NOIDA INSTITUTE OF ENGG. & TECHNOLOGY, GREATER NOIDA, GAUTAM BUDDH NAGAR
(AN AUTONOMOUS INSTITUTE)

Affiliated to

DR. A.P.J. ABDUL KALAM TECHNICAL UNIVERSITY UTTAR PRADESH, LUCKNOW

Evaluation Scheme & Syllabus

For

Bachelor of Technology

Computer Science and Engineering (Regional) (CSE-(R))

Third Year

(Effective from the Session: 2023-24)

NOIDA INSTITUTE OF ENGINEERING & TECHNOLOGY, GREATER NOIDA
(AN AUTONOMOUS INSTITUTE)

Bachelor of Technology
Computer Science and Engineering (R)
EVALUATION SCHEME
SEMESTER-V

Sl. No.	Subject Codes	Subject Name	Periods			Evaluation Schemes				End Semester		Total	Credit
			L	T	P	CT	TA	TOTAL	PS	TE	PE		
WEEKS COMPULSORY INDUCTION PROGRAM													
1	ACSEH0503	Design Thinking-II	2	1	0	30	20	50		100		150	3
2	ACSEH0506	Database Management System	3	1	0	30	20	50		100		150	4
3	ACSEH0504	Compiler Design	3	1	0	30	20	50		100		150	4
4	ACSEH0505	Web Technology	3	0	0	30	20	50		100		150	3
5		Departmental Elective I	3	0	0	30	20	50		100		150	3
6		Departmental Elective II	3	0	0	30	20	50		100		150	3
7	ACSEH0556	Database Management Systems Lab	0	0	2				25		25	50	1
8	ACSEH0554	Compiler Design Lab	0	0	2				25		25	50	1
9	ACSEH0555	Web Technology Lab	0	0	2				25		25	50	1
10	ACSEH0559	Internship Assessment-II	0	0	2				50			50	1
11	ANC0501/ ANC0502	Constitution of India, Law and Engineering/ Essence of Indian Traditional Knowledge	2	0	0	30	20	50		50		100	
12		MOOCs for Hons. degree											
		TOTAL										**1100**	**24**

List of MOOCs (Coursera) Based Recommended Courses for Third Year (Semester-V) B. Tech Students

S. No.	Subject Code	Course Name	University / Industry Partner Name	No of Hours	Credits
1	AMC0084	Introduction to Cloud Computing (FS)	IBM	13	1
2	AMC0085	Introduction to Cloud Development with HTML, CSS, JavaScript (FS)	IBM	17	1
OR					
1	AMC0077	Google Cloud Platform Fundamentals: Core Infrastructure	Google	13	1
2	AMC0074	Essential Google Cloud Infrastructure: Foundation	Google	8	0.5
OR					
1	AMC0078	Groundwork for Success in Sales Development	Salesforce SV Academy	19	1.5
2	AMC0075	Foundations for Interviewing with Confidence	Salesforce SV Academy	19	1.5
OR					

1	AMC0070	Databases and SQL for Data Science with Python	IBM	37	3
2	AMC0041	Introduction to NoSQL databases	IBM	18	1

PLEASE NOTE:-

- **Internship (3-4 weeks) shall be conducted during summer break after semester-IV and will be assessed during semester-V**
- **Compulsory Audit Courses (Non Credit - ANC0501/ANC0502)**
  - All Compulsory Audit Courses (a qualifying exam) has no credit.
  - Total and obtained marks are not added in the Grand Total.

List of Departmental Electives

Sl.No.	Departmental Electives	Subject Codes	Subject Name	Bucket Name	Branch	Semester
1	Elective-I	ACSAIH0513	Introduction to Artificial Intelligence	AI/ML	CSE- R	5
2	Elective-II	ACSEH0515	Machine Learning		CSE- R	5
3	Elective-I	ACSAIH0514	Introduction to cloud computing	Cloud Computing	CSE- R	5
4	Elective-II	ACSAIH0520	Cloud Virtualization		CSE- R	5
5	Elective-I	ACSEH0511	CRM Fundamentals	CRM-RPA	CSE- R	5
6	Elective-II	ACSEH0513	CRM Administration		CSE- R	5
7	Elective-I	ACSEH0512	Python web development with Django	Full Stack Development	CSE- R	5
8	Elective-II	ACSEH0514	Design Patterns		CSE- R	5

Abbreviation Used: -

L: Lecture, T: Tutorial, P: Practical, CT: Class Test, TA: Teacher Assessment, PS: Practical Sessional, TE: Theory End Semester Exam., PE: Practical End Semester Exam.

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Bachelor of Technology
Computer Science and Engineering (R)
EVALUATION SCHEME
SEMESTER-VI

Sl. No.	Subject Codes	Subject Name	Periods			Evaluation Schemes				End Semester		Total	Credit
			L	T	P	CT	TA	TOTAL	PS	TE	PE		
WEEKS COMPULSORY INDUCTION PROGRAM													
1	ACSEH0602	Computer Networks	3	1	0	30	20	50		100		150	4
2	ACSEH0601	Advanced Java Programming	3	0	0	30	20	50		100		150	3
3	ACSEH0603	Software Engineering	3	0	0	30	20	50		100		150	3
4		Departmental Elective III	3	0	0	30	20	50		100		150	3
5		Departmental Elective IV	3	0	0	30	20	50		100		150	3
6		Open elective I	3	0	0	30	20	50		100		150	3
7	ACSEH0651	Advanced Java Programming Lab	0	0	2				25		25	50	1
8	ACSEH0652	Computer Networks Lab	0	0	2				25		25	50	1
9	ACSEH0653	Software Engineering Lab	0	0	2				25		25	50	1
10	ACSEH0659	Mini Project	0	0	2				50			50	1
11	ANC0602 / ANC0601	Essence of Indian Traditional Knowledge/ Constitution of India	2	0	0			50		50		100	
12		MOOCs											
		TOTAL										**1100**	**23**

List of MOOCs (Coursera) Based Recommended Courses for Third Year (Semester-VI) B. Tech Students

S.No.	Subject Code	Course Name	University / Industry Partner Name	No of Hours	Credits
1	AMC0243	The Complete Machine Learning Course with Python	Infosys Wingspan	21h 36m	1.5
2	AMC0242	Data Analysis with Pandas and Python	Infosys Wingspan	19h 49m	1.5

PLEASE NOTE:-

- **Compulsory Audit Courses (Non Credit - ANC0601/ANC0602)**
  - All Compulsory Audit Courses (a qualifying exam) has no credit.
  - Total and obtained marks are not added in the Grand Total.

Abbreviation Used: -

L: Lecture, T: Tutorial, P: Practical, CT: Class Test, TA: Teacher Assessment, PS: Practical Sessional, TE: Theory End Semester Exam., PE: Practical End Semester Exam.

List of Departmental Electives

Sl. No.	Departmental Electives	Subject Codes	Subject Name	Bucket Name	Branch	Semester
1	Elective-III	ACSAIH0613	Deep Learning	AI/ML	CSE- R	6
2	Elective-IV	ACSAIH0619	Business Intelligence and Data Visualization	AI/ML	CSE- R	6
3	Elective-III	ACSAIH0611	Cloud Storage Management	Cloud Computing	CSE- R	6
4	Elective-IV	ACSAIH0621	Big Data		CSE- R	6
5	Elective-III	ACSEH0611	CRM Development	CRM-RPA	CSE- R	6
6	Elective-IV	ACSEH0613	Robotics Process Automation(RPA)		CSE- R	6
7	Elective-III	ACSEH0614	Web Development using MEAN stack	Full Stack Development	CSE- R	6
8	Elective-IV	ACSEH0612	Full-Stack Web Development using Laravel with Vue.JS		CSE- R	6

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AICTE Guidelines in Model Curriculum:

A student will be eligible to get Under Graduate degree with Honours only, if he/she completes the additional MOOCs courses such as Coursera certifications, or any other online courses recommended by the Institute (Equivalent to 20 credits). During Complete B.Tech. Program Guidelines for credit calculations are as follows.

1. For 6 to 12 Hours =0.5 Credit
2. For 13 to18 =1 Credit
3. For 19 to 24 =1.5 Credit
4. For 25 to 30 =2 Credit
5. For 31 to 35 =2.5 Credit
6. For 36 to 41 =3 Credit
7. For 42 to 47 =3.5 Credit
8. For 48 and above =4 Credit

For registration to MOOCs Courses, the students shall follow Coursera registration details as per the assigned login and password by the Institute these courses may be cleared during the B. Tech degree program (as per the list provided). After successful completion of these MOOCs courses, the students shall provide their successful completion status/certificates to the Controller of Examination (COE) of the Institute through their coordinators/Mentors only.

The students shall be awarded Honours Degree as per following criterion.

i. If he / she secures 7.50 as above CGPA.
ii. Passed each subject of that degree program in the single attempt without any grace.
iii. Successful completion of MOOCs based 20 credits.

B. TECH. THIRD YEAR		
Subject Code: ACSEH0503		**L T P** **2 1 0**
Subject Name: Design Thinking II		**Credits** **3**

Course Objectives:

The objective of this course is to upgrade Design Thinking skills by learning & applying advanced and contextual Design Thinking Tools. It aims to solve a Real-Life Problem by applying Design Thinking to create an impact for all the stakeholders

Pre-requisites: Student must complete Design Thinking-I course

Course Contents / Syllabus

Unit-1	**Introduction** Design thinking& Innovation, Design Thinking Mindset and Principles, recap of 5-Step Process of Design Thinking, Design Approaches, additional in-depth examples of each design approaches. Simon Sinek's – Start with Why, The Golden Circle, Asking the "Why" behind each example (an in-class activity of asking 5-WHYS), The Higher Purpose, in-class activity for LDO& sharing insights, Visualization and its importance in design thinking, reflections on wheel of life (in-class activity for visualization & Wheel of Life), Linking it with Balancing Priorities (in class activity), DBS Singapore and Bank of Americas' Keep the Change Campaign. Litter of Light & Arvind Eye Care Examples, understanding practical application of design thinking tools and concepts, case study on McDonald's Milkshake / Amazon India's Rural Ecommerce& Gillette, Working on 1-hour Design problem, Applying RCA and Brainstorm on innovative solutions. Main project allocation and expectations from the project	**10 Hours**
Unit-2	**Refinement and Prototyping** Refine and narrow down to the best idea, 10-100-1000gm, QBL, Design Tools for Convergence – SWOT Analysis for 1000gm discussion. In-class activity for 10-100-1000gm & QBL Prototyping (Convergence): Prototyping mindset, tools for prototyping – Sketching, paper models, pseudo-codes, physical mockups, Interaction flows, storyboards, acting/role-playing etc, importance of garnering user feedback for revisiting Brainstormed ideas, Napkin Pitch, Usability, Minimum Viable Prototype, Connecting Prototype with 3 Laws, A/B Testing, Learning Launch. Decision Making Tools and Approaches – Vroom Yetton Matrix, Shift-Left, Up, Right, Value Proposition, Case study: Career buddy, You-Me-Health Story & IBM Learning Launch. In-class activities on prototyping- paper-pen / physical prototype/ digital prototype of project's 1000gm idea	**8 Hours**
Unit-3	**Storytelling, Testing and Assessment** Storytelling: Elements of storytelling, Mapping personas with storytelling, Art of influencing, Elevator Pitch, Successful Campaigns of well-known examples, in-class activity on storytelling. Testing of design with people, conducting usability test, testing as hypothesis, testing as empathy, observation and shadowing methods, Guerrilla Interviews, validation workshops, user feedback, record results, enhance, retest, and refine design, Software validation tools, design parameters, alpha &beta testing, Taguchi, defect classification, random sampling Final Project Presentation and assessing the impact of using design thinking	**8 Hours**
Unit-4	**Innovation, Quality and Leadership**	**6 Hours**

	Innovation: Need & Importance, Principles of innovations, Asking the Right Questions for innovation, Rationale for innovation, Quality: Principles & Philosophies, Customer perception on quality, Kaizen, 6 Sigma. FinTech case study of Design Thinking application – CANVAS Leadership, types, qualities and traits of leaders and leadership styles, Leaders vs Manager, Personas of Leaders & Managers, Connecting Leaders-Managers with 13 Musical Notes, Trait theory, LSM (Leadership Situational Model), Team Building Models: Tuckman's and Belbin's. Importance of Spatial elements for innovation	
Unit-5	**Understanding Human Desirability** Program needed to achieve the comprehensive human goal: the five dimensions of human endeavour (Manaviya Vyavstha) are: Education- Right living (Sikhsa- Sanskar), Health – Self-regulation (Swasthya Sanyam), Justice – Preservation (Nyaya- Suraksha), Production – Work (Utpadan – Karya), Exchange – Storage (Vinimya – Kosh), Darshan – Gyan-Charitra (Shifting the Thinking) Interconnectedness and mutual fulfilment among the four orders of nature recyclability and self-regulation in nature, Thinking expansion for harmony: Self-exploration (Johari's window), group behaviour, interpersonal behaviour and skills, Myers-Briggs personality types (MBTI), FIRO-B test to repair relationships.	**8 Hours**
Course outcome: After completion of this course, students will be able to		
CO 1	Learn sophisticated design tools to sharpen their problem-solving skills	K2
CO 2	Generate innovate ideas using design thinking tools and converge to feasible idea for breakthrough solution	K3,K4
CO 3	Implement storytelling for persuasive articulation	K3
CO 4	Understanding the nature of leadership empowerment	K2
CO 5	Understand the role of a human being in ensuring harmony in society and nature.	K2

Textbooks:

1. Arun Jain, UnMukt : Science & Art of Design Thinking, 2020, Polaris
2. Gavin Ambrose and Paul Harris, Basics Design 08: Design Thinking, 2010, AVA Publishing SA
3. R R Gaur, R Sangal, G P Bagaria, A Foundation Course in Human Values and Professional Ethics, First Edition, 2009, Excel Books: New Delhi

Reference Books:

1. Jeanne Liedta, Andrew King and Kevin Benett , Solving Problems with Design Thinking – Ten Stories of What Works, 2013, Columbia Business School Publishing
2. Dr Ritu Soryan, Universal Human Values and Professional Ethics, 2022, Katson Books
3. Vijay Kumar, 101 Design Methods: A Structured Approach for Driving Innovation in Your Organization, 2013, John Wiley and Sons Inc, New Jersey
4. Roger L. Martin, Design of Business: Why Design Thinking is the Next Competitive Advantage, 2009, Harvard Business Press, Boston MA
5. Tim Brown, Change by Design, 2009, Harper Collins

6. Pavan Soni, Design your Thinking : The Mindsets, Toolsets and Skill Sets for Creative Problem-Solving, 2020, Penguin Books

NPTEL/ YouTube/ Web Link:

https://www.youtube.com/watch?v=6_mHCOAAEI8
https://nptel.ac.in/courses/110106124
https://designthinking.ideo.com/
https://blog.experiencepoint.com/how-mcdonalds-evolved-with-design-thinking

https://www.coursera.org/lecture/uva-darden-design-thinking-innovation/the-ibm-story-iq0kE
https://www.coursera.org/lecture/uva-darden-design-thinking-innovation/the-meyouhealth-story-part-i-what-is-W6tTs
https://onlinecourses.nptel.ac.in/noc19_mg60/preview

https://nptel.ac.in/courses/109/104/109104109/
https://www.d-thinking.com/2021/07/01/how-to-use-storytelling-in-design-thinking/

https://www.worldofinsights.co/2020/10/infographic-8-design-thinking-skills-for-leadership-development/

https://www.youtube.com/watch?v=hFGVcx1Us5Y

B. TECH. THIRD YEAR

Subject Code: ACSEH0506	**L T P** **3 1 0**
Subject Name: Database Management System	**Credits** **4**

Course objective:
The objective of the course is to present an introduction to database management systems, with an emphasis on how to organize, maintain and retrieve - efficiently, and effectively - information in relational and non-relation DBMS.

Pre-requisites: The student should have basic knowledge of discrete mathematics and data structures.

Course Contents / Syllabus

Unit-1	**Introduction** Overview, Database system Vs File system, Database system concepts, architecture and structures, data model schema and instances, Data independence and Database language and Interfaces, DDL, DML. Data Modelling using the Entity Relationship Model: ER model concepts, notation for ER diagram, mapping constraints, keys, Concepts of Super Key, Candidate key, Primary key, Generalization, Aggregation, and Reduction of an ER diagrams to tables, Extended ER model, Relationship of higher degree.	**8 Hours**
Unit-2	Relational data model Concepts, Integrity constraints, Entity integrity, Referential integrity, Keys constraints, Domain constraints, Relational algebra, Relational calculus, Tuple and Domain calculus. Introduction on SQL: Characteristics of SQL, advantage of SQL. SQL data type and literals. Types of SQL commands. SQL operators and their procedure. Tables, Views and indexes. Queries and sub queries. Aggregate functions. Insert, Update and Delete operations, Joins, Unions, Intersection, Minus, Cursors, Triggers and Procedures in SQL/PL SQL.	**8 Hours**
Unit-3	**Database Design-Normalization** Normalization, Normal Form (NF), Functional Dependencies (FD), Closure of an attribu te set and FD sets, Canonical Cover of FD Sets, Normal Forms based on Functional Dep endencies (1 NF, 2 NF, 3 NF, BCNF), Multivalued Dependencies (MVDs) and 4NF, Joi n Dependencies (JDs) and 5NF and Domain Key Normal Formal (DKNF or 6NF), Inclusion Dependencies, Loss-Less Join Decompositions.	**8 Hours**
Unit-4	**Transaction Processing and Recovery Concept** Transaction system, Testing of serializability, Serializability of schedules, Conflict & View serializable schedule, Recoverability, Recovery from transaction failures, Log based recovery, Checkpoints, Deadlock handling. Control Concurrency Techniques: Concurrency Control, Locking Techniques for concurrency control, Time stamping protocols for concurrency control, Validation-based protocol, Multiple granularity, Multi version schemes, Recovery with concurrent transaction, Case study of Oracle. Distributed Database: -Introduction Distributed Database, Centralized and Distributed System Database System.	**8 Hours**

Unit-5	**Introduction No-SQL with cloud Database** Definition of NOSQL, History of NOSQL and Different NOSQL products, Exploring Mongo DB, Interfacing and Interacting with NOSQL, NOSQL Storage Architecture, CRUD operations with MongoDB, Querying, Modifying and Managing NOSQL Data stores, Indexing and ordering datasets (MongoDB). **Cloud database: -** Introduction of Cloud database, NOSQL with Cloud Database	**8 Hours**
Course outcome: After completion of this course students will be able to:		
CO 1	Analyse database used to solve real world and complex problem and design the ER, EER Model.	K4
CO 2	Analyse and apply Structured Query Language (SQL) or Procedural Query Language (PL/SQL) to solve the complex queries. Implement relational model, integrity constraints.	K4, K3
CO 3	Design and implement database for storing, managing data efficiently by applying the Normalization process on the database.	K6
CO 4	Synthesize the concepts of transaction management, concurrency control and recovery.	K5
CO 5	Understand and implement the concepts of NOSQL with cloud database.	K2, K5

Text books:

1. Korth, Silbertz, Sudarshan," Database System Concepts", Seventh Edition, Year 2021 McGraw - Hill.
2. Elmasri, Navathe, "Fundamentals of Database Systems", Seventh Edition, Year 2021 Addision Wesley.
3. Ivan Bayross "SQL, PL/SQL The programming language Oracle, Fourth Edition Year 2018, BPB Publication.
4. Brad Dayley "NoSQL with MongoDB in 24 Hours" First Edition, Sams Publisher.

Reference Books

1. Raghu Ramakrishan and Johannes Gehrke "Database Management Systems" Third Edition, Year 2018 McGraw-Hill.
2. Thomas Cannolly and Carolyn Begg, "Database Systems: A Practical Approach to Design, Implementation and Management", Third Edition, Pearson Education, 2007.
3. NoSQL and SQL Data Modelling: Bringing Together Data, Semantics, and Software First Edition by Ted Hills.
4. Sadalage, P. & Fowler, "NoSQL Distilled: A Brief Guide to the Emerging World of Polyglot Persistence", Pearson Education.

https://www.youtube.com/watch?v=TlbJk78TqYY
http://www.nptelvideos.com/lecture.php?id=6472
http://www.nptelvideos.com/lecture.php?id=6473

http://www.nptelvideos.com/lecture.php?id=6474 http://www.nptelvideos.com/lecture.php?id=6475 http://www.nptelvideos.com/lecture.php?id=6476 http://www.nptelvideos.com/lecture.php?id=6477 http://www.nptelvideos.com/lecture.php?id=6478 http://www.nptelvideos.com/lecture.php?id=6479 http://www.nptelvideos.com/lecture.php?id=6480 http://www.nptelvideos.com/lecture.php?id=6481
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http://www.nptelvideos.com/lecture.php?id=6499 http://www.nptelvideos.com/lecture.php?id=6500 http://www.nptelvideos.com/lecture.php?id=6501 http://www.nptelvideos.com/lecture.php?id=6502 http://www.nptelvideos.com/lecture.php?id=6503 http://www.nptelvideos.com/lecture.php?id=6504 http://www.nptelvideos.com/lecture.php?id=6505 http://www.nptelvideos.com/lecture.php?id=6506 http://www.nptelvideos.com/lecture.php?id=6508 http://www.nptelvideos.com/lecture.php?id=6509 http://www.nptelvideos.com/lecture.php?id=6514 http://www.nptelvideos.com/lecture.php?id=6516 http://www.nptelvideos.com/lecture.php?id=6517 http://www.nptelvideos.com/lecture.php?id=6518 http://www.nptelvideos.com/lecture.php?id=6519
http://www.nptelvideos.com/lecture.php?id=6516 http://www.nptelvideos.com/lecture.php?id=6517 http://www.nptelvideos.com/lecture.php?id=6518 http://www.nptelvideos.com/lecture.php?id=6519 https://www.youtube.com/watch?v=2yQ9TGFpDuM

B. TECH. THIRD YEAR

Subject Code: ACSEH0504	**L T P** **3 1 0**
Subject Name: Compiler Design	**Credits** **4**

Course objective:

The main objective of this course is to introduce the major concept areas of language translation and compiler design and to develop an awareness of the function and complexity of modern compilers. This course is a study of the theory and practice required for the design and implementation of interpreters and compilers for programming languages. Design of top-down and bottom-up parsers also to develop algorithms to generate code for a target machine. Introduce of many compiler tools like LEX and YACC.

Pre-requisites: Theory of Computation

Course Contents / Syllabus

Unit-1	**Notion and Concepts** Phases and passes, Bootstrapping, Finite state machines and regular expressions and their applications to lexical analysis, Optimization of DFA-Based Pattern Matchers implementation of lexical analyzers, lexical- analyzer generator, LEX compiler, Formal grammars and their application to syntax analysis, BNF notation, ambiguity, YACC. The syntactic specification of programming languages: Context free grammars, derivation and parse trees, capabilities of CFG.	**8 Hours**
Unit-2	**Parsing** Parsers, Shift reduce parsing, operator precedence parsing, top down parsing, predictive parsers. Automatic Construction of efficient Parsers: LR parsers, the canonical Collection of LR(0) items, constructing SLR parsing tables, constructing Canonical LR parsing tables, Constructing LALR parsing tables, using ambiguous grammars, an automatic parser generator, implementation of LR parsing tables.	**8 Hours**
Unit-3	**Syntax-directed Translation** Syntax-directed Translation schemes, Implementation of Syntax-directed Translators, Intermediate code, postfix notation, Parse trees & syntax trees, three address code, quadruple & triples, translation of assignment statements, Boolean expressions, statements that alter the flow of control, postfix translation, translation with a top down parser. More about translation: Array references in arithmetic expressions, procedures call, declarations and case statements.	**8 Hours**
Unit-4	**Symbol Tables and Run-Time Administration** Data structure for symbols tables, representing scope information. Storage Management – Static, Stack and Heap, Activation Record, static and control links, Error Detection & Recovery: Lexical Phase errors, syntactic phase errors semantic errors.	**8 Hours**
Unit-5	**Code Generation and Code optimization** Issues in code generation, basic blocks, flow graphs, DAG representation of basic blocks, Target machine description, peephole optimization, Register allocation and Assignment, Simple code generator, Machine-Independent Optimizations, Loop optimization, DAG representation of basic blocks, value numbers and algebraic	**8 Hours**

	laws, Introduction to global data flow analysis, Data flow equations and iterative data flow analysis.	
Course Outcome: After the completions of this course students will be able to		
CO 1	Identify and interpret the different phases of a compiler and their functioning.	K1,K2
CO 2	Design and implement Syntax Analyzer.	K2,K3
CO 3	Specify appropriate translations to generate an intermediate code for the given programming language constructs.	K4,K5
CO 4	Design and develop various data structure for symbols tables and Error Detection & Recovery at every phase.	K2
CO 5	Apply various new code optimization techniques to improve the performance of a program in terms of speed & space.	K3,K6

Text books:

1. Alfred V. Aho, Ravi Sethi, Reffrey D. Ullman, “Compilers Principles, Techniques, and Tools”, Addison Wesley, ISBN 981-235-885-4, 2007
2. J R Levin, T Mason, D Brown, “Lex and Yacc", O'Reilly, 2000 ISBN 81-7366-061-X, 2010.

Reference Books:

1. K. Muneeswaran, “Compiler Design”, First Edition, Oxford University Press,2012
2. V. Raghavan, “Principles of Compiler Design‖”, Tata McGraw Hill Education Publishers, 2010.
3. Dick Grune, Bal, Jacobs, Langendoen, “Modern Compiler Design”, Wiley, ISBN 81-265-
4. 0418-8,2012.
5. J.P. Bennet, “Introduction to Compiler Techniques”, Second Edition, Tata McGraw-Hill,2003
6. Henk Alblas and Albert Nymeyer, “Practice and Principles of Compiler Building with C”, PHI, 2001

NPTEL/Youtube/ Faculty Video Link:

https://nptel.ac.in/courses/106108113

https://nptel.ac.in/courses/106104123

https://nptel.ac.in/courses/106104072

https://onlinecourses.nptel.ac.in/noc21_cs07/preview

https://nptel.ac.in/courses/106108052

B. TECH. THIRD YEAR

Subject Code: ACSEH0505	**L T P** **3 0 0**
Subject Name: Web Technology	**Credits** **3**

Course objective:
This course covers different aspect of web technology such as HTML, CSS, Java Script and **provide fundamental concepts of Internet, Web Technology and Web Programming.** Students will be able to build a proper responsive website.

Pre-requisites: Basic Knowledge of any programming language like C/C++/Python/Java. Familiarity with basic concepts of Internet.

Course Contents / Syllabus

Unit-1	**Basics of Web Technology & Testing** History of Web and Internet, connecting to Internet, Introduction to Internet services and tools, Client-Server Computing, Protocols Governing Web, Basic principles involved in developing a web site, Planning process, Types of Websites, Web Standards and W3C recommendations, Web Hosting Basics, Types of Hosting Packages, Introduction to Web testing, Functional Testing, Usability & Visual Testing, Performance & Load Testing.	**8 Hours**
Unit-2	**Introduction to HTML & XML** HTML, DOM- Introduction to Document Object Model, Basic structure of an HTML document, Mark up Tags, Heading-Paragraphs, Line Breaks, Understand the structure of HTML tables. Lists, Working with Hyperlinks, Image Handling, Understanding Frames and their needs, HTML forms for User inputs. New form Elements- date, number, range, email, search and data list, Understanding audio, video and article tags XML Syntax, Elements, Attributes, Namespaces, Display, HTTP request, Parser, DOM, XPath, XSLT, XQuerry, XLink, Validator, DTD and XML Schema.	**8 Hours**
Unit-3	**Concepts of CSS3 & Bootstrap** Creating Style Sheet, CSS Properties, CSS Styling (Background, Text Format, Controlling Fonts), Working with block elements and objects, Working with Lists and Tables, CSSIdandClass,BoxModel(Introduction,Borderproperties,PaddingProperties, Marginproperties) CSS Advanced(Grouping, Dimension, Display, Positioning, Floating, Align,Pseudoclass,NavigationBar,ImageSprites,Attributesector),CSSColor,CreatingpageLayoutandSite. Bootstrap Features & Bootstrap grid system, Bootstrap Components, Bootstrap Plug-Ins.	**8 Hours**
Unit-4	**JavaScript and ES6** Introduction to Java Script, JavascriptTypes, Var, Let and Const Keywords, Operators in JS, ConditionalStatements, Java Script Loops, JS Popup Boxes JS Events, JS Arrays, Working with Arrays, JS Objects,JS Functions Validation of Forms, Arrow functions and default arguments, Template Strings, Strings methods, Callback functions, Object de-structuring, Spread and Rest Operator, Typescript fundamentals, Typescript OOPs-Classes, Interfaces, Constructor etc. Decorator and Spread Operator, Asynchronous Programming in ES6, Promise Constructor, Promise with Chain, Promise Race.	**8 Hours**
Unit-5	**Introduction to PHP** Basic Syntax of PHP,Variables & Constants, Data Type, Operator & Expressions, Control flow and Decision making statements, Functions, Strings, Arrays, Understanding file& directory, Opening and closing, a file, Copying, renaming and deleting a file, working with directories, Creating and deleting folder, File Uploading	**8 Hours**

	&Downloading. Introduction to Session Control, Session Functionality What is a Cookie, Setting Cookies with PHP. Using Cookies with Sessions, Deleting Cookies, Registering Session variables, Destroying the variables and Session.	
Course outcome: After completion of this course students will be able to		
CO 1	Identify the basic facts and explaining the basic ideas of Web technology and internet.	K1, K2
CO 2	Applying and creating various HTML5 semantic elements and application with working on HTML forms for user input.	K3, K6
CO 3	Understanding and applyingtheconceptsofCreatingStyleSheetCSS3 and bootstrap.	K2, K3
CO 4	Analysing and implementing concept ofJavaScript and its applications.	K4, K6
CO 5	Creating and evaluating dynamic web pages using the concept of PHP.	K5, K6

Text books:

1. C Xavier, "Web Technology and Design", 1nd Edition 2003, New Age International.
2. Raj Kamal, "Internet and Web Technologies", 2nd Edition 2017,Mc Graw Hill Education.
3. Oluwafemi Alofe,"Beginning PHP Laravel",2nd Edition 2020, kindle Publication.

Reference Books:

1. Burdman, Jessica, "Collaborative Web Development" 5th Edition 1999, Addison Wesley Publication.
2. Randy Connolly, "Fundamentals of Web Development",3rd Edition 2016,
3. Ivan Bayross," HTML, DHTML, Java Script, Perl & CGI", 4th Edition 2010 BPB Publication

NPTEL/ YouTube/ Faculty Video Link:

https://youtu.be/96xF9phMsWA
https://youtu.be/Zopo5C79m2k
https://youtu.be/ZliIs7jHi1s
https://youtu.be/htbY9-yggB0

https://youtu.be/vHmUVQKXlVo
https://youtu.be/qz0aGYrrlhU
https://youtu.be/BsDoLVMnmZs
https://youtu.be/a8W952NBZUE

https://youtu.be/1Rs2ND1ryYc
https://youtu.be/vpAJ0s5S2t0
https://youtu.be/GBOK1-nvdU4
https://youtu.be/Eu7G0jV0ImY

https://youtu.be/-qfEOE4vtxE
https://youtu.be/PkZNo7MFNFg
https://youtu.be/W6NZfCO5SIk
https://youtu.be/DqaTKBU9TZk

https://youtu.be/_GMEqhUyyFM
https://youtu.be/ImtZ5yENzgE
https://youtu.be/xIApzP4mWyA
https://youtu.be/qKR5V9rdht0

B. TECH. THIRD YEAR

Subject Code: ACSEH0556	**L T P** **0 0 2**
Subject Name: Database Management System Lab	**Credit** **1**

List of Experiment:

Sr. No.	**Name of Experiment**	**CO**
1	Installing ORACLE/ MYSQL/NOSQL.	CO1
2	Creating Entity-Relationship Diagram using case tools with Identifying (entities, attributes, keys and relationships between entities, cardinalities, generalization, specialization etc.)	CO1
3	I. Implement DDL commands –Create, Alter, Drop etc. II. Implement DML commands- Insert, Select, Update, Delete	CO2
4	I. Implement DCL Commands-Grant and Revoke II. Implement TCL commands- Rollback, Commit, Save point III. Implement different type key:-Primary Key, Foreign Key and Unique etc.	CO2
5	Converting ER Model to Relational Model (Represent entities and relationships in Tabular form, Represent attributes as columns, identifying keys).	CO1,CO2
6	Practice Queries using COUNT, SUM, AVG, MAX, MIN, GROUP BY, HAVING, VIEWS Creation and Dropping.	CO2
7	Practicing Queries using ANY, ALL, IN, EXISTS, NOT EXISTS, UNION, INTERSECT, CONSTRAINTS etc.	CO2
8	Practicing Sub queries (Nested, Correlated) and Joins (Inner, Outer and Equi).	CO2
9	**Practicing on Triggers** - creation of trigger, Insertion using trigger, Deletion using trigger, Updating using trigger	CO4
10	**Procedures-** Creation of Stored Procedures, Execution of Procedure, and Modification of Procedure	CO4
11	**Cursors**- Declaring Cursor, Opening Cursor, Fetching the data, closing the cursor.L	CO4
12	Study of Open Source NOSQL Database: MongoDB (Installation, Basic CRUD operations, Execution)	CO5
13	Design and Develop MongoDB Queries using CRUD operations. (Use CRUD operations, SAVE method, logical operators)	CO5
14	Implement aggregation and indexing with suitable example using MongoDB.	CO5
15	Mini project (Design & Development of Data and Application) for following:- A. Inventory Control System. B. Material Requirement Processing. C. Hospital Management System. D. Railway Reservation System. E. Personal Information System. F. Web Based User Identification System. G. Timetable Management System. **H.** Hotel Management System	CO6

Lab Course Outcome: After completionof this course students will be able to		
CO 1	Design and implement the ER, EER model to solve the real world problem and Transform an information model into a relational database schema and to use a data.	K6
CO 2	Formulate and evaluate query using SQL solutions to a broad range of query and data update problems.	K6
CO 3	Apply and create PL/SQL blocks, procedure functions, packages and triggers, cursors.	K3,K6
CO 4	Analyze entity integrity, referential integrity, key constraints, and domain constraints on database.	K4
CO5	Demonstrate understanding of MongoDB and its query operations.	K3

B. TECH. THIRD YEAR		
Subject Code: ACSEH0554		**L T P 0 0 2**
Subject Name: Compiler Design Lab		**Credit 1**
List of Experiments:		
Sr. No.	**Name of Experiment**	**CO**
1.	Develop a lexical analyzer to recognize few patterns in C. (Ex. identifiers, constants, comments, operators etc.).	CO1
2.	Design a lexical analyzer for given language and the lexical analyzer should ignore redundant spaces, tabs and new lines.	CO1
3.	Write a C program to test whether a given identifier is valid or not.	CO1
4.	Implementation of recursive descent parser.	CO2
5.	Implementation of a Lexical Analyzer using LEX.	CO1
6.	Implementation of a parser for an expression grammar using LEX and YACC.	CO2
7.	Generate three address codes for a simple program using LEX and YACC.	CO3
8.	Generate and populate appropriate Symbol Table.	CO4
9.	Implementation of simple code optimization techniques (Constant folding, Strength reduction and Algebraic transformation)	CO5
10.	Generate an appropriate Target Code from the given intermediate code assuming suitable processor details.	CO5
Lab Course Outcome: After the completions of this course students will be able		
CO 1	Design Lexical analyzer for given language using C and LEX tools	K2
CO 2	Design and convert BNF rules into YACC form to generate various parsers.	K2,K4
CO 3	Generate machine code from the intermediate code forms	K3
CO 4	Implement Symbol table	K6
CO 5	Implement the back end of the compiler which takes the three address code	K6,K2

B. TECH. THIRD YEAR		
Subject Code: ACSEH0555		**L T P** **0 0 2**
Subject Name: Web Technology Lab		**Credit** **1**
List of Experiments:		
Sr. No.	**Name of Experiment**	**CO**
1.	Write HTML program to display your CV in navigator, your Institute website, Department Website and Tutorial website for specific subject.	CO2
2.	Write a program in XML for creation of DTD, which specifies set of rules. Create a style sheet in CSS/ XSL & display the document in internet explorer.	CO2
3.	Write a program to show the use of XML Schema.	CO2
4.	Write a CSS program to show use of Inline, Internal and External CSS.	CO3
5.	Write a program for CSS Box Model.	CO3
6.	Write a program to show the use of Bootstrap components and Grid System	CO3
7.	Write HTML program to design Registration form and Validate it using JavaScript.	CO1,CO4
8.	Write JavaScript program to show the use of Dialogue Boxes i.e. Alert, Confirm and Prompt Boxes.	CO4
9.	Write a program to show various types of JavaScript Events.	CO4
10.	Write a program in PHP to find the factorial of given number.	CO5
11.	Write a program in PHP to perform file handling.	CO5
12.	Write a PHP program to show the use of Session & Cookies.	CO5
Lab Course Outcome: After completionof this course students will be able to		
CO 1	Implementing the concepts and creating pages of HTML	K3
CO 2	Implementing the concepts and creating HTML and XML pages.	K3, K6
CO 3	Implementing the concepts of CSS and Bootstrap and Creation of various types of style sheets.	K3, K6
CO 4	Implementing JavaScript and creating Client Side Pages with functionalities.	K3, K6
CO 5	Implementing the concepts of PHP and creating Server Side Pages.	K3, K6

B. TECH. THIRD YEAR

Course code	ANC0501	L T P	Credits
Course Title	CONSTITUTION OF INDIA, LAW AND ENGINEERING	2 0 0	2

Course objective: To acquaint the students with legacies of constitutional development in India and help them to understand the most diversified legal document of India and philosophy behind it.

Pre-requisites: Computer Organization and Architecture

Course Contents / Syllabus

UNIT-I	INTRODUCTION AND BASIC INFORMATION ABOUT INDIAN CONSTITUTION	8 Hours

Meaning of the constitution law and constitutionalism, Historical Background of the Constituent Assembly, Government of India Act of 1935 and Indian Independence Act of 1947,Enforcement of the Constitution, Indian Constitution and its Salient Features, The Preamble of the Constitution, Fundamental Rights, Fundamental Duties, Directive Principles of State Policy, Parliamentary System, Federal System, Centre-State Relations, Amendment of the Constitutional Powers and Procedure, The historical perspectives of the constitutional amendments in India, Emergency Provisions: National Emergency, President Rule, Financial Emergency, and Local Self Government – Constitutional Scheme in India.

UNIT-II	UNION EXECUTIVE AND STATE EXECUTIVE	8 Hours

Powers of Indian Parliament Functions of Rajya Sabha, Functions of Lok Sabha, Powers and Functions of the President, Comparison of powers of Indian President with the United States, Powers and Functions of Vice-President, Powers and Functions of the Prime Minister, Judiciary – The Independence of the Supreme Court, Appointment of Judges, Judicial Review, Public Interest Litigation, Judicial Activism, LokPal, Lok Ayukta, The Lokpal and Lok ayuktas Act 2013, State Executives – Powers and Functions of the Governor, Powers and Functions of the Chief Minister, Functions of State Cabinet, Functions of State Legislature, Functions of High Court and Subordinate Courts.

UNIT-III	INTRODUCTION AND BASIC INFORMATION ABOUT LEGAL SYSTEM	8 Hours

The Legal System: Sources of Law and the Court Structure: Enacted law -Acts of Parliament are of primary legislation, Common Law or Case law, Principles taken from decisions of judges constitute binding legal rules. The Court System in India and Foreign Courtiers (District Court, District Consumer Forum, Tribunals, High Courts, Supreme Court). Arbitration: As an alternative to resolving disputes in the normal courts, parties who are in dispute can agree that this will instead be referred to arbitration. Contract law, Tort, Law at workplace.

UNIT-IV	INTELLECTUAL PROPERTY LAWS AND REGULATION TO INFORMATION	8 Hours
Intellectual Property Laws: Introduction, Legal Aspects of Patents, Filing of Patent Applications, Rights from Patents, Infringement of Patents, Copyright and its Ownership, Infringement of Copyright, Civil Remedies for Infringement, Regulation to Information, Introduction, Right to Information Act, 2005, Information Technology Act, 2000, Electronic Governance, Secure Electronic Records and Digital Signatures, Digital Signature Certificates, Cyber Regulations Appellate Tribunal, Offences, Limitations of the Information Technology Act.		
UNIT-V	**BUSINESS ORGANIZATIONS AND E-GOVERNANCE**	**8 Hours**
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.		
COURSE OUTCOMES: After completion of this course students will be able to		
CO 1	Identify and explore the basic features and modalities about Indian constitution.	K1
CO 2	Differentiate and relate the functioning of Indian parliamentary system at the center and state level.	K2
CO 3	Differentiate different aspects of Indian Legal System and its related bodies.	K4
CO 4	Discover and apply different laws and regulations related to engineering practices.	K4
CO 5	Correlate role of engineers with different organizations and governance models	K4

Text Books:

1. M Laxmikanth: Indian Polity for civil services and other State Examination,6th Edition, Mc Graw Hill
2. Brij Kishore Sharma: Introduction to the Indian Constitution, 8th Edition, PHI Learning Pvt. Ltd.
3. Granville Austin: The Indian Constitution: Cornerstone of a Nation (Classic Reissue), Oxford University Press.

Reference Books:

1. Madhav Khosla: The Indian Constitution, Oxford University Press.
2. PM Bakshi: The Constitution of India, Latest Edition, Universal Law Publishing.
3. V.K. Ahuja: Law Relating to Intellectual Property Rights (2007)

B. TECH. THIRD YEAR

Course code	ANC0502	L T P	Credits
Course Title	ESSENCE OF INDIAN TRADITIONAL KNOWLEDGE	2 0 0	2

Course objective: This course aims to provide basic knowledge about different theories of society, state and polity in India, Indian literature, culture, Indian religion, philosophy, science, management, cultural heritage and different arts in India.s

Pre-requisites: Computer Organization and Architecture

Course Contents / Syllabus

UNIT-I	SOCIETY STATE AND POLITY IN INDIA	8 Hours

State in Ancient India: Evolutionary Theory, Force Theory, Mystical Theory Contract Theory, Stages of State Formation in Ancient India, Kingship , Council of Ministers Administration Political Ideals in Ancient India Conditions' of the Welfare of Societies, The Seven Limbs of the State, Society in Ancient India, Purusārtha, Varnāshrama System, Āshrama or the Stages of Life, Marriage, Understanding Gender as a social category, The representation of Women in Historical traditions, Challenges faced by Women.

UNIT-II	INDIAN LITERATURE, CULTURE, TRADITION, AND PRACTICES	8 Hours

Evolution of script and languages in India: Harappan Script and Brahmi Script. The Vedas, the Upanishads, the Ramayana and the Mahabharata, Puranas, Buddhist And Jain Literature in Pali,Prakrit And Sanskrit, Sikh Literature, Kautilya's Arthashastra, Famous Sanskrit Authors, Telugu Literature, Kannada Literature,Malayalam Literature ,Sangama Literature Northern Indian Languages & Literature, Persian And Urdu ,Hindi Literature

UNIT-III	INDIAN RELIGION, PHILOSOPHY, AND PRACTICES	8 Hours

Pre-Vedic and Vedic Religion, Buddhism, Jainism, Six System Indian Philosophy, Shankaracharya, Various Philosophical Doctrines , Other Heterodox Sects, Bhakti Movement, Sufi movement, Socio religious reform movement of 19th century, Modern religious practices.

UNIT-IV	SCIENCE, MANAGEMENT AND INDIAN KNOWLEDGE SYSTEM	8 Hours

Astronomy in India, Chemistry in India, Mathematics in India, Physics in India, Agriculture in India, Medicine in India , Metallurgy in India, Geography, Biology, Harappan Technologies, Water Management in India, Textile Technology in India ,Writing Technology in India Pyrotechnics in India Trade in Ancient India/,India's Dominance up to Pre-colonial Times.

UNIT-V	CULTURAL HERITAGE AND PERFORMING ARTS	8 Hours

Indian Architect, Engineering and Architecture in Ancient India, Sculptures, Pottery, Painting, Indian Handicraft, UNESCO'S List of World Heritage sites in India, Seals, coins, Puppetry, Dance, Music, Theatre,

drama, Martial Arts Traditions, Fairs and Festivals, UNESCO'S List of Intangible Cultural Heritage, Calenders, Current developments in Arts and Cultural, Indian's Cultural Contribution to the World. Indian Cinema.

COURSE OUTCOMES: After completion of this course students will be able to

CO 1	Understand the basics of past Indian politics and state polity.	K2
CO 2	Understand the Vedas, Upanishads, languages & literature of Indian society.	K2
CO 3	Know the different religions and religious movements in India.	K4
CO 4	Identify and explore the basic knowledge about the ancient history of Indian agriculture, science & technology, and ayurveda.	K4
CO 5	Identify Indian dances, fairs & festivals, and cinema.	K1

Text Books:

1. Sivaramakrishna (Ed.), Cultural Heritage of India-Course Material, Bharatiya Vidya Bhavan, Mumbai, 5th Edition, 2014.
2. S. Baliyan, Indian Art and Culture, Oxford University Press, India
3. Nitin Singhania, Indian Art and Culture: for civil services and other competitive Examinations,3rd Edition,Mc Graw Hill

Reference Books:

1. Romila Thapar, Readings In Early Indian History Oxford University Press, India
2. Basham, A.L., The Wonder that was India (34th impression), New Delhi, Rupa & co.

B. TECH. THIRD YEAR

Subject code: ACSAIH0513	**L T P** **3 0 0**
Subject Name: Introduction to Artificial Intelligence	**Credits** **3**

Course objective: Introductory knowledge of historical perspective of AI and its foundations and familiarity with principles of AI toward problem solving, inference, perception, knowledge representation, and learning.

Pre-requisites: Basic Knowledge of Transform techniques.

Course Contents / Syllabus

Unit-1	**Introduction** Introduction to Artificial Intelligence, Historical developments of Artificial Intelligence, well defined learning problems, Designing a Learning System, Basics of problem-solving: problem representation paradigms, state space, Problem reduction, Constraint satisfaction, Applications of AI	**8 Hours**
Unit-2	**Search Techniques** Searching for solutions, Uninformed Search Strategies: DFS, BFS, Informed Search Strategies: Local search algorithms and optimistic problems, adversarial Search, Search for games, minimax, Alpha - Beta pruning, Heuristic Search techniques, Hill Climbing, Best-first search, Means Ends Analysis, Iterative deepening Heuristic Search and A*.	**8 Hours**
Unit-3	**Logic and Knowledge Representation** Introduction of Logic, Propositional Logic Concepts, Semantic Tableaux and Resolution in Propositional logic, FOPL, Semantic Tableaux and Resolution in FOPL, Logic Programming in Prolog. Production systems and rules for some AI problems: Water Jug Problem, Missionaries-Cannibals Problem, n-Queen problem, monkey banana problem, Travelling Salesman Problem. Knowledge representation, semantic nets, partitioned nets, parallel implementation of semantic nets. Frames, Common Sense reasoning and thematic role frames.	**8 Hours**
Unit-4	**Expert System** Architecture of knowledge-Based System, Rule-based systems, Forward and Backward Chaining, Frame Based systems. Architecture of Expert System, Agents and Environment, Forward & Backward chaining, Resolution, Probabilistic reasoning, Utility theory, Hidden Markov Models (HMM), Bayesian Networks.	**8 Hours**
Unit-5	**Planning &Uncertainty** Planning with state Space Search, Conditional Planning, Continuous planning, Multi-Agent Planning, Forms of learning, inductive learning, Reinforcement Learning, learning decision trees, Neural Net learning and Genetic learning. Probabilistic Methods, Bayesian Theory, Dempster Shafer Theory, Bayes Network. 19 Evolutionary computations: Swarm Intelligence, ant colony optimization Agents, Intelligent Agents, Structure of Intelligent Agents, Virtual Agents, Multi-agent systems. Case Study: Health Care, E Commerce, Smart Cities.	**8 Hours**

Course outcome: After completion of this course students will be able to:

CO 1	Understand fundamentals of the history of Artificial intelligence (AI) and its foundations	K2
CO 2	Apply principles of AI in solutions that require problem solving, inference and perception.	K3
CO 3	Explain strong familiarity with a number of important AI techniques, including in particular intelligent search methods and solutions.	K3
CO4	Apply the concepts of knowledge & reasoning of predicate logic and representing knowledge using rules and Probabilistic reasoning.	K3
CO 5	Evaluate critically the techniques presented and apply them to real world problems.	K5

Textbooks:

1) Stuart Russell, Peter Norvig, "Artificial Intelligence – A Modern Approach", Pearson Education. Fourth Edition 2021.

2) Elaine Rich and Kevin Knight, "Artificial Intelligence", McGraw-Hill 3rdEdition 2010.

Reference Books:

1) Patrick Henry Winston, "Artificial Intelligence", Pearson Education Inc., Third edition.
2) Python Machine Learning: Learn Python in a Week and Master It. An Hands-On Introduction to Artificial Intelligence Coding, a Project-Based Guide with Practical Exercises (7 Days Crash Course, Book 2) 2020.
3) Nils J.Nilsson, "Artificial Intelligence - A New Synthesis", Harcourt Asia Pvt. Ltd
4) AI in the Wild: Sustainability in the Age of Artificial Intelligence 2020.
5) Knowledge-Based Systems Techniques and Applications (4-Volume Set).

NPTEL/ YouTube/ Faculty Video Link:

https://nptel.ac.in/courses/106/106/106106198/

https://nptel.ac.in/courses/111/107/111107137/

https://nptel.ac.in/courses/106/106/106106202/

https://nptel.ac.in/courses/106/106/106106213/

https://nptel.ac.in/courses/106/105/106105152/

B. TECH. THIRD YEAR

Subject Code: ACSEH0515	**L T P** **3 0 0**
Subject Name: Machine Learning	**Credit** **3**

Course objective:

This course focuses on to enabling the student with basic knowledge on the techniques to build an intellectual machine for making decisions behalf of humans. This course covers the techniques on how to make learning by a model, how it can be evaluated, what are all different algorithms to construct a learning model.

Pre-requisites: Basic knowledge of Python language for Machine Learning

Course Contents / Syllabus

Unit-1	**Introduction** What is Machine Learning?, Fundamental of Machine Learning, Key Concepts and an example of ML, Basics of Python for machine learning, Machine Learning Libraries, Data Pre-processing, Handling Missing Values, Handling Outliers, One Hot Encoder & Feature Scaling	**8 Hours**
Unit-2	**Supervised Learning** Linear regression (Hands on lab), Multiple Regression, Problem visualization, Polynomial regression, Distance Metrics (Eculidean, Manhattan), Regression and Classification, Clustering, Gradient Descent, Logistic Regression, Regularization: Overfitting and underfitting, Cost Function for Logistic Regression, house price prediction (Hands on)	**8 Hours**
Unit-3	**Unsupervised Learning and Classification** Logistic regression(Classification), Defining cost, Gradient descent (Hands on lab) Other Techniques - Naïve Bayes, SVM, KNN, Unsupervised Learning: Nearest Neighbor, Cosine Similarity, Decision Trees - Intuition, Multiclass classification, Overfitting & Regularization - Ridge regression, Lasso regression for feature selection, Bagging - Random Forest for regression, Knowledge, Logic and Reasoning Planning, Random Forest for classification, Reasoning Under Uncertainty, Visualizing Decision boundaries, early stopping to prevent over fitting, Fraud detection problem (Hands on) , probabilities in classification, Random Forest for classification, Reasoning Under Uncertainty.	**8 Hours**
Unit-4	**Semi-Supervised Learning and Principal Component Analysis** Reinforcement Learning –Introduction to Reinforcement Learning, Learning Task, Example of Reinforcement Learning in Practice, Machine Learning Tools - Engineering applications, Dimensionality Reduction - principal component analysis (Hands on)	**8 Hours**
Unit-5	Boosting – XGBoost, Boosting – LightGBM, Collaborative Recommender System, Content based Recommender System, Knowledge based Recommender System, Creating Recommendation System like Movie Recommendation System using python	**8 Hours**

Course outcome: At the end of course, the student will be able

CO 1	To understand the need for machine learning for various problem solving	K1, K2
CO 2	Apply the concept of classification and regression problems .	K3, K5
CO 3	To understand a wide variety of learning algorithms and how to evaluate models generated from data	K1, K3

CO 4	To optimize the models learned and report on the expected accuracy that can be achieved by applying the models	K4, K5
CO 5	Design and implement various machine learning algorithms for real-world applications	K4

Text books

1. Kevin P. Murphy, "Machine Learning: A Probabilistic Perspective", MIT Press, 2012
2. Ethem Alpaydin, "Introduction to Machine Learning", Second Edition, Prentice Hall of India, 2010
3. Tom M. Mitchell, ―Machine Learning, McGraw-Hill Education (India) Private Limited, 2013.
4. Stephen Marsland, ―Machine Learning: An Algorithmic Perspective, CRC Press, 2009.
5. Pratap Dangeti, Statistics for Machine Learning, Packt Publishing, 2017.
6. E. Alpaydin, Introduction to Machine Learning, 3rd Edition, MIT Press, 2015.

Reference Books

1. Laurene Fausett, "Fundamentals of Neural Networks, Architectures, Algorithms and Applications", Pearson Education, 2008.
2. Tom Mitchell, "Machine Learning", McGraw-Hill, 1997
3. C. M. Bishop, "Pattern Recognition and Machine Learning", Springer, 2007.
4. Simon Haykin, "Neural Networks and Learning Machines", Pearson 2008.
5. C.M. Bishop, Pattern Recognition and Machine Learning, Springer, 2016
6. K. P. Murphy, Machine Learning: A Probabilistic Perspective, MIT Press, 2012

NPTEL/ YouTube/ Faculty Video Link:

https://www.youtube.com/watch?v=gmvvaobm7eQ&list=PLeo1K3hjS3uvCeTYTeyfe0-rN5r8zn9rw

https://www.youtube.com/watch?v=8jazNUpO3lQ&list=PLeo1K3hjS3uvCeTYTeyfe0-rN5r8zn9rw&index=2
https://www.youtube.com/watch?v=J_LnPL3Qg70&list=PLeo1K3hjS3uvCeTYTeyfe0-rN5r8zn9rw&index=3
https://www.youtube.com/watch?v=vsWrXfO3wWw&list=PLeo1K3hjS3uvCeTYTeyfe0-rN5r8zn9rw&index=4

https://www.youtube.com/watch?v=zM4VZR0px8E&list=PLeo1K3hjS3uvCeTYTeyfe0-rN5r8zn9rw&index=8
https://www.youtube.com/watch?v=J5bXOOmkopc&list=PLeo1K3hjS3uvCeTYTeyfe0-rN5r8zn9rw&index=9

https://www.youtube.com/watch?v=PHxYNGo8NcI&list=PLeo1K3hjS3uvCeTYTeyfe0-rN5r8zn9rw&index=10
https://www.youtube.com/watch?v=FB5EdxAGxQg&list=PLeo1K3hjS3uvCeTYTeyfe0-rN5r8zn9rw&index=11

https://www.youtube.com/watch?v=QrUPjFHqhhs&t=414s
https://www.youtube.com/watch?v=1qvlw21dnZA
https://www.youtube.com/watch?v=EFXeiD-jZrQ

B. TECH. THIRD YEAR

Subject Code: ACSAIH0514	**L T P** **3 0 0**
Subject Name: Introduction to Cloud Computing	**Credits** **3**

Course Objectives:

Introduce the concepts of Cloud Computing to understand Services &Storage. Gain aknledge of Resource Management and Security in Cloud.

Pre-requisites: Basics of Computer networking

Course Contents / Syllabus

Unit-1	**Introduction** Introduction to Cloud Computing, Definition of Cloud, Evolution of Cloud Computing, Underlying Principles of Parallel and Distributed Computing, Cloud Characteristics, Elasticity in Cloud, On-demand Provisioning, EC2 Instances and its types, Cloud economics.	**8 Hours**
Unit-2	**Cloud Enabling Technologies** Service Oriented Architecture, REST and Systems of Systems, Web Services, Publish Subscribe Model, Basics of Virtualization, Types of Virtualizations, Implementation Levels of Virtualization, Virtualization Structures, Tools and Mechanisms, Virtualization of CPU, Memory – I/O Devices, Virtualization Support and Disaster Recovery, networking fundamentals.	**8 Hours**
Unit-3	**Cloud Architecture, Services and Storage** Layered Cloud Architecture Design, NIST Cloud Computing Reference Architecture, Public, Private and Hybrid Clouds – IaaS – PaaS – SaaS, Architectural Design Challenges, database storages, Cloud Storage, Storage-as-a-Service –, Advantages of Cloud Storage –, Cloud Storage Providers - S3, RDS, EBS.	**8 Hours**
Unit-4	**Resource Management & Security in Cloud** Inter Cloud Resource Management, Resource Provisioning and Resource Provisioning Methods, Global Exchange of Cloud Resources, Security Overview – Cloud Security Challenges, Software-as-a-Service Security, Security Governance, Virtual Machine Security, IAM, Security Standards, VPC.	**8 Hours**
Unit-5	**Case Studies and Advancements** Case Study based on cloud computing, open Source& Commercial Engine, Programming Environment for Google App Engine, Open Stack, Federation in the Cloud, Four Levels of Federation, Federated Services and Applications, Future of Federation, serverless computing	**8 Hours**

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

CO 1	Understand the basics and Principles of Cloud Computing.	K2
CO 2	Describe the importance of virtualization and its types.	K2
CO 3	Use and examine different cloud computing services &storage.	K3
CO 4	Understand resource management and security in the cloud.	K2
CO 5	Analyze the components of open stack & Google app engine.	K4

Text Books:

1. Ritting house, John W., And James F. Ransome, ―Cloud Computing: Implementation, Management And Security, CRC Press, 2017.

2. Kai Hwang, Geoffrey C. Fox, Jack G. Dongarra, "Distributed And Cloud Computing, From Parallel Processing To The Internet Of Things", Morgan Kaufmann Publishers, 2013.
3. Raj kumarBuyya, Christian Vecchiola, S. Thamaraiselvi, ―Mastering Cloud Computing, Tata Mcgraw Hill, 2013.

Reference Books:

1. Toby Velte, Anthony Velte, Robert Elsenpeter, "Cloud Computing – A Practical
2. Approach, Tata Mcgraw Hill, 2009.
3. George Reese, "Cloud Application Architectures: Building Applications And
4. Infrastructure In The Cloud: Transactional Systems For EC2 And Beyond (Theory In Practice), O'Reilly, 2009**.**

NPTEL/ Youtube/ Faculty Video Link:

https://acloud.guru/
https://nptel.ac.in/courses/106/105/106105223/
https://nptel.ac.in/courses/106/104/106104182/
https://nptel.ac.in/courses/106/105/106105167/
https://aws.amazon.com/

B. Tech. Third Year

Subject Code: ACSAIH0520	**L T P** **3 0 0**
Subject Name: Cloud Virtualization	**Credits** **3**

Course objective:

The course intends to introduce students to the fundamentals of developing application on Cloud, specifically public clouds such as AWS, AZURE and Google.

Pre-requisites: Adequate knowledge of Basics of Cloud Computing and its architecture covered through courses prior to this semester.

Course Contents / Syllabus

Unit-1	**Cloud and Virtualization** Virtual Machines and Virtualization of Clusters Virtualization Structures/Tools and Mechanisms and Data Centers, Implementation Levels of Virtualization, Virtualization of CPU, Memory, and I/O Devices, Virtual Clusters and Resource Management, Virtualization for Data-Centre Automation.	**8 Hours**
Unit-2	**Virtualization Architecture** Architecture over Virtualized Data Centers, Cloud Computing and Service Models, Data-Centre Design and Interconnection Networks, Architectural Design of Compute and Storage Clouds, Public Cloud Platforms: GAB, AWS, and Azure, Inter-cloud Resource Management, Cloud Security and Trust Management.	**8 Hours**
Unit-3	**AWS Virtual Infrastructure** Building Virtual Infrastructure consisting of Servers and Networking, Using Virtual Servers: EC2, Programming your Infrastructure: The Command-Line Interface, SDKs, AWS CloudFormation, Automating Deployment: CloudFormation, Elastic Beanstalk, OPSWORKS, Securing your System: IAM, Security Groups, VPC.	**8 Hours**
Unit-4	**Cloud Storage and Migration Solutions** Storing data in the cloud, Storing your objects: S3 and Glacier, Securing your System: IAM, Security Groups, VPC, Storing your Data on Hard Drives: EBS and Instance Store, Using Relational Database Service: RDS, Programming for NoSQL DataBase Service: DynamoDB.	**8 Hours**
Unit-5	**Cloud Security & Virtualized Solutions** Federation in the Cloud, Presence in the Cloud, Privacy and Its Relation to Cloud-Based Information Systems, Cloud Security Challenges, Software-as-a-Service Security, Architecting on AWS, Achieving high Availability: Availability Zones, Auto-Scaling, CloudWatch, DeCoupling your Infrastructure: ELB and SQS, Designing for Fault-Tolerance, Scaling Up and Down: Auto-Scaling and Cloudwatch.	**8 Hours**

Course outcome: After completion of this course students will be able to:

CO 1	Understand the fundamentals and core of Virtualization	K2
CO 2	Create Virtual Machines (VM) and compute instances of various configurations.	K6
CO 3	Develop virtual private connections using various network virtualization techniques	K6
CO4	Understand and analyze virtual storage solutions for various usage.	K4

CO 5	Analyze cloud security solutions and monitoring tools to evaluate the performance of cloud resources.	K5

Textbooks:

1) Distributed and Cloud Computing: From Parallel Processing to the Internet of Things Geoffrey C. Fox, Jack Dongarra, and Kai Hwang.

2) Amazon Web Services in Action , Michael Wittig and Andreas Wittig

Reference Books:

1) 'Cloud Computing' by Shailendra Singh ; Oxford higher education 2022

NPTEL/Youtube/Faculty Video Link:

https://acloud.guru/
https://nptel.ac.in/courses/106105167

https://aws.amazon.com/
https://nptel.ac.in/courses/106105223

https://docs.aws.amazon.com/vpc
https://docs.aws.amazon.com/ElasticBeanstalk
https://docs.aws.amazon.com/EC2

https://docs.aws.amazon.com/S3

https://docs.aws.amazon.com/Security
https://docs.aws.amazon.com/CloudWatch

B. TECH. THIRD YEAR

Subject Code: ACSEH0511	**L T P** **3 0 0**
Subject Name: CRM Fundamentals	**Credits** **3**

Course objective:

This course is designed to help in understanding the fundamentals of CRM. It will help in providing better services for Sales, Marketing and Customer Relations in an Enterprise. To make the students understand the organizational need, benefits and process of creating long-term value for individual customers. To disseminate knowledge regarding the concept of e-CRM and e-CRM technologies. To enable the students understand the technological and human issues relating to implementation of Customer Relationship Management in the organizations.

Pre-requisites: None

Course Contents / Syllabus

Unit-1	**Introduction** CRM- definition, history, goals. Sources of CRM value. Components of CRM: people, process, technology. Evolution of CRM: marketing and its principles, customer relations to CRM.Dynamics of Customer Supplier Relationships, Nature and context of CRM, Strategy and Organization of CRM: strategy, The relationship-oriented organization: Mission, Culture, Structure, People, Communication & Information Systems.	**8 Hours**
Unit-2	**CRM Strategy and Framework** Developing a CRM strategy. Customer oriented (C in CRM), Relationship driven, 360 degree view of customer. CRM system features- functions, application, benefits and solutions. Importance of loyalty- active, passive, split, shifting and switchers, customer profiling, customer segmentation model, Customer Experience, relationship marketing and journey, Case study.	**8 Hours**
Unit-3	**Solution Design and Architecture** CRM system solution- specifications. Data Analysis, Solution Requirements. Types of CRM- On-Premise, cloud based. Pros and Cons of each. Integration CRM with other enterprise applications. The Technology of CRM: Data warehouses and customer relationships, creating data mart model, components of operational data warehouse.	**8 Hours**
Unit-4	**CRM for Business** CRM in Sales, Service, Marketing, E-commerce. Social Customer Relationship Management. Analytical CRM: Predictive Analytics vs Operational Analytics. Channel Partner Relationship management, Collaborative CRM (using data pooling), Business Benefits of Cloud Based System, SLAs, Practical Challenges.	**8 Hours**
Unit-5	**CRM implementation** Building CRM roadmaps: current processes, customers, strategic goals, technology	**8 Hours**

	issues, pilot and proof of concept projects. Preliminary Roadmap and its template, developing roadmap midstream. Design stage, custom development, integration, reporting, data migration, and implementation, testing, launching and application management. Introduction to following CRM tools: ZOHO, Pega, Microsoft Dynamics 365, Sales force.	

Course Outcome: At the end of course, the student will be able

CO 1	Understand the basic concepts of Customer relationship management.	K1, K2
CO 2	To understand strategy and framework of Customer relationship management.	K2
CO 3	Learn basics of Cloud Based Customer relationship management.	K1
CO 4	Understand Customer relationship management in context with business use cases.	K2, K3
CO 5	Understand implementation basics of CRM.	K2, K3

Text books:

1. CRM Fundamentals by Scott Kostojohn Mathew Johnson Brian Paulen. Apress, 2011.
2. Customer Relationship Management- How to develop and execute a CRM strategy By Michael Pearce, Business Expert Press, 2021.

Reference Books:

1. The CRM Handbook-A Business Guide to Customer Relationship Management by Jill Dyché; Addison-Wesley (for case studies)
2. Customer Relationship Management Systems handbook by Duane E Sharp. AUERBACH PUBLICATIONS by CRC Press Company

NPTEL/ YouTube/ Faculty Video Link:

https://onlinecourses.nptel.ac.in/noc20_mg57/preview

https://archive.nptel.ac.in/courses/110/105/110105145/

B. TECH. THIRD YEAR

Subject Code: ACSEH0513	**L T P** **3 0 0**
Subject Name: CRM Administration	**Credits** **3**

Course objective:

This course focus on to understand the concept of Sales force, and the concepts of Sales force App which familiarize with the concepts administration to undernderstand the concepts of Admin Essentials in Lightning Experience

Pre-requisites: Creative thinking and which is being used by the creative talent in your business areas.

Course Contents / Syllabus

Unit - 1	**Introduction** Sales force Platform Basics, User Management, Data Modelling ,Data Management, Identity Basic , Data Security ,Lightning Experience Customization, Lightning APP Builder Sales force Mobile App Customization, User Engagement , Formulas and Validation, Data Security, Picklist Administration	**8 Hours**
Unit - 2	**Lightning & Salesforce App Experience Customization** Formula and Validation, Accounts and Contacts for Lightning Experience, Lead and Opportunity for Lightning Experience, Product Quotes and Contracts, Campaign Basic	**8 Hours**
Unit- 3	**Salesforce Administration** Service Cloud for lightning Experience, Sales force mobile app customization, AppExchange basic Duplicate ManagementLightning Experience for Sales force Classic Users, Chatter Administration for Lightning Experience, Reports and Dashboards for lightning experience, Lightning experience customization, Lightning experience rollout , Sales force flow, Lightning experience report dashboard Specialist	**8 Hours**
Unit - 4	**Lightning Experience** Prepare Your Sales force Org for Users, Customize an Org to Support a New Business Unit, Protect Your Data in Sales force, Customize a Sales Path for Your Team, Customize a Sales force Object, Import and Export with Data Management Tools	**8 Hours**
Unit - 5	**Learn Admin Essentials in Lightning Experience** Create Reports and Dashboards for Sales and Marketing Managers, Improve Data Quality for Your Sales and Support Teams, Create a Process for Managing Support Cases, User Engagement, Business Administration Specialist	**8 Hours**

Course Outcome: At the end of course , the student will be able to

CO1	Understand the basic working environment of Sales force	K1,K2
CO2	Understand the concepts of Lightning & Sales force App Experience Customization	K1,K2
CO3	Familiarize with concepts reports chatter administration	K3
CO4	Understand the concepts of Lightning Experience	K1,K2
CO5	Learn Admin Essentials in Lightning Experience	K1,K3

Text Books:

1. Alok Kumar Rai, Customer Relationship Management : Concepts and Cases(Second Edition), PHI Learning, 2018
2. Bhasin- Customer Relationship Management (Wiley Dreamtech) ,2019
3. Sales force for beginners by ShaarifSahaalane book by Amazon (Online edition)
Reference Books:
1. Sales force Essentials for Administrators , By ShrivasthavaMohith, Edition Ist ,2018
2. Sales force : A quick Study laminated Reference Guide by Christopher Mathew Spencer eBook by Amazon (Online)
3. Mastering Sales force CRM Administration By Gupta Rakesh Edition IInd 2018
NPTEL/Youtube/Faculty Video Link:
www. Trailhead.salesforce.com
www.mindmajix.com/salesforce-tutorial
www,youtube.com/watch?v=7K42geizQCI

B. TECH. THIRD YEAR

Subject Code: ACSEH0512	**L T P** **3 0 0**
Subject Name: Python Web Development with Django	**Credits** **3**

Course objective:

This course focuses on how to design and build static as well as dynamic webpages and interactive web based applications. These courses mainly focus how Python operates within web development using the increasingly popular Django framework.

Pre-requisites: Students should have good knowledge of Python Programming and Python coding experience.

Course Contents / Syllabus

Unit-1	**Python libraries for web development** Collections-Container datatypes, Tkinter-GUI applications, Requests-HTTP requests, BeautifulSoup4-web scraping, Scrapy, Zappa, Dash, CherryPy, Turbo Gears, Flask, Web2Py, Bottle, Falcon, Cubic Web, Quixote, Pyramid.	**8 Hours**
Unit-2	**Introduction to Django Framework** Understanding Django environment, Features of Django and Django architecture, MVC and MTV, Urls and Views, Mapping the views to URLs, Django Template, Template inheritance Django Models, Creating model for site, Converting the model into a table, Fields in Models, Integrating Bootstrap into Django, Creating tables, Creating grids, Creating carousels.	**8 Hours**
Unit-3	**Integrating Accounts & Authentication on Django** Introduction to Django Authentication System, Security Problem & Solution with DjangoCreating Registration Form using Django, Adding Email Field In Forms, Configuring email settings, Sending emails with Django, Adding Grid Layout On Registration Page, Adding Page Restrictions, Login Functionality Test and Logout.	**8 Hours**
Unit-4	**Connecting SQLite with Django** Database Migrations, Fetch Data From Database, Displaying Data On Templates, Adding Condition On Data, Sending data from url to view, Sending data from view to template, Saving objects into database, Sorting objects, Filtering objects, Deleting objects, Difference between session and cookie, Creating sessions and cookies in Django.	**8 Hours**
Unit-5	**Deploying Django Web Application on Cloud** Creating a functional website in Django, Four Important Pillars to Deploy, Registering on Heroku and GitHub, Push project from Local System to GitHub, Working with Django Heroku Working with Static Root, Handling WSGI with gunicorn, Setting up Database & adding users	**8 Hours**

Course Outcome: After completion of this course students will be able to

CO 1	Apply the knowledge of python programing that are vital in understanding Django application and analyze the concepts, principles and methods in current client-side technology to implement Django application over the web.	K3,K6
CO 2	Demonstrate web application framework i.e. Django to design and implement typical dynamic web pages and interactive web based applications.	K3, K6
CO 3	Implementing and analyzing the concept of Integrating Accounts & Authentication on Django.	K3, K4

CO 4	Understand the impact of web designing by database connectivity with SQLite in the current market place where everyone uses to prefer electronic medium for shoping, commerce, and even social life also.	K2, K3
CO 5	Analyzing and creating a functional website in Django and deploy Django Web Application on Cloud.	K3, K6

Text books:

1. Martin C. Brown, "Python: The Complete Reference Paperback", 4th Edition 2018, McGraw Hill Education Publication.
2. Reema Thareja, "Python Programming: Using Problem Solving Approach", 3rd Edition 2017, Oxford University Press Publication.
3. Daniel Rubio, Apress," Beginning Django Web Application Development and Deployment with Python", 2nd Edition 2017, Apress Publication.
4. William Jordon, "Python Django Web Development: The Ultimate Django web framework guide for Beginners", 2nd Edition 2019, Kindle Edition.

Reference Books:

1. Tom Aratyn, "Building Django 2.0 Web Applications: Create enterprise-grade, scalable Python web applications easily with Django 2.0", 2nd Edition 2018, and Packt Publishing.
2. Nigel George, "Build a website with Django", 1st Edition 2019, GNW Independent Publishing Edition.
3. Ray Yao," Django in 8 Hours: For Beginners, Learn Coding Fast! 2nd Edition 2020, independently published Edition.
4. Harry Percival, "Test-Driven Development with Python: Obey the Testing Goat: Using Django, Selenium, and JavaScript", 2nd Edition 2019, Kindle Edition.

NPTEL/ YouTube/ Faculty Video Link:

https://youtu.be/eoPsX7MKfe8?list=PLIdgECt554OVFKXRpo_kuI0XpUQKk0ycO
https://youtu.be/tA42nHmmEKw?list=PLh2mXjKcTPSACrQxPM2_1Ojus5HX88ht7
https://youtu.be/8ndsDXohLMQ?list=PLDsnL5pk7-N_9oy2RN4A65Z-PEnvtc7rf
https://youtu.be/QXeEoD0pB3E?list=PLsyeobzWxl7poL9JTVyndKe62ieoN-MZ3
https://youtu.be/9MmC_uGjBsM?list=PL3pGy4HtqwD02GVgM96-V0sq4_DSinqvf

https://youtu.be/F5mRW0jo-U4
https://youtu.be/yD0_1DPmfKM?list=PLQVvvaa0QuDe9nqlirjacLkBYdgc2inh3
https://youtu.be/rHux0gMZ3Eg
https://youtu.be/jBzwzrDvZ18
https://youtu.be/RiMRJMbLZmg

https://youtu.be/8DF1zJA7cfc
https://youtu.be/CTrVDi3tt8o
https://youtu.be/FzGTpnI5tpo
https://youtu.be/z4lfVsb_7MA
https://youtu.be/WuyKxdLcw3w

https://youtu.be/UxTwFMZ4r5k
https://youtu.be/2Oe55iXjZQI
https://youtu.be/zV8GOI5Zd6E
https://youtu.be/uf2tdzh7Bq4
https://youtu.be/RzkVbz7Ie44

https://youtu.be/kBwhtEIXGII
https://youtu.be/Q_YOYNiSVDY
https://youtu.be/_3AKAdHUY1M
https://youtu.be/6DI_7Zja8Zc
https://youtu.be/UkokhawLKDU

B. TECH. THIRD YEAR

Subject Code: ACSEH0514	**L T P** **3 0 0**
Subject Name: Design Patterns	**Credits** **3**

Course objective:
The course objective is to familiarize the student with techniques for designing reusable combinations of Java classes and organizing their cooperation to produce modular and maintainable Java programs.

Pre-requisites: Object Oriented Analysis and Design. Data structures and algorithms. Programming Language (C++ or Java)

Course Contents / Syllabus

Unit-1	**Introduction** Describing Design Patterns ,Design Patterns in Smalltalk MVC,The Catalog of Design Patterns, Organizing the Catalogue, Design Patterns for Solving the Real life Problems, Selection and Use of Design patterns . Principle of least knowledge.	**8 Hours**
Unit-2	**Creational Design Pattern** Creational Patterns: Abstract Factory, Builder, Factory Pattern, Prototype Pattern, Singleton pattern.	**8 Hours**
Unit-3	**Structural Design Pattern** Structural Pattern Part-I, Adapter, Bridge, Composite. Structural Pattern Part-II, Decorator Pattern, Façade Pattern, Flyweight Pattern, Proxy Pattern.	**8 Hours**
Unit-4	**Behavioural Design Pattern – I** Behavioural Patterns Part: I, Chain of Responsibility Pattern, Command Pattern, Interpreter Pattern, Iterator Pattern. Behavioural Patterns Part: II, Mediator, Memento, Observer Pattern.	**8 Hours**
Unit-5	**Behavioural Design Pattern – II** Behavioural Patterns Part: III, State Patterns, Strategy, Template Patterns, Visitor, Expectation from Design Patterns	**8 Hours**

Course outcome: After completion of this course students will be able to

CO 1	Construct a design consisting of a collection of modules.	K2, K6
CO 2	Exploit well-known design patterns (such as Iterator, Observer, Factory and Visitor)	K4, K5
CO 3	Distinguish between different categories of design patterns	K4
CO 4	Ability to understand and apply common design patterns to incremental/iterative development	K2, K6
CO 5	Ability to identify appropriate patterns for design of given problem and Design the software using Pattern Oriented Architectures	K1, K2, K6

Text books:

1. Eric Freeman, Elisabeth Freeman, Kathy Sierra, Bert Bates Head First Design Patterns, 2004, O'Reilly

2. Erich Gamma, Richard Helm, Ralph Johnson, John Vlissides Design Patterns: Elements of Reusable Object-oriented Software Addison-Wesley, 1995
Reference Books:
1. Design Pattern s By Erich Gamma , Pearson Education
2. Patterns in JAVA Volume -I By Mark Grand, Wiley Dream
NPTEL/ YouTube/ Faculty Video Link:
https://youtu.be/C_oPLDaSy-8
https://youtu.be/NU_1StN5Tkk

B. TECH. THIRD YEAR

Subject Code : ACSEH0602	**L T P** **3 1 0**
Subject Name: Computer Networks	**Credits** **4**

Course objective:
Objective of this course is to develop an understanding of computer networking basics, different components of computer networks, various protocols, modern technologies and their applications.

Pre-requisites: Basic knowledge of Computer system and their interconnection, operating system, Digital logic and design and hands on experience of programming languages.

Course Contents / Syllabus

Unit-1	**Introduction** Goals and applications of networks, Categories of networks, Organization of the Internet, ISP, The OSI reference model, TCP/IP protocol suite, Network devices and components, Mode of communications **Physical Layer:** Network topology design, Types of connections, LAN, MAN and MAN Transmission media, Signal transmission and encoding, Network performance and transmission impairments, Switching techniques and multiplexing, IEEE standards.	**8 Hours**
Unit-2	**Data Link layer** Framing, Error Detection and Correction, Flow control (Elementary Data Link Protocols, Sliding Window protocols). Medium Access Control and Local Area Networks: Channel allocation, Multiple access protocols, LAN standards, Link layer switches & bridges.	**8 Hours**
Unit-3	**Network Layer** Point-to-point networks, Logical addressing, Basic internetworking (IP, CIDR, ARP, RARP, DHCP, ICMP), IPv4, Routing, forwarding and delivery, Static and dynamic routing, Routing algorithms and protocols, Congestion control algorithms, IPv6.	**8 Hours**
Unit-4	**Transport Layer** Process-to-process delivery, Transport layer protocols (UDP and TCP), Connection management, Flow control and retransmission, Window management, TCP Congestion control, Quality of service.	**8 Hours**
Unit-5	**Application Layer** Process-to-process delivery, Transport layer protocols (UDP and TCP), Connection management, Flow control and retransmission, Window management, TCP Congestion control, Quality of service.	**8 Hours**

Course outcome: After completion of this course students will be able to

CO 1	Build an understanding of the fundamental concepts and Layered Architecture of computer networking.	K2, K6
CO 2	Understand the basic concepts of link layer properties to detect error and develop the solution for error control and flow control.	K2, K6
CO 3	Design, calculate, and apply subnet masks and addresses to fulfil networking requirements and calculate distance among routers in subnet.	K3,K4, K6
CO 4	Understand the duties of transport layer, Session layer with connection management of TCP protocol.	K2, K4
CO 5	Discuss the different protocols used at application layer.	K2

Text books:

1. Behrouz Forouzan, “Data Communication and Networking” Fourth Edition-2006, Tata McGraw Hill
2. Andrew Tanenbaum “Computer Networks”, Fifth Edition-2011, Prentice Hall.
3. William Stallings, “Data and Computer Communication”, Eighth Edition-2008, Pearson.
Reference Books:
1. Kurose and Ross, “Computer Networking- A Top-Down Approach”, Eighth Edition-2021,Pearson.
2. Peterson and Davie, “Computer Networks: A Systems Approach”, Fourth Edition-1996, Morgan Kaufmann
NPTEL/ Youtube/ Faculty Video Link:
https://www.youtube.com/watch?v=LX_b2M3IzN8
https://www.youtube.com/watch?v=LnbvhoxHn8M
https://www.youtube.com/watch?v=ddM9AcreVqY
https://www.youtube.com/watch?v=uwoD5YsGACg
https://www.youtube.com/watch?v=bTwYSA478eA&list=PLJ5C_6qdAvBH01tVf0V4PQsCxGE3hSqEr https://www.youtube.com/watch?v=tSodBEAJz9Y

B. TECH. THIRD YEAR

Subject Code: ACSEH0601	**L T P** **3 0 0**
Subject Name: Advanced Java Programming	**Credits** **3**

Course objective:

Objective of this course is to provide the ability to design console based, GUI based ,web based applications, integrated development environment to create, debug and run multi-tier and enterprise-level applications.

Pre-requisites: Basics of C, C++, and basic concept of Core JAVA.

Course Contents / Syllabus

Unit-1	**Introduction** JDBC: Introduction, JDBC Driver, DB Connectivity, Driver Manager, Connection, Statement, Result Set, Prepared Statement, Transaction Management, Stored Procedures. Servlet: Servlet Overview, Servlet API, Servlet Interface, Generic Servlet, HTTP Servlet, Servlet Life Cycle, Redirect requests to other resources, Session Tracking, Event and Listener.	**8 Hours**
Unit-2	**JSP** **JSP:** Introduction, Overview, JSP Scriptlet Tag, JSP expression Tag, JSP declaration Tag, Life Cycle of JSP, JSP API, Implicit Objects: JSP request, JSP response, JSP config, JSP session, JSP Application, JSP PageContext; JSP Page, JSP Exception.	**8 Hours**
Unit-3	**Spring 5.0** **Spring 5.0**: Spring Core Introduction and Overview, Managing Beans, The Spring Container, The Factory Pattern, Dependency Injection (DI), Spring Managed Bean Lifecycle, Constructor Injection, Metadata/Configuration: Life Cycle Annotations, Java Configuration, XML Free configuration.	**8 Hours**
Unit-4	**Spring MVC & Spring Boot** Spring MVC: Introduction/Developing Web Application with Spring MVC, Advanced Techniques, Spring Controllers Spring Boot: Spring Boot Starters, CLI, Application Class, Logging, Auto Configuration Classes, Spring Boot dependencies, Spring data JPA introduction and Overview	**8 Hours**
Unit-5	**JPA** JPA: Introduction & overview of data persistence, Overview of ORM tools, Understanding JPA, Entities: Requirement for Entity Class, Persistent Fields and Properties, Primary keys in Entries, Entity Management, Querying Entities, Entities Relationships	**8 Hours**

Course outcome: After completion of this course students will be able to

CO 1	Understand the concept of implementing the connection between Java and Database using JDBC.	K2, K4
CO 2	Understand, Analyse, and Build dynamic web pages for server-side programming	K2, K3
CO 3	Analyze and design the Spring Core Modules and DI to configure and wire beans (application objects) together	K4,K5

CO 4	Design Model View Controller architecture and ready components that can be used to develop flexible and loosely coupled web applications.	K2, K3, K6
CO 5	Deploy JPA to Map, store, retrieve, and update data from java objects to relational databases and vice versa.	K5

Text books:

1. Bhave, “Programming with Java”, Pearson Education, 2009
2. Herbert Schieldt, “The Complete Refernce: Java”, TMH, 1991
3. Hans Bergsten, “Java Server Pages”, SPD O’Really, 1985
4. Katy Sierra and Bert Bates, “Head First: Java”, O’Really, 2008
5. Katy Sierra and Bert Bates, “Head First: Servlets & JSP”, O’Really , 2008

Reference Books:

1. NaughtonSchildt, “The Complete Refernce: JAVA2”, TMH ,1991
2. Balagurusamy E, “Programming in JAVA”, TMH, 2010
3. Introduction to Web Development with HTML,CSS,JavaScript(Cousera Course)

NPTEL/ YouTube/ Faculty Video Link:

https://youtu.be/96xF9phMsWA
https://youtu.be/Zopo5C79m2k
https://youtu.be/ZliIs7jHi1s
https://youtu.be/htbY9-yggB0

https://youtu.be/vHmUVQKXlVo
https://youtu.be/qz0aGYrrlhU
https://youtu.be/BsDoLVMnmZs
https://youtu.be/a8W952NBZUE

https://youtu.be/1Rs2ND1ryYc
https://youtu.be/vpAJ0s5S2t0
https://youtu.be/GBOK1-nvdU4
https://youtu.be/Eu7G0jV0ImY

https://youtu.be/-qfEOE4vtxE
https://youtu.be/PkZNo7MFNFg
https://youtu.be/W6NZfCO5SIk
https://youtu.be/DqaTKBU9TZk

https://youtu.be/_GMEqhUyyFM
https://youtu.be/ImtZ5yENzgE
https://youtu.be/xIApzP4mWyA
https://youtu.be/qKR5V9rdht0

B. TECH. THIRD YEAR

Subject Code: ACSEH0603	**L T P** **3 0 0**
Subject Name: Software Engineering	**Credits** **3**

Course objective:

"To teach the students all phases of the Software Development Life Cycle(SDLC) and their role in software development through theory as well as practice." Students will be able to apply the scientific knowledge in systematic way to create and build cost effective software solutions.

Pre-requisites: Basic knowledge about software and its types. Basic knowledge of OOPs concepts.

Course Contents / Syllabus

Unit-1	**Introduction** Introduction: Evolving role of software, Software Characteristics, Software crisis, Silver bullet, Software myths, Software Engineering Phases, Team Software Process (TSP), emergence of software engineering, Software process, project and product, Software Process Models: Waterfall Model, Prototype Model, Spiral Model, Iterative Model, Incremental Model, Agile Methodology: Scrum Sprint, Scrum Team, Scrum Master, Product Owner.	**8 Hours**
Unit-2	**Software Requirement** Software Requirement Specifications (SRS): Requirement Engineering Process: Elicitation, Analysis, Documentation, Review and Management of User Needs, Feasibility Study, Information Modelling, Use Case Diagram, Data Flow Diagrams, Entity Relationship Diagrams,Decision Tables, SRS Document, IEEE Standards for SRS. Software Quality Assurance (SQA): Quality concepts, SQA activities, Formal approaches to SQA; Statistical software quality assurance; CMM, The ISO standard.	**8 Hours**
Unit-3	**Software Design** Software Design: Design principles, the design process; Design concepts: refinement, modularity: Cohesion, Coupling, Effective modular design: Functional independence, Design Heuristics for effective modularity, Software architecture: Function Oriented Design, Object Oriented Design: OOPs concepts-Abstraction, object, classification, inheritance, encapsulation, UML Diagrams-Class Diagram, Interaction diagram, Activity Diagram, control hierarchy: Top-Down and Bottom-Up Design, structural partitioning, software procedure.	**8 Hours**
Unit-4	**Software Testing** Software Testing: Testing Objectives, 7 Principals of Testing, Levels of Testing: Unit Testing, System Testing, Integration Testing, User Acceptance Testing, Regression Testing, Testing for Functionality and Testing for Performance, Top Down and Bottom-Up Testing Strategies: Test Drivers and Test Stubs, Structural Testing (White Box Testing), Functional Testing (Black Box Testing), Test Data Suit Preparation, Alpha and Beta Testing of Products. Functional Testing(DAO, BO) Static Testing Strategies: Formal Technical Reviews (Peer Reviews), Walk Through, Code Inspection, Compliance with Design and Coding Standards.	**8 Hours**
Unit-5	**Project Maintenance and management concepts**	**8 Hours**

	Project management concepts, Planning the software project, Estimation: Software Measurement and Metrics, Various Size Oriented Measures-LOC based, FP based, Halestead's Software Science, Cyclomatic Complexity Measures: Control Flow Graphs, Use-case based, empirical estimation COCOMO- A Heuristic estimation techniques, staffing level estimation, team structures, risk analysis and management. Configuration Management, Software reengineering: reverse engineering, restructuring: forward engineering, Clean Room software engineering. Case Tools, Software Maintenance: Preventive, Corrective and Perfective Maintenance, Cost of Maintenance, Need of Maintenance.	

Course outcome: After completion of this course students will be able to		
CO 1	Identify, formulate, analyse, and solve problems, as well as identify the computing requirements appropriate to their solutions. The ability to work in one or more significant application domains	K2,K4,K5
CO 2	Design, implement, and evaluate software-based systems, components, or programs of varying complexity that meet desired needs, satisfy realistic constraints, and demonstrate accepted design and development principles.	K2,K3,K4,K6
CO 3	Apply knowledge of computing, mathematics, science, and engineering appropriate to the discipline, particularly in the modelling and design of software systems and in the analysis of trade-offs inherent in design decisions.	K3,K4
CO 4	Formulate testing strategies for software system, apply various testing techniques such as unit testing, test driven development and functional testing.	K3
CO 5	Understand ability to engage in life-long maintenance and continuing Software development using various software management tools.	K2, K5

Text books:

1. K.K. Aggarwal and Yogesh Singh, Software Engineering, New Age International Publishers 3RDEdition(December 11, 2008)
2. RS Pressman, Software Engineering: A Practitioners Approach, McGraw Hill. 7thEdition.(14-Jan-2022)
3. Rajib Mall, Fundamentals of Software Engineering, PHI Publication.4thEdition.(1 January 2014)

Reference Books:

1. Pankaj Jalote, Software Engineering, Wiley. (1 January 2010)
2. Ghezzi, M. Jarayeri, D. Manodrioli, Fundamentals of Software Engineering, PHI Publication. 2nd Edition. (1 January 2007)
3. Kassem Saleh, "Software Engineering", Cengage Learning. (2009)
4. Ian Sommerville, Software Engineering, Addison Wesley. 9th Edition.(29 October 2017)

NPTEL/ Youtube/ Faculty Video Link:

https://youtu.be/x-jqSXYE4S4

https://youtu.be/mGkkZoFc-4I

https://youtu.be/sGxgZxwuHzc

https://youtu.be/BNk7vni-1Bo

https://youtu.be/8swQr0kckZI

B. TECH. THIRD YEAR		
Subject Code: ACSEH0651		**L TP 0 0 2**
Subject Name: Advanced Java Programming Lab		**Credit 1**
List of Experiments:		
Sr. No.	**Name of Experiment**	**CO**
1	Program to illustrate JDBC connectivity. Program for maintaining database by sending queries. Design and implement a simple servlet book query with the help of JDBC & SQL. Create MS Access Database, create on ODBC link, Compile &Execute JAVA JDVC Socket.	CO1
2	Install TOMCAT web server and APACHE. Access the above developed static web pages for books web site, using these servers by putting the web pages developed.	CO1
3	Assume four users user1, user2, user3 anduser4havingthepasswordspwd1, pwd2, pwd3 and pwd4respectively. Write a servlet for doing the following. CreateaCookieandaddthesefour-user id's and passwords to this Cookie.2. Read the user id and passwords entered in the Login form and authenticate with the values available in the cookies.	CO1, CO2
4	Install a database (MySQL or Oracle). Create a table which should contain at least the following fields: name, password, email-id, phone number Write a java program/servlet/JSP to connect to that database and extract data from the tables and display them. Insert the details of the users who register with the web site, whenever a new user clicks the submit button in the registration page.	CO2
5	Write a JSP which insert the details of the 3 or 4 users who register with the web site by using registration form. Authenticate the user when he submits the login form using the user's name and passwordfromthedatabase.Design and implement a simple shoppingcart examplewithsessiontrackingAPI.	CO2
6	Create the First Spring Application using command Prompt and print the value from XML.	CO3
7	Create the First Spring Application using eclipse and print the value from XML.	CO3
8	Write the program to inject primitive and string-based values using Constructor Injection.	CO3
9	Write the program to inject primitive and string-based values using Setter Injection.	CO3
10	Write the program for Spring Web MVC Framework.	CO4
11	Write the program for Spring Boot Example.	CO4
12	Write a program to transform a regular Java class into an entity class with the help of an example.	CO5
Lab Course Outcome: After the completions of this course students will be able to		

CO**1**	learn to access database through Java programs, using Java Data Base Connectivity (JDBC)	K2, K3, K6
CO2	Analyze the performance of JSP over Servlet and to develop the JSP page.	K2, K4
CO3	Implementing Spring Application usingXML with the help of Command Prompt and Eclipse	K3, K6
CO4	Design and Deployweb pageusing Spring MVC and Spring Boot.	K3, K6
CO5	Understand, analyze, and apply the role of JPA to solve real world problem	K2, K3, K5

B. TECH. THIRD YEAR		
Subject Code: ACSEH0652		**L T P** **0 0 2**
Subject Code: Computer Network Lab		**Credit** **1**
List of Experiments:		
Sr. No.	**Name of Experiment**	**CO**
1	To make an UTP cable with RJ-45 connector, and build and test simple network using UTP cable (crossover) and a hub based network**.**	CO1
2	Implementation of data link layer framing method such as bit stuffing in any language like C++ ,Java or Python.	CO2
3	Test the Network connection using ping command and use of ipconfig, netstat and trcert command provided by TCP/IP.	CO3
4	Implementation of CRC algorithm in any language like C++ , Java or Python.	CO3
5	Implementation of stop and wait protocol in any language like C++ , Java or Python.	CO3
6	Implementation of hamming code (7, 4) code to limit the noise. We have to code the bit data in to 7bit data by adding 3 parity bits. Implement in in any language like C++ , Java or Python.	CO3
7	Implementation of Caesar cipher technique & RSA algorithm in any language like C++ , Java or Python.	CO4
8	Write a program in java to find the IP address of the system.	CO4
9	Write a program in java to find the IP address of the any site if name is given.	CO4
10	Introduction to Network Devices (Repeater, Hub, Bridge, Switch, Router, Gateways, NIC etc.).	CO5
11	Introduction to CISCO Packet Tracer. Design Bus, Star, Mesh, Ring Topology and check the connectivity using ping command.	CO5
12	Switch Configuration on CISCO packet tracer using CLI.	CO5
Lab Course Outcome: After the completions of this course students will be able to		
CO 1	Build an understanding of UTP cable with RJ-45 connector, and build and test simple network using UTP cable.	K2, K4, K6
CO 2	Understand and implementation of the bit stuffing protocol.	K2,K3
CO 3	Understand and test the various network connection commands of TCP/IP and error control, flow control.	K2,K4
CO 4	Understand and implementation of the concept of IP addressing and security technique like Caesar cipher and RSA.	K2,K3
CO 5	Design and understanding the various topology and configuration of switch and router using cisco packet tracer	K2,K6

B. TECH. THIRD YEAR		
Subject Code: ACSEH0653		**L T P** **0 0 2**
Subject Name: Software Engineering Lab		**Credit** **1**
List of Experiment:		
Sr. No.	**Name of Experiment**	**CO**
1	Team formation and allotment of Mini project: Problem statement, Literature survey, Requirement analysis.	CO1
2	Draw the use case diagram: specify the role of each of the actors, Data Flow Diagram(DFD): All levels.	CO2
3	Design an ER diagram for with multiplicity.	CO2
4	Prepare a SRS document in line with the IEEE recommended standards.	CO2
5	Create a Software Design Document(SDD): Object and Class diagram.	CO3
6	Create Interaction diagram: sequence diagram, collaboration diagram for SDD.	CO3
7	Create Activity diagram and Component diagram for SDD	CO4
8	Estimation of Test Coverage Metrics and Structural Complexity.	CO5
9	Design test suite for equivalence class partitioning.	CO5
10	Design test cases for Boundary value analysis	CO5
11	Mini Project with CASE tools.	CO4
Lab Course Outcome: After completion of this course students will be able to		
CO 1	Formulate and propose a plan for creating a model for real world problems.	K2,K4,K6
CO 2	Analyzestructural Modeling.	K4
CO 3	Understandbehavioral Modeling.	K2
CO 4	Create architectural Modeling.	K6
CO 5	Apply various testing strategies.	K3, K4

B. TECH. THIRD YEAR

Subject Code : ACSAIH0613	**L T P** **3 0 0**
Subject Name: Deep Learning	**Credits** **3**

Course objective:

To be able to learn unsupervised techniques and provide continuous improvement in accuracy and outcomes of various datasets with more reliable and concise analysis results.

Pre-requisites: Python, Basic Modeling Concepts.

Course Contents / Syllabus

Unit-1	**Introduction** **Model Improvement and Performance:** Curse of Dimensionality, Bias and Variance Trade off, Overfitting and underfitting, Regression - MAE, MSE, RMSE, R Squared, Adjusted R Squared, p-Value, Classification - Precision, Recall, F1, Other topics, K-Fold Cross validation, RoC curve, Hyper-Parameter Tuning Introduction – Grid search, random search, Introduction to Deep Learning. **Artificial Neural Network:** Neuron, Nerve structure and synapse, Artificial Neuron and its model, activation functions, Neural network architecture: Single layer and Multilayer feed forward networks, recurrent networks. Various learning techniques; Perception and Convergence rule, Hebb Learning. Perceptron's, Multilayer perceptron, Gradient descent and the Delta rule, Multilayer networks, Derivation of Backpropagation Algorithm.	**8 Hours**
Unit-2	**Convolution Neural Network** What is computer vision? Why Convolutions (CNN)? Introduction to CNN,Train a simple convolutional neural net,Explore the design space for convolutional nets, Pooling layer motivation inCNN, Design a convolutional layered application, Understanding and visualizing aCNN, Transfer learning and fine-tuningCNN, Image classification,Text classification, Image classification and hyper-parameter tuning, Emerging NN architectures.	**8 Hours**
Unit-3	**Detection & Recognition** Padding & Edge Detection, Strided Convolutions, Networks in Networks and 1x1Convolutions, Inception Network Motivation, Object Detection, YOLO Algorithm.	**8 Hours**
Unit-4	**Recurrent Neural Networks** Why use sequence models? Recurrent Neural Network Model, Notation, Back-propagation through time (BTT), Different types of RNNs, Language model and sequence generation, Sampling novel sequences, Vanishing gradients with RNNs, Gated Recurrent Unit (GRU), Long Short-Term Memory (LSTM), Bidirectional RNN, Deep RNNs.	**8 Hours**
Unit-5	**Auto Encoders in Deep Learning** Auto-encoders and unsupervised learning, Stacked auto-encoders and semi-supervised learning, Regularization - Dropout and Batch normalization.	**8 Hours**

Course outcome: After completion of this course students will be able to

CO 1	Analyze ANN model and understand the ways of accuracy measurement.	K4
CO 2	Develop a convolutional neural network for multi-class classification in images	K6
CO 3	Apply Deep Learning algorithm to detect and recognize an object.	K3
CO 4	Apply RNNs to Time Series Forecasting, NLP, Text and Image Classification.ss	K3
CO 5	Apply Lower-dimensional representation over higher-dimensional data for dimensionality reduction and capture the important features of an object.	K3

Text books:

1. Zurada and Jacek M, “Introduction to Artificial Neural Systems”, West Publishing Company, 1992, ISBN: 9780534954604
2. Bishop, C. M. Neural Networks for Pattern Recognition. Oxford University Press. 1995.
3. Simon Haykin, “Neural Networks and Learning Machines” Third Edition
4. Deep Learning", I Goodfellow, Y Bengio and A Courville, 1st Edition 2016
5. Introduction to Machine Learning with Python “, by Andreas C. Müller, Sarah Guido
6. R2. Deep Learning with Python by François Chollet 1st Edition

Reference Books:

1. Aston Zhang, Zachary C. Lipton, Mu Li, and Alexander J. Smola“Dive into Deep Learning”, Release 0.17.4
2. Artificial Intelligence: A Modern Approach. Prentice Hall Series in Arti ϒRussell, S. and Norvig, N. Arti Intelligence. 2003.

NPTEL/ Youtube/ Faculty Video Link:

(371) Lec-1 Introduction to Artificial Neural Networks - YouTube
(3) Deep Learning(CS7015): Lec 8.1 Bias and Variance - YouTube
(3) Mod-10 Lec-39 Assessing Learnt classifiers; Cross Validation; - YouTube
(3) Lec-1 Introduction to Artificial Neural Networks - YouTube
(3) Lec-2 Artificial Neuron Model and Linear Regression - YouTube
(3) Evaluation and Cross-Validation - YouTube

(3) Lecture 1 | Introduction to Convolutional Neural Networks for Visual Recognition - YouTube
(3) Lecture 2 | Image Classification - YouTube
(3) Lecture 3 | Loss Functions and Optimization - YouTube
(3) Hyperparameter optimization - YouTube
(3) Deep Learning(CS7015): Lec 11.3 Convolutional Neural Networks - YouTube

(3) C4W3L09 YOLO Algorithm - YouTube
(3) Edge Detection - YouTube
(3) Neural Networks - Networks in Networks and 1x1 Convolutions - YouTube

(3) Backpropagation in CNNs - YouTube
(3) Deep RNNs and Bi- RNNs - YouTube
(3) Deep Learning(CS7015): Lec 13.4 The problem of Exploding and Vanishing Gradients - YouTube
(3) Deep Learning(CS7015): Lec 14.2 Long Short Term Memory(LSTM) and Gated Recurrent Units(GRUs) - YouTube

(3) Deep Learning(CS7015): Lec 7.1 Introduction to Autoncoders - YouTube
(3) Deep Learning(CS7015): Lec 9.5 Batch Normalization - YouTube
(3) Deep Learning(CS7015): Lec 7.3 Regularization in autoencoders (Motivation) - YouTube

B. TECH. THIRD YEAR

Subject Code: ACSAIH0619	**L T P** **3 0 0**
Subject Name: Business Intelligence and Data Visualization	**Credits** **3**

Course objective: This course covers fundamental concepts of Business Intelligence tools, techniques, components and its future.As well as a bit more formal understanding of data visualization concepts and techniques. The underlying theme in the course is feature of Tableau, its capabilities.

Pre-requisites: Basic Knowledge of Business intelligence.

Course Contents / Syllabus

Unit-1	**Introduction To Business Intelligence** Business Intelligence (BI), Scope of BI solutions and their fitting into existing infrastructure, BI Components and architecture, BI Components, Future of Business Intelligence, Functional areas of BI tools, End user assumptions, setting up data for BI, Data warehouse, OLAP and advanced analytics, Supporting the requirements of senior executives including performance management, Glossary of terms and their definitions specific to the field of BI and BI systems.	**8 Hours**
Unit-2	**Elements Of Business Intelligence Solutions** Business Query and Reporting, Reporting, Dashboards and Scorecards Development, Development, Scorecards, Metadata models, Automated Tasks and Events, Mobile Business Intelligence, Software development kit (SDK). Stages of Business Intelligence Projects, Project Tasks, Risk Management and Mitigation, Cost justifying BI solutions and measuring success, BI Design and Development, Building Reports, Building a Report, Drill-up, Drill-down Capabilities.	**8 Hours**
Unit-3	**TABLEAU** **Introductions and overview:** What Tableau can and cannot do well, Debug and troubleshoot installation and configuration of the software. **Creating Your First visualization:** Getting started with Tableau Software, Using Data file formats, connecting your Data to Tableau, creating basic charts (line, bar charts, Tree maps), Using the Show me panel **Tableau Calculations:** Overview of SUM, AVR, and Aggregate features Creating custom calculations and fields, Applying new data calculations to your visualization. **Formatting Visualizations:** Formatting Tools and Menus, formatting specific parts of the view, Editing and Formatting Axes.	**8 Hours**
Unit-4	**Data Visualization** **Manipulating Data in Tableau:** Cleaning-up the data with the Data Interpreter, structuring your data, Sorting, and filtering Tableau data, Pivoting Tableau data. **Advanced Visualization Tools:** Using Filters, Using the Detail panel Using the Size panels, customizing filters, Using and Customizing tooltips, Formatting your data with colours. **Creating Dashboards & Stories:** Using Storytelling, creating your first dashboard and Story, Design for different displays, Adding interactivity to your Dashboard	**8 Hours**

	Distributing & Publishing Your Visualization: Tableau file types, Publishing to Tableau Online, sharing your visualization, Printing, and exporting. **Given a case study**: Perform Interactive Data Visualization with Tableau	
Unit-5	**Introduction to Power BI** Describe the Power BI ecosystem, Define Power BI and its relationship with Excel, Discuss the Power BI suite of products, Describe how the Power BI products integrate, Explain the typical analytics process flow, Differentiate between the various data sources, Connect Power BI to a data source, Clean and transform data to ensure data quality, Load the data to the Power BI Data Model, Describe the Power BI ecosystem, Define Power BI and its relationship with Excel, Discuss the Power BI suite of products, Describe how the Power BI products integrate, Explain the typical analytics process flow.	**8 Hours**
Course outcome: After completion of this course students will be able to		
CO 1	Apply quantitative modelling and data analysis techniques to the solution of real-world business problems	K3
CO 2	Understand the importance of data visualization and the design and use of many visual components	K2
CO 3	Understand as products integrate defining various analytical process flow.	K2
CO 4	Learn the basics of troubleshooting and creating charts using various formatting tools.	K6
CO 5	Learn basics of structuring data and creating dashboard stories adding interactivity dashboard stories.	K6
Textbooks:		
1. Efraim Turban, Ramesh Sharda, DursunDelen, "Decision Support and Business Intelligence Systems", 9th Edition, Pearson 2013.		
2. Learning Tableau 10 - Second Edition: Business Intelligence and data visualization that brings your business into focus" by Joshua N. Milligan		
3. Tableau Your Data! - "Daniel G. Murray and the Inter Works BI Team"-Wiley		
Reference Books:		
1. Larissa T. Moss, S. Atre, "Business Intelligence Roadmap: The Complete Project Lifecycle of Decision Making", Addison Wesley, 2003.		
2. Carlo Vercellis, "Business Intelligence: Data Mining and Optimization for Decision Making", Wiley Publications, 2009.		
3. David Loshin Morgan, Kaufman, "Business Intelligence: The Savvy Manager"s Guide", Second Edition, 2012.		
NPTEL/ Youtube/ Faculty Video Link:		
Introduction to Business Intelligence - YouTube		
Business Intelligence Tutorial - YouTube		
What Is Power BI? | Introduction To Microsoft Power BI | Power BI Training | Edureka - YouTube		
https://www.tableau.com/academic/students		
Top 10 Data Visualization Tools in 2020 | Best Tools for Data Visualization | Edureka - YouTube Learn Data Visualization Using Tableau | Tableau Tutorial | Tableau | Edureka Live - YouTube		

B. TECH. THIRD YEAR

Subject Code: ACSAIH0611	**L T P** **3 0 0**
Subject Name: Cloud Storage Management	**Credits** **3**

Course objective:

The course intends to introduce students to the fundamentals of cloud storage applications and services, specifically private clouds such as AWS, AZURE and Google.

Pre-requisites: Adequate knowledge of Basics of Cloud Computing and its architecture covered through courses prior to this semester.

Course Contents / Syllabus

Unit-1	**Introduction** Importance of data storage - Business issues and IT challenges - Business and IT opportunities opportunity for Cloud, Virtualization and Data Storage Networking - Server and Storage I/O Fundamentals - I/O connectivity and Networking Fundamentals - IT Clouds - Virtualization - Virtualization and Storage Services - Data and Storage Access.	**8 Hours**
Unit-2	**Cloud Infrastructure and Storage** Managing Data Infrastructures for Cloud and Virtual Environments, Being Secure without Being Scared - Eliminating Blind Spots, Gaps in Coverage, or Dark Territories - Security Threat Risks Challenges - Taking Action to resources - Securing Networks- Securing Storage - Virtual Servers, Physical Servers, and Desktops - Security Clouds - Disposing of Digital Assets and Technology - Security Checklist.	**8 Hours**
Unit-3	**Cloud Storage Solutions** Tiered Storage - Storage Reliability - Availability - Serviceability (RAS) - Storage Services and Functionalities - Storage System Architectures - Storage Virtualization and Virtual Storage, Cloud storage, Types of storage in cloud, AWS: S3, EBS, EFS FSx. Google Cloud Storage: Persistent Disk, Filestore, Cloud Storage, Archival storage. Hybrid cloud storage: AWS storage gateway.	**8 Hours**
Unit-4	**Cloud Infrastructure and Migration Solutions** Data Movement and Migration, IaaS migration, PaaS Migration, SaaS migration, VM migration, Migration solutions, AWS: Snow family, DataSync, Transfer family. Google cloud migration, Database Migration Services (DMS).	**8 Hours**
Unit-5	**Migration Case Study** Case Study 1: The company struggled with the maintenance difficulties and lack of scalability of the bare metal infrastructure supporting their operations. Case Study 2: Analyse the benefits with data of a company that has switched its computing solutions to cloud.	**8 Hours**

Course outcome: After completion of this course students will be able to:

CO 1	Understand the basics of data storage, Virtualization and storage services	K2
CO 2	Analyze the infrastructures for Cloud storage	K4

CO 3	Evaluate the storage solutions	K5
CO4	Understand cloud migration solutions	K2
CO 5	Analyze cloud migration solutions on different needs	K4

Textbooks:

1) AWS Docs.

NPTEL/ YouTube/Faculty Video Link:

s07/slides/cse497b-lecture-26-virtualmachine.pdf

https://docs.aws.amazon.com/Security

https://aws.amazon.com/what-is-cloud-storage/
https://docs.aws.amazon.com/S3

https://www.ibm.com/in-en/cloud/learn/iaas-paas-saas

https://aws.amazon.com/cloud-migration/
https://docs.aws.amazon.com/migrationhub/?id=docs_gateway

B. Tech. Third Year

Subject Code : ACSAIH0621	**L T P** **3 0 0**
Subject Name: Big Data	**Credits** **3**

Course objective:

To understand the basic concepts of Big Data in cloud and analyse sample dataset using big data ecosystem.

Course Contents / Syllabus

Unit-1	**Introduction to Big Data And Cloud** Introduction to Big Data : Types of digital data, history of Big Data innovation, introduction to Big Data platform, drivers for Big Data , Big Data architecture and characteristics, 5 Vs of Big Data, Big Data technology components, Big Data importance and applications, Big Data features, Big Data Analytics, modern data analytic tools. Introduction to Cloud Computing: Definition of Cloud, Evolution of Cloud Computing, Underlying Principles of Parallel and Distributed Computing, Cloud Characteristics.	**8 Hours**
Unit-2	**Hadoop and Map-Reduce** Hadoop: History of Hadoop, Apache Hadoop, the Hadoop Distributed File System, components of Hadoop, data format, analyzing data with Hadoop, scaling out, Hadoop streaming, Hadoop pipes, Hadoop Echo System. Map Reduce: Map-Reduce framework and basics, how Map Reduce works, anatomy of a Map Reduce job run, failures, job scheduling, shuffle and sort, task execution, Map Reduce types, input formats, output formats, Map Reduce features, Real-world Map Reduce. Hadoop Eco System and YARN: Hadoop ecosystem components, Hadoop 2.0 New Features, MRv2, YARN	**8 Hours**
Unit-3	**Hadoop Architecture & Frame Work** Hdfs (Hadoop Distributed File System): Design Of Hdfs, Hdfs Concepts, Benefits And Challenges, File Sizes, Block Sizes And Block Abstraction In Hdfs, How Does Hdfs Store, Read, And Write Files, Flume And Scoop, Hadoop Archives, Hadoop I/O: Compression, Serialization, Avro And File-Based Data Structures. Hadoop Eco System Frameworks: Pig , Hive , Hbase , Zookeeper. Importing And Handling Relational Data In Hadoop Using Sqoop ,Scala , Spark.	**8 Hours**
Unit-4	**Hadoop in Cloud** Cloud Technologies And Advancements Hadoop: MapReduce , Cloud overview & characteristics, cloud service model (iaas, paas, saas) , cloud deployment model (public, private, hybrid), Google cloud platform (gcp) infrastructure overview , create gcp account & console overview , Virtual Box , Google App Engine, Programming Environment for Google App Engine , Open Stack , Federation in the Cloud , Four Levels of Federation , Federated Services and Applications , Future of Federation.	**8 Hours**
Unit-5	**Network and Data Storage Services** **Virtual networks :** virtual private cloud (vpc) & types, subnets , ip addresses (public/private), nic ,routes & route table , firewalls , network topology options .	**8 Hours**

	Google cloud storage overview & Structure: cloud datastore , cloud bigtable : nosql big data service bigquery basics , how to use machine learning with Bigquery.	
Course outcome: After completion of this course students will be able to		
CO 1	Identify Big Data ecosystemin cloud and understand relevance of Big Data in data analytics.	K2
CO 2	Analyze Map Reduce and demonstrate its use in features extraction.	K4
CO 3	Explain the YARN and HDFC in Data management	K2
CO 4	Articulate the concept of Cloud Computing and understand cloud computingcharacteristics .	K3
CO 5	Analyze the components of open stack & Google Cloud platform	K4

Text books:

1. Michael Minelli, Michelle Chambers, and AmbigaDhiraj, "Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends for Today's Businesses", Wiley, 2013. 2. Big-Data Black Book, DT Editorial Services, Wily India

2. Tom White, "Hadoop: The Definitive Guide", Third Edition, O'Reilley, 2012. 5. Eric Sammer, "Hadoop Operations", O'Reilley, 2012.

3. E. Capriolo, D. Wampler, and J. Rutherglen, "Programming Hive", O'Reilley, 2012. 7. Lars George, "HBase: The Definitive Guide", O'Reilley, 2011.

Reference Books:

1. Alan Gates, "Programming Pig", O'Reilley, 2011.

3. "Big-Data Black Book", DT Editorial Services, Wily India

3. Viktor Mayer-Schonberger, Enneth Cukier, "Data: A Revolution that will transform how we live, work and think".

NPTEL/ YouTube/Faculty Video Link:

(4) noc19-cs33 Lecture 1-Introduction to Big Data - YouTube

(4) Lecture 26: Map-reduce and Hadoop - YouTube(3) Lecture 2 | Image Classification - YouTube

(4) Hadoop Ecosystem | Big Data Analytics Tools | Hadoop Tutorial | Edureka - YouTube
(4) What is HDFS | Hadoop Distributed File System (HDFS) Introduction | Hadoop Training | Edureka - YouTube

(4) Hive Tutorial for Beginners | Hive Architecture | Hadoop Hive Tutorial | Hadoop Training | Edureka - YouTube
(4) HBase Tutorial for Beginners | Introduction to Apache HBase | Hadoop Training | Edureka - YouTube
(4) Introduction to Hadoop Zookeeper | Edureka - YouTube

(4) Sqoop Tutorial - How To Import Data From RDBMS To HDFS | Sqoop Hadoop Tutorial | Simplilearn - YouTube
(4) Java in Spark | Spark-Submit Job with Spark UI Example | Tech Primers - YouTube
(4) Java in Spark | Spark-Submit Job with Spark UI Example | Tech Primers - YouTube

B. TECH. THIRD YEAR

Subject Code: ACSEH0611	**L T P** **3 0 0**
Subject Name: CRM Development	**Credits** **3**

Course objective:

Meet the tools and technologies that power development on the Salesforce platform. Give your data structure with objects, fields, and relationships. Automate processes for every app, experience, and portal with declarative tools. Use Visual force to build custom user interfaces for mobile and web apps.Write robust code by executing Apex unit tests.

Pre-requisites: Creative thinking and which is being used by the creative talent in your business areas.

Course Contents / Syllabus

Unit-1	**Salesforce Fundamentals** Building blocks of Salesforce, Data model & Security model, Business process automation options, Master Sales Cloud and Service Cloud , Salesforce platform, Salesforce terminology, force platform,Multi-tenancy and cloud, Salesforce metadata and APIs,Salesforce architecture	**8 Hours**
Unit-2	**Salesforce Data Modeling** Salesforce Data model ,IDIC model QIC model, CRM value chain model ,Payne & Frow's five forces and CRM objects , Relationship types, Formula fields and roll-up summary fields ,Importing and exporting data	**8 Hours**
Unit- 3	**Logic and Process Automation** Formulas and Validations, Formula Operators and Functions, Screen Flow Distribution, Salesforce Flow, Apex Basics , Apex Triggers, Database & .NET Basics, Search Solution Basics, Triggers and Order of Execution, Platform Events Basics, Process Automation Specialist, Apex Specialist, Apex integration Services, Apex Metadata API.	**8 Hours**
Unit- 4	**User Interface** General development, Apex code development Visualforce development , Sales dashboard , Visualforce performance ,Technique for optimizing performance Lightning Web Components Basics Lightning App Builders Development,	**8 Hours**
Unit- 5	**Testing, Debugging, and Deployment** Apex Testing, Apex code Test Method, Custom controller and Controller Extension ,Test Data Developer Console Basics, Asynchronous Apex, Debugging Tool and Techniques, Debug logs, Application lifecycle and development model, Change Set Development model	**8 Hours**

Course Outcome: At the end of course , the student will be able to:

CO1	Implement the working concept of variables	K1,K2
CO2	Apply the concepts of Data Management	K1,K2

CO3	Understand the concepts of APEX	K3
CO4	Understand the concepts of APEX Code development	K1,K2
CO5	Implement concepts of APEX Integration	K1,K3

Text Books:
Alok Kumar Rai : Customer Relationship Management : Concepts and Cases(Second Edition), PHI Learning, 2018
Bhasin- Customer Relationship Management (Wiley Dreamtech),2019
Salesforce for beginners by Shaarif Sahaalane book by Amazon(Online Edition)
Reference Books:
Salesforce : A quick Study laminated Reference Guide by Christopher Mathew Spencer eBook by Amazon(Online)
Salesforce Platform Developer By Vandevelde Jain Edition Ist 2018
Learning Salesforce Development By Paul Battisson E-book (Online)
NPTEL/ YouTube/Faculty Video Link:
www. Trailhead.salesforce.com
www.mindmajix.com/salesforce-tutorial
www,youtube.com/watch?v=7K42geizQCI

B. TECH. THIRD YEAR

Subject Code: ACSEH0613	**L T P** **3 0 0**
Subject Name: Robotic Process Automation	**Credits** **3**

Course objective:

This course focus on The Robotic Process Automation (RPA) specialization offers comprehensive knowledge and professional-level s
kills focused on developing and deploying software robots. It starts with the basic concepts of Robotic Process Automation. It builds on these concepts and introduces key RPA Design and Development strategies and methodologies, specifically in the context of UiPath products. A student undergoing the course shall develop the competence to design and develop automation solutions for business processes.

Pre-requisites: Computer Organization and Architecture

Course Contents / Syllabus

Unit-1	**Programming Basics &Recap** PROGRAMMING BASICS &RECAP:Programming Concepts Basics - Understanding the application - Basic Web Concepts - Protocols - Email Clients -. Data Structures - Data Tables - Algorithms - Software Processes - Software Design - Scripting - .Net Framework - .Net Fundamentals - XML - Control structures and functions - XML - HTML - CSS - Variables & Arguments.	**8 Hours**
Unit-2	**RPA Concepts** RPA Concepts: RPA Basics - History of Automation - What is RPA - RPA vs Automation - Processes & Flowcharts - Programming Constructs in RPA - What Processes can be Automated - Types of Bots - Workloads which can be automated - RPA Advanced Concepts - Standardization of processes - RPA Development methodologies - Difference from SDLC - Robotic control flow architecture - RPA business case - RPA Team - Process Design Document/Solution Design Document - Industries best suited for RPA - Risks & Challenges with RPA - RPA and emerging ecosystem	**8 Hours**
Unit-3	**RPA Tool Introduction &Basics** RPA TOOL INTRODUCTION &BASICS:Introduction to RPA Tool - The User Interface - Variables - Managing Variables - Naming Best Practices - The Variables Panel - Generic Value Variables - Text Variables - True or False Variables - Number Variables - Array Variables - Date and Time Variables - Data Table Variables - Managing Arguments - Naming Best Practices - The Arguments Panel - Using Arguments - About Imported Namespaces - Importing New NamespacesControl Flow - Control Flow Introduction - If Else Statements - Loops - Advanced Control Flow - Sequences - Flowcharts - About Control Flow - Control Flow Activities - The Assign Activity - The Delay Activity - The Do While Activity - The If Activity - The Switch Activity - The While Activity - The For Each Activity - The Break Activity - Data Manipulation - Data Manipulation Introduction - Scalar variables, collections and Tables - Text Manipulation - Data Manipulation - Gathering and Assembling Data	**8 Hours**
Unit-4	**Advanced Automation Concepts And Techniques** ADVANCED AUTOMATION CONCEPTS AND TECHNIQUES : Recording and Advanced UI Interaction-Recording Introduction-Basic and	**8 Hours**

	Desktop Recording-Web Recording - Input/output Methods - Screen Scraping-Data Scraping - Scraping advanced techniques - Selectors - Selectors - Defining and Assessing Selectors - Customization - Debugging - Dynamic Selectors - Partial Selectors - RPA Challenge - Image, Text & Advanced Citrix Automation - Introduction to Image & Text Automation - Image based automation - Keyboard based automation - Information Retrieval - Advanced Citrix Automation challenges - Best Practices - Using tab for Images - Starting Apps - Excel Data Tables & PDF - Data Tables in RPA - Excel and Data Table basics - Data Manipulation in excel - Extracting Data from PDF - Extracting a single piece of data - Anchors - Using anchors in PDF	
Unit-5	**Email Automation & Exceptional** EMAIL AUTOMATION & EXCEPTIONAL: Email Automation - Email Automation - Incoming Email automation - Sending Email , automation - Debugging and Exception Handling - Debugging Tools - Strategies for solving issues - Catching errors.	**8 Hours**
COURSE OUTCOMES : After completion of this course students will be able to		
CO 1	Understand RPA principles, its features and applications	K3
CO 2	Demonstrate proficiency in handling several types of variables inside a workflow and data manipulation techniques	K3
CO 3	Gain insights into Desktop, Web, Citrix, Email Automation and exception handling.	K2
CO 4	Analyze and design a real-world automation project and debug the workflows.	K2
CO5	Student will be able to understand architecture of computing technology.	K2

TEXT BOOKS:

1. Tripathi, Alok Mani. Learning Robotic Process Automation: Create Software robots and automate business processes with the leading RPA tool–UiPath. Packt Publishing Ltd, 2018.
2. Primer, A. "Introduction To Robotic Process Automation." Institute for Robotic Process Automation (2015).
3. Murdoch, Richard. “Robotic Process Automation: Guide to Building Software Robots, Automate Repetitive Tasks & Become An RPA Consultant”, Richard Murdoch & RPA Ultra, 2018.
4. Taulli, Tom. "The robotic process automation handbook." The Robotic Process Automation Handbook. https://doi. org/10.1007/978-1-4842-5729-6 (2020).

Reference Books:

1. Gaonkar, Sushant. "Future of work: Leveraging the power of technologies to create a near-human like digital worker." Gavesana Journal of Management 13.1 (2020): 15-23.
2. Vellaichamy, Mr NMS S., Mr R. Dinesh, and Mrs JR Rajalakshmi. "Reskillng Indian Workforce: The Need of the Hour LavanyanjaliMukkerlaDr.Braou."

NPTEL/YouTube/Faculty Video Links:

https://www.youtube.com/watch?v=3SMZHd_ngIw

https://www.youtube.com/watch?v=3zXb8H3odek

https://www.youtube.com/watch?v=3zXb8H3odek

https://www.youtube.com/watch?v=3zXb8H3odek

B. TECH. THIRD YEAR

Subject Code: ACSEH0614	**L T P** **3 0 0**
Subject Code: Web Development using MEAN Stack	**Credits** **3**

Course objective:

This course focuses on how to design and build static as well as dynamic webpages and interactive web applications. Students examine advanced topics like Angular, nodejs, Mongodb and Express framework for interactive web applications that use rich user interfaces.

Pre-requisites: Basic knowledge ofHTML,CSS and ES6 required.

Course Contents / Syllabus

Unit-1	**Introduction to Nodejs** Installing Nodejs, Node in-built packages (buffer, fs, http, os, path, util, url)Node.js modules, File System Module, Json data, Http Server and Client,Error handling with appropriate HTTP, Callback function,asynchronous programing REST API's(GET, POST PUT, DELETE UPDATE), GraphQL, Promises, Promise Chaining, Introduction to template engine (EJS).	**8 Hours**
Unit-2	**Express Framework** Configuring Express, Postman configuration,, Environment Variables, Routing, Defining pug templates, HTTP method of Express, URL binding, middleware function, Serving static files, Express sessions, REST full API's, FORM data in Express, document modeling with Mongoose.	**8 Hours**
Unit-3	**Basics of Angular js** Typescript, Setup and installation,Power of Types,Functions,Function as types Optional and default parameters, Arrow functions, Function overloading,Access modifiers, Getters and setters, Read-only & static, Abstract classes,Interfaces,Extending and Implementing Interface,Import and Export modules.	**8 Hours**
Unit-4	**Building Single Page App with Angular js** MVC Architecture, One-way and Two-way data binding, AngularJS Expressions, AngularJS Controllers, AngularJS Modules, adding controller to a module, Component, Dependency Injection, Filters, Tables, AngularJS Forms and Forms validation, Select using ng-option, AngularJS AJAX.	**8 Hours**
Unit-5	**Connecting Angular js with MongoDB** Environment Setup of Mongodb, data modeling,The current SQL/NoSQL landscape, Create collection in Mongodb, CRUD Operations in MongoDB.Mongo's feature set, Introduction to Mongoose, Understanding mongoose schemas and datatypes, Connecting Angular with mongoDB using API.	**8 Hours**

Course outcome: After completion of this course students will be able to

CO 1	Explain, analyze and apply the role of server side scripting language like Nodejs in the workings of the web and web applications.	K2, K3
CO 2	Demonstrate web application framework i.e. Express js to design and implement typical dynamic web pages and interactive web based applications.	K3, K6
CO 3	Apply the knowledge of Typescript that are vital in understanding angular js, and analyze the concepts, principles and methods in current client-side technology to implement angular application over the web.	K3,K6

CO 4	Analyze build and develop single page application using client side programming i.e. angular js and also develop a static web application.	K3, K4
CO 5	Understand the impact of web designing by database connectivity with Mongodb in the current market place where everyone use to prefer electronic medium for shoping, commerce, and even social life also.	K2, K3

Text books:

1. Amos Q. Haviv (Author), Adrian Mejia (Author), Robert Onodi (Author), "Web Application Development with MEAN",3rdIllustrated Edition 2017,Packt Publications.
2. Simon Holmes (Author), Clive Herber (Author), "Getting MEAN with Mongo, Express, Angular, and Node", 2nd Edition 2016, Addison Wesley Publication.
3. Dhruti Shah, "Comprehensive guide to learn Node.js", 1st Edition, 2018 BPB Publications.
4. Christoffer Noring,Pablo Deeleman, "Learning Angular",3rd Edition,2017
5. Packt publications.

Reference Books:

1. Anthony Accomazzo, Ari Lerner, and Nate Murray, "Fullstack Angular: The Complete Guide to AngularJS and Friends",4th edition, 2020 International Publishing.
2. David Cho, "Full-Stack Angular, Type Script, and Node: Build cloud-ready web applications using Angular 10 with Hooks and GraphQL",2nd edition, 2017 Packt Publishing Limited.
3. Richard Haltman & Shubham Vernekar, "Complete node.js: The fast guide: Learn complete backend development with node.js"5th edition, 2017 SMV publication.
4. Glenn Geenen,Sandro Pasquali , Kevin Faaborg, "Mastering Node.js: Build robust and scalable real-time server-side web applications efficiently" 2nd edition Packt Publishing Limited.
5. Greg Lim,"Beginning Node.js, Express & MongoDB Development ,kindle edition, international publishing.
6. Daniel Perkins, "AngularJS Master Angular.js with simple steps, guide and instructions" 3rd edition, 2015 SMV publication.
7. Peter Membrey, David Hows, Eelco Plugge, "MongoDB Basics", 2nd edition,2018 International Publication.

NPTEL/ Youtube/ Faculty Video Link:

https://youtu.be/BLl32FvcdVM
https://youtu.be/fCACk9ziarQ
https://youtu.be/YSyFSnisip0
https://youtu.be/mGVFltBxLKU
https://youtu.be/bWaucYA1YRI

https://youtu.be/7H_QH9nipNs
https://youtu.be/AX1AP83CuK4
https://youtu.be/SccSCuHhOw0
https://youtu.be/lY6icfhap2o
https://youtu.be/z7ikpQCWbtQ

https://youtu.be/0LhBvp8qpro
https://youtu.be/k5E2AVpwsko
https://youtu.be/SQJkj0WYWOE?list=PLvQjNLQMdagP3OzoBMfBT48uJ-SPfSsWj
https://youtu.be/0eWrpsCLMJQ?list=PLC3y8-rFHvwhBRAgFinJR8KHIrCdTkZcZ
https://youtu.be/ZSB4JcLLrIo

https://youtu.be/0LhBvp8qpro
https://youtu.be/k5E2AVpwsko
https://youtu.be/SQJkj0WYWOE?list=PLvQjNLQMdagP3OzoBMfBT48uJ-SPfSsWj
https://youtu.be/0eWrpsCLMJQ?list=PLC3y8-rFHvwhBRAgFinJR8KHIrCdTkZcZ
https://youtu.be/ZSB4JcLLrIo

https://youtu.be/Kvb0cHWFkdc
https://youtu.be/pQcV5CMara8
https://youtu.be/c3Hz1qUUIyQ
https://youtu.be/Mfp94RjugWQ
https://youtu.be/SyEQLbbSTWg

B. TECH. THIRD YEAR

Subject Code: ACSEH0612	**L T P** **3 0 0**
Subject Name: Full-Stack Web Development using Laravel with Vue.JS	**Credits** **3**

Course objective:

This course focuses on how to design and build a robust API in Laravel and a Single Page Application with Vuejs.This courseinclude advanced topics like Inertia.js, Model Events, and Laravel framework for interactive web applications that use rich user interfaces.

Pre-requisites: Basic knowledge of HTML, CSS, JavaScript & PHP required.

Course Contents / Syllabus

Unit-1	**Introduction to Laravel** Laravel Features, Laravel installation, Application Structure of Laravel, Root Directory, App Directory, Basic Configuration, Environmental Configuration, Routing, Routing Parameters, Middleware, Terminable Middleware, Middleware Parameter, Controllers, Restful Resource Controllers, Implicit Controllers, Constructor Injection, Method Injection, Laravel Sail, Laravel Jetstream.	**8 Hours**
Unit-2	**Vue.js Framework&Inertia.js** Vue.js Template Syntax And Expressions,Vue directives, loops and conditional rendering,VueDevtools,Handling user Inputs,Handling Events,Vuejs Methods and Computed Properties,Attribute Bindings and dynamic classes, Concepts of Inertia.js, How it works,Inertia protocol, Routing, Responses and Pages,Creating links,GET, POST, PUT, PATCH, and DELETE method in Inertia.js	**8 Hours**
Unit-3	**Laravel Authentication & Laravel Faker** Laravel design patter,Laravel blade template engine,Artisan command,Login with username or email, Register with username or email, Logout,Validate request data (required, unique, etc..), Protecting Router,PasswordConfirmation,Social & Other Authentication method, Show success / Failure message, Faker PHP library, Create data seeder,Seed data,Localisation, Model Factories.	**8 Hours**
Unit-4	**ConnectingLaravelwith databases** Database Configuration File,Read/Write connections, Running A Select Query, Running an Insert, Update, Statement, Listening For Query Events, Database Transaction, rollback and commit method, Accessing connections, Query Logging,Laravel Query Builder & ORM, Laravel Migration& Eloquent.	**8 Hours**
Unit-5	**Deployment Laravel Application to Production** PHP Extension: BCMath, Ctype, cURL, JSON, Mbstring, OpenSSL, PCRE, PDOServer Configuration, Nginx, Laravel server management service LaravelForge, Autoloader optimization, Optimizing Configuration Loading, Optimizing Route Loading, Optimizing View Loading, Debug Mode, Deploying With Vapor.	**8 Hours**

Course outcome: After completion of this course students will be able to

CO 1	Apply the knowledge of PHP that are vital in understanding Laravel application and analyze the concepts, principles and methods in current Server-side technology to implement Laravel application over the web.	K3, K6
CO 2	Explain, analyze and apply the role of Client-side scripting language like Vuejs in the workings of the web and web applications.	K2, K3
CO 3	Implementing and analyzing the concept of Larvel Faker and Authentication on Laravel.	K3, K6

CO 4	Understand the impact of web designing by database connectivity with different databases in the current market place where everyone use to prefer electronic medium for shoping, commerce, and even social life also.	K2, K3
CO 5	Analysing and Creating a functional website using Laravel and Vuejs and Deploying and Optimizing Web Application using Forge / Vapor.	K3, K4

Text books:

1. Rufus Stewart, mEmlnc, "Laravel: The Ultimate Beginner's Guide to Learn Laravel Step by Step", 2nd Edition 2020, BPB Publications.
2. Anthony Gore, "Full-Stack Vue.js 2 and Laravel 5", 3rd Edition 2017, Packet Publication.
3. Stewart Rufus, "Laravel (French, Paperback, Stewart Rufus)", 2ndEdition, 2018 BPB Publications.
4. Matt Stauffer,"Laravel: Up & Running: A Framework for Building Modern PHP Apps", 2nd Edition, 2019, O'Reilly Media Publications.
5. Callum Macrae,"Vue.js – Up and Running: Building Accessible and Performant Web Apps",1stEdition, 2019, O'Reilly Media Publications.

Reference Books:

1. Anthony Accomazzo, Ari Lerner, and Nate Murray, "FullstackLaravel: The Complete Guide to Laravel and Friends", 4th edition, 2020 International Publishin
2. David Cho, "Full-Stack Laravel, Type Script, and Vuejs: Build cloud-ready web applications using Laravel with Hooks and GraphQL", 2nd edition, 2017 Packt Publishing Limited.
3. Sanjib Sinha, "Beginning Laravel: Build Websites with Laravel 5.8"2nd edition, 2019, Apress publication.
4. Glenn Geenen, Sandro Pasquali, Kevin Faaborg, "Mastering Vue.js: Build robust and scalable real-time server-side web applications efficiently" 2nd edition, 2016,Packt Publishing Limited.
5. Greg Lim,"Beginning Node.js, Express & MongoDB Development ,kindle edition,2015, international publishing.
6. Daniel Perkins, "Laravel and Vuejs Master Angular.js with simple steps, guide and instructions" 3rd edition, 2015 SMV publication.
7. Peter Membrey, David Hows, EelcoPlugge, "MongoDB Basics", 2nd edition ,2018 International Publication.

NPTEL/ Youtube/ Faculty Video Link

https://youtu.be/ImtZ5yENzgE
https://youtu.be/0urHFBFHsLc?list=PL8p2I9GklV46dciS4GDzBFHBi0JVIbnzT
https://youtu.be/vjDLtAPXP34?list=PL7BQ4lqtgECS0oCt5jGaf0v77mBjS5r5O
https://youtu.be/EU7PRmCpx-0?list=PLillGF-RfqbYhQsN5WMXy6VsDMKGadrJ-
https://youtu.be/JNhmEoBsZ48

https://youtu.be/qZXt1Aom3Cs
https://youtu.be/FXpIoQ_rT_c
https://youtu.be/nhBVL41-_Cw
https://youtu.be/bzlFvd0b65c
https://youtu.be/e-E0UB-YDRk

https://youtu.be/Od1RSXGLnEI
https://youtu.be/XCrmk1bKxf4
https://youtu.be/ORus3-By4lk
https://youtu.be/UWniysfpTmM
https://youtu.be/ko4PU4eplnY

https://youtu.be/UN3de_GEJiI
https://youtu.be/qCMgxDfRKCo
https://youtu.be/XP1DntIzyyI
https://youtu.be/Zf6o7ag5WPI
https://youtu.be/XoULf9nFclk

https://youtu.be/dB1mazCqQAU
https://youtu.be/w1JNkv-GH3A
https://youtu.be/G5Nk4VykcUw
https://youtu.be/X4KElZcUi-g

B. TECH. THIRD YEAR

Course code	ANC0601	L T P	Credits
Course Title	CONSTITUTION OF INDIA, LAW AND ENGINEERING	2 0 0	2

Course objective: To acquaint the students with legacies of constitutional development in India and help them to understand the most diversified legal document of India and philosophy behind it.

Pre-requisites: Computer Organization and Architecture

Course Contents / Syllabus

UNIT-I	INTRODUCTION AND BASIC INFORMATION ABOUT INDIAN CONSTITUTION	8 Hours

Meaning of the constitution law and constitutionalism, Historical Background of the Constituent Assembly, Government of India Act of 1935 and Indian Independence Act of 1947,Enforcement of the Constitution, Indian Constitution and its Salient Features, The Preamble of the Constitution, Fundamental Rights, Fundamental Duties, Directive Principles of State Policy, Parliamentary System, Federal System, Centre-State Relations, Amendment of the Constitutional Powers and Procedure, The historical perspectives of the constitutional amendments in India, Emergency Provisions: National Emergency, President Rule, Financial Emergency, and Local Self Government – Constitutional Scheme in India.

UNIT-II	UNION EXECUTIVE AND STATE EXECUTIVE	8 Hours

Powers of Indian Parliament Functions of Rajya Sabha, Functions of Lok Sabha, Powers and Functions of the President, Comparison of powers of Indian President with the United States, Powers and Functions of Vice-President, Powers and Functions of the Prime Minister, Judiciary – The Independence of the Supreme Court, Appointment of Judges, Judicial Review, Public Interest Litigation, Judicial Activism, LokPal, Lok Ayukta, The Lokpal and Lok ayuktas Act 2013, State Executives – Powers and Functions of the Governor, Powers and Functions of the Chief Minister, Functions of State Cabinet, Functions of State Legislature, Functions of High Court and Subordinate Courts.

UNIT-III	INTRODUCTION AND BASIC INFORMATION ABOUT LEGAL SYSTEM	8 Hours

The Legal System: Sources of Law and the Court Structure: Enacted law -Acts of Parliament are of primary legislation, Common Law or Case law, Principles taken from decisions of judges constitute binding legal rules. The Court System in India and Foreign Courtiers (District Court, District Consumer Forum, Tribunals, High Courts, Supreme Court). Arbitration: As an alternative to resolving disputes in the normal courts, parties who are in dispute can agree that this will instead be referred to arbitration. Contract law, Tort, Law at workplace.

UNIT-IV	INTELLECTUAL PROPERTY LAWS AND REGULATION TO INFORMATION	8 Hours
Intellectual Property Laws: Introduction, Legal Aspects of Patents, Filing of Patent Applications, Rights from Patents, Infringement of Patents, Copyright and its Ownership, Infringement of Copyright, Civil Remedies for Infringement, Regulation to Information, Introduction, Right to Information Act, 2005, Information Technology Act, 2000, Electronic Governance, Secure Electronic Records and Digital Signatures, Digital Signature Certificates, Cyber Regulations Appellate Tribunal, Offences, Limitations of the Information Technology Act.		
UNIT-V	**BUSINESS ORGANIZATIONS AND E-GOVERNANCE**	**8 Hours**
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.		
COURSE OUTCOMES: After completion of this course students will be able to		
CO 1	Identify and explore the basic features and modalities about Indian constitution.	K1
CO 2	Differentiate and relate the functioning of Indian parliamentary system at the center and state level.	K2
CO 3	Differentiate different aspects of Indian Legal System and its related bodies.	K4
CO 4	Discover and apply different laws and regulations related to engineering practices.	K4
CO 5	Correlate role of engineers with different organizations and governance models	K4

Text Books:

4. M Laxmikanth: Indian Polity for civil services and other State Examination,6th Edition, Mc Graw Hill
5. Brij Kishore Sharma: Introduction to the Indian Constitution, 8th Edition, PHI Learning Pvt. Ltd.
6. Granville Austin: The Indian Constitution: Cornerstone of a Nation (Classic Reissue), Oxford University Press.

Reference Books:

1. Madhav Khosla: The Indian Constitution, Oxford University Press.
2. PM Bakshi: The Constitution of India, Latest Edition, Universal Law Publishing.
3. V.K. Ahuja: Law Relating to Intellectual Property Rights (2007)

B. TECH. THIRD YEAR

Course code	ANC0602	L T P	Credits
Course Title	ESSENCE OF INDIAN TRADITIONAL KNOWLEDGE	2 0 0	2

Course objective: This course aims to provide basic knowledge about different theories of society, state and polity in India, Indian literature, culture, Indian religion, philosophy, science, management, cultural heritage and different arts in India

Pre-requisites: Computer Organization and Architecture

Course Contents / Syllabus

UNIT-I	SOCIETY STATE AND POLITY IN INDIA	8 Hours

State in Ancient India: Evolutionary Theory, Force Theory, Mystical Theory Contract Theory, Stages of State Formation in Ancient India, Kingship , Council of Ministers Administration Political Ideals in Ancient India Conditions' of the Welfare of Societies, The Seven Limbs of the State, Society in Ancient India, Purusārtha, Varnāshrama System, Āshrama or the Stages of Life, Marriage, Understanding Gender as a social category, The representation of Women in Historical traditions, Challenges faced by Women.

UNIT-II	INDIAN LITERATURE, CULTURE, TRADITION, AND PRACTICES	8 Hours

Evolution of script and languages in India: Harappan Script and Brahmi Script. The Vedas, the Upanishads, the Ramayana and the Mahabharata, Puranas, Buddhist And Jain Literature in Pali,Prakrit And Sanskrit, Sikh Literature, Kautilya's Arthashastra, Famous Sanskrit Authors, Telugu Literature, Kannada Literature,Malayalam Literature ,Sangama Literature Northern Indian Languages & Literature, Persian And Urdu ,Hindi Literature

UNIT-III	INDIAN RELIGION, PHILOSOPHY, AND PRACTICES	8 Hours

Pre-Vedic and Vedic Religion, Buddhism, Jainism, Six System Indian Philosophy, Shankaracharya, Various Philosophical Doctrines, Other Heterodox Sects, Bhakti Movement, Sufi movement, Socio religious reform movement of 19th century, Modern religious practices.

UNIT-IV	SCIENCE, MANAGEMENT AND INDIAN KNOWLEDGE SYSTEM	8 Hours

Astronomy in India, Chemistry in India, Mathematics in India, Physics in India, Agriculture in India, Medicine in India, Metallurgy in India, Geography, Biology, Harappan Technologies, Water Management in India, Textile Technology in India ,Writing Technology in India Pyrotechnics in India Trade in Ancient India/,India's Dominance up to Pre-colonial Times.

UNIT-V	CULTURAL HERITAGE AND PERFORMING ARTS	8 Hours
Indian Architect, Engineering and Architecture in Ancient India, Sculptures, Pottery, Painting, Indian Handicraft, UNESCO'S List of World Heritage sites in India, Seals, coins, Puppetry, Dance, Music, Theatre, drama, Martial Arts Traditions, Fairs and Festivals, UNESCO'S List of Intangible Cultural Heritage, Calenders, Current developments in Arts and Cultural, Indian's Cultural Contribution to the World. Indian Cinema.		
COURSE OUTCOMES: After completion of this course students will be able to		
CO 1	Understand the basics of past Indian politics and state polity.	K2
CO 2	Understand the Vedas, Upanishads, languages & literature of Indian society.	K2
CO 3	Know the different religions and religious movements in India.	K4
CO 4	Identify and explore the basic knowledge about the ancient history of Indian agriculture, science & technology, and ayurveda.	K4
CO 5	Identify Indian dances, fairs & festivals, and cinema.	K1

Text Books:

3. Sivaramakrishna (Ed.), Cultural Heritage of India-Course Material, Bharatiya Vidya Bhavan, Mumbai, 5th Edition, 2014.
4. S. Baliyan, Indian Art and Culture, Oxford University Press, India
5. Nitin Singhania, Indian Art and Culture: for civil services and other competitive Examinations,3rd Edition,Mc Graw Hill

Reference Books:

1. Romila Thapar, Readings In Early Indian History Oxford University Press, India
2. Basham, A.L., The Wonder that was India (34th impression), New Delhi, Rupa & co.