flow and Mutation Testing:

- https://www.youtube.com/watch?v=RR_nEUtwbBA

Module-4	L1,L2, L3	**Hours 8**

Levels of testing- Phase-I:The Need for Levels of Testing: Levels of Testing and Software Development Paradigms - Unit Test: Functions, Procedures, Classes, and Methods as Units - Unit Test: The Need for Preparation - Unit Test Planning - Designing the Unit Tests - The Class as a Testable Unit: Special Considerations -The Test Harness - Running the Unit Tests and Recording Results- Integration Test: Goals - Integration Strategies for Procedures and Functions - Integration Strategies for Classes - Designing Integration Tests - Integration Test Planning

Laboratory Sessions/ Experimental learning:

- Take any System(e.g ATM System) and study its system specifications and report the various bugs.

- Study of automated tools used in Unit Testing

Applications: Lap Top Manufacturing, Washing Machine

Video link / Additional online information :

Unit Testing

- https://www.guru99.com/unit-testing-guide.html
- https://www.youtube.com/watch?time_continue=7&v=lj5nnGa_DIw&feature=emb_logo

Integration Testing

- https://www.guru99.com/integration-testing.html

Module-5	L1,L2, L3	**Hours 8**

Levels of testing- Phase-II: System Test: The Different Types : Functional Testing – Performance Testing – Stress Testing –Configuration Testing – Security Testing – Recovery Testing – Regression Testing – Alpha, Beta, and Acceptance Tests – Summary Statement on Testing Levels – The Special Role of Use Cases –Levels of Testing and the TMM

Laboratory Sessions/ Experimental learning:

- Perform the steps involved in Acceptance Testing

Applications: TV Manufacturing, Microwave Oven Manufacturing

Video link / Additional online information :

Functional Testing

- https://www.guru99.com/functional-testing.html
- https://www.youtube.com/watch?v=U-_e1xPKnZY

Regression Testing

- https://www.youtube.com/watch?v=4MtsWBxCPHw

Course Outcomes:

CO1	Recall the role of tester and their functionalities.
CO2	Apply mathematical logic for testing
CO3	Communicate effectively with developers and other stakeholders
CO4	Choose appropriate testing strategies to perform unit and integration test
CO5	Choose appropriate testing strategies to perform System test

Text Books:

1	Ilene Burnstein, Practical Software Testing, Springer Verlag International Edition, Springer (India) Pvt Ltd, 2012

Reference Books:

1	NareshChauhan, Software Testing Principles and Practices,Oxford University Press, 2013.

2	Edward Kit Software Testing in the Real World – Improving the Process, Pearson Education, 1995

CIE Assessment:
CIE is based on quizzes, tests, assignments/seminars and any other form of evaluation. Generally, there will be: Three Internal Assessment (IA) tests during the semester (30 marks each), the final IA marks to be awarded will be the average of three tests - Quizzes/mini tests (4 marks) - Mini Project / Case Studies (8 Marks) - Activities/Experimentations related to courses (8 Marks)
SEE Assessment:
i. Question paper for the SEE consists two parts i.e. Part A and Part B. Part A is compulsory and consists of objective type or short answer type questions of 1 or 2 marks each for total of 20 marks covering the whole syllabus. ii. Part B also covers the entire syllabus consisting of five questions having choices and may contain sub–divisions, each carrying 16 marks. Students have to answer five full questions. iii. One question must be set from each unit. The duration of examination is 3 hours.

CO–**PO/PSO Mapping**														
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	1	1	-	1	1	2	-	-	-	-	-	-	-
CO2	3	3	3	3	2	-	-	-	-	-	-	-	3	2
CO3	1	-	-	1	1	-	2	3	3	3	3	-	-	-
CO4	3	3	2	2	2	-	-	-	-	-	-	3	1	-
CO5	3	3	3	3	3	2	-	-	3	3	3	3	1	-

High–3, Medium–2, Low–1

Course Title	**LAW FOR ENGINEERS**	Semester	05
Course Code	MVJ19CS553	CIE	50
Total No. of Contact Hours	40	SEE	50
No. of Contact Hours/week	3 (L : T : P :: 3 : 0 : 0)	Total	100
Credits	3	**Exam. Duration**	3 Hours

Course objective is to: ***This course will enable students to***

- Outline the commercial context for engineering processes and business models that are socially responsible and environmentally sustainable.
- Channelize thinking towards basic understanding of the legal concepts and its implications for engineers.
- Acquaint with latest intellectual property rights and innovation environment with related regulatory framework.

Module–1	L1,L2, L3	**Hours 8**

Origin of Environmental Law, Concept of Pollution Sources of Pollution, Types of Pollution, and Effects of pollution. Nature and Scope of Environmental Law Importance. Case Study.

Application: Environmental Law:

Video Link:https://www.digimat.in/nptel/courses/video/110106081/L01.html

Module–2	L1,L2, L3	**Hours 8**

Provisions of various labor laws – workmen's compensation Act 1923; Disablement, Total Permanent disablement, Temporary disablement, Formula for compensation; Minimum wages act, 1948; Payment of bonus act, 1965; Weekly holidays Act, 1942; Payment of wages Act, 1936; employees Insurance Act, 1948.

Application: Labour Law

Video Link:https://www.digimat.in/nptel/courses/video/110106081/L01.html

Module–3	L1,L2, L3	**Hours 8**
A brief introduction to criminal liability of Engineers as per the Indian Penal Code. Application: Indian Penal Code **Video Link:**https://www.digimat.in/nptel/courses/video/110106081/L01.html		
Module–4	L1,L2, L3	**Hours 8**
IPR and Law of Torts: Definition, categories of torts, Breach of Duty and Damages. Concept of Property, Types of Property; Introduction to IPR; Types of IPR: Copyrights, Patents, Trademarks, Designs, Trade Secrets, Plant Varieties and Geographical Indications; Infringement of IPRs and Remedies available under the Indian Law. Application: IPR **Video Link:**https://www.digimat.in/nptel/courses/video/110106081/L01.html		
Module–5	L1,L2, L3	**Hours 8**
Business Organizations and E– Governance: Sole Traders, Partnerships: Companies: The Company's Act: Introduction, Formation of a Company, Memorandum of Association, Articles of Association, Prospectus, Shares, Directors, General Meetings and Proceedings, Auditor, Winding up. E–Governance and role of engineers in E–Governance, Need for reformed engineering serving at the Union and State level, Role of I.T. professionals in Judiciary, Problem of Alienation and Secessionism in few states creating hurdles in Industrial development. Applications: G2C, G2B,G2G **Video link / Additional online information (related to module if any):** • https://www.digimat.in/nptel/courses/video/110105083/L01.html		

Course Outcomes:	
CO1	Enumerate the principles of sustainable development.
CO2	Discuss the significance of various legislations pertaining to engineers
CO3	Understand legal systems relevant for engineering:
CO4	Understand codes of conduct, conflicts of interest and other ethical dilemmas
CO5	Correlate role of engineers with different organizations and governance models

Text Books:	
1	B.S. Patil, Legal Aspects of Building and Engineering Contracts
2	Ratanlal and Dhirajlal&: The Law of Torts.

Reference Books:	
1	S. Shantha Kumar– Introduction to Environmental Law.
2	Cornish W. R. (2008), Intellectual Property Rights, Patents, Trademarks, Copyrights & Allied Rights, Sweet & Maxwell
3	Madhavan Pillai – Labour and Industrial Laws.
4	Handbook on e–Governance Project Lifecycle, Department of Electronics & Information Technology, Government of India, https://www.meity.gov.in/writereaddata/files/eGovernance_Project_Lifecycle_Participant_Handbook-5Day_CourseV1_20412.pdf

CIE Assessment:

CIE is based on quizzes, tests, assignments/seminars and any other form of evaluation. Generally, there will be: Three Internal Assessment (IA) tests during the semester (30 marks each), the final IA marks to be awarded will be the average of three tests

- Quizzes/mini tests (4 marks)
- Mini Project / Case Studies (8 Marks)
- Activities/Experimentations related to courses (8 Marks)

SEE Assessment:

i. Question paper for the SEE consists two parts i.e. Part A and Part B. Part A is compulsory and consists of objective type or short answer type questions of 1 or 2 marks each for total of 20 marks covering the whole syllabus.

ii. Part B also covers the entire syllabus consisting of five questions having choices and may contain sub–divisions, each carrying 16 marks. Students have to answer five full questions.

iii. One question must be set from each unit. The duration of examination is 3 hours.

CO–PO/PSO Mapping

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	2	2	3	3	2	-	-	-	-	3	-	-
CO2	3	2	2	2	3	3	2	-	-	-	-	3	1	-
CO3	3	2	2	1	3	3	2	-	-	-	-	3	1	-
CO4	3	2	2	2	3	3	2	-	-	-	-	3	2	3
CO5	3	2	2	1	3	3	2	-	-	-	-	3	1	-

High–3, Medium–2, Low–1

Course Title	**PARALLEL AND DISTRIBUTED SYSTEMS**	Semester	05
Course Code	MVJ19CS554	CIE	50
Total No. of Contact Hours	40	SEE	50
No. of Contact Hours/week	5 (L : T : P :: 3 : 0 : 0)	Total	100
Credits	3	**Exam. Duration**	3 Hours

Course objective is to: ***This course will enable students to***

- Understand the architecture of parallel systems and identify the scope for parallelism in present day's processors.

Prerequisites: Basics of Computer Organisation

Module–1	L1,L2, L3	**Hours 8**

Introduction to Parallel Computing: Motivating Parallelism, Scope of Parallel Computing. **Parallel Programming Platforms**: Trends in microprocessor architectures – limitations of memory system performance parallel computing platforms communication costs in parallel machines routing mechanisms for interconnection networks.

Video link / Additional online information (related to module if any):

- https://nptel.ac.in/courses/106/102/106102114/

Module–2	L1,L2, L3	**Hours 8**

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: One–to–all broadcast and all–to–one reduction all–to–all broadcast reduction all–reduce and prefix–sum operations scatter and gather all–to–all personalized communication circular shift improving the speed of some communication operation

Video **link / Additional online information (related to module if any):**

- https://nptel.ac.in/courses/106/102/106102114/

Module–3	L1,L2 ,L3	**Hours 8**

Examples of Distributed Systems Trends in Distributed Systems Focus on resource sharing

Challenges. Case study: World Wide Web. **Video link / Additional online information (related to module if any):** • https://nptel.ac.in/courses/106/102/106102114/		
Module–4	L1,L2 ,L3	**Hours 8**
System Model Inter process Communication the API for internet protocols External data representation and Multicast communication. Network virtualization: Overlay networks. Case study: MPI Remote Method Invocation And Objects: Remote Invocation Introduction Request–reply protocols Remote procedure call Remote method invocation. Case study: Java RMI. **Video link / Additional online information (related to module if any):** • https://nptel.ac.in/courses/106/106/106106168/		
Module–5	L1,L2 ,L3	**Hours 8**
Peer–to–**peer Systems** Introduction Napster and its legacy Peer–to–peer Middleware Routing overlays. Overlay case studies: Pastry, Tapestry. **Distributed File Systems** Introduction File service architecture Andrew File system. **Video link / Additional online information (related to module if any):** • https://nptel.ac.in/courses/106/106/106106168/		

Course Outcomes:	
CO1	Acquire the skills to implement software effectively and efficiently on parallel hardware platforms
CO2	Discuss trends in Distributed Systems.
CO3	Apply network virtualization.
CO4	Apply remote method invocation and objects.
CO5	Differentiate the file systems.

Text Books:	
1	Ananth Grama, Anshul gupta, George Karypis and Vipin Kumar, "Introduction to Parallel Computing", Pearson Education, Second edition, 2004..
2	Pradeep K Sinha, "Distributed Operating Systems: Concepts and Design", Prentice Hall of India, 2007.

Reference Books:	
1	M.J. Quinn, "Parallel Computing – Theory and Practice", McGraw–Hill, 1994.
2	Tanenbaum A.S., Van Steen M., "Distributed Systems: Principles and Paradigms", Pearson Education, 2007.

CIE Assessment:
CIE is based on quizzes, tests, assignments/seminars and any other form of evaluation. Generally, there will be: Three Internal Assessment (IA) tests during the semester (30 marks each), the final IA marks to be awarded will be the average of three tests - Quizzes/mini tests (4 marks) - Mini Project / Case Studies (8 Marks) - Activities/Experimentations related to courses (8 Marks)
SEE Assessment:
i. Question paper for the SEE consists two parts i.e. Part A and Part B. Part A is compulsory and consists of objective type or short answer type questions of 1 or 2 marks each for total of 20 marks covering the whole syllabus. ii. Part B also covers the entire syllabus consisting of five questions having choices and may contain sub-divisions, each carrying 16 marks. Students have to answer five full questions. iii. One question must be set from each unit. The duration of examination is 3 hours.

CO-**PO/PSO Mapping**														
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	3	2	1	-	-	-	2	2	-	-	-
CO2	3	3	3	3	2	1	-	-	-	2	2	-	-	-
CO3	3	3	3	3	2	1	-	-	-	2	2	-	2	1
CO4	3	3	3	3	2	1	-	-	-	2	2	-	2	1
CO5	3	3	3	3	2	1	-	-	-	2	2	-	1	-

High-3, Medium-2, Low-1

Course Title	**DATABASE MANAGEMENT SYSTEM LABORATORY**	Semester	05
Course Code	MVJ19SCSL56	CIE	50
Total No. of Contact Hours	30	SEE	50
No. of Contact Hours/week	3(L : T : P :: 0 : 2 : 2)	Total	100
Credits	2	**Exam. Duration**	3 Hours

Course objective is to: ***The students will be able to***

- Foundation knowledge in database concepts, technology and practice to groom students into well– informed database application developers.
- Strong practice in SQL programming through a variety of database problems.
- Develop database applications using front–end tools and back–end DBMS.

S No	Experiment Name	RBT Level	Hours
1	**The following relations keep track of airline flight information**: FLIGHTS (no: integer, from: string, to: string, distance: integer, Departs: time, arrives: time, price: real) AIRCRAFT (aid: integer, aname: string, cruisingrange: integer) CERTIFIED (eid: integer, aid: integer) EMPLOYEES (eid: integer, ename: string, salary: integer) Note that the Employees relation describes pilots and other kinds of employees as well; every pilot is certified for some aircraft, and only pilots are certified to fly. Write each of the following queries in SQL. i. Find the names of aircraft such that all pilots certified to operate them have salaries more than Rs.80, 000. ii. For each pilot who is certified for more than three aircrafts, find the eid and the maximum cruising range of the aircraft for which she or he is certified. iii. Find the names of pilots whose salary is less than the price of the cheapest route from Bengaluru to Frankfurt. iv. For all aircraft with cruising range over 1000 Kms, .find the name of the aircraft and the average salary of all pilots certified for this aircraft. v. Find the names of pilots certified for some Boeing aircraft. vi. Find the aids of all aircraft that can be used on routes from Bengaluru to New Delhi.	L3	3
2	**Consider the Schema for a banking enterprise:**	L3	3

	BRANCH(branch–name:string, branch–city:string, assets:real) ACCOUNT(accno:int, branch–name:string, balance:real) DEPOSITOR(customer–name:string, accno:int) CUSTOMER(customer–name:string, customer–Street:string, customer–city:string) LOAN(loan–number:int, branch–name:string, amount:real) BORROWER(customer–name:string, loan–number:int) i. Create the above tables by properly specifying the primary keys and the foreign keys ii. Enter at least five tuples for each relation iii. Find all the customers who have at least two accounts at the Main branch. iv. Find all the customers who have an account at all the branches located in a specific city. Demonstrate how you delete all account tuples at every branch located in a specific city.		
3	**Consider the schema for College Database:** STUDENT(USN, SName, Address, Phone, Gender) SEMSEC(SSID, Sem, Sec) CLASS(USN, SSID) SUBJECT(Subcode, Title, Sem, Credits) IAMARKS(USN, Subcode, SSID, Test1, Test2, Test3, FinalIA) Write SQL queries to 1. List all the student details studying in fourth semester 'C' section. 2. Compute the total number of male and female students in each semester and in each section. 3. Create a view of Test1 marks of student USN '1MJ15CS101' in all subjects. 4. Calculate the FinalIA (average of best two test marks) and update the corresponding table for all students. 5. Categorize students based on the following criterion: If FinalIA = 17 to 20 then CAT = 'Outstanding' If FinalIA = 12 to 16 then CAT = 'Average' If FinalIA< 12 then CAT = 'Weak' Give these details only for 8th semester A, B, and C section students.	L3	3
4	Consider the schema for Company Database:		

	EMPLOYEE(SSN, Name, Address, Sex, Salary, SuperSSN, DNo) DEPARTMENT(DNo, DName, MgrSSN, MgrStartDate) DLOCATION(DNo,DLoc) PROJECT(PNo, PName, PLocation, DNo) WORKS_ON(SSN, PNo, Hours) Write SQL queries to 1. Make a list of all project numbers for projects that involve an employee whose last name is 'Scott', either as a worker or as a manager of the department that controls the project. 2. Show the resulting salaries if every employee working on the 'IoT' project is given a 10 percent raise. 3. Find the sum of the salaries of all employees of the 'Accounts' department, as well as the maximum salary, the minimum salary, and the average salary in this department 4. Retrieve the name of each employee who works on all the projects controlled by department number 5 (use NOT EXISTS operator). 5. For each department that has more than five employees, retrieve the department number and the number of its employees who are making more than Rs. 6,00,000.	L3	3
	STUDY EXPERIMENT For any problem selected, write the ER Diagram, apply ER–mapping rules, normalize the relations, and follow the application development process. • Make sure that the application should have five or more tables, at least one trigger and one stored procedure, using suitable front end tool. **Indicative areas include; health care, education, industry, transport, supply chain etc.**	L2	2

Course Outcomes:	
CO1	Demonstrate the creation of relational tables using DDL/DML
CO2	Design and demonstrate the execution of simple queries retrieve information
CO3	Demonstrate the execution of complex queries
CO4	Design and implement a front end using modern tools

CO5	Implement, analyze and evaluate the project developed for an application.
Reference Books:	
1	Silberschatz Korth and Sudharshan, Database System Concepts, 6th Edition, McGraw Hill, 2013.
2	Database Principles Fundamentals of Design, Implementation and Management, Cengage Learning 2012.

CIE Assessment:
Regular Lab work :20 Record writing :5 Lab Tests(Minimum 2 tests shall be conducted for 15 marks and average of two will be taken) Viva 10 marks
SEE Assessment:
Examinations will be conducted for 100 marks and scaled–down to 50. The weightage shall be, i. Writeup : 20 marks ii. Conduction : 40 marks iii. Analysis of results : 20 marks iv. Viva : 20

High–3, Medium–2, Low–1

CO–**PO/PSO Mapping**														
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	1	3	1	2	1	-	1	-	-	2	2	-
CO2	3	3	2	3	2	2	-	-	1	-	-	2	2	1
CO3	3	3	2	3	2	1	-	-	1	-	-	2	1	-
CO4	3	3	2	2	2	1	-	-	-	-	-	2	1	3
CO5	3	3	2	2	1	1	1	-	-	-	-	2	1	3

Course Title	**COMMUNICATION NETWORK LAB**	Semester	05
Course Code	MVJ19CSL57	CIE	50
Total No. of Contact Hours	30	SEE	50
No. of Contact Hours/week	3(L : T : P :: 0 : 2 : 2)	Total	100
Credits	2	**Exam. Duration**	3 Hours
Course objective is to: ***This course will enable students to***			

- Learn and use network commands.
- Learn socket programming.
- Implement and analyze various network protocols.
- Learn and use simulation tools.
- Use simulation tools to analyze the performance of various network protocols.

S No	Experiment Name	RBT Level	Hours
1	Learn to use commands like tcpdump, netstat, ifconfig, nslookup and traceroute. Capture ping and traceroute PDUs using a network protocol analyzer and examine.	L3	3
2	Write a program for error detecting code using CRC–CCITT (16– bits).	L3	3
3	Write a program to find the shortest path between vertices using bellman–ford algorithm.	L3	3
4	Applications using TCP sockets like: a) Echo client and echo server b) Chat c) File Transfer	L3	3
5	Simulation of DNS using UDP sockets.	L3	3
6	Write a code for simulating ARP /RARP protocols.	L3	3
7	Implementation of Stop and Wait Protocol and Sliding Window Protocol.	L3	3
8	Write a program for congestion control using leaky bucket algorithm.	L3	3
9	Simulate the transmission of ping messages/trace route over a network topology consisting of 6 nodes and find the number of packets dropped due to congestion.	L3	3
10	Simulate an Ethernet LAN using n nodes and set multiple traffic nodes and plot congestion window for different source / destination.	L3	3
11	Simulate simple ESS and with transmitting nodes in wireless LAN by simulation and determine the performance with respect to transmission of packets.	L3	3
12	Simulate and study the performance of GSM on NS2/NS3 (Using MAC layer) or equivalent environment.	L3	3
13	Simulate and study the performance of CDMA on NS2/NS3 (Using stack called Call net) or equivalent environment	L3	3
14	Simulate and study the performance of LTE on NS2/NS3	L3	3

Web Link and Video Lectures: (Self Learning)

- https://www.youtube.com/watch?v=rurs7cdT5cc
- https://www.youtube.com/watch?v=jQerVWxOGMc
- https://www.youtube.com/watch?v=X-wAtdGS5No
- https://www.youtube.com/watch?v=Db-tV8JJ3ZQ
- https://www.youtube.com/watch?v=Yb7vcX0inbM

Course Outcomes:

CO1	Implement various protocols using TCP and UDP.
CO2	Compare the performance of different transport layer protocols.
CO3	Use simulation tools to analyze the performance of various network protocols.
CO4	Analyze various routing algorithms
CO5	Implement error correction codes.

Reference Books:	
1	Larry L. Peterson, Bruce S. Davie, Computer Networks: A Systems Approach, Fifth Edition, Morgan Kaufmann Publishers Inc., 2012.
2	William Stallings, Data and Computer Communications, Tenth Edition, Pearson Education, 2013.

CIE Assessment:

Regular Lab work :20

Record writing :5

Lab Tests(Minimum 2 tests shall be conducted for 15 marks and average of two will be taken)

Viva 10 marks

SEE Assessment:

Examinations will be conducted for 100 marks and scaled-down to 50. The weightage shall be,

i. Writeup : 20 marks
ii. Conduction : 40 marks
iii. Analysis of results : 20 marks
iv. Viva : 20

CO–PO/PSO Mapping														
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	2	1	-	-	-	-	-	-	-	1	3
CO2	3	3	2	2	1	-	-	-	-	-	1	-	-	-
CO3	3	3	2	2	1	-	-	-	-	-	1	-	3	-
CO4	3	3	2	2	1	-	-	-	-	-	1	-	3	-
CO5	3	2	2	2	1	-	-	-	-	-	-	-	1	3

High–3, Medium–2, Low–1

Course Title	**WEB PROGRAMMING** LABORATORY	Semester	05
Course Code	MVJ19CSL58	CIE	50
Total No. of Contact Hours	30	SEE	50
No. of Contact Hours/week	3(L : T : P :: 0 : 2 : 2)	Total	100
Credits	2	**Exam. Duration**	3 Hours

Course objective is to:

This course will enable students to get practical experience in design, develop, implement, analyze and evaluation of

- Web pages and Style sheet creation.
- Client side programming and Java script
- PHP and Database creation.

S No	Experiment Name	RBT Level	Hours

1	Create a web page with the following. a. Cascading style sheets. b. Embedded style sheets. c. Inline style sheets. Use our college information(Department of CSE) for the web pages.	L3	3
2	Design HTML form for keeping student record and validate it using script.	L3	3
3	Write an HTML program to design an entry form of student details send it to store at database server like SQL, Oracle or MS Access.	L3	3
4	Write a JavaScript code that displays text "TEXT-GROWING" increasing font size in the interval of 100ms in RED COLOR, when the size reaches 50pt it displays "TEXT-SHRINKING" in BLUE color. Then font size decreases to 5pt.	L3	3
5	Assume four users user1, user2, user3 and user4 having the passw pwd1, pwd2, pwd3 and pwd4 respectively. Write a servlet for doing following. 1. Create a Cookie and add these four user id's and passwords to Cookie. 2. Read the user id and passwords entered in the Login form authenticate with the values available in the cookies.	L3	3
6	Write a JSP which insert the details of the 3 or 4 users who register the web site by using registration form. Authenticate the user whe submits the login form using the user name and password from database.	L3	3
7	Validate the form using PHP regular expression. PHP stores a form da to database	L3	3
8	Write a PHP program to display a digital clock which displays the cur time of the server.	L3	3
9	Creating simple application to access data base using JDBC Format HTML with CSS.	L3	3
10	Write a Program for manipulating Databases and SQL with real application	L3	3
Course Outcomes:			
CO1	Construct Web pages using HTML/XML and style sheets.		

CO2	Build dynamic web pages with validation using Java Script objects and by applying different event handling mechanisms.
CO3	Develop dynamic web pages using server side scripting.
CO4	Use PHP programming to develop web applications
CO5	Use JDBC and SQL to develop web applications

Reference Books:	
1	Jeffrey C and Jackson, ―Web Technologies A Computer Science Perspective‖ Pearson Education, 2011.
2	UttamK.Roy, ―Web Technologies‖ Oxford University Press, 2011

CIE Assessment:
Regular Lab work :20 Record writing :5 Lab Tests(Minimum 2 tests shall be conducted for 15 marks and average of two will be taken) Viva 10 marks
SEE Assessment:
Examinations will be conducted for 100 marks and scaled–down to 50. The weightage shall be, i. Writeup : 20 marks ii. Conduction : 40 marks iii. Analysis of results : 20 marks iv. Viva : 20

CO–**PO/PSO Mapping**														
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	2	-	3	3	-	-	3	-	3	2	1	-
CO2	3	3	2	-	3	3	-	-	3	-	3	2	1	2
CO3	3	3	2	-	3	3	-	-	3	-	3	2	1	2
CO4	3	3	2	-	3	3	-	-	3	-	3	2	1	3
CO5	3	3	2	-	3	3	-	-	3	-	3	2	2	3

High–3, Medium–2, Low–1

Course Title	ENVIRONMENTAL STUDIES	Semester	V
Course Code	MVJ19ENV59	CIE	50
Total No. of Contact Hours	20	SEE	50
No. of Contact Hours/week	1 (L: T: P 1 : 0 :0)	Total	100
Credits	1	**Exam. Duration**	3 Hrs.

Course objective is to: This course will enable the students to

- Relate to interdisciplinary approach to complex environmental problems using basic tools of the natura and social sciences including geo–systems, biology, chemistry, economics, political science and international processes; Study drinking water quality standards and to illustrate qualitative analysis of water.
- Critically evaluate the science and policy ramifications of diverse energy portfolios on air and water quality, climate, weapons proliferation and societal stability.

Prerequisites: ***Basic Science***

Module-1	**L1, L2**	**4 Hrs**
Introduction to environmental studies, Multidisciplinary nature of environmental studies; Scope and importance; Concept of sustainability and sustainable development. **Ecosystems (Structure and Function):** Forest, Desert, Rivers, Ocean **Biodiversity:** Types, Hot spots; Threats and Conservation of biodiversity, Deforestation. **Video link:** • https://nptel.ac.in/courses/127/106/127106004/		
Module-2	L1,L2	**4 Hrs.**
Advances in Energy Systems (Merits, Demerits, Global Status and **Applications):** Hydrogen, Solar, OTEC, Tidal and Wind. **Natural Resource Management (Concept and case-study):** Disaster Management, Sustainable Mining, Cloud Seeding, and Carbon Trading. **Video link:** • https://nptel.ac.in/courses/121/106/121106014/		
Module-3	L1	**4 Hrs.**
Environmental Pollution (Sources, Impacts, Corrective and Preventive measures, Relevant Environmental Acts, Case-studies):Surface and Ground Water Pollution; Noise pollution; Soil Pollution and Air Pollution. **Waste Management & Public Health Aspects:** Bio-medical Waste; Solid waste; Hazardous waste; E-waste. **Video link**: • https://nptel.ac.in/courses/122/106/122106030/ • https://nptel.ac.in/courses/105/103/105103205/ • https://nptel.ac.in/courses/120/108/120108005/ • https://nptel.ac.in/courses/105/105/105105160/		
Module-4	L1,	**4 Hrs.**

Global Environmental Concerns (Concept, policies, and case–studies): Global Warming Climate Change; Acid Rain; Ozone Depletion; Fluoride problem in drinking water.

Video link:

- https://nptel.ac.in/courses/122/106/122106030/
- https://nptel.ac.in/courses/120108004/
- https://onlinecourses.nptel.ac.in/noc19_ge23/preview

Module–5	L1,L2	**4 Hrs.**

Latest Developments in Environmental Pollution Mitigation Tools (Concept and Applications): G.I.S. & Remote Sensing, Environment Impact Assessment, Environmental Management Systems, ISO 14001.

Video link:

- https://nptel.ac.in/courses/105/102/105102015/
- https://nptel.ac.in/courses/120/108/120108004/

Course Outcomes: On completion of the course, students would be able to

CO1	Describe the principles of ecology and environmental issues that apply to air, land, and water issues on a global scale.
CO2	Develop critical thinking and/or observation skills, and apply them to the analysis of a problem or question related to the environment.
CO3	Demonstrate ecology knowledge of a complex relationship between biotic and Abiotic components.
CO4	Apply their ecological knowledge to illustrate and graph a problem and describe the realities that managers face when dealing with complex issues.

Reference Books:

1.	Principals of Environmental Science and Engineering, Raman Siva kumar, Cengage learning, Singapur, 2nd Edition, 2005
2.	Environmental Science working with the Earth G.Tyler Miller Jr. Thomson Brooks /Cole, 11th Edition, 2006
3.	Textbook of Environmental and Ecology, Pratiba Singh, Anoop Singh & Piyush Malaviya , ACME Learning Pvt. Ltd. New Delhi, 1st Edition.

CIE Assessment:

CIE is based on quizzes, tests, assignments/seminars and any other form of evaluation. Generally, there will be: Three Internal Assessment (IA) tests during the semester (30 marks each), the final IA marks to be awarded will be the average of three tests

- Quizzes/mini tests (4 marks)
- Mini Project / Case Studies (8 Marks)
- Activities/Experimentations related to courses (8 Marks)

SEE Assessment:

i. Question paper for the SEE consists two parts i.e. Part A and Part B. Part A is compulsory and consists of objective type or short answer type questions of 1 or 2 marks each for total of 20 marks covering the whole syllabus.

ii. Part B also covers the entire syllabus consisting of five questions having choices and may contain sub–divisions, each carrying 16 marks. Students have to answer five full questions.

iii. One question must be set from each unit. The duration of examination is 3 hours.

CO-PO Mapping												
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	1	-	2	2	1	1	-	2	1
CO2	3	3	2	1	-	1	2	-	1	1	2	1
CO3	3	3	2	1	-	2	2	-	1	1	2	1
CO4	3	3	2	2	-	2	2	-	1	1	2	1

High–3, Medium–2, Low–1