Annexure 2

DESIGN AND ANALYSIS OF ALGORITHMS

Course Code: CSE 303 **Credit Units: 03**
Total Hours: 45

Course Objective:
The designing of algorithm isan important component of computer science. The objective of this course is to make students aware of various techniques used to evaluate the efficiency of a particular algorithm. Students eventually should learn to design efficient algorithm for a particular program

Course Contents:

Module I: Introduction: (9 Hours)
Algorithm Design paradigms - Motivation, Concept of algorithmic efficiency, Run Time Analysis of algorithms, Asymptotic Notations.
Recurrences- Substitution Method, Recursion Tree Method, Masters Method.

Module II: Divide and conquer: (9 Hours)
Structure of divide-and-conquer algorithms: examples; Binary search, quick sort, Merge sort**,** Strassen Multiplication; Analysis of divide and conquer run time recurrence relations.

Greedy Method
Overview of the greedy paradigm examples of exact optimization solution (minimum cost spanning tree), Approximate solution (Knapsack problem), Single source shortest paths, traveling salesman

Module III: Dynamic programming: (9 Hours)
Overview, difference between dynamic programming and divide and conquer, Applications: Shortest path in graph, chain Matrix multiplication, Traveling salesman Problem, longest Common sequence, knapsack problem

Module IV: Graph searching and Traversal: (9 Hours)
Overview, Representation of graphs, strongly connected components, Traversal methods (depth first and breadth first search)

Back tracking
Overview, 8-queen problem, and Knapsack problem

Brach and bound
LC searching Bounding, FIFO branch and bound, LC branch and bound application: 0/1 Knapsack problem, Traveling Salesman Problem

Module V: Computational Complexity: (9 Hours)
Complexity measures, Polynomial Vs non-polynomial time complexity; NP-hard and NP-complete classes, examples.

Course Outcomes:

- Analyze the asymptotic performance of algorithms.
- Write rigorous correctness proofs for algorithms.
- Demonstrate a familiarity with major algorithms and data structures.
- Apply important algorithmic design paradigms and methods of analysis.
- Synthesize efficient algorithms in common engineering design situations.

Examination Scheme:

Components	A	CT	S/V/Q/HA	ESE
Weightage (%)	5	15	10	70

A: Attendance, CT: Class Test,:, S/V/Q/HA: Seminar/Viva/Quiz/ Home Assignment, ESE: End Semester Examination;

Text & References:

Text:

- E. Horowitz, S. Sahni, and S. Rajsekaran, “Funadmentals of Computer Algorithms”, Galgotia Publication.
- T. H. Cormen, Leiserson , Rivest and Stein, “Introduction of Computer algorithm”, PHI.

References:

- Sara Basse, A. V. Gelder, “ Computer Algorithms”, Addison-Wesley.

- J.E Hopcroft, J.D Ullman, " Design and analysis of algorithms", Addison-Wesley.
- D. E. Knuth , " The art of Computer Program", Addison-Wesley.

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Syllabus

Programme Name: B. Tech. (CSE)		**Session: 2023-27**
Course Code: CSE501	**Course Name:** Theory of Computation	**Semester:** V

Credits (Total)	**L**	**T**	**P**	**Marks (Internal/External**		**Contact Hours(per week)**	**Independent Study Hour (perweek)**	**Section (Group)**
3	3	0	0	30	70	3	3	
UG level						Basic and applied	**Student specific course outcome**	Higher Education Placement Research

Course Objective:

Students will be able to understand the formal mathematical models of computation along with their relationshipswith formal languages. In particular, they will learn regular languages and context free languages which are crucial to understand how compilers and programming languages are built. Also, students will learn that not all problems are solvable by computers, and some problems do not admit efficient algorithms. Throughout this course, students will strengthen their rigorous mathematical reasoning skills.

Course outcomes: After completion of course, the student will be able to:

CO-1	Students will demonstrate knowledge of basic mathematical models of computation and describe how they relate to formal languages
CO-2	Students will understand that there are limitations on what computers can do and learn examples of unsolvable problems.
CO-3	Students will learn that certain problems do not admit efficient algorithms and identify such problems.
CO-4	To explain important notions in computing like nondeterminism, reductions and resource boundedness.

Teaching Pedagogy:

T1	Classroom teaching (white board), Power Point Presentations, Interactive lectures, Inquiry based teaching
T2	Assignments, Flip Class/ Seminars, Quiz, Oral Viva-voce examination

Assessment Tools

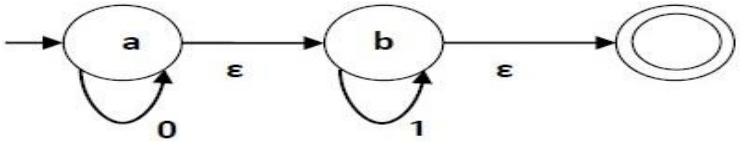
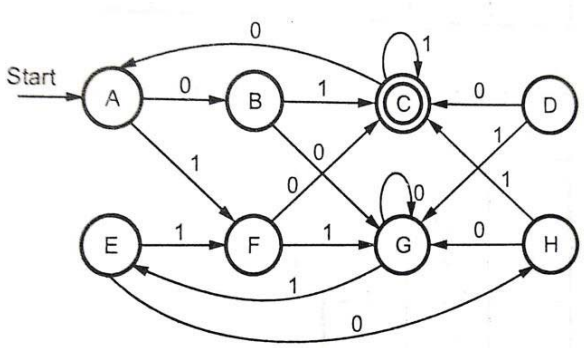
AT1-1	Quiz

AT1-2	Activity Based Learning
AT1-3	Midterm Exams
AT1-4	Flip Class
AT1-5	Seminar Presentation
AT1-6	Assignments
AT1-7	Poster
AT1-8	Oral Viva-voce examination

Prerequisites: Discrete Mathematics should have been completed. It is also desirable (not mandatory) that thestudents have done/are doing in parallel the Design and Analysis of Algorithms course.

Module wise contents details	**Assessment tools**
Module I: Finite Automata and Regular Languages: (13 Hours) Introduction- Basic Mathematical Notation and techniques- Finite State systems – Basic Definitions – Finite Automaton – DFA & NDFA – Finite Automaton with €-moves – Regular Languages- Regular Expression – Equivalence of NFA and DFA – Equivalence of NDFA‟s with and without €-moves – Equivalence of finite Automatonand regular expressions –Minimization of DFA- – Pumping Lemma for Regular sets – Problems based on Pumping Lemma.	Quiz Mid-term Exam Assignment
Module II: Grammars: (11 Hours) Grammar Introduction– Types of Grammar – Context Free Grammars and Languages– Derivations and Languages – Ambiguity- Relationship between derivation and derivation trees – Simplification of CFG – Elimination of Useless symbols – Unit productions – Null productions – Greibach Normal form – Chomsky normal form – Problems related to CNF and GNF. Chomsky hierarchy of languages.	Mid-Term Quiz Assignment
Module III: Pushdown Automata (7 Hours) Pushdown Automata- Definitions – Moves – Instantaneous descriptions – Deterministic pushdown automata – Equivalence of Pushdown automata and CFL – pumping lemma for CFL – problems based on pumping Lemma. Linear Bounded Automata (LBA).	Mid-Term Oral Viva-voce examination Seminar Presentation
Module IV: Turing Machines: (7 Hours) The Turing Machine Model, Language acceptability of Turing Machine, Design of TM, Variation of TM, Universal TM, Church's Machine. Turing machine halting Problem, Post correspondence problems (PCP) and Modified Post correspondence problems	Quiz Assignment Industrial Visit Report Seminar Presentation
Module V: Unsolvable Problems and Computable Functions: (7 Hours) Unsolvable Problems and Computable Functions – Primitive recursive functions –Recursive and recursively enumerable languages. Tractable and Intractable problems: P and NP Class problems, NP completeness, Satisfiability problem.	Quiz Assignment Industrial Visit Report Poster Oral Viva-voce examination

Additional Learning:

List of Assignments	Q1. Design a complete DFA which accept all the strings over ∑ = {a, b} where |w|<=3. Q2. Construct a NDFA for L= {strings where 2rd and 4th symbol from RHS is 'c'} over ∑ = {c, d}. Q3. Design a mealy machine to find 2's complement of given binary number and convert it into equivalent moore machine. Q4. Convert the following RA into its equivalent DFA − 1 (0 + 1)* 0. Q5. Obtain an equivalent automata without null(^) move for the finite automata with null(^) moves given below  Q6. Design a PDA for the language L= { 0^n1^n} where n >=1. Q7. Write need of minimization of finite automata. Minimize the DFA given below using Myhill Nerode theorem.  Q8. Design Turing machine for language L= {0n1n| n>=1}. Take n=3 for the demonstration of Turing machine. Q9. Explain primitive recursive function with the help of example. Q10.Symbolically define PDA. How is it differ from DFA. Design a PDA to acceptthe following languages: i) L= { WWR | W ϵ (0,1)*} ii) L ={ w ϵ (a,b)* | w has equal number of a's and b's}
Suggested reading:	**Text:** • Hopcroft and Ullman, "Introduction to Automata Theory, languages and computation", Addision Wesley. • "An introduction to formal languages and Automata (2nd ed)" by Peter Linz, D. C. Health and Company. **References:** • "Introduction to theory of computation (2nd Ed)" by Michael sipser. • Mishra & Chandrashekharan, "Theory of Computer Sciences", PHI. • Zavi Kohavi, "Switching and finite Automata Theory " • Kohan, "Theory of Computer Sciences". • Korral, "Theory of Computer Sciences".

Suggested e- resources (Websites/e-books)	Lecture Notes | Theory of Computation | Mathematics | MIT OpenCourseWare CS331: Theory of Computation (iitb.ac.in)

Assessment Plan:

Component of Evaluation	**Description**	**Code**	**Weightage %**
Continuous Internal Evaluation	Mid Term	CT	15%
	Seminar/Viva-Voce/Quiz/Home Assignment	S/V/Q/HA	10%
Attendance	A minimum of 75% Attendance is required to be maintained by astudent to be qualified for taking the End Semester examination. The dispensation of 25% includes all types of leaves. including medical leaves.	A	5%
End Semester Examination	End Semester Examination	ESE	70%
Total			**100%**

Abbreviations: CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, ESE: End SemesterExamination; A: Attendance

Course Articulation Matrix (Mapping of COs with POs)

Course Outcomes	**Correlation with POs**												**Correlation with PSOs**		
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	3	1	3	1				2		2	1			
CO2	3	2	2	2	2				2		1	1			
CO3	3	2	2	2	2				3		3	1			
CO4	3	3	2	3	2				1		2	1			

Syllabus

Programme Name	B. Tech. (CSE)		**APPLIED**	**Batch**	2023-2027
Course Code	CSE503	**Course Name**	Introduction to Android Application Development	**Semester**	V

Credits (Total)	**L**	**T**	**P**	**Marks (Internal/External**		**Contact Hours (per week)**	**Independent Study Hour (per week)**
2	2	0	0	30	70	2	2

Course Objective:

The objective of this course is to provide students with a comprehensive understanding of Android application development using the Kotlin programming language. Through a combination of theoretical concepts and hands-on practice, students will learn to set up the Android development environment, build user interfaces with XML and Android widgets, and implement essential Android components.

Course Alignment with UNSDG:

The Course aims to fulfill the United Nations Sustainable Development Goals SDG 4 (Quality Education)

Course outcomes:

After completion of course, the student will be able to:

CO-1	Understand the android architecture and various technologies.
CO-2	Design and implement user interfaces using XML layouts and Android UI components.
CO-3	Develop Android apps that handle data efficiently using SharedPreferences, SQLite databases.
CO-4	Apply advanced Android development concepts such as background services, fragment navigation, and MVVM architecture.
CO-5	Create a Web Application with server controls.

Teaching Pedagogy:

T1	Classroom teaching (white board), Power Point Presentations, Interactive lectures, Inquiry based teaching
T2	ABL activities, Assignments, Flip Class/ Seminars, Quiz, Oral Viva-voce examination

Assessment Tools

AT1-1	Quiz	**AT1-6**	Assignments/ Case studies
AT1-2	Activity Based Learning	**AT1-7**	Poster
AT1-3	Midterm Exams	**AT1-8**	Oral viva-voce examination
AT1-4	Flip Class/Group Discussion	**AT1-9**	Industrial Visit Report
AT1-5	Seminar Presentation		

Prerequisites: Basic understanding of programming languages and software development concepts.

Module	Descriptors/Topics	Hours	Assessment tools
I	**Introduction to Android Development and Kotlin:** Setting up the Development Environment: Installing Android Studio, configuring emulators. Introduction to Kotlin: Kotlin syntax, data types, control structures, and functions. Android Project Structure: Understanding the different files and folders in an Android project, Android Components Overview: Activities, Services, Broadcast Receivers, and Content Providers	6	Quiz Mid-term Exam Assignment
II	**User Interface (UI) Design and Layouts:** XML Layouts: Using XML to create UIs, Views and Widgets: TextViews, Buttons, EditTexts, and more. Layouts: LinearLayout, RelativeLayout, ConstraintLayout, Activity Lifecycle.	6	Mid-Term Quiz Assignment
III	**Module III: Data Storage and Networking:** Shared Preferences: Storing small amounts of data ; Database: Handling more complex data, such as storing and retrieving large datasets. Networking: Making HTTP requests and receiving responses, using libraries such as Retrofit or Volley. JSON Parsing: Converting the server's reply (JSON) into a format your app understands	6	Mid-Term Oral Viva- voce examination Seminar Presentation
IV	**Advanced Features :** RecyclerView: Displaying lists of data in an optimized way; Background Tasks: Using services and asynchronous tasks to handle background operations, Fragment Navigation: Creating dynamic, reusable components within an app; MVVM Architecture: Structuring your code for maintainability and scalability, where Model, View, and ViewModel interact	6	Quiz Assignment Industrial Visit Report Seminar Presentation
V	**Publishing and Optimization:** Optimizing Performance: Ensuring your app runs smoothly, even under pressure, Publishing the App: Preparing the app for release Handling Permissions and Security: Managing user data securely.	6	Quiz Assignment Industrial Visit Report Poster Oral Viva-voce examination
	Total Teaching Hours	30	

Additional Resources

A. Value addition to course content/ Skill enhancement content

a. https://material.io/design
b. https://developer.android.com/jetpack/compose
c. https://firebase.google.com/docs/android/setup
d. https://www.youtube.com/c/AndroidDevelopers

B. Remedial classes for slow learners: As per the AUMP SOP for Slow & Advanced Learners

Suggested reading:

1. Textbooks:

- Lauren Darcey and Shane Conder, "Android Wireless Application Development", Pearson Education, 2nd ed. 2011, ISBN-13: 978-9332518889
- Reto Meier, "Professional Android 2 Application Development", Wiley India Pvt Ltd 2010, ISBN-13: 978-0470565520

2. Reference books

- Mark L Murphy, "Beginning Android", Wiley India Pvt Ltd., 2009**,** ISBN-13**:** 978-1430224198
- Barry Burd, "Android Application Development All in one for Dummies", Edition: 2nd, For Dummies (Wiley) , 2015, ISBN-13: 978-1118973806

3. Suggested e- resources (Websites/e-books)

- https://www.geeksforgeeks.org/android-tutorial/
- https://www.tutorialspoint.com/android/index.htm
- https://commonsware.com/Android/
- https://github.com/JStumpp/awesome-android

Assessment Plan:

Component of Evaluation	**Description**	**Code**	**Weightage %**
Continuous Internal Evaluation	Mid Term	CT	15%
	Home Assignment/Seminar/ Viva-Voce/Quiz	S/ HA/ V/Q	10%
Attendance	A minimum of 75% Attendance is required to be maintained by a student to be qualified for taking the End Semester examination. The dispensation of 25% includes all types of leaves. including medical leave	A	5%
End Semester Examination	End Semester Examination	ESE	70%
Total			**100%**

Abbreviations: CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, ESE: End Semester Examination; A: Attendance

Course Articulation Matrix (Mapping of COs with POs)

Course Outcomes	Correlation with POs												Correlation with PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	1	3	1	3				2		2	3	3		
CO2	1	2	2	2	2				2		3	3	2	3	
CO3	1	2	2	2	2				1		1	3	2	3	2
CO4	1	1	2	1	2				3		2	3			2
CO5	2	2	3	2	1				2		2	3			3

1: weakly related, 2: moderately related and 3: strongly related

Syllabus

Programme Name	B. Tech. (CSE)		APPLIED	Batch	2023-2027
Course Code	CSE523	Course Name	Introduction to Android Application Development Lab	Semester	V

Credits (Total)	L	T	P	Marks (Internal/External		Contact Hours (per week)	Independent Study Hour (per week)
1	0	0	2	30	70	2	2

Course Objective:

The objective of this course is to provide students with the knowledge of fundamentals of Android application and essential skills in developing applications on mobile platform. The course emphasizes developing interactive mobile apps that handle user input, navigate between screens, and manage data using SharedPreferences and SQLite. By the end of the lab, students will be capable of creating functional, user-friendly mobile applications and will have a solid foundation for advanced Android development.

Course Alignment with UNSDG:

The Course aims to fulfill the United Nations Sustainable Development Goals SDG 4 (Quality Education)

Course outcomes:

After completion of course, the student will be able to:

CO-1	Understand android architecture and various technologies of Android.
CO-2	Design and implement user interfaces using XML and integrate various UI components such as TextViews, Buttons, and EditTexts.
CO-3	Develop simple Android applications that utilize core components like Activities and Intents for navigation and interaction.
CO-4	Understand the concept and working of widgets.
CO-5	Create a Web Application with server controls.

Teaching Pedagogy:

T1	Classroom teaching (white board), Power Point Presentations, Interactive lectures, Inquiry based teaching
T2	ABL activities, Assignments, Flip Class/ Seminars, Quiz, Oral Viva-voce examination

Lab Plan

Lab Session	Practical/Lab Exercise	Mapped CO	Mode of Assessing CO
Lab 1	Installation and setup of java development kit(JDK),setup android SDK,setup eclipse IDE,setup android development tools (ADT) plugins, create android virtual device.	**CO1**	Viva/Quiz & End Sem Practical Exam
Lab 2	Create "Hello World" application. That will display "Hello World" in the middle of the screen using TextView Widget in the red color.	**CO1**	Viva/Quiz & End Sem Practical Exam
Lab 3	Create application for demonstration of android activity life cycle.	**CO1**	Viva/Quiz & End Sem Practical Exam
Lab 4	Create Registration page to demonstration of Basic widgets available in android.	**CO2**	Viva/Quiz & End Sem Practical Exam
Lab 5	Create sample application with login module. (Check username and password) On successful login, Change TextVie "Login Successful". And on failing login, alert user using Toast "Login fail".	**CO2**	Viva/Quiz & End Sem Practical Exam
Lab 6	Create Login application where you will have to validate username and passwords. Till the username and password is validated, login button should be disabled.	**CO2**	Viva/Quiz & End Sem Practical Exam
Lab 7	Create and Login application as above: Validate login data and display Error to user using setError() method.	**CO3**	Viva/Quiz & End Sem Practical Exam
Lab 8	Create an application for demonstration of Relative and Table Layout in android.	**CO3**	Viva/Quiz & End Sem Practical Exam
Lab 9	Create an application for demonstration of Scroll view in android.	**CO4**	Viva/Quiz & End Sem Practical Exam
Lab 10	Create an application that will pass two number using Text View to the next screen, and on the next screen display sum of that number.	**CO4**	Viva/Quiz & End Sem Practical Exam

Lab 11	Create a user registration application that stores the user details in a database table.	**CO5**	Viva/Quiz & End Sem Practical Exam
Lab 12	Create an application that works with strings and store the list of strings in database.	**CO5**	Viva/Quiz & End Sem Practical Exam

Suggested reading:

1. Textbooks:

- Lauren Darcey and Shane Conder, "Android Wireless Application Development", Pearson Education, 2nd ed. 2011, ISBN-13: 978-0321743015
- Reto Meier, "Professional Android 2 Application Development", Wiley India Pvt Ltd, 2010, ISBN-13: 978-8126525898

2. Reference books

- Mark L Murphy, "Beginning Android", 4th Edition,2014, Wiley India Pvt Ltd., ISBN (Android 4 Edition): 978-1118387100
- Barry Burd, "Android Application Development All in one for Dummies",Edition: I ,2013, John Wiley & Sons, ISBN-13: 978-1118027747

3. Suggested e- resources (Websites/e-books)

- https://developer.android.com/codelabs
- https://github.com/features/codespaces
- https://aws.amazon.com/cloud9/

Assessment Plan:

Component of Evaluation	**Description**	**Code**	**Weightage %**
Continuous Internal Evaluation	Mid Term	CT	15%
	Viva-Voce/Assignments/Practical records	V/P/PR	10%
Attendance	A minimum of 75% Attendance is required to be maintained by a student to be qualified for taking the End Semester examination. The dispensation of 25% includes all types of leaves. including medical leaves.	A	5%
End Semester Practical Examination	End Semester Practical Examination	ESE	70%
Total			**100%**

Abbreviations: CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, ESE: End Semester Examination; A: Attendance

Course Articulation Matrix (Mapping of COs with POs)

Course Outcomes	Correlation with Pos												Correlation with PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2		2									3		3
CO2	3	3	2	2									3		3
CO3	3	3	3	1									3		3
CO4	3	3	3	2	1								3		3
CO4		3	3	2	2	1	2							2	

1: weakly related, 2: moderately related and 3: strongly related

Module 1: Basics of Web Development using Servlets and JSP (8 Hours)

Introduction to Web Development, Overview of Servlets, Servlet lifecycle, Handling HTTP requests and responses, Introduction to JavaServer Pages (JSP), JSP lifecycle, Writing JSP scripts, Basic web application architecture, Setting up a basic Servlet and JSP project

Module II: JDBC

Database Connectivity using JDBC- Understanding JDBC, Define the layers in JDBC architecture, various types of JDBC drivers, manipulating various SQL Queries, Manage transactions and perform batch updates in JDBC, Creating Database Connectivity Applications, and Connection to Database with the java.sql Package.

Module III: Spring Fundamentals

Introduction to Spring Framework, Dependency Injection and Inversion of Control (IoC)

Aspect-Oriented Programming (AOP), Spring beans and bean configuration, Spring MVC architecture, Creating controllers and views with Spring MVC.

Module IV: Spring Boot Basics

Introduction to Spring Boot, Developing Your First Spring Boot Application, Spring Boot Starter Dependencies and Auto-Configuration, Spring Boot starters and auto-configuration, Spring Boot Annotations, Working with Spring Data JPA and Caching Connecting to databases with Spring Boot, Introduction to Postman for API testing Creating and testing endpoints with Postman

Module V: Building Microservices with Spring Boot

Microservice, Examples of microservice, REST, RESTful Web Services concepts, First REST Service, Designing RESTful APIs, Building RESTful APIs with Spring Boot, Implementing CRUD operations, Request and Response handling, Error handling in RESTful APIs, Logging, Caching.

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
Course Handout
Course : ADVANCED JAVA PROGRAMMING LAB
Course Code : CSE524, Crédits : 01, Session: 2023-27(Odd Sem.), Class : B.Tech. 3rd Year

A. **Introduction:** The objective is to equip the students with the advanced feature of contemporary java which would enable them to handle complex programs relating to managing data and processes over the Enterprise network. The major objective of thiscourse is to provide a sound foundation to the students on the concepts, precepts andpractices, in a field that is of immense concern to the industry and business.

B. **Course Outcomes:** At the end of the course, students will be able to:

CO1: Ability to design and develop Java Applets, Beans programming
CO2: Ability to design and structure the Server Side Programming Concepts
CO3: Ability to Create and design Dynamic web Application.
CO4: Write the structured code for JDBC (back end database).
CO5: Ability to develop and design the enterprise level applications.

C. **Syllabus**

1. Servlet Basics

i) Create a simple Servlet to handle HTTP requests and responses.
ii) Implement doGet() and doPost() methods to handle different types of requests.
iii) Demonstrate Servlet lifecycle methods such as init(), service(), and destroy().
iv) Develop a web application to display user input using Servlets.

2. JavaServer Pages (JSP)

i) Create a basic JSP page to generate dynamic content.
ii) Use JSP scriptlets, expressions, and declarations to embed Java code in JSP.
iii) Implement JSP actions like include, forward, and useBean.
iv) Develop a web application combining Servlets and JSP to manage user authentication.

3. Spring Dependency Injection

i) Implement Dependency Injection (DI) using Spring framework.
ii) Configure Spring beans using XML and annotations.
iii) Demonstrate IoC (Inversion of Control) principle in Spring.
iv) Develop a Spring-based application to manage employee data with DI.

4.Spring MVC Architecture

i) Create a simple Spring MVC application with controllers and views.
ii) Define RequestMapping for handling HTTP requests.
iii) Implement form handling and validation using Spring MVC.

5.Spring Boot Application Development

i) Create a Spring Boot application using Spring Initializr.
ii) Explore Spring Boot starters and auto-configuration.
iii) Configure database connectivity using Spring Boot.
iv) Develop RESTful APIs using Spring Boot for CRUD operations on an entity.

Examination Scheme:

IA			EE			
A	**PR**	**Practical Based Test**	**Major Experiment**	**Minor Experiment**	**LR**	**Viva**
5	10	15	35	15	10	10

Note: IA – Internal Assessment, EE - External Exam, A - Attendance, PR- Performance, LR – Lab Record, V – Viva.

D. Lab Plan

Lab Session	Program Name	Mapped CO	Mode of Assessing CO
1	Create a simple Servlet to handle HTTP requests and responses. Implement doGet() and doPost() methods to handle different types of requests.	CO1	Viva/Quiz & End Sem Practical Exam
2	Demonstrate Servlet lifecycle methods such as init(), service(), and destroy(). Develop a web application to display user input using Servlets	CO1	Viva/Quiz & End Sem Practical Exam
3	Create a basic JSP page to generate dynamic content. Use JSP scriptlets, expressions, and declarations to embed Java code in JSP.	CO1	Viva/Quiz & End Sem Practical Exam
4	Implement JSP actions like include, forward, and useBean. Develop a web application combining Servlets and JSP to manage user authentication.	CO2	Viva/Quiz & End Sem Practical Exam
5	Implement Dependency Injection (DI) using Spring framework. Configure Spring beans using XML and annotations.	CO2	Viva/Quiz & End Sem Practical Exam
6	Demonstrate IoC (Inversion of Control) principle in Spring. Develop a Spring-based application to manage employee data with DI.	CO3	Viva/Quiz & End Sem Practical Exam
7	Create a simple Spring MVC application with controllers and views. Define RequestMapping for handling HTTP requests.	CO3	Viva/Quiz & End Sem Practical Exam
8	Create a Spring Boot application using Spring Initializr. Explore Spring Boot starters and auto-configuration.	CO4	Viva/Quiz & End Sem Practical Exam
9	Configure database connectivity using Spring Boot. Develop RESTful APIs using Spring Boot for CRUD operations on an entity.	CO4	Viva/Quiz & End Sem Practical Exam
10	Use Postman to test RESTful APIs developed in previous experiments. Send GET, POST, PUT, and DELETE requests using Postman.	CO4	Viva/Quiz & End Sem Practical Exam

11	Validate request parameters, headers, and response status codes. Implement error handling and exception responses in RESTful APIs.	CO2	Viva/Quiz & End Sem Practical Exam
12	Understand the concept of microservices and its advantages. Design RESTful APIs for microservices communication. Implement multiple microservices using Spring Boot. Demonstrate communication between microservices using REST calls.	CO5	Viva/Quiz & End Sem Practical Exam
13	Implement caching using Spring Boot annotations. Integrate Spring Data JPA for database operations. Implement logging using Spring Boot logging framework.	CO5	Viva/Quiz & End Sem Practical Exam
14	Deploy Spring Boot applications to a local server (e.g., Tomcat). Monitor and manage Spring Boot applications using Spring Boot Actuator. Configure logging levels and monitor application performance.	CO5	Viva/Quiz & End Sem Practical Exam

A. Course Articulation Matrix (Mapping of COs with POs)

CO	CORRELATION WITH PROGRAMME OUTCOMES												CORRELATIONWITH PROGRAMME SPECIFIC OUTCOMES		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	1	1	2				1		1	1			
CO2	3	2	1	2	2				1		1	1			
CO3	3	2	2	2	2				1		1	1			
CO4	3	2	2	2	2				1		1	1			
CO5	2		1						1			1	1		

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Syllabus

Programme Name: B. Tech. (CSE)		**Session: 2023-27**
Course Code: CSE505	**Course Name:** **INTRODUCTION TO WEBTECHNOLOGIES**	**Semester:** V

Credits (Total)	**L**	**T**	**P**	**Marks (Internal/External**		**Contact Hours(per week)**	**Independent Study Hour (perweek)**	**Section (Group)**
2	2	0	0	30	70	2	2	
UG level						**Basic and applied**	**Student specific course outcome**	**Higher Education Placement Research**

Course Objective:

1. Understand different components in web technology and know about CGI and CMS.
2. Develop interactive Web pages using HTML/XHTML and CSS.
3. Understand the concepts of Java Script and JQuery.
4. Design and develop websites for user interactions using JavaScript and JQuery.
5. Develop Web applications using PHP

Course outcomes: After completion of course, the student will be able to:

CO-1	Analyze a web page and identify its elements and attributes.
CO-2	Create web pages using X HTML and Cascading Style Sheets.
CO-3	Build dynamic web pages using JavaScript (Client side programming).
CO-4	Create XML documents and Schema.

Teaching Pedagogy:

T1	Classroom teaching (white board), Power Point Presentations, Interactive lectures, Inquiry based teaching
T2	Assignments, Flip Class/ Seminars, Quiz, Oral Viva-voce examination

Assessment Tools

AT1-1	Quiz
AT1-2	Midterm Exams
AT1-3	Flip Class
AT1-4	Seminar Presentation
AT1-5	Assignments
AT1-6	Poster
AT1-7	Oral Viva-voce examination

Prerequisites: Basics of Web Technology and Programming

Module wise contents details	Assessment tools
Module I: Introduction to HTML/XHTML: (6 Hours) Origins and Evolution of HTML and XHTML, Basic Syntax of HTML, Standard HTML Document Structure, Basic Text Markup, Images, Hypertext Links, Lists, Tables, Forms, HTML5, Syntactic Differences between HTML and XHTML.	Quiz Mid-term Exam Assignment
Module II: Introduction to Styles sheets and Frameworks Cascading Style Sheets:(5 Hours) Levels of Style Sheets - Style Specification Formats, Selector Forms, Property-Value Forms, Font Properties, List Properties, Alignment of Text, Color, The Box Model, Background Images, The span, and div Tags. Frameworks: Overview and Basics of Responsive CSS Frameworks - Bootstrap.	Mid-Term Quiz Assignment
Module III: Introduction to JavaScript and jQuery: (9 Hours) Overview of JavaScript, Object Orientation and JavaScript, General Syntactic Characteristics Primitives, Operations, and Expressions, Screen Output and Keyboard Input, Control Statements, Object Creation and Modification, Arrays, Functions.Callback Functions, Java Script HTML DOM. Introduction to jQuery: Overview and Basics	Mid-Term Oral Viva-voce examination Seminar Presentation
Module IV: Introduction to PHP: (10 Hours) Origins and Uses of PHP, Overview of PHP - General Syntactic Characteristics - Primitives, Operations, and Expressions - Control Statements, Arrays, Functions, Pattern Matching, Form Handling, Cookies, Session Tracking.	Quiz Assignment Industrial Visit Report Seminar Presentation

List of Assignments	1. Design Wireframes for your semester project based on Web Design Principles (Tools like,www.cacoo.com www.gliffy.com) 2. Formatting web pages with CSS (Inline CSS, Document level CSS and External CSS)[Create semester project website's home page] 3. Formatting web pages with CSS [Create semester project website's inner pages] 4. Browser interaction and form validations (Web browser environments, forms andvalidations, image sliders) [Image slider plugins of jQuery, Client-side validation ofRegistration & Login page to be created in semester project website] 5. Introduction to PHP (Starting to script on server side, Arrays, function, validations)[Server-side validations for Registration and Login page of semester project website] 6. Advanced PHP (Management of sessions and cookies) [Implement Admin login/logout 7. functionality and cookie wherever required]
Suggested reading:	• P. J. Deitel, H.M. Deitel, Internet &World Wide Web How To Program, 4/e, PearsonInternational Edition 2010. • Robert W Sebesta, Programming the World Wide Web, 7/e, Pearson Education Inc.,2014. • Bear Bibeault and Yehuda Katz, jQuery in Action, Second Edition, ManningPublications. [Chapter 1] Black Book, Kogent Learning Solutions Inc. 2009. • Bob Boiko, Content Management Bible, 2nd Edition, Wiley Publishers. [Chapter 1,2] • Chris Bates, Web Programming Building Internet Applications, 3/e, Wiley IndiaEdition 2009. • Dream Tech, Web Technologies: HTML, JS, PHP, Java, JSP, ASP.NET, XML,AJAX, • Jeffrey C Jackson, Web Technologies A Computer Science Perspective,

	PearsonEducation Inc. 2009. • Lindsay Bassett, Introduction to JavaScript Object Notation: A To-the-Point Guideto JSON 1st Edition, O'Reilly. [Chapter 1,2,3,4] 7. Matthew MacDonald, WordPress: The Missing Manual, 2nd Edition, O'Reilly Media.

Additional Learning:

Suggested e-resources (Websites/e-books)	https://www.geeksforgeeks.org/web-technology/

Assessment Plan:

Component of Evaluation	**Description**	**Code**	**Weightage %**
Continuous Internal Evaluation	Mid Term	CT	15%
	Seminar/Viva-Voce/Quiz/Home Assignment	S/V/Q/HA	10%
Attendance	A minimum of 75% Attendance is required to be maintained by astudent to be qualified for taking the End Semester examination. The dispensation of 25% includes all types of leaves. including medical leaves.	A	5%
End Semester Examination	End Semester Examination	ESE	70%
Total			**100%**

Abbreviations: CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, ESE: End SemesterExamination; A: Attendance

Course Articulation Matrix (Mapping of COs with POs)

Course Outcomes	**Correlation with POs**												**Correlation with PSOs**		
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	3	3	2	1						2	1	2	2	
CO2	3	3	3											2	
CO3	3	3	3	1							2		2	3	
CO4	3	**2**	3	1									2	3	

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
Course Handout
Course: WEB TECHNOLOGIES LAB
Course Code : CSE 525, Crédits : 01, Session: 2023-27(Odd Sem.), Class : B.Tech. 3rd Year

Introduction:

The objective of this course is to develop an ability to design and implement static and dynamic website.

Course Outcomes:

At the end of the course, students will be able to:

CO1. Design and implement dynamic websites with a good aesthetic sense of designing and the latesttechnical know-how.

CO2. Understanding of Web Application Terminologies, Internet Tools, E-Commerce, and other webservices.

CO3. Create a web page using HTML and CSS.

CO4. Implement the concepts of Javascript and database to design an interactive web page.

CO5. Implement PHP concepts in web designing.

Syllabus

Lab assignment will be based on the following:

1. Write an HTML code to display your education details in a tabular format. **(1 Hours)**
2. Write an HTML code to display your CV on a web page. **(1 Hours)**
3. Write an HTML code to create a Home page having three links: About Us, Our Services and Contact Us.Create separate web pages for the three links. **(1 Hours)**
4. Write an HTML code to create a login form. On submitting the form, the user should get navigated to aprofile page. **(1 Hours)**
5. Write an HTML code to create a Registration Form. On submitting the form, the user should be asked tologin with these new credentials. **(2 Hours)**
6. Write an HTML code to create your Institute website, Department Website and Tutorial website for aspecific subject. **(2 Hours)**

7. Write an HTML code to illustrate the usage of the following:
   - Ordered List
   - Unordered List
   - Definition List. **(2 Hours)**
8. Write an HTML code to create a frameset having header, navigation, and content sections: **(2 Hours)**
9. Write an HTML code to demonstrate the usage of inline CSS. **(2 Hours)**
10. Write an HTML code to demonstrate the usage of internal CSS. **(2 Hours)**
11. Write an HTML code to demonstrate the usage of external CSS. **(2 Hours)**
12. Write a Javascript to prompt for the user's name and display it on the screen. **(2 Hours)**
13. Design an HTML form for keeping the student's record and validate it using Javascript. **(2 Hours)**
14. Write an HTML program to design an entry form of student details and send it to store a database serverlike SQL, Oracle, or MS Access. **(2 Hours)**
15. Write programs using a Java script for Web Page to display browser information. **(2 Hours)**
16. Create an applet that will have a line, an Oval & a Rectangle. **(2 Hours)**
17. Write a program using PHP and HTML to create a form and display the details entered by the user. **(2 Hours)**

Examination Scheme:

IA			EE			
A	**PR**	**Practical Based Test**	**Major Experiment**	**Minor Experiment**	**LR**	**Viva**
5	10	15	35	15	10	10

Note: IA – Internal Assessment, EE - External Exam, A - Attendance, PR- Performance, LR – Lab Record, V – Viva.

Lab Plan

Lab Session	**Program Name**	**Mapped CO**	**Mode of AssessingCO**
Lab 1	Write an HTML code to display your education details in a tabular format & Write an HTML code todisplay your CV on a web page	**CO1**	Viva/Quiz/Practical Performance
Lab 2	Write an HTML code to create aHome page having three links: About Us, Our Services and Contact Us. Create separate webpages for the three links & Write an HTML code to create a login form. On submitting the form, the user should get navigated to a profile page:	**CO1**	Viva/Quiz/Practical Performance

Lab 3	Write an HTML code to create a Registration Form. On submitting the form, the user should be asked to login with these new credentials	**CO1**	Viva/Quiz/Practical Performance
Lab 4	Write an HTML code to create your Institute website, Department Website, and Tutorial website for a specific subject:	**CO1**	Viva/Quiz/Practical Performance
Lab 5	Write an HTML code to illustrate the usage of the following: Ordered List Unordered List Definition List:	**CO1**	Viva/Quiz/Practical Performance
Lab 6	Write an HTML code to create a frameset having header, navigation, and content sections	**CO1**	Viva/Quiz/Practical Performance
Lab 7	Write an HTML code to demonstrate the usage of inline,internal & external CSS.	**CO2**	Viva/Quiz/Practical Performance
Lab 8	Write a Javascript to prompt for the user's name and display it on the screen	**CO3**	Viva/Quiz/Practical Performance
Lab 9	Design HTML form for keeping the students' records and validate it using Javascript	**CO3**	Viva/Quiz/Practical Performance
Lab 10	Write an HTML program to design an entry form of student details and send it to store a database server like SQL, Oracle, or MS Access	**CO3**	Viva/Quiz/Practical Performance
Lab 11	Write programs using a Java script for Web Page to display browsers' information	**CO3**	Viva/Quiz/Practical Performance
Lab 12	Create an applet that will have a line, an Oval & a Rectangle & Write a program using PHP and HTML to create a form and display the details entered by the user	**CO4**	Viva/Quiz/Practical Performance
Lab 13	Design an HTML form for keeping the student's record and validate it using Javascript.	**CO4**	Viva/Quiz/Practical Performance
Lab 14	Write programs using a Java script for Web Page to display browser information.	**CO5**	Viva/Quiz/Practical Performance
Lab 15	Write an HTML program to design an entry form of student details and send it to store a database server like SQL, Oracle, or MS Access.	**CO5**	Viva/Quiz/Practical Performance
Lab 16	Create an applet that will have a line, an Oval & a Rectangle.	**CO5**	Viva/Quiz/Practical Performance

Lab 17	Write a program using PHP and HTML to create a form and display the details entered by the user.	**CO5**	Viva/Quiz/Practical Performance

Course Articulation Matrix (Mapping of COs with POs)

	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PSO 1**	**PSO 2**	**PSO 3**	**PSO 4**
CO1	--	--	--	2	--	--	--	--	--	--	--	--	1	--	--	--
CO2	--	--	--		--	--	--	--	--	--	--	--		--	--	1
CO3	--	--	--	2	--	--	--	--	--	--	--	--		--	--	1
CO4	--	--	2	--	--	--	--	--	--	--	--	--	1	--	--	1
CO5	--	--	2	--	--	--	--	--	--	--	--	--	1	--	--	--

1: strongly related, 2: moderately related and 3: weakly related

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Syllabus

Programme Name: B. Tech. (Information Technology)		**Session:**2024-28
Course Code: IT 501	**Course Name:** Introduction to Blockchain Technology	**Semester:** V

Credits (Total)	**L**	**T**	**P**	**Marks (Internal/External**		**Contact Hours (per week)**	**Independent Study Hour (per week)**	**Section (Group)**
3	3	0	0	30	70	3	3	
UG level						**Basic and applied**	**Student-specific course outcome**	Higher Education Placement Research

Course Objective:

The objective of the course "Introduction to Blockchain Technology" is to equip students with a foundational understanding of blockchain technology and its potential applications. Through a combination of theoretical concepts and practical exercises, students will explore the architecture, protocols, and security features that define blockchain systems. The course aims to foster critical thinking about the implications of blockchain for various industries, including finance, healthcare, and supply chain management. By the end of the course, students should be able to articulate the advantages and challenges of blockchain implementations and consider its future developments and opportunities.

Course outcomes: After completion of course, the student will be able to:

CO-1	Understand the key concepts underlying blockchain technology, including distributed ledgers, consensus mechanisms, and cryptographic hashing.
CO-2	Identify and analyze various use cases of blockchain technology across different sectors such as finance, healthcare, and logistics, evaluating their benefits and limitations.
CO-3	Acquire knowledge with blockchain development tools and platforms, enabling them to build basic decentralized applications.
CO-4	Understand the security protocols integral to blockchain systems, enabling them to evaluate and mitigate potential vulnerabilities within blockchain networks.
CO-5	Critically assess the societal, ethical, and economic impacts of blockchain technology, fostering an informed perspective on its potential and challenges in real-world scenarios..

Teaching Pedagogy:

T1	Classroom teaching (white board), Power Point Presentations, Interactive lectures, Inquiry based teaching
T2	ABL activities, Assignments, Flip Class/ Seminars, Quiz, Oral Viva-voce examination

Assessment Tools

AT1-1	Quiz
AT1-2	Activity Based Learning
AT1-3	Midterm Exams
AT1-4	Flip Class
AT1-5	Seminar Presentation
AT1-6	Assignments
AT1-7	Poster
AT1-8	Oral Viva-voce examination
AT1-9	Industrial Visit Report

Prerequisites: Basic knowledge of computer networks.

Module wise contents details	Assessment tools
Module I: Introduction (9 Hours) Distributed Database, Two General Problem, Byzantine General problem and Fault Tolerance, Hadoop Distributed File System, Distributed Hash Table, ASIC resistance, Turing Complete. Cryptography: Hash function, Digital Signature – ECDSA, Memory Hard Algorithm, Zero Knowledge Proof.	Quiz Mid-term Exam Assignment
Module II: Blockchain (9 Hours) Introduction, Advantage over conventional distributed database, Blockchain Network, Mining Mechanism, Distributed Consensus, Merkle Patricia Tree, Gas Limit, Transactions and Fee,Anonymity, Reward, Chain Policy, Life of Blockchain application, Soft & Hard Fork, Private and Public blockchain.	Mid-Term Quiz Assignment
Module III: Distributed Consensus (9 Hours) Nakamoto consensus, Proof of Work, Proof of Stake, Proof of Burn, Difficulty Level, Sybil Attack, Energy utilization and alternate.	Mid-Term Oral Viva-voce examination Seminar Presentation
Module IV: Cryptocurrency and Regulation (9 Hours) History, Distributed Ledger, Bitcoin protocols – Mining strategy and rewards, Ethereum -Construction, DAO, Smart Contract, GHOST, Vulnerability, Attacks, Sidechain, Namecoin Stakeholders, Roots of Bit	Quiz Assignment Industrial Visit Report Seminar Presentation

coin, Legal Aspects-Crypto currency Exchange, Black Market and Global Economy. Applications:	
Module V: Blockchain Applications (9 Hours) Internet of Things, Medical Record Management System, Domain Name Service and future of Blockchain.	Quiz Assignment Industrial Visit Report Poster Oral Viva-voce examination

Additional Learning:

List of Assignments	• Define Blockchain Technology: Explain what blockchain technology is and describe its basic components and functionality. • Distinguish Blockchain Types: Differentiate between public, private, and consortium blockchains. Provide examples of each type and discuss their respective advantages and disadvantages. • Consensus Mechanisms: Describe at least three different consensus mechanisms used in blockchain technologies. What are the pros and cons of each mechanism? • Cryptography in Blockchain: Explain how cryptographic hash functions contribute to the security and integrity of blockchain transactions. • Blockchain and Bitcoin: Discuss how blockchain technology is implemented in Bitcoin. How does Bitcoin utilize blockchain to achieve decentralization and trust? • Smart Contracts: Define smart contracts and explain how they are executed within a blockchain framework. What are potential benefits and risks associated with smart contracts? • Real-World Applications: Identify three real-world applications of blockchain technology outside of cryptocurrency. Describe how blockchain adds value in these applications. • Blockchain Scalability Issues: What are the main scalability challenges facing blockchain technology? Discuss at least two proposed solutions to address these challenges. • Regulatory Considerations: Analyze the impact of regulatory frameworks on blockchain development and adoption. How can regulation both hinder and facilitate blockchain innovation? • Future Trends: Speculate on the future developments in blockchain technology. Which industries might see the next big breakthrough in blockchain applications?

Suggested reading:	• Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller and Steven Goldfeder, • Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction, PrincetonUniversity Press . • Antonopoulos, Mastering Bitcoin: Unlocking Digital Cryptocurrencies • Nicola Atzei, Massimo Bartoletti, and Tiziana Cimoli, A survey of attacks on Ethereum smart contracts
Suggested e- resources (Websites/e-books)	**https://onlinecourses.nptel.ac.in/noc22_cs44/preview**

Assessment Plan:

Component of Evaluation	**Description**	**Code**	**Weightage %**
Continuous Internal Evaluation	Mid Term	CT	15%
	Seminar/Viva-Voce/Quiz/Home Assignment	S/V/Q/HA	10%
Attendance	A minimum of 75% Attendance is required to be maintained by a student to be qualified for taking the End Semester examination. The dispensation of 25% includes all types of leaves. including medical leaves.	A	5%
End Semester Examination	End Semester Examination	ESE	70%
Total			**100%**

Abbreviations: CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, ESE: End Semester Examination; A: Attendance

Course Articulation Matrix (Mapping of COs with POs)

Course Outcomes	Correlation with POs												Correlation with PSOs		
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	3	1	3	1				2		2	1			
CO2	3	2	2	2	2				2		1	1			
CO3	3	2	2	2	2				3		3	1			
CO4	3	3	2	3	2				1		2	1			
CO5	2	2	1	2	3				2		2	1			

1: strongly related, 2: moderately related and 3: weakly related

COURSE CURRICULUM

UG : Semester V
Course Title : Communication Skills-V
Credit Units: 1
Course Code: BCU 541
Course Objective:

L	T	P/S	SW/FW	TOTAL CREDIT UNITS
1	0	0	0	1

- To enable the students to adopt strategies for effective reading and writing skills.
- The course would enhance student's vocabulary, language and fluency. It would also teach the students to deliver professional presentations.

Prerequisites: NIL

Course Contents / Syllabus:		
1.	**Module I Report Writing**	**35% Weightage**
	Report Writing • Purpose/Significance • Types • Format	
2.	**Module II Comprehension Skills**	**25% Weightage**
	• **Reading Comprehension-SQ3R Reading Techniques** • **Summarising and Paraphrasing** • **Précis Writing** • **Listening Comprehension**	
3.	**Module III Presentation Skills** • Discussing the Significance of Audio-visual Aids, Audience and Feedback in Presentation Skills • Analyzing the Significance of Non-Verbal Communication	**30% Weightage**
4.	**Module IV Literature** • Success is Counted Sweetest – Emily Dickinson (Poem) • My Wood - E.M.Forster (Prose) • I have a Dream-Martin Luther King (Prose) • Spoken English and Broken English-G.B. Shaw (Prose)	**10% Weightage**

5. **Student Learning Outcomes:**

- Communicate fluently and sustain comprehension of an extended discourse.
- Demonstrate ability to interpret texts and observe the rules of good writing.
- Prepare and present effective presentations aided by ICT tools.

Pedagogy for Course Delivery: Workshop

- Group Discussions
- Presentations
- Lectures

6.

7. **Assessment/ Examination Scheme:**

Theory L/T (%)	Lab/Practical/Studio (%)	End Term Examination
100%	NA	70%

Theory Assessment (L&T):

Components (Drop down)	CIE	Attendance	End Term Examination
Weightage (%)	25%	5%	70%

Text: Jaffe, C.I. Public Speaking: Concepts and Skills for a Diverse Society, 4th ed. Belmont, CA: Wadsworth, 2004.
Effective English for Engineering Students, B Cauveri, Macmillan India
***Creative English for Communication*, Krishnaswamy N, Macmillan**

Reference: *A Textbook of English Phonetics*, Balasubramanian T, Macmillan

Additional Reading: Newspapers and Journals

Annexure 2

BEHAVIOURAL SCIENCE – V

Course Code: BSU 543 **Credit Units: 01**
Total Hours: 15

Course Objective:

- To inculcate in the students an elementary level of understanding of group/team functions
- To develop team spirit and to know the importance of working in teams

Course Contents:

Module I: Group formation: (03 Hours)

- Definition and Characteristics
- Importance of groups
- Classification of groups
- Stages of group formation
- Benefits of group formation

Module II: Group Functions: (03 Hours)

- External Conditions affecting group functioning: Authority, Structure, Org. Resources, Organizational policies etc.
- Internal conditions affecting group functioning: Roles, Norms, Conformity, Status, Cohesiveness, Size, Inter group conflict.
- Group Cohesiveness and Group Conflict
- Adjustment in Groups

Module III: Teams: (03 Hours)

- Meaning and nature of teams
- External and internal factors effecting team
- Building Effective Teams
- Consensus Building
- Collaboration

Module IV: Leadership: (03 Hours)

- Meaning, Nature and Functions
- Self leadership
- Leadership styles in organization
- Leadership in Teams

Module V: Power to empower: Individual and Teams: (03 Hours)

- Meaning and Nature
- Types of power
- Relevance in organization and Society

Course Outcomes:

- Students will Develop critical and reflective thinking abilities
- Students will Demonstrate an understanding of group dynamics and effective teamwork
- Student will develop a range of leadership skills and abilities such as effectively leading change, resolving conflict, and motivating others
- Student will Gain knowledge and understanding of organization resources, policies, and involvement opportunities.
- Student will Develop strategies to recruit, retain, and continually motivate contributing members to the organization

Examination Scheme:

Evaluation Components	Attendance	Journal of Success (JOS)	Social Awareness Program (SAP) SAP Report/SAP Presentation	End Semester Exam	Total
Weightage (%)	**5**	**10**	**15**	**70**	**100**

Text & References:

- Organizational Behaviour, Davis, K.
- Hoover, Judhith D. Effective Small Group and Team Communication, 2002, Harcourt College Publishers
- Dick, Mc Cann & Margerison, Charles: Team Management, 1992 Edition, viva books
- Bates, A. P. and Julian, J.: Sociology - Understanding Social Behaviour
- Dressers, David and Cans, Donald: The Study of Human Interaction
- Lapiere, Richard. T – Social Change
- Lindzey, G. and Borgatta, E: Sociometric Measurement in the Handbook of Social Psychology, Addison – Welsley, US.
- Rose, G.: Oxford Textbook of Public Health, Vol.4, 1985.
- LaFasto and Larson: When Teams Work Best, 2001, Response Books (Sage), New Delhi
- J William Pfeiffer (ed.) Theories and Models in Applied Behavioural Science, Vol 2, Group (1996); Pfeiffer & Company
- Smither Robert D.; The Psychology of Work and Human Performance, 1994, Harper Collins College Publishers.

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Syllabus

Programme Name: B. Tech. (CSE/IT)							**Session: 2024-28**
Course Code: CSA501				**Course Name:** REINFORCEMENT LEARNING			**Semester:** V
Credits (Total)	**L**	**T**	**P**	**Marks (Internal/External)**	**Contact Hours (per week)**	**Independent Study Hour (per week)**	**Section (Group)**
3	2	1	0	30 / 70	3	3	-
Curriculum level UG					**Basic and applied**	**Student specific course outcome**	**Higher Education Placement Research**

Course Objective:
The objective is to grasp fundamental concepts such as Markov decision processes (MDPs), value functions, policies, and the basic algorithms used in reinforcement learning such as dynamic programming, Monte Carlo methods, and temporal difference learning. Implementation of reinforcement learning algorithms, both model-free (e.g., Q-learning, SARSA) and model-based (e.g., policy iteration, value iteration), and understand their strengths, weaknesses, and applicability.

Course outcomes: After completion of course, the student will be able to:

CO-1	lerstand fundamental concepts and the basic algorithms used in reinforcement learning.
CO-2	Understand various applications of reinforcement learning across different domains such as robotics, game playing, finance, healthcare, and recommendation systems.
CO-3	Understand implementation of reinforcement learning algorithms and understand their strengths, weaknesses, and applicability.
CO-4	Know how to evaluate and compare different reinforcement learning algorithms, understand the importance of exploration-exploitation trade-offs.

CO-5	Critically analyze the societal impact of reinforcement learning technologies and propose responsible development practices.

Teaching Pedagogy:

T1	Classroom teaching (white board), Power Point Presentations, Interactive lectures, Inquiry based teaching
T2	ABL activities, Assignments, Flip Class/ Seminars, Quiz, Oral Viva-voce examination

Assessment Tools

AT1-1	Quiz
AT1-2	Activity Based Learning
AT1-3	Midterm Exams
AT1-4	Flip Class
AT1-5	Seminar Presentation
AT1-6	Assignments
AT1-7	Poster
AT1-8	Oral Viva-voce examination
AT1-9	Industrial Visit Report

Prerequisites: Probability and Statistics, Linear Algebra, Calculus, Algorithms and Data Structures, Machine Learning Basics, Programming Skills

Module wise contents details	**Assessment tools**
Module I: (10 Hours) Introduction to Reinforcement Learning What is RL?, RL algorithm, How RL differs from other ML paradigms Elements of RL: Agent, Policy function,Value function,Model Agent environment interface, Types of RL environment, Deterministic environment Stochastic environment, Fully observable environment, Partially observable environment Discrete environment, Continuous environment, Episodic and non-episodic environment, Single and multi-agent environment, RL platforms, OpenAI Gym and Universe, DeepMind Lab, RL-Glue, Project Malmo, ViZDoom, Applications of RL, Education, Medicine and	Quiz Mid-term Exam Assignment

healthcare, Manufacturing, Inventory management, Finance Natural Language Processing and Computer Vision	
Module II: (9 Hours) Multi-armed Bandits, A k-armed Bandit Problem, Action-value Methods, the 10-armed Testbed, Incremental Implementation, Tracking a Nonstationary Problem, Optimistic Initial Values, Upper-Confidence-Bound Action Selection, Gradient Bandit Algorithms Associative Search (Contextual Bandits) Finite Markov Decision Processes, The Agent–Environment Interface, Goals and Rewards, Returns and Episodes, Unified Notation for Episodic and Continuing Tasks, Policies and Value Functions, Optimal Policies and Optimal Value Functions, Optimality and Approximation, The Bellman equation and optimality, Deriving the Bellman equation for value and Q functions Solving the Bellman equation.	Mid-Term Quiz Assignment
Module III: (9 Hours) Dynamic Programming: Policy Evaluation (Prediction), Policy Improvement, Policy Iteration, Value Iteration, Asynchronous Dynamic Programming, Generalized Policy Iteration, Efficiency of Dynamic Programming, Solving the frozen lake problem Value iteration, Policy iteration Monte Carlo Methods: Monte Carlo Prediction, First visit Monte Carlo, Every visit Monte Carlo Let's play Blackjack with Monte Carlo, Monte Carlo Estimation of Action Values Monte Carlo Control, Monte Carlo Control without Exploring Starts, Off-policy Prediction via Importance Sampling, Incremental Implementation, Off-policy Monte Carlo Control	Mid-Term Quiz Assignment
Module IV: (8 Hours) Temporal-Difference Learning: TD Prediction, Advantages of TD Prediction Methods, Optimality of TD (0), Sarsa: On-policy TD Control, Q-learning: Off-policy TD Control, Solving the taxi problem using Q learning, Frozen lake solution using Q-learning, Expected Sarsa, Solving the taxi problem using SARSA, Maximization Bias and Double Learning, Games, Afterstates, and Other Special Cases, Deep Q-learning,	Mid-Term Oral Viva-voce examination Seminar Presentation
Module V: (9 Hours) On-policy Prediction with Approximation:Value-function Approximation, The Prediction Objective (VE) , Stochastic-gradient and Semi-gradient Methods , Linear Methods , Feature Construction for Linear Methods, Polynomials , Fourier Basis , Coarse Coding, Tile Coding , Radial Basis Functions , Selecting Step-Size Parameters Manually , Nonlinear Function Approximation: Artificial Neural Networks , Least-Squares TD , Memory-based Function Approximation , Kernel-based Function	Quiz Assignment ,Presentation

Approximation , Looking Deeper at On-policy Learning: Interest and Emphasis	

Additional Learning:

List of Assignments	**Assignment -1** Define reinforcement learning and explain its difference from supervised and unsupervised learning. Explain the key components of a reinforcement learning problem: agent, environment, state, action, reward, policy, and value function. Describe the difference between model-free and model-based reinforcement learning approaches. Discuss the exploration-exploitation trade-off in reinforcement learning and provide examples of exploration strategies. **Assignment -2** Implement a simple reinforcement learning algorithm, such as Q-learning or SARSA, to solve a classic reinforcement learning problem, such as the gridworld environment. Define the environment (e.g., gridworld) with states, actions, rewards, and transition probabilities. 2.Implement the chosen algorithm to learn the optimal policy for navigating the environment. 3. Test the implemented algorithm and evaluate its performance over multiple episodes. 4.Analyze the impact of different hyperparameters (e.g., learning rate, discount factor) on the algorithm's convergence and performance. **Assignment -3** Apply reinforcement learning to a real-world problem or simulated environment of your choice (e.g., a simple game, robotic navigation task, or stock trading simulation). 1. Define the problem and environment, specifying states, actions, rewards, and any additional relevant parameters. 2. Implement a suitable reinforcement learning algorithm to learn a policy for solving the problem. 3.Evaluate the performance of the learned policy and compare it to

	alternative approaches (if applicable). 4.Discuss the limitations and potential improvements of the implemented reinforcement learning solution.
Suggested reading:	**Text:** "Reinforcement Learning: An Introduction", 2nd Edition, Richard S. Sutton and Andrew G. Barto, The MIT Presss,Cambridge, Massachusetts London, England **References:** "Hands-On Reinforcement Learning with Python",1st Edition, Sudharsan Ravichandiran,Pacts Publication "Applied Reinforcement Learning with Python", Ist Edition, Taweh Beysolow II,Apress Publication
Suggested e-resources (Websites /e-books)	https://web.eecs.umich.edu/~baveja/NIPS05RLTutorial/NIPS05RLMainTutorial.pdf

Reinforcement Learning Lab

Course Code: CSA 521 **Credit Unit: 01**

Total Hours: 20

Course Objective:
The main objective is to teach and implement basic methods in Reinforcement Learning including: basics of RL, techniques, algorithms, temporal learning, policy, tools using python, OpenAI and Gym.

SOFTWARE REQUIREMENTS: Python, OpenAI, Gym, Tensorflow, Keras.

List of experiments/demonstrations:

Installation of OpenAI,gym ,Practicals based on theory covered in the lectures using Anaconda Framework, OpenAI Basics,Practicals using OpenAI, gym, keras, tensorflow

Course Outcomes:

Learner will learn

- Basics of python, OpenAI, Gym and deep learning.
- Use of RL tools to implement RL agent and algorithms of RL.

Examination Scheme:

IA			EE			
A	**PR**	**Practical Based Test**	**Major Experiment**	**Minor Experiment**	**LR**	**Viva**
5	10	15	35	15	10	10

CYBER LAWS & CYBER FORENSICS

Course Code : CSC 501 **Credit Units: 03**
Total Hours: 45

Course Objectives:

- To provide the fundamentals of digital and cyber space, impact of the activities.
- To cover the fundamentals of cyber-crime and steps involved in collecting the evidence through various tools.
- To provide basics of Cyber-crime incidents and implementing cyber law based on IT Act

Course Contents:

Module I: Introduction to cyber laws & cyber forensics: (9 Hours)

Classifications of Cyber Crimes against individuals, property and nation, Need for Digital forensics and steps in digital forensics (scientific methods), Number System: Binary, Decimal, Hexadecimal, ASCII, and Unicode representation of data, Arenas for digital forensics: disk, network, wireless, database, mobile, e-mail, GPS and memory, Incident handling and response with forensic triage, Ethical Hacking and future of cybercrime.

Module II: Fundamentals for Cyber Forensics: (9 Hours)

Locard's exchange principle and digital forensic investigation models, types: artifacts, identifying raw and proprietary forensic storage formats, identification of potential evidence: slack space, swap space, steganography, recovery of hidden, deleted and corrupt data, standard file formats with their headers and forensic file carving, planning your investigation, order of volatility and forensic triage, overview of file systems.

Module III: Rules for Cyber Security and Digital Forensics: (9 Hours)

Rules of collecting Digital Evidence, Standard collection procedures: seizure, write blockers, bit-stream imaging, hashing, Chain of Custody (COC), evidence bags and SOP for collecting evidence, Source and Location of Digital Evidence, Duplicating and Preserving Digital Evidence, Importance of MAC timings, Types of System logs and Windows Registry.

Module IV: Implementation of Cyber Law and Digital Forensics: (9 Hours)

Forensic laboratory requirements: setting up of lab, evaluating lab staff, selection of appropriate forensic workstations, backup and recovery plans, generating forensically sound reports, IPR and Cyber Laws in India - IT Act 2000 and 2008 Amendment and like-minded IPC sections, Code of Ethics, Expert Witness and analyzing sample forensic reports.

Module V: Practical approaches of Cyber Forensics: (9 Hours)

Validating and gathering evidence using DOS Commands and Unix/Linux Commands, Forensic imaging using DD commands, Software tools - Open Source and proprietary digital forensic frameworks, Hardware tools - write blockers, images and evidence protection containers/bags, NIST tools - CFReDS, CTFF and NSRL and analyzing e-mail headers and network packets.

Course Outcomes:

The student will learn

- Explain the concept of digital forensics and cyber forensics
- Understand and able to perform cyber forensics for the cybercrime incident
- Able to use different forensics tools and standard to report the real-world cyber incidents
- Familiarizing the fundamentals of Anti-forensics and Cyber laws.

Examination Scheme:

Components	A	CT	S/V/Q/HA	EE
Weightage (%)	5	15	10	70

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Director-ASET
Amity University Madhya Pradesh Gwalior

A: Attendance, CT: Class Test, S/V/Q/HA: Seminar/Viva/Quiz/ Home Assignment, EE: End Semester Examination.

Text & References:

- E. Casey, Handbook of Digital Forensics and Investigation, Academic Press; 2010.
- David Cowen, Computer Forensics: A Beginners Guide, McGraw Hill Education.
- Bill Nelson, Amelia Phillips, Christopher Steuart, Guide to Computer Forensics and Investigations.
- Brian Carrier, File System Forensic Analysis, Pearson.
- Marjie T. Britz, Computer Forensics and Cyber Crime, Pearson.

CYBER FORENSICS LAB

Course Code : CSC 521 **Credit Unit : 01**
Total Hours: 20

Course Objectives:
Cyber Security enables the stakeholders to use various range of tools, software and equipment's to enhance the knowledge in Information security and Cyber Forensics for the purpose of consulting and training.

- Understand key terms and concepts in cyber law, intellectual property and cyber-crimes, trademarks and domain theft.
- To understand important cyber security legal principles that need to be made as an integral component and part of the growth and further evolution of emerging technologies.

Program List :

1. How implement security and privacy concerns**: (2 Hours)**
2. Implement Mobile Forensics**: (2 Hours)**
3. Understanding Digital Forensics**: (2 Hours)**
4. Understanding Cell Site Analyzer**: (2 Hours)**
5. Use of Computer Forensic Investigation and Cyber Terrorism**: (2 Hours)**
6. Use of XG-1541 Base pfSense+ Security Gateway**: (2 Hours)**
7. Implementing System Security and System Monitoring**: (2 Hours)**
8. Implement Security Auditing**: (2 Hours)**
9. Design Information Security Virtual Lab: **(2 Hours)**
10. Highly scalable infrastructure to create Virtualized environnement for Virtual machine server consolidation and Creating and managing server profiles for target users: **(2 Hours)**

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

- Describe and analyze the hardware, software, components of a network and the interrelations.
- Explain networking protocols and their hierarchical relationship hardware and software. Compare protocol models and select appropriate protocols for a particular design.
- Manage multiple operating systems, systems software, network services and security. Evaluate and compare systems software and emerging technologies.
- Develop solutions for networking and security problems, balancing business concerns, technical issues and security.

Examination Scheme:

IA			EE			
A	**PR**	**Practical Based Test**	**Major Experiment**	**Minor Experiment**	**LR**	**Viva**
5	10	15	35	15	10	10

Note: IA –Internal Assessment, EE- External Exam, A- Attendance PR- Performance, LR – Lab Record, V –Viva.

Text & References:

- David Cowen, Computer Forensics: A Beginners Guide, McGraw Hill Education.
- Bill Nelson, Amelia Phillips, Christopher Steuart, Guide to Computer Forensics and Investigations.

- Brian Carrier, File System Forensic Analysis, Pearson.
- Marjie T. Britz, Computer Forensics and Cyber Crime, Pearson
- Cyber Security Law by Pavan Duggal

TEXT AND SOCIAL MEDIA ANALYTICS

Course Code: CSD 501 Credit Units: 03
Total Hours: 30

Course Objective:
The objective of the course is to provide the understanding of the fundamental graphical operations and the implementation on computer, the mathematics behind computer graphics, including the use of spline curves and surfaces. It gives the glimpse of recent advances in computer graphics, user interface issues that make the computer easy, for the novice to use.

Course Contents:

Module I: Introduction: (5 Hours)
Introduction of social media and natural language processing research. Collecting and Extracting Social Media Data using API'S.

Module II: Language Identification and Naïve Bayes: (7 Hours)
Domain/Genre Difference Language Identification Supervised Learning and Classification Naïve Bayes Algorithm + feature selection (Information Gain) Tokenization, Emoticons, Noisy Text Normalization

Module III: Overview of paraphrase research: (6 Hours)
WordNet, DIRT, MRPC (Microsoft Research Paraphrase Corpus), PPDB (Paraphrase Database), etc Linear Regression Cost Function, Gradient Descent Logistic Regression, Decision Boundary.

Module IV: Vector Semantics: (5 Hours)
Unsupervised Learning Class-based Clustering: Brown Clusters Soft Clustering: Singular Value Decomposition (SVD) Neural Word Embeddings: Word2vec (CBOW and Skip-gram)

Module V: Deep Learning for NLP: (7 Hours)
Neural Network Basics: Neuron, Activation Function, Non-linearity, Learning Recurrent Neural Network Long Short-Term Memory Networks Neural Machine Translation Neural Conversation Generation Sentiment Analysis, Convolutional Neural Networks and Attention Sentiment Analysis Attention Model Convolutional Neural Network

Course Outcomes:

After taking this course, you will be able to:

- Utilize various Application Programming Interface (API) services to collect data from different social media sources such as YouTube, Twitter, and Flickr.
- Process the collected data - primarily structured - using methods involving correlation, regression, and classification to derive insights about the sources and people who generated that data.
- Analyze unstructured data - primarily textual comments - for sentiments expressed in them.
- Use different tools for collecting, analyzing, and exploring social media data for research and development purposes.

Examination Scheme:

Components	A	CT	S/V/Q/HA	ESE
Weightage (%)	5	15	10	70

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, ESE: End Semester Examination;A: Attendance

Text & References*:*

Text:

- Mining Text Data. Charu C. Aggarwal and ChengXiang Zhai, Springer, 2012.
- Speech & Language Processing. Dan Jurafsky and James H Martin, Pearson Education India, 2000.

References:

- Introduction to Information Retrieval. Christopher D. Manning, Prabhakar Raghavan, and Hinrich Schuetze, Cambridge University Press, 2007.

TEXT AND SOCIAL MEDIA ANALYTICS LAB

Course Code: CSD 521 **Credit Unit: 01**
Total Hours: 20

Course Objective :
The objective of the course is to provide the understanding of the fundamental graphical operations and the implementation on computer, the mathematics behind computer graphics, including the use of spline curves and surfaces. It gives the glimpse of recent advances in computer graphics, user interface issues that make the computer easy, for the novice to use.

SOFTWARE REQUIREMENTS: Python 3.6, Anaconda IDE with Spider

List of experiments/demonstrations:

1. Write python code to flatten and evaluate a deep tree in NLP
2. Create Shallow Tree in NLP and print its height
3. Download wine quality data set from the UCI Machine Learning Repository which is available for free. Then print data of five rows of red and white wines. Check for NULL Values in red wine. Create a histogram to show distribution of alcohol and finally split the data for training and validation.
4. Avengers Endgame and Deep learning. Write python code to implement Image Caption Generation using the Avengers End Games Characters
5. Create a Neural network using Python (you can use NumPy to implement this)
6. Implement Word Embedding using Word2Vec
7. Collocations are two or more words that tend to appear frequently together, for example – United States. Implement this using Python.
8. WordNet is the lexical database i.e. dictionary for the English language, specifically designed for natural language processing. Synset is a special kind of a simple interface that is present in NLTK to look up words in WordNet. Synset instances are the groupings of synonymous words that express the same concept Show working of these using Python
9. Implement Naïve Baye's Classifier using python.
10. Twitter Sentiment Analysis using Python. Fetch tweets from twitter using Python and implement it.

Examination Scheme:

IA			EE			
A	**PR**	**Practical Based Test**	**Major Experiment**	**Minor Experiment**	**LR**	**Viva**
5	10	15	35	15	10	10

Note: IA –Internal Assessment, EE- External Exam, A- Attendance PR- Performance, LR – Lab Record, V – Viva.

Course Outcomes:

After taking this course, you will be able to:

- Utilize various Application Programming Interface (API) services to collect data from different social media sources such as YouTube, Twitter, and Flickr.
- Process the collected data - primarily structured - using methods involving correlation, regression, and classification to derive insights about the sources and people who generated that data.
- Analyze unstructured data - primarily textual comments - for sentiments expressed in them.
- Use different tools for collecting, analyzing, and exploring social media data for research and development purposes.

Text & References*:*

Text:

- Mining Text Data. Charu C. Aggarwal and ChengXiang Zhai, Springer, 2012.
- Speech & Language Processing. Dan Jurafsky and James H Martin, Pearson Education India, 2000.

References:

- Introduction to Information Retrieval. Christopher D. Manning, Prabhakar Raghavan, and Hinrich Schuetze, Cambridge University Press, 2007.

CYBER SECURITY AND PRIVACY IN IOT

ASET, AUMP

Course Credits	03	**Total Hours**	30
Course Code	CSI501	**Programme**	BTech

Course Outcomes:

- Ability to Understand the security requirements in IOT
- Understanding the cryptographic fundamentals of IOT
- Ability to Understand the authentication credentials and access control
- Understand various types of trust models and cloud security

Syllabus

MI: Securing the Internet of Things	● Security requirements in IoT architecture ● Security in enabling technologies ● Cipher suites ● Security architecture in the Internet of Things ● Security requirements in IoT ○ Insufficient authentication/authorization ○ Insecure access control ○ Threats to access control, privacy, and availability ● Attacks specific to IoT ● Vulnerabilities ● Secrecy and secret-key capacity ● Authentication/authorization for smart devices ● Transport encryption ● Attack trees and fault trees
MII: Cryptographic Fundamentals for IoT	● Cryptographic primitives and their role in IoT ● Encryption and decryption ● Hashes ● Digital signatures ● Random number generation ● Cipher suites ● Key management fundamentals ● Cryptographic controls in IoT messaging and communication protocols ● IoT node authentication
MIII: Identity and Access Management for IoT	● Identity lifecycle ● Authentication credentials ● IoT IAM infrastructure

	• Authorization with publish/subscribe schemes • Access control
MIV: Privacy Preservation and Trust Models for IoT	• Concerns in data dissemination • Lightweight and robust privacy protection schemes • Trust and trust models for IoT • Self-organizing things • Preventing unauthorized access
MV: Cloud Security for IoT Cloud Services and IoT	• IoT offerings from cloud service providers • Cloud IoT security controls • Enterprise IoT cloud security architecture • New directions in cloud-enabled IoT computing

CYBER SECURITY AND PRIVACY IN IOT LAB

Course Code : CSI 521 **Credit Unit: 01**
Total Hours: 30

Course Objectives:

- Understand key terms and concepts in cyber law, intellectual property and cyber-crimes, trademarks and domain theft.
- To understand important cyber security legal principles that need to be made as an integral component and part of the growth and further evolution of emerging technologies like Internet of Things.

Program List :

1. How implement security and privacy concerns in IOT**: (3 Hours)**
2. Implement Android-based Smartphone Security using IOT**: (3 Hours)**
3. How can do Stepping Stone Detection using IOT**: (3 Hours)**
4. How Broken Authentication and Session Management Vulnerabilities in IOT**: (3 Hours)**
5. Use of Computer Forensic Investigation and Cyber Terrorism**: (3 Hours)**
6. How is underlying architecture of internet of things is different from web of things explain with help of example**: (3 Hours)**
7. Construct a model to demonstrate working of network of communicating devices with help of suitable diagram**: (3 Hours)**
8. State the following with example: Public cloud, Private cloud, Hybrid cloud and Community cloud**: (3 Hours)**
9. Exemple of Identity based authentication in IOT**: (3 Hours)**
10. Exemple of public-key-based authentication in IOT**: (3 Hours)**

Course Outcomes :

Upon completion of this course, students will be able to:

- Describe and analyze the hardware, software, components of a network and the interrelations.
- Explain networking protocols and their hierarchical relationship hardware and software. Compare protocol models and select appropriate protocols for a particular design.
- Manage multiple operating systems, systems software, network services and security. Evaluate and compare systems software and emerging technologies.
- Develop solutions for networking and security problems, balancing business concerns, technical issues and security.

Examination Scheme:

IA			EE			
A	**PR**	**Practical Based Test**	**Major Experiment**	**Minor Experiment**	**LR**	**Viva**
5	10	15	35	15	10	10

Note: IA –Internal Assessment, EE- External Exam, A- Attendance PR- Performance, LR – Lab Record, V –Viva.

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Text & References:

- Practical Internet of Things Security (Kindle Edition) by Brian Russell, Drew Van Duren Securing the Internet of Things Elsevier
- Security and Privacy in Internet of Things (IoTs): Models, Algorithms, and Implementations
- Thomas Erl, Ricardo Puttini, ZaighamMahmood, Cloud Computing: Concepts, Technology & Architecture, Prentice Hall, 2013.
- Cyber Security Law Thoughts On Iot, Ai & Blockchain by Pavan Duggal

Annexure 2

INDUSTRIAL PRACTICAL TRAINING – I

Course Code: NPT 550 **Credit Units: 03**

Course Objective:
This course will enable the students to explore the preferred field of specialization and develop analytical / hardware / software / experimental / observation skills. It will help them to manage the technical content and work. It will also help them to prepare and present technical report.

Methodology:
Practical training is based on the theoretical subjects studied by students. It can be arranged within the college or in any related industrial unit. The students are to learn various industrial, technical and administrative processes followed in the industry. In case of on-campus training the students will be given specific task of fabrication/assembly/testing/analysis. On completion of the practical training the students are to present a report covering various aspects learnt by them and give a presentation on same.

Course Outcomes:

After successful completion of the course, the students will be able to

- Explore the preferred field of specialization and develop analytical / hardware / software / experimental / observation skills.
- Manage the technical content and work.
- Learn the various administrative process followed in industry.
- Prepare and present technical report.

Examination Scheme:

Feedback from industry/work place	20
Training Report	40
Viva	15
Presentation	25
Total	**100**

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Annexure 2

FRENCH – V

Course Code: FLU 544 **Credit Units: 02**
Total Hours: 30

Course Objectives:

- To strengthen the language of the students in both oral and written
- To revise the grammar in application and the communication asks related to topics covered already
- To get acquainted with the current social communication skills, oral (dialogue, telephone conversations, etc.) and written and perform simple communication tasks such as narrating events in the past, marking the stages, using appropriate connectors; expressing causes and consequences, using appropriate logical connectors and presenting a biography

Course Contents:

Dossier8–Pg75 - 84
Dossiers4, 5 and 6(révision)
Dossier8:Vivre ensemble
Actesde Communication:
Exprimerlacause,l'opposition,laconséquence,décrirelesétapesd'uneaction,s'exprimersurl'environnement, l'écologie, identifieret décrirelesdifférencesde comportement, décrire le fonctionnementd'une association, fairela biographied'une personne.

Dossiers 4, 5,6–Révision
Exercicesd'écoute,productionorale et écrite.
Grammaire :

1. le présent (révision),lepassé composé(révision)
2. lespronomscomplémentsdirects,lespronomscompléments indirects
3. lesmarqueurschronologiques
4. lesarticulateurslogiques

Examination Scheme:

	INTERNAL				EXTERNAL	GRAND TOTAL
Components	**MID-SEM**	**VIVA-VOCE**	**ATTENDANCE**	**TOTAL**	**END SEMESTER**	
Weightage (%)	**15**	**10**	**5**	**30**	**70**	**100**

Text & References:

- Andant,Christineet al.A proposA1Livre del'élève.Grenoble:Pressesuniversitairesde Grenoble,2010.
- Andant,Christineet al.A proposA1Cahierd'exercices.Grenoble:Pressesuniversitairesde Grenoble,2010.
- Girardeau,Brunoet NellyMous.Réussirle DELFA1.Paris:Didier,2010.