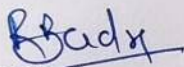**MIT** | Academy of Engineering

MIT ACADEMY OF ENGINEERING, ALANDI

Savitribai Phule Pune University
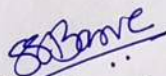
Curriculum for

Master of Technology in

Computer Engineering

(Choice Based Credit System)

2020-22

BoS Chairman
Dean, School of
Computer
Engineering &
Technology

Member Secretary
Academic Council
Dean Academics

Chairman
Academic Council
Director MITAOE

MIT Academy of Engineering, Alandi, Pune
An Autonomous Institute affiliated to Savitribai Phule Pune University

CURRICULUM FRAMEWORK (COMPUTER ENGINEERING)
2020-22 PATTERN W.E.F 2020-21

The Master of Technology Program shall be based on the following type of courses.

S.N.	TYPE OF COURSE	1	2	3	4	5	6			TOTAL
	COURSE DISTRIBUTION : TRIMESTER WISE									
		NO. OF COURSES/TRIMESTER								
1.	Program Core (PC)	2	1	1						04
2.	Discipline Core (DC)	1	2	2						05
3.	Department Elective (DE)				2					02
4.	Skill Development and Project (SDP)			1	1	1	1			04
	TOTAL	3	3	4	3	1	1			15

S.N.	TYPE OF COURSE	1	2	3	4	5	6			TOTAL	%
	CREDIT DISTRIBUTION : TRIMESTER WISE										
	1 Lecture hour = 1 Credit 2 Lab Hours = 1 Credit 1 Tutorial Hour = 1 Credit										
		NO. OF CREDITS/TRIMESTER									
1.	Program Core (PC)	8	2	2						12	18.75
2.	Discipline Core (DC)	4	8	8						20	31.25
3.	Department Elective (DE)				6					06	9.37
4.	Skill Development and Project (SDP)			2	4	10	10			26	40.62
	TOTAL	12	10	12	10	10	10			64	100

		CREDITS			
	1 Lecture hour = 1 Credit 2 Lab Hours = 1 Credit				
SL. NO.	**YEAR**	**TRIMESTER**			**TOTAL**
		1	**2**	**3**	
1.	First Year	12	10	12	**34**
2.	Second Year	10	10	10	**30**
TOTAL					**64**

		CONTACT HOURS			
SL. NO.	**YEAR**	**TRIMESTER**			**TOTAL**
		1	**2**	**3**	
1.	First Year	13	12	16	41
2.	Second Year	14	20	20	54
TOTAL					**95**

ABBREVATIONS			
1.	ECE	End Course Exam
2.	IA	Internal Assessment
3.	T/P	Term Work / Practical
4.	DM	Demonstration
5.	L	Lecture
6.	P	Practical
7.	T	Tutorial
8.	Lab	Laboratory

MIT | Academy of Engineering	COURSE STRUCTURE (2020 - 2022)		
Autonomous Institute Affiliated to SPPU			
SCHOOL OFCOMPUTER ENGINEERING AND TECHNOLOGY	**W.E.F**	**:**	**2020-2021**
FIRST YEAR MASTER OF TECHNOLOGY IN COMPUTER ENGINEERING	**RELEASE DATE**	**:**	**01/07/2020**
	REVISION NO.	**:**	**1.0**

TRIMESTER-I

COURSE			TEACHING SCHEME			EXAMINATION SCHEME AND MARKS				TOTAL	CREDIT
			Hours/Week			THEORY		PRACT			
TYPE	CODE	NAME	L	P	T	ECE	IA	T/P	DM		
PC1	AS502	Computing and Mathematics	2	-	2	60	40	50	-	150	4
PC2	CS531	Management System	2	-	2	60	40	50	-	150	4
DC1	CS532	Modern Technologies	3	2	-	60	40	50	-	150	4
TOTAL			7	2	4	180	120	150		450	12

TRIMESTER-II

COURSE			TEACHING SCHEME			EXAMINATION SCHEME AND MARKS				TOTAL	CREDIT
			Hours/Week			THEORY		PRACT			
TYPE	CODE	NAME	L	P	T	ECE	IA	T/P	DM		
PC3	EX531	Research Methodology	2	-	-	50	25	-	-	75	2
DC2	CS541	Advanced Data Structure & Algorithms	3	2	-	60	40	-	50	150	4
DC3	CS542	IoT Technology and Applications	3	2	-	60	40	-	50	150	4
TOTAL			8	4	-	170	105		100	375	10

TRIMESTER-III											
COURSE			**TEACHING SCHEME**			**EXAMINATION SCHEME AND MARKS**					**CREDIT**
TYPE	**CODE**	**NAME**	**Hours/Week**			**THEORY**		**PRACT**		**TOTAL**	
			L	P	T	ECE	IA	T/P	DM		
PC4	EX533	Technical Writing	2	-	-	-	25	-	50	75	2
DC4	CS543	Machine Learning	3	2	-	60	40	-	50	150	4
DC5	CS544	Cloud Application Development and Management	3	2	-	60	40	-	50	150	4
SDP1	CS545	Project Work – I	-	4	-			-	50	50	2
TOTAL			8	8	**-**	**120**	**105**		**200**	425	**12**

SCHOOL OF HUMANITIES AND ENGINEERING SCIENCES		**W.E.F**	2020 - 2021
FIRST YEAR MASTER OF TECHNOLOGY MECH/COMP/ETX ENGG	**COURSE NAME**	Computing and Higher Mathematics	
	COURSE CODE	AS 502	
	COURSE CREDITS	4	
RELEASED DATE : 01/07/2020	**REVISION NO**	1.0	

TEACHING SCHEME		EXAMINATION SCHEME AND MARKS					
(HOURS/WEEK)		THEORY			TUTORIAL/	PRESENTATION/	TOTAL
LECTURE	TUTORIAL	MCE	ECE	IA	PRACTICAL	DEMONSTRATION	
2	2	NIL	60	40	50	NIL	150

PRE-REQUISITE : NIL

COURSE OBJECTIVES :

AS501.CEO.1: To learn different numerical methods to solve differential equations and obtain the solution.

AS501.CEO.2: To understand different sampling techniques, analyze the data and process it to obtain a quality product.

AS501.CEO.3: To learn mathematical methodologies, techniques and mathematical tools to obtain an optimal solution of the problems theoretically and also by ANOVA.

COURSE OUTCOMES :

The students after completion of the course will be able to,

AS501.CO.1: Identify the accurate solution method (minimizing the error) to solve the differential equation with given conditions and obtains the particular solution of the problem.

AS501.CO.2: Collect, categorize, analyze, processing mathematically the data, thereby to obtain a quality proven product.

AS501.CO.3: Understand the physical situation, identify the accurate mathematical model and solve the problem mathematically or with the use of Statistical tools available and finally interpret it in the original context.

CONTENTS:

Computational Methods for Ordinary Differential Equations: Euler's Method, Heun's Method, Mid- point Method, Runge-Kutta Method and Multi step Methods-Explicit Adams-Bash forth technique and Implicit Adams-Moulton techniques, Adaptive RK Method, Embedded RK Method, Higher Order Ordinary differential equation- Shooting Method.

Operations Research: Simplex method: Feasible solution to system of equations, reduction of feasible to basic feasible solution, solution of LPP: computational procedure, Penalty (Big M) method. Transportation problem: North-West corner method, Least-cost method, Vogel's approximation method, Assignment Models: Hungerian Method.

Statistics and ANOVA: Central Tendency of data, Variance, Standard Deviation, Coefficient of Variance, Moments, Correlation, Coefficient of Correlation, Least Squares, Linear Regression, Inference in Linear Regression, Multiple Linear Regression, ANOVA for Regression

TUTORIAL NO.1		**2 HOURS**
Introduction to first order first degree Differential equation and its actual solution.		
TUTORIAL NO.02		**2 HOURS**
Euler's Method, Heun's Method, Mid- point Method, Runge-Kutta Method.		
TUTORIAL NO.03		**2 HOURS**
Adams-Bash forth technique and Implicit Adams-Moulton techniques.		
TUTORIAL NO.04		**2 HOURS**
Adaptive RK Method, Embedded RK Method, Shooting Method.		
TUTORIAL NO.05		**2 HOURS**
Solution of system of equations using simplex method (Feasible soln).		
TUTORIAL NO.06		**2 HOURS**
Solution of system of equations using simplex method (Feasible to basic feasible soln).		
TUTORIAL NO.07		**2 HOURS**
Transportation problem: North-West corner method, Least-cost method.		
TUTORIAL NO.08		**2 HOURS**
Transportation problem: Vogel's approximation, Assignment problem: Hungerian method.		
TUTORIAL NO.09		**2 HOURS**
Central Tendency of data, Variance, Standard Deviation.		
TUTORIAL NO.10		**2 HOURS**
Moments, Correlation, Coefficient of Correlation.		
TUTORIAL NO.11		**2 HOURS**
Regression lines.		
TUTORIAL NO.12		**2 HOURS**
ANOVA for Regression.		

TEXT BOOK

1. Dr. B.V. Ramana, Higher Engineering Mathematics, 5 th edition, Tata McGraw Hill, 2017, ISBN: 978-0-07-063419-0
2. Peter W. Vik, Regression, ANOVA, and the General Linear Model: A Statistics Primer, First Edition, ISBN-13: 978-1412997355.

REFERENCE BOOK

1. B.S. Grewal, Higher Engineering Mathematics, 44 th edition, Khanna Publications, 2018, ISBN: 978-81-933284-9-1.
2. Erwin Kreyszig, Advanced Engineering Mathematics, 10 th edition, Wiley Eastern Ltd., 2015, ISBN: 13: 9788126554232
3. Amos Gilat, "MATLAB: An Introduction with Applications", 4th edition, Wiley Publication, 2003, ISBN-13: 9788126537204, 8126537205.

SCHOOL OF HUMANITIES AND ENGINEERING SCIENCES		**W.E.F**	2020 - 2021
FIRST YEAR MASTER OF TECHNOLOGY MECH/COMP/ETX ENGG		**COURSE NAME**	Management Systems
		COURSE CODE	CS531
		COURSE CREDITS	04
RELEASED DATE : 01/07/2020		**REVISION NO**	1.0

TEACHING SCHEME		EXAMINATION SCHEME AND MARKS					
(HOURS/WEEK)		THEORY			TUTORIAL/	PRESENTATION/	TOTAL
LECTURE	TUTORIAL	MCE	ECE	IA	PRACTICAL	DEMONSTRATION	
2	2	NIL	60	40	50	NIL	150

PRE-REQUISITE : NIL

COURSE OBJECTIVES :

CS531.CEO.1: To expose the students to fundamental concepts of management and its processes in organizations.

CS531.CEO.2: To create scientific attitude towards solving a management problem and impart knowledge about tools available for carrying out research.

CS531.CEO.3: To inculcate a spirit of entrepreneurship by promoting inquisitiveness for technological innovations, their conversion into business ideas and evolving strategy for induction of new products in new markets for growth of their entrepreneurial projects.

CS531.CEO.4: To effectively use the latest technology to support ever growing business.

COURSE OUTCOMES :

The students after completion of the course will be able to,

CS531.CO.1: Describe and explain the Significance of Businesses in Society, their Management and linking these up with other relevant systems.

CS531.CO.2: Critically analyze the organizational structure, systems, competencies and identify the areas of improvement.

CS531.CO.3: The ability and confidence to tackle common environmental and financial problems of business.

CS531.CO.4: Build an awareness of ethical and social responsibilities to multi-cultural, team-oriented, rapidly changing environments.

CONTENTS:

Basics of Management: Nature and scope of management; Evolution of Management thought; -Scientific, Behavioral, Systems and Contingency Approaches, Social responsibility of an organization. Analysis for Managerial Decision Making, Corporate Image Building.

Organizational Behavior: Concepts of OB, Designing and Delegation of Authority, Decision Making Process, Management of Creativity and Relationships, Human Resource Management, Skillful use of Emotional Intelligence in conflict management. Techniques for Self Management and Stress Management for improving personal efficiency.

Economics and Financial Management: Demand and Business Forecasting, Economics of Information and Network Industries, Entrepreneurship and New Ventures, Finance function – Scope and Significance, Capital Budgeting- Nature and Significance.

Project Management: Essentials of Project Management with use of Critical Path Method (CPM) and Programme Evaluation and Review Techniques (PERT), Functioning and growth of a Business Unit with understanding of Break-Even Analysis.

Information System: Business and Data Communications Networks, Technology Management with the help of Cyber Security, Data Mining, Enterprise Resource Planning, Industry 4.0 concepts, Business startups and growth in current Indian Environment.

TUTORIAL NO.1	Corporate management case presentation	4 HOURS

A corporate management case to be selected by students on their own choice, writing a Synopsis (2.5 Marks) and its Presentation before the class in 5 Minutes including answers to questions by class (2.5 Marks)

TUTORIAL NO.02	Entrepreneurial Business Plan presentation	6 HOURS

Preparation and submission of an innovative and entrepreneurial Business Plan of student's own choice, submitting a Power Point Presentation to be evaluated by Faculty (2.5 Marks), and its presenting/ defending it before the class, to be evaluated by two peers on a Format to be given by Faculty (2.5 Marks).

TUTORIAL NO.03	Industry 4.0	6 HOURS

Understand the concept of Industry 4.0 and prepare a report using any of the technology to prove that use of this technology will improve the performance of the organization.

TEXT BOOK

1. Harold Koontz, Heinz Weihrich and Mark V Cannice, Management – A Global and Entrepreneurial Perspective, Tata McGraw Hill Publications, 12th Edition, 2008.
2. Vachaspati Mishra, Management and Entrepreneurship in Indian Environment – A Perspective through Joining the Dots, Himalaya Publishing House, First Edition, 2016

REFERENCE BOOK

1. Dr A Sivathanu Pillai; Technology Leadership – A Revolution in the Making; Tata McGraw Hill Publishing Company Ltd, New Delhi, 2005
2. James A Alexander and Mark W Hordes; S-Business: Reinventing the Services Organisations, Select Books Inc Biztantra, 2006
3. Vohra ND, Quantitative Techniques in Management; Tata McGraw Hill Publishing Company Limited, Third Edition 2007
4. Nakkiran S and Karthikeyan M; Training Techniques for Management Development; Deep and Deep Publications Pvt Ltd; 2007

MIT Academy of Engineering (An autonomous Institute Affiliated to SPPU)	COURSE SYLLABI (2020 – 2022)	
SCHOOL OF COMPUTER ENGINEERING AND TECHNOLOGY	**W.E.F**	**AY:** 2020-2021
FIRST YEAR MASTER OF TECHNOLOGY COMPUTER ENGINEERING	**COURSE NAME**	Modern Technology
	COURSE CODE	CS532
	COURSE CREDITS	04
RELEASED DATE : 01/07/2020	**REVISION NO**	1.0

TEACHING SCHEME		EVALUATION SCHEME				
		THEORY			PRESENTATION/	TOTAL
LECTURE	PRACTICAL	ECE	IA	PRACTICAL	DEMONSTRATION	
3	2	60	40	50	–	150

PRE-REQUISITE:

1: Nil

COURSE OBJECTIVES :

CS532.CEO.1: To get familiar with big data and Hadoop system

CS532.CEO.2: To acquire the knowledge of AWS and Google cloud services.

CS532.CEO.3: To study basic principles of Nano car and different modern technologies.

CS532.CEO.4: Apply their knowledge to understand different statistical tools and analysis software.

COURSE OUTCOMES :

The students after completion of the course will be able to,

CS532.CO1: Understand the knowledge of advanced software's.

CS532.CO2: Apply their knowledge in different fields.

CS532.CO3: Apply advance technologies in automobile industry.

CONTENTS:

Full Stack Development: Overview of Java Basics, basics of backend technologies - Servlet, JSP and Hibernate, SQL, UI Skills - Spring basics and framework ,Spring Boot, RESTful web service, basics of frontend stack technologies – JavaScript ,Angular using MongoDB.

DevOps: DevOps overview, Relationship between DevOps and Agile, DevOps Toolchain, Challenges with traditional approach, Overview of DevOps tools, Best practice for DevOps, version control – overview of GitHub, Continuous integration continuous deployment – Jenkins overview, Configuration Management Tool – Puppet and Chef overview, Containerization with Docker – Docker Overview, software and Automation testing framework – JUnit and Cucumber overview.

AWS Cloud: Cloud concepts overview, Global Infrastructure overview- Region, Zone, edge location, Overview of AWS cloud services – Compute - EC2, AWS Lambda, Storage – S3, EBS, S3 Glacier, Databases –RDS, DynamoDB, Security – I AM, Networking and content delivery –AWS VPC, auto scaling and monitoring cloud architecture - Cloud Watch, Cloud economics and Billing –AWS Cost Explorer.

PRACTICAL		
PRACTICAL No. 01	**Web application front end development**	**4 HOURS**
Designing of web application using front end technologies.		
PRACTICAL NO.02	**Web application back end development**	**2 HOURS**
Designing of web application using back end technologies.		
PRACTICAL NO.03	**Git and GiHub**	**2 HOURS**
Getting started with Git and GitHub – repository, types of Git workflow, fork, Git pages and Clone		
PRACTICAL NO.04	**Jenkins**	**2 HOURS**
Installing Jenkins, configure, setup Jenkins job.		
PRACTICAL NO.05	**Docker**	**2 HOURS**
Installing Docker, operations – deploy, login exit, start, stop container.		
PRACTICAL NO.06	**AWS Cloud Services – Compute, Storage**	**2 HOURS**
Configuring AWS cloud services – Compute EC2, Storage –S3.		
PRACTICAL No. 07	**AWS Cloud Services – Security, Databases**	**2 HOURS**
Configuring IAM policies and RDS system		
PRACTICAL No. 08	**Deployment of application on cloud platform**	**2 HOURS**
Deployment of web application on cloud – free tier.		

TEXT BOOKS

1. Chris Northwood, "The Full Stack Developer – Your Essential Guide to the everyday Skills Expected of a Modern Full Stack Web Developer", Apress Publications, 1st Edition 2018, ISBN – 1484241517.
2. Micro Hering, "DevOps for the Modern Enterprise – Winning Practices to Transform Legacy IT Organizations", 1st Edition, IT Revolution Publications, 2018, ISBN 1942788193.
3. Joe Baron, Hisham Baz, "AWS Certified Solution Architect official study guide", 1st edition, Sybex publisher, ISBN – 13: 978-1119138556.

REFERENCE BOOKS

1. Azat Mardon, "Full Stack Java Script – Learn Node.js and MongoDB", APress Publication, 1st Edition, ISBN -1484217500.
2. Deepu Sasidharan, "Full Stack Development – Build Full Stack applications and micro service with Spring Boot and Modern JavaScript Frameworks", 2nd Edition, Packt – Publishing, ISBN – 1838824987.
3. Peter Bell, "Introducing Github – A Non – Technical Guide", 1st Edition, Oreilly Publications, ISBN – 1491949740.
4. Jeff Nickoloff, Stephen Kuenzli, "Docker in Action", 2nd Edition, Manning Publications, 2019, ISBN 9781617294761.
5. John Ferguson Smart, "Jenkins the Definitive Guide", 2nd Edition, Oreilly Publications, ISBN -9781449305352.
6. AWS official documentation - https://docs.aws.amazon.com/

MIT Academy of Engineering (An autonomous Institute Affiliated to SPPU)		COURSE SYLLABI (2020 – 2022)	
SCHOOL OF COMPUTER ENGINEERING AND TECHNOLOGY		**W.E.F**	**AY:** 2020-2021
FIRST YEAR MASTER OF TECHNOLOGY COMPUTER ENGINEERING		**COURSE NAME**	Research Methodology
		COURSE CODE	EX531
		COURSE CREDITS	02
RELEASED DATE : 01/07/2020		**REVISION NO**	1.0

TEACHING SCHEME		EVALUATION SCHEME				
		THEORY			PRESENTATION/	TOTAL
LECTURE	PRACTICAL	ECE	IA	PRACTICAL	DEMONSTRATION	
2	-	50	25	–	–	75

PRE-REQUISITE:

1: Nil

COURSE OBJECTIVES :

EX531.CEO.1: To understand the basic framework of research process.

EX531.CEO.2: To identify various sources of information of survey and data collection.

EX531.CEO.3: To Illustrate the use of documentation and evaluate its quality.

COURSE OUTCOMES :

The students after completion of the course will be able to,

EX531.CO1: Classify different types of Research , objective and paradigm of research process.

EX531.CO2: Explore the basics of research framework and Hypothesis.

EX531.CO3: Describe about different data collection methods.

EX531.CO4: Explain the different stages of preparing scholarly writing proposals.

CONTENTS:

Introduction: What is research, Research definition, Objective paradigm for the research, Identifying defining the research problem, Literature it's analysis, Qualitative quantitative research, development of theoretical and conceptual frame work.

Hypothesis and Data Processing: Ethical Issues concerning research participants, Ethical issues in data collection, , Definition and functions of hypothesis, Processing operations, Problems in processing, Coding descriptive and quantitative data, Sampling techniques.

Statistics in research: Data collection methods – use , types , examples , Multivariate analysis, Concept of regression, Establishing validity and reliability.

Writing Research Proposal: Interpretation and its meaning, Readability of Manuscript, techniques, Contents, Report writing, structure, types of report, Procedure of writing research proposal, Writing as thinking, Habit of writing, Skills and thought process in technical writing, Role of computer in technical writing.

PRACTICAL List

Practical No.01	Web application front end development	4 HOURS
Designing and development of web application using front end technologies.		
Practical No.02	Web application back end development	2 HOURS
~~Designing of web application using back end technologies.~~		
Getting started with Git and GitHub – repository, types of Git workflow, fork, Git pages and Clone		
Configuring AWS cloud services – Compute EC2, Storage –S3		

TEXT BOOKS

1. John W. Creswell," Research Design-Qualitative Quantitative Approaches", SAGE publications, New Delhi ISBN: 0-8039-5254-6
2. Ranjit Kumar," Research Methodology- A Step by Step Guide for Beginners", 2nd ed., Pearson publication, New Delhi ISBN: 978-81-317-0496-7
3. Bernard M. Moret," The Theory of Computation", Pearson Publication ISBN: 978-81-317-0870-5

REFERENCE BOOKS

1. C. R. Kothari," Research Methodology, Methods Techniques", 2nd Edition, New Age International Publication ISBN:978-81-224-1522-3
2. Hamdy A. Taha, "Operation Research- An Introduction", 8th Edition, Pearson Publication , ISBN: 9780132729154

	COURSE SYLLABI (2020 – 2022)		

MIT Academy of Engineering (An autonomous Institute Affiliated to SPPU)	**COURSE SYLLABI** **(2020 – 2022)**		
SCHOOL OF COMPUTER ENGINEERING AND TECHNOLOGY	**W.E.F**	**AY:** 2020-2021	
FIRST YEAR MASTER OF TECHNOLOGY COMPUTER ENGINEERING	**COURSE NAME**	Advanced Data Structures and Algorithms	
	COURSE CODE	CS541	
	COURSE CREDITS	4	
RELEASED DATE : 01/07/2020	**REVISION NO**	1.0	

TEACHING SCHEME		EVALUATION SCHEME				
		THEORY			PRESENTATION/	TOTAL
LECTURE	PRACTICAL	ECE	IA	PRACTICAL	DEMONSTRATION	
3	2	60	40	–	50	150

PRE-REQUISITE:

1: Data Structures
2: Design and Analysis of Algorithms

COURSE OBJECTIVES :

CS541.CEO.1: To learn advanced data structures like persistent, cache oblivious data structures

CS541.CEO.2: To model data using retroactive and probabilisitc data structures

CS541.CEO.3: To learn online algorithms

CS541.CEO.4: To learn genetic algorithms

CS541.CEO.5: To learn nature inspired algorithms

COURSE OUTCOMES :

The students after completion of the course will be able to,

CS541.CO1: To implement various advanced data structures like disjoint sets, self-adjusting succinct data structures

CS541.CO2: To demonstrate the use of persistent, retroactive, cache oblivious and probabilistic data structures in various applications

CS541.CO3: To differentiate between online and offline algorithms

CS541.CO4: To provide solution to various optimization problems using Genetic Algorithms

CS541.CO5: To provide solution to various optimization problems using Nature Inspired Algorithms

CONTENTS:

Advanced Data Structures: Data structures for disjoint sets, augmented data structures, self-adjusting data structures, persistent data structures, retroactive data structures, cache oblivious data structures, probabilistic data structures

Genetic Algorithms: Introduction to Genetic Algorithms, Variants of Genetic Algorithms, Genetic Algorithms for subset sum problem, TSP, Knapsack

Online Algorithms: Introduction, Online Ski Rental Problem, Line Search Problem, Paging Problem, List Accessing Problem, K-Server Problem

Nature Inspired Algorithms: Swarm Intelligence : Ant colony optimization, Ant clustering algorithm, Particle swarm optimization Biological Motivations: Cuckoo Search, bat algorithm, flower pollination, firefly algorithm Immune Systems: Colnal selection algorithms, Negative selection algorithms, Immune network algorithms

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PRACTICAL List

Practical No.01	**Disjoint Sets**	**4 HOURS**

Implement Kruskal's Algorithm for finding minimum spanning tree of graph using disjoint set data structure

Practical No.02	**Probabilistic Data Structures**	**4 HOURS**

Implement Bloom Filter and Cuckoo Filter

Practical No.03	**Genetic Algorithms**	**4 HOURS**

Implement Travelling Salesman Problem using Genetic Algorithm

Practical No.04	**Ant Colony Optimization**	**4 HOURS**

Implement Travelling Salesperson Problem using Ant Colony Optimization

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TEXT BOOKS

1. Cormen, Thomas H., et al. Introduction to algorithms. MIT press, 2009
2. Sahni, Sartaj, and Ellis Horowitz. Fundamentals of computer algorithms. Computer science press, 1978
3. Fiat, Amos, and Gerhard J. Woeginger. Online algorithms: The state of the art. Vol. 1442. Heidelberg: Springer, 1998
4. Goldberg, David E. Genetic Algorithms. Pearson Education India, 2006
5. Kaplan, Haim. "Persistent data structures." Handbook of Data Structures and Applications. Chapman and Hall/CRC, 2018. 511-527
6. Yang, Xin-She. Nature-inspired optimization algorithms. Elsevier, 2014

REFERENCE BOOKS

1. Mehta, Dinesh P., and Sartaj Sahni. Handbook of data structures and applications. Chapman and Hall/CRC, 2004
2. Skiena, Steven S. The algorithm design manual: Text. Vol. 1. Springer Science Business Media, 1998
3. Davis, Lawrence. "Handbook of genetic algorithms." (1991)
4. Chan, Felix, and Manoj Tiwari, eds. Swarm Intelligence: focus on ant and particle swarm optimization. BoD–Books on Demand, 2007

	COURSE SYLLABI (2020 – 2022)	

MIT Academy of Engineering
(An autonomous Institute Affiliated to SPPU)

SCHOOL OF COMPUTER ENGINEERING AND TECHNOLOGY		W.E.F	**AY:** 2020-2021

FIRST YEAR MASTER OF TECHNOLOGY COMPUTER ENGINEERING	**COURSE NAME**	IoT Technology and Management
	COURSE CODE	CS542
	COURSE CREDITS	04
RELEASED DATE : 01/07/2020	**REVISION NO**	1.0

TEACHING SCHEME		EVALUATION SCHEME				
		THEORY			PRESENTATION/	TOTAL
LECTURE	PRACTICAL	ECE	IA	PRACTICAL	DEMONSTRATION	
3	2	60	40	–	50	150

PRE-REQUISITE:

1: Computer Networks
2: Wireless and Mobile Networks

COURSE OBJECTIVES :

CS542.CEO.1: To get knowledge of key technologies in Internet of Things and their applications in various areas.
CS542.CEO.2: To identify and describe different types of open source hardware.
CS542.CEO.3: To examine issues of privacy and security in IoT.
CS542.CEO.4: To apply the concept of Internet of Things (IoT) in the real world scenario.

COURSE OUTCOMES :

The students after completion of the course will be able to,

CS542.CO1: Apply key technologies in Internet of Things and their applications in various areas.
CS542.CO2: Design the system using Arduino/Raspberry Pi or equivalent hardware.
CS542.CO3: Demonstrate the knowledge of security and ethical issues in IoT.
CS542.CO4: Outline the application usage of IoT in real time scenario.

CONTENTS:

Introduction: Enabling Technologies, Small-Scale Computer Systems, Medium-Scale Computer Systems, Access to the Internet, IP Addressing Evolution, Data Storage and Processing Mobile Devices, Mobility – New Paradigm for IoT Systems, Cloud Computing, Fog Computing, Cognitive IoT Systems ,Data Management Aspects in IoT, Application Domains and Their Specifics, IoT hardwares.

IoT Communications: Networking overview, Communication models Device to device and Industry 4.0 revolution, Device to gateway, Device to cloud, Media layers - Wired networking, Media layers - Wireless protocols, PHY+MAC+LLC layers, NET (NWY) Layer, Host layer protocols.

IoT security and privacy: Types of vulnerabilities of IoT, Monitoring of vulnerabilities, Malware detection in IoT, IoT security protocols, IoT privacy , privacy preservation, IoT privacy preservation threats

Application: IoT based Precision Agriculture, Irrigation, Precision Livestock Farming, Landslide Prediction and Risk Communication, The Smart Health Care Ecosystem, Novel application using Internet of Flying Things(IoFT).

PRACTICAL List

Practical No.01	**8 HOURS**

Design and simulate Smart Home using Cisco Packet tracer.

Practical No.02	**8 HOURS**

Design and simulate Smart Home using Cisco Packet tracer.

Practical No.03	**6 HOURS**

Identify and simulate different kinds of vulnerabilities with practical assignment no.1 and 2.

TEXT BOOKS

1. ITMO University, "IOT-OPEN.EU: Introduction to the IoT Coursebook in English", v1(ebook), May 2018
2. Adrian McEwen, Hakim Cassimally, "Designing the Internet of Things", ISBN 978-1-118-43062-0 (paperback); ISBN:978-1-118-43063-7 (ebook); 978-1-118-43065-1 (ebook), 2014 John Wiley and Sons, Ltd.
3. Daniel Minoli, "Building the Internet of Things with IPv6 and MIPv6: The Evolving World of M2M Communications", ISBN: 978-1-118-47347-4, Willy Publications
4. Donald Norris, "Internet of Things: Do-it-yourself", 1st Edition, 2015, McGraw Hill Education, ISBN:978-0-07-183520-6

REFERENCE BOOKS

1. Hakima Chaouchi, "The Internet of Things Connecting Objects to the Web", ISBN : 978-1-84821-140-7, Wiley Publications

2. Olivier Hersent, David Boswarthick, Omar Elloumi, "The Internet of Things: Key Applications and Protocols", ISBN: 978-1-119-99435-0, 2nd Edition, Wiley Publications

3. Bernd Scholz-Reiter, Florian Michahelles, "Architecting the Internet of Things",ISBN:978-3-642-19156-5,e-ISBN:978-3-642-19157-2, Springer

4. Quasy F Hussain, "Internet of Things A to Z: Technologies and Applications", ISBN: 978-1-119-45674-2, Wiley-IEEE Press

5. David Hanes, Gonzalo Salgueiro, Patrick Grossetete, Robert Barton, "IoT Fundamentals:Networking Technologies, Protocols, and Use Cases for the Internet of Things", ISBN:978-1587144561,Cisco Press

	COURSE SYLLABI
MIT Academy of Engineering (An autonomous Institute Affiliated to SPPU)	**(2020 – 2022)**

SCHOOL OF COMPUTER ENGINEERING AND TECHNOLOGY	**W.E.F**	**AY:** 2020-2021	
FIRST YEAR MASTER OF TECHNOLOGY COMPUTER ENGINEERING	**COURSE NAME**	Technical Writting	
	COURSE CODE	EX533	
	COURSE CREDITS	02	
RELEASED DATE : 01/07/2020	**REVISION NO**	1.0	

TEACHING SCHEME		**EVALUATION SCHEME**				
		THEORY			PRESENTATION/	TOTAL
LECTURE	PRACTICAL	ECE	IA	PRACTICAL	DEMONSTRATION	
2	-	–	25	–	50	75

PRE-REQUISITE:

1: Research Methodology

COURSE OBJECTIVES :

EX533.CEO.1: To share the skills and finer aspects of scientific and technical writing with the research students of the Institute order to prepare technical documents clearly, concisely, consistently, and effectively, following internationally accepted standards.

EX533.CEO.2: Students will be made to evaluate the correct error-free writing by being well versed in rules of English grammar and cultivate relevant technical style of communication presentation at their work place and also for academic uses.

EX533.CEO.3: To provide overview of technical English for research paper writing with a special focus on research methods typical for classroom based studies of pedagogical innovations.

COURSE OUTCOMES :

The students after completion of the course will be able to,

EX533.CO1: Creates substantial base by the formation of strong professional vocabulary for its application at different platforms and through numerous modes as comprehension, reading, writing and speaking etc.

EX533.CO2: Find information about scientific and technical publications using two premier analytics information resources: the Web of Science platform and Derwent Innovation Index for the patent information discovery.

EX533.CO3: Identify plagiarism and explain how to prevent it.

EX533.CO4: Read and analyze several articles to form your own opinion on a topic - make connections between several articles.

EX533.CO5: Write a 7- 8-page research paper / review paper by using source material correctly with MLA format.

CONTENTS:

Introduction: Introduction to Technical Communication: Reading Skill, Basics of English Grammar, Introduction to Effective Writing: Effective writing as an art, principles of effective writing, types and stages of effective writing, notions of correctness and appropriateness, essentials of academic writing Technical Instructions: Purpose, Content Structure: Understanding the Audience, Creative Writing: Use of tools, Guidelines for Technical Writing, Microsoft Word, Text Editor for Drafting Content, The Role of Visuals in Technical Instructions, the features of Authorizing Tool, Adobe Frame maker, Desktop Publishing and Help Publishing Tool, Snag IT, Image Capturing Tool MS-Visio Image Drawing Tool.

Role of Ethics in Technical Instructions: Role of Ethics in Technical Instructions Understanding the subject: formulating ideas for the paper, developing a thesis statement Preparing the anatomy of the paper: Literature review, research methodology, Writing the results, analysis of the results, discussion and conclusion, apply correct citation, formatting, write the first draft, revise, edit and proofread, Use of tools for research paper help: Grammar checkers, plagiarism checkers, citation generators. Selecting a journal / conference: Targeting a high impact factor journal in Elsevier, IEEE, Springer, Wiley etc., Introduction to the Web of Science, Science Citation Index (SCI)/SCI Expanded (SCIE) and Scopus, preparing the manuscript according to the chosen journal's requirements, submission ethics, and use of peer review comments in a constructive way, submission, revision and galley proof. Proposal writing, the Web of Science platform and Derwent Innovation Index for the patent information discovery, Patent Searching, Drafting and Filing.

Internal Assessment Activities		
Activity No.01	**Preparing the document on**	**6 HOURS**
a) A representative official correspondence. b) Work progress report c) Technical brochures and newsletters d) Instruction Manual e) Demo patent writing		
Activity No.02	**Technical discussions**	**2 HOURS**
Graded technical discussions will be planned online and in class		
Activity No.03	**Quiz**	**2 HOURS**
Quiz on every major component of the course.		
Activity No. 04	**Writing gist**	**2 HOURS**
Writing gist from a set of related papers		
Activity No.05	**Writing the technical blogs**	**2 HOURS**
Writing the technical blogs		

Demonstration/Presentation	
Presentation /Demonstration Students will have to submit and present :	.
Project proposal to be submitted to the funding agencies of repute (Peer review) Review paper / Research paper or research letter.	

TEXT BOOKS

1. Kenneth G. Budinski, Writing Engineers' Guide to Technical, ASM internationals, ISBN: 978-0-87170-693-5
2. Gerald. J. Alred, Charles. T.Brusaw, and Walter. E. Oliu, Handbook of Technical Writing, St. Martin's Press, New York, Ninth Ed., ISBN 1250004411, 2008
3. Hofmann, A. Angelika, Scientific Writing and Communication, Oxford University Press, Oxford., ISBN 0199947562 2014

REFERENCE BOOKS

1. Meenakshi Raman and Sangeeta Sharma, Technical Communication – Principles and Practices Oxford Univ. Press, 2016
2. Websites: https://swayam.gov.in/nd1$_n$oc19$_h$s31/$Dated$: 22ndMay2020

	COURSE SYLLABI (2020)
![MIT Academy of Engineering logo] **(An autonomous Institute Affiliated to SPPU)**	

SCHOOL OF COMPUTER AND INFORMATION TECHNOLOGY	**W.E.F**	**AY:** 2020 - 2021	
FIRST YEAR MASTER OF TECHNOLOGY COMPUTER ENGINEERING	**COURSE NAME**		MACHINE LEARNING
	COURSE CODE		CS543
	COURSE CREDITS		4
RELEASED DATE : 01/07/2020	**REVISION NO**		1.0

TEACHING SCHEME		**EXAMINATION SCHEME AND MARKS**				
(HOURS/WEEK)		**THEORY**		**TUTORIAL/**	**PRESENTATION/**	**TOTAL**
LECTURE	**PRACTICAL**	**ECE**	**IA**	**PRACTICAL**	**DEMONSTRATION**	
3	2	60	40	NIL	50	150

PRE-REQUISITE : NIL

COURSE OBJECTIVES :

CS543.CEO.1: To provide knowledge about the key algorithms and theory that form the foundation of machine learning and computational intelligence.

CS543.CEO.2: To introduce modern techniques in machine learning, and a practical knowledge of algorithms and methods.

CS543.CEO.3: To formulate machine learning problems as per characteristics of real-world applications.

CS543.CEO.4: To be familiar with the use machine learning ideas, paradigms and techniques with its performance evaluation.

COURSE OUTCOMES :

The students after completion of the course will be able to,

CS543.CO.1: Understand strengths and weaknesses of many popular machine learning approaches.

CS543.CO.2: Understand and differentiate modern machine learning techniques and applications.

CS543.CO.3: Analyze appropriate method based on the particular characteristics of the domains and applications under consideration.

CS543.CO.4: Accurately formulate, test and and evaluate hypothesis and the performance of machine learning algorithms.

CONTENTS:

Introduction to Machine Learning and Applications, Supervised Learning, Unsupervised Learning, Linear Regression Model, Cost Function, Optimization of Cost Function, Gradient Descent, Convergence, Multivariate Linear Regression, Multiple Features, Gradient Descent for multiple variable, Subset Selection, Polynomial Regression.

Logistic Regression, Classification, Cost Function for Classification, Multi class classification and Regularization.

Neural Network, Non-linear Hypothesis, Artificial Neural Network Representation, Training, Initialization and Validation, Parameter Estimation, Feed forward Network, Back-Propagation Algorithm, Cost Function, Gradient Checking.

Hypothesis Evaluation, Model Selection, Cross Validation, Bias and Variance. Support Vector Machine Formulation, Decision Boundary, Kernals. Decision Trees for Classification, Regression Trees, Stopping Criteria and Pruning. Ensemble Learning: Combining Multiple Models, Bagging, Randomization, Boosting, Stacking.

Partitional Clustering, Hierarchical Clustering, BIRCH Algorithm, CURE Algorithm, Density Based Clustering.

Reinforcement Learning, Exploration, Exploitation, Rewards, Penalties, Markov Decision Process in Reinforcement Learning

PRACTICAL	
PRACTICAL NO.01	**4 HOURS**
To implement Multiple Linear Regression model with parameter estimation.	
PRACTICAL NO.02	**4 HOURS**
To implement Logistic Regression for Binary Classification.	
PRACTICAL NO.03	**4 HOURS**
To implement Back Propogation Algorithm.	
PRACTICAL NO.04	**4 HOURS**
To implement the Support Vector Machine classifier and find the accuracy for selected dataset.	
PRACTICAL NO.05	**4 HOURS**
To implement the any one algorithm in Partitional Clustering or Hierarchical Clustering.	
PRACTICAL NO.06	**4 HOURS**
Identify real world application and implement mini project using machine learning techniques and Algorithms.	

TEXT BOOK

1. Ethem Alpaydin, "Introduction to Machine Learning", Third Edition, The MIT Press,2014, ISBN 978-0-262-02818-9
2. Tom Mitchell, "Machine Learning" , McGraw Hill, 1997, ISBN 007-0-42807-7
3. Parag Kulkarni, "Reinforcement and Systemic Machine Learning for Decision Making", Wiley, IEEE Press, 2012, ISBN: 978-0-470-91999-6

REFERENCE BOOK

1. Peter Harrington, "Machine Learning in Action", Dreamtech Press, 2012, ISBN 978-1-617-29018-3
2. Trevor Hastie, Robert Tibshirani, Jerome Friedman, "The Elements of Statistical Learning: Data Mining, Inference, and Prediction", Second Edition, Springer, 2009, ISBN: 978-0-387-84857-0
3. Introduction to Machine Learning with Python: A Guide for Data Scientists, by Andreas Muller,Paperback: 392 pages,Publisher: Shroff/O'Reilly; First edition (2016), ISBN-10: 9352134575, ISBN-13: 978-9352134571
4. Python Machine Learning Cookbook, Prateek Joshi,Paperback: 304 pages, Publisher: Packt Publishing Limited (23 June 2016), ISBN-10: 1786464470 ISBN-13: 978-TMH, 2009, ISBN-13: 978-8120337312
5. Data Mining: Concepts and Techniques, Jiawei Han, Micheline Kamber, Jian Pei, Hardcover: 744,Publisher: Morgan Kaufmann; 3 edition (25 July 2011), ISBN-10: 9380931913, ISBN-13: 978-9380931913

COURSE SYLLABI (2020-2022)		

MIT | Academy of Engineering
(An Autonomous Institute)

SCHOOL OF COMPUTER ENGINEERING AND TECHNOLOGY	W.E.F.	:	2020-21
SECOND YEAR MASTER OF TECHNOLOGY IN COMPUTER ENGINEERING	COURSE NAME	:	Project-I
	COURSE CODE	:	CS545
	COURSE CREDITS	:	02
RELEASE DATE : 01/07/2020	REVISION NO.	:	2.0

TEACHING SCHEME :		EVALUATION SCHEME :				
LECTURE	PRACTICAL	THEORY		PRACTICAL	PRESENTATION/ DEMONSTRATION	TOTAL
		ECE	IA			
--	04	--	--	--	50	50

PRE-REQUISITE

1. EX531- Research Methodology
2. EX533- Technical Writing

COURSE OBJECTIVES

1. CS545 CEO.1: To Manage the selection and initiation of individual projects
2. CS545 CEO.2: To conduct project planning activities that accurately forecast project costs, timeline and quality.

COURSE OUTCOMES

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

1. CS545 CO.1: Identify the real life problem/ important concepts / current applications from engineering domain
2. CS545 CO.2: Describe the aim and objective of selected problem statement
3. CS545 CO.3: Describe the plan and cost of the project

CONTENTS

Project work is divided into four stages namely Project Stage I, Project Stage II, Project Stage III and Project Stage IV.

Project Stage I is entirely related with selection of PROBLEM STATEMENT /problem by the students related to thrust areas identified by respective departments. Synopsis submission and mid trimester presentation will be conducted by department based on following points,

- Literature survey
- Motivation and Problem Statement
- Goals and Objectives

Final Project Stage I Report submission and Presentation shall be conducted at the end of the trimester. End-Trimester Assessment (ETA) presentation shall be conducted in front of eminent expert from Academics or Industry.

		CREDITS			
	1 Lecture hour = 1 Credit 2 Lab Hours = 1 Credit				
SL. NO.	**YEAR**	**TRIMESTER**			**TOTAL**
		1	**2**	**3**	
1.	First Year	12	10	12	**34**
2.	Second Year	10	10	10	**30**
TOTAL					**64**

		CONTACT HOURS			
SL. NO.	**YEAR**	**TRIMESTER**			**TOTAL**
		1	**2**	**3**	
1.	First Year	13	12	16	41
2.	Second Year	14	20	20	54
TOTAL					**95**

		ABBREVATIONS	
1.	ECE	End Course Exam	
2.	IA	Internal Assessment	
3.	T/P	Term Work / Practical	
4.	DM	Demonstration	
5.	L	Lecture	
6.	P	Practical	
7.	T	Tutorial	
8.	Lab	Laboratory	

MIT | Academy of Engineering Autonomous Institute Affiliated to SPPU	COURSE STRUCTURE (2020 - 2022)		
SCHOOL OFCOMPUTER ENGINEERING AND TECHNOLOGY	W.E.F	:	2021-2022
SECOND YEAR MASTER OF TECHNOLOGY IN COMPUTER ENGINEERING	RELEASE DATE	:	01/07/2020
	REVISION NO.	:	1.0

TRIMESTER-IV

COURSE			TEACHING SCHEME			EXAMINATION SCHEME AND MARKS				TOTAL	CREDIT
			Hours/Week			THEORY		PRACT			
TYPE	CODE	NAME	L	P	T	ECE	IA	T/P	DM		
DE1	CS66#	Elective course – I	3	-	-	60	40	-	-	100	3
DE2	CS67#	Elective course – II	3	-	-	60	40	-	-	100	3
SDP2	CS651	Project Work – II	-	8	-			50	50	100	4
TOTAL			6	8	-	120	80	50	50	300	10

TRIMESTER-V

COURSE			TEACHING SCHEME			EXAMINATION SCHEME AND MARKS				TOTAL	CREDIT
			Hours/Week			THEORY		PRACT			
TYPE	CODE	NAME	L	P	T	ECE	IA	T/P	DM		
SDP3	CS652	Project Work - III	-	20	-	-	-	150	50	200	10
TOTAL				20				150	50	200	10

TRIMESTER-VI

COURSE			TEACHING SCHEME			EXAMINATION SCHEME AND MARKS				TOTAL	CREDIT
			Hours/Week			THEORY		PRACT			
TYPE	CODE	NAME	L	P	T	ECE	IA	T/P	DM		
SDP4	CS653	Project Work – IV	-	20	-	-	-	200	100	300	10
TOTAL				20				200	100	300	10

ANNEXTURE-I

Department Elective Course I: 1 Course		
Sl. No.	**Course Code**	**Course**
1	CS661	Information Retrieval
2	CS662	Computer Vision
3	CS663	Network Security Techniques
4	CS664	Open Elective

Department Elective Course II: 1 Course		
Sl. No.	**Course Code**	**Course**
1	CS671	Big Data Analytics
2	CS672	Business Intelligence
3	CS673	Ad-hoc Wireless Network: Principle, Protocol and Applications
4	CS674	Open Elective

	COURSE SYLLABI (2020 − 2024)	
MIT Academy of Engineering (An autonomous Institute Affiliated to SPPU)		
SCHOOL OF COMPUTER ENGINEERING AND TECHNOLOGY	**W.E.F**	**AY:** 2021 - 2022
SECOND YEAR MASTER OF TECHNOLOGY IN COMPUTER ENGG	**COURSE NAME**	Information Retrieval
	COURSE CODE	CS661
	COURSE CREDITS	3
RELEASED DATE : 01/01/2020	**REVISION NO**	1.0

TEACHING SCHEME (HOURS/WEEK)		EXAMINATION SCHEME & MARKS						
		THEORY			PRACTICAL			TOTAL
LECTURE	PRACTICAL	MSE	ESE	IA	MSE	ESE	IA	
3	NIL	NIL	40	40	NIL	NIL	NIL	100

PRE-REQUISITE :

1. CS212 - Database Management Systems
2. CS313 - Foundation of Data Mining and Warehousing

COURSE OBJECTIVES :

CS661.CEO.1: : To learn the information retrieval models.

CS661.CEO.2: To be familiar with Web Search Engine.

CS661.CEO.3: To be exposed to Link Analysis

CS661.CEO.4: To understand Hadoop and Map Reduce

CS661.CEO.5: To learn document text mining techniques

COURSE OUTCOMES:

The students after completion of the course will be able to,

CS661.CO.1: To understand the theoretical basis behind the standard models of IR (Boolean, Vector-space, Probabilistic and Logical models)

CS661.CO.2: To understand the difficulty of representing and retrieving documents, images, speech, etc.

CS661.CO.3: To implement, run and test a standard IR system

CS661.CO.4: To Develop the standard methods for Web indexing and retrieval

CS661.CO.5: To evaluate techniques from natural language processing, artificial intelligence, human-computer interaction and visualization integrate with IR, and be familiar with various algorithms and Systems

THEORY COURSE CONTENT		
UNIT 1	**INTRODUCTION**	**7 HOURS**

Introduction, History of IR- Components of IR – Issues –Open source Search engine Frameworks – The impact of the web on IR – The role of artificial intelligence (AI) in IR – IR Versus Web Search – Components of a Search engine- Characterizing the web.

UNIT 2	**INFORMATION RETRIEVAL**	**7 HOURS**

Boolean and vector-space retrieval models- Term weighting – TF-IDF weighting- cosine similarity – Preprocessing – Inverted indices – efficient processing with sparse vectors – Language Model based IR – Probabilistic IR –Latent Semantic Indexing – Relevance feedback and query expansion.

UNIT 3	**WEB SEARCH ENGINE – INTRODUCTION AND CRAWLING**	**7 HOURS**

Web search overview, web structure, the user, paid placement, search engine optimization/ spam. Web size measurement – search engine optimization/spam – Web Search Architectures – crawling – meta-crawlers- Focused Crawling – web indexes — Near-duplicate detection – Index Compression – XML retrieval.

UNIT 4	**WEB SEARCH – LINK ANALYSIS AND SPECIALIZED SEARCH**	**7 HOURS**

Link Analysis –hubs and authorities – Page Rank and HITS algorithms -Searching and Ranking – Relevance Scoring and ranking for Web – Similarity – Hadoop Map Reduce – Evaluation – Personalized search – Collaborative filtering and content-based recommendation of documents and products – handling "invisible" Web – Snippet generation, Summarization, Question Answering, Cross- Lingual Retrieval.

UNIT 5	**DOCUMENT TEXT MINING**	**7 HOURS**

Information filtering; organization and relevance feedback – Text Mining -Text classification and clustering – Categorization algorithms: naive Bayes; decision trees; and nearest neighbor – Clustering algorithms: agglomerative clustering; k-means; expectation maximization (EM).

TEXT BOOKS

1. C. Manning, P. Raghavan, and H. Schütze, Introduction to Information Retrieval , Cambridge University Press, 2008.
2. Ricardo Baeza -Yates and BerthierRibeiro – Neto
3. Modern Information Retrieval: The Concepts and Technology behind Search 2nd Edition, ACM Press Books 2011.
4. Bruce Croft, Donald Metzler and Trevor Strohman, Search Engines: Information Retrieval in Practice, 1st Edition Addison Wesley, 2009.
5. Mark Levene, An Introduction to Search Engines and Web Navigation, 2nd Edition Wiley, 2010.

REFERENCE BOOKS

1. Stefan Buettcher, Charles L. A. Clarke, Gordon V. Cormack, Information Retrieval: Implementing and Evaluating Search Engines, The MIT Press, 2010.
2. OphirFrieder "Information Retrieval: Algorithms and Heuristics: The Information Retrieval Series ", 2nd Edition, Springer, 2004.
3. Manu Konchady, "Building Search Applications: Lucene, Ling Pipe", and First Edition, Gate Mustru Publishing, 2008.

MIT Academy of Engineering (An Autonomous Institute)	COURSE SYLLABI (2020-2022)		
DEPARTMENT OF COMPUTER ENGG.	**W.E.F.**	**:**	2020-21
SY MTECH	**COURSE NAME**	**:**	Computer Vision
	COURSE CODE	**:**	CS662
	COURSE CREDITS	**:**	03
RELEASE DATE : 1/08/2017	**REVISION NO.**	**:**	1.0

TEACHING SCHEME :		**EVALUATION SCHEME :**					
LECTURE	**PRACTICAL**	**THEORY**			**PRACTICAL**	**PRESENTATION/ DEMONSTRATION**	**TOTAL**
		ITA	**ETA**	**IA**			
3	NIL	40	50	10	NIL	NIL	100

PRE-REQUISITE:

1. CS323 - Signal Processing & Application
2. AS201 - Applied Mathematics

COURSE OBJECTIVES:

1. CS633.CEO.1: To describe the foundation of image formation, measurement, and analysis.
2. CS633.CEO.2: To implement common methods for robust image matching and alignment.
3. CS633.CEO.3: To gain exposure to object and scene recognition and categorization from images.

COURSE OUTCOMES:

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

1. CS633.CO.1: To demonstrate a thorough knowledge of fundamental concepts pertaining to computer vision.
2. CS633.CO.2: To segment objects in an image based on texture and color features.
3. CS633.CO.3: To design and implement a computer vision project utilizing the concepts taught in this course and evaluate their approach, analyze results and present research in class

THEORY:

Introduction: Digital Image Processing & Computer Vision-Introduction, Digital Image Fundamentals, Relationships between pixels, Distance measures; Image operations

Image Enhancement: Image Enhancement in spatial domain Gray level , Histogram processing , Enhancement operations , Frequency Domain 2-D Fourier transform, Convolution and Correlation theorems; Filtering in frequency domain - low pass smoothing, high pass sharpening.

Image restoration and reconstruction: Image degradation and restoration processes, Restoration in the presence of noise, linear position, Geometric

Image processing: Image segmentation, Image compression –Fundamentals, basic compression methods-Huffman coding, golomb coding, bit plane coding, wavelet coding, Image wavelets and description-Wavelets-Background of wavelets, multiresolution expansion, wavelet transforms in one dimensions, Image descriptions Image.

Object Recognition: Patterns and pattern classes; Decision theoretic methods , Structural methods, Need of intelligent processing and expert systems

TEXT BOOKS:
1. R. Gonzalez, R. Woods, and S. Eddins, Digital Image Processing Using Matlab (second edition), Gatesmark Publishing, 2009.   2. Richard Szeliski, "Computer Vision: Algorithm and Applications",Springer,2011,ISBN 978-1-84882-935-0
REFERENCES:
1. R. Gonzalez and R. Woods, Digital Image Processing (third edition), Prentice-Hall, 2008   2. Forsyth, David A. & Ponce, Jean," Computer Vision ,modern Approach" , Prentice Hall Professional Technical Reference,2000   3. Brian L. DeCost,Harshvardhan Jain,Anthony D. Rollett,Elizabeth A. Holm,"Computer Vision and Machine Learning for Autonomous Characterization of AM Powder Feedstocks",Springer ,2016   4. Xianghua XieMark Jones,Gary Tam,"Recognition, Tracking, and Optimization", Springer 2017

SCHOOL OF COMPUTER ENGINEERING AND TECHNOLOGY	**W.E.F**	2021 - 2022
SECOND YEAR MASTERS OF TECHNOLOGY COMPUTER ENGINEERING	**COURSE NAME**	Network Security Techniques
	COURSE CODE	CS634
	COURSE CREDITS	3
RELEASED DATE : 01/07/2020	**REVISION NO**	2.0

TEACHING SCHEME		EXAMINATION SCHEME AND MARKS					
(HOURS/WEEK)		THEORY			TUTORIAL/ PRACTICAL	PRESENTATION / DEMONSTRATION	TOTAL
LECTURE	PRACTICAL	MSE	ESE	IA			
3	NIL	35	35	30	NIL	NIL	100

PRE-REQUISITE :

1. CS303 – Data Communication & Networking

COURSE OBJECTIVES :

1. CS634.CEO.1: Identify various network security threats

2. CS634.CEO.2: Explain the concepts of malicious codes

3. CS634.CEO.3: Build security model to prevent, detect and recover from the attacks

4. CS634.CEO.4: Illustrate various securities issues and techniques applied in network security.

COURSE OUTCOMES:

The students after completion of the course will be able to,

1. CS634.CO.1: Identify various security practices applied in real time applications

2. CS634.CO.2: Analyze information security issue in computer and networking environment.

3. CS634.CO.3: Explain network security principles.

4. CS634.CO.4: Develop security algorithms for given computing system.

THEORY COURSE CONTENT

A Model for Network Security, Classical Encryption Techniques.

Block Ciphers and Data Encryption Standard: Strength of DES, Cryptanalysis, Block Cipher, Design Principles, Finite Fields of the Form GF(p), Advanced Encryption Standard, Fermat's and Euler's Theorems, The Chinese Remainder Theorem, Discrete Logarithms, Public-Key Cryptography and RSA, Diffie-Hellman Key Exchange, El-Gamal Cryptosystem, Elliptic Curve Arithmetic, Elliptic Curve Cryptography, Pseudorandom Number Generation Based on an Asymmetric Cipher.

Cryptographic Hash Functions: Simple Hash Functions, Requirements and Security, Cipher Block Chaining, MACs Based on Hash Functions, Authenticated Encryption, And Digital Signature Standard.

Key Management and Distribution: Symmetric Key Distribution Techniques, Distribution of Public Keys, User Authentication Protocols, Remote User Authentication, Federated Identity Management.

TEXT BOOK

1. William Stallings, "Cryptography and Network Security – Principles and Practices", Pearson Education, Fifth Edition, 2011.

2. Wade Trappe and Lawrence C. Washington, "Introduction to Cryptography with Coding Theory" Second Edition, Pearson Education, 2007.

REFERENCE BOOK

1. Cryptography and Network Security : Forouzan Mukhopadhyay, McGraw Hill,

2. Godbole," Information Systems Security", Willey Publication

3. Mark Stamp, "Information Security: Principles and Practice", Wiley Inter Science, 2011

		COURSE SYLLABI		
MIT | Academy of Engineering (An Autonomous Institute)		**COURSE SYLLABI (2020-2022)**		
SCHOOL OF COMPUTER ENGINEERING AND TECHNOLOGY		**W.E.F.**	**:**	2021-22
SECOND YEAR MASTER OF TECHNOLOGY IN COMPUTER ENGINEERING		**COURSE NAME**	**:**	Big Data Analytics
		COURSE CODE	**:**	CS671
		COURSE CREDITS	**:**	03
RELEASE DATE	**:** 01/07/2020	**REVISION NO.**	**:**	2.0

TEACHING SCHEME :		EVALUATION SCHEME :				
LECTURE	**PRACTICAL**	**THEORY**		**PRACTICAL**	**PRESENTATION/ DEMONSTRATION**	**TOTAL**
		ECE	**IA**			
3	NIL	60	40	NIL	NIL	100

PRE-REQUISITE:

1. CS212 - Database Management Systems
2. CS313 - Foundation of Data Mining and Warehousing

COURSE OBJECTIVES:

1. CS671.CEO.1: To learn the concept of Big data and applications of big data analytics
2. CS671.CEO.2: To use framework for processing and storing data.

COURSE OUTCOMES:

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

1. CS671.CO.1: To apply Hadoop ecosystem components.
2. CS671.CO.2: To Develop Map Reduce Work Application.
3. CS671.CO.3: To Create the HDFS tables and loading them in Hive and learn joining of tables in Hive.
4. CS671.CO.4: To design and build Hive and Hase based Big data Applications.

THEORY		
Unit-I		**8 Hours**

Parallel database architecture, Design of parallel systems, Study of DDBMS architectures, Analysis of Concurrency control in distributed databases, Implementation of Distributed query processing.

Introduction to big data : Introduction to Big Data Platform – Challenges of Conventional Systems - Intelligent data analysis – Nature of Data - Analytic Processes and Tools - Analysis vs Reporting.

Unit-II		**8 Hours**

Hadoop: History of Hadoop- the Hadoop Distributed File System, Components of Hadoop Analysing the Data with Hadoop, Hadoop Ecosystem 2.0, Developing a Map Reduce Application, How Map Reduce Works, Anatomy of a Map Reduce Job run, Failures-Job Scheduling-Shuffle and Sort, Task execution, Map Reduce Types and Formats, Map Reduce Features Hadoop environment.

Unit-III		**8 Hours**

Frameworks: Applications on Big Data Using Pig and Hive, Data processing operators in Pig, Hive services, HiveQL – Querying Data in Hive, fundamentals of HBase and ZooKeeper, IBM InfoSphere BigInsights and Streams.

TEXT BOOKS:

1. Coronel, Morris and Rob, "Database Principals: Fundamentals of Design, Implementation and Management",9th edition, Cengage Learning, (ISBN: 978-81-315-1736-9)
2. Bill Franks, "Taming The Big Data Tidal Wave", 1st Edition, Wiley, 2012.
3. VigneshPrajapati, "Big Data Analyticswith R and Haoop", Packet Publishing 2013.
4. Kyle Banker, Piter Bakkum, Shaun Verch, "MongoDB in Action" Dream tech Press
5. Tom White, "HADOOP: The definitive Guide", O Reilly 2012.

REFERENCES:

1. Michael Berthold, David J. Hand, "Intelligent Data Analysis", Springer, 2007.
2. Tom White "Hadoop: The Definitive Guide" Third Edition, O'reilly Media, 2012.
3. Chris Eaton, Dirk DeRoos, Tom Deutsch, George Lapis, Paul Zikopoulos, "Understanding Big Data: Analytics for Enterprise Class Hadoop and Streaming Data", McGrawHill Publishing, 2012.
4. Anand Rajaraman and Jeffrey David Ullman, "Mining of Massive Datasets", CUP, 2012.
5. Bill Franks, "Taming the Big Data Tidal Wave: Finding Opportunities in Huge Data Streams with Advanced Analytics", John Wiley& sons, 2012.
6. Glenn J. Myatt, "Making Sense of Data", John Wiley & Sons, 2007.
7. Pete Warden, "Big Data Glossary", O'Reilly, 2011.
8. Jiawei Han, Micheline Kamber "Data Mining Concepts and Techniques", 2nd Edition, Elsevier, Reprinted 2008.
9. Da Ruan, Guoquing Chen, Etienne E.Kerre, Geert Wets, "Intelligent Data Mining", Springer, 2007.

10. Paul Zikopoulos, Dirkde Roos, Krishnan Parasuraman, Thomas Deutsch, James Giles , David Corrigan, "Harness the Power of Big Data The IBM Big Data Platform", Tata McGraw Hill Publications, 2012.
11. Arshdeep Bahga, Vijay Madisetti, "Big Data Science & Analytics: A HandsOn Approach ",VPT, 2016
12. Bart Baesens "Analytics in a Big Data World: The Essential Guide to Data Science and its Applications (WILEY Big Data Series)", John Wiley & Sons,2014

MIT | Academy of Engineering (An Autonomous Institute)	COURSE SYLLABI (2020-2022)		
DEPARTMENT OF COMPUTER ENGG.	**W.E.F.**	**:**	2021-22
SECOND YEAR MASTER OF TECHNOLOGY IN COMPUTER ENGINEERING	**COURSE NAME**	**:**	Business Intelligence
	COURSE CODE	**:**	CS643
	COURSE CREDITS	**:**	03
RELEASE DATE **:** 1/7/2019	**REVISION NO.**	**:**	1.0

TEACHING SCHEME :		EVALUATION SCHEME :					
LECTURE	**PRACTICAL**	**THEORY**			**PRACTICAL**	**PRESENTATION/ DEMONSTRATION**	**TOTAL**
		ITA	**ETA**	**IA**			
3	NIL	40	50	10	NIL	NIL	100

PRE-REQUISITE:

1. CS212 - Database Management Systems
2. AS501 – Computing and Mathematics

COURSE OBJECTIVES:

1. CS643.CEO.1: To introduce the idea of decision making in complex industrial and service environments
2. CS643.CEO.2: To understand the science behind better predictions and decisions.
3. CS643.CEO.3: To generate an ability to design, analyze and perform experiments on real life problems using various Decision making methodologies

COURSE OUTCOMES:

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

1. CS643.CO.1: To understand articulate modern BI practices, including knowledge integration, sourcing and managing BI solutions.
2. CS643.CO.2: To discuss the social and ethical issues related to the use of Business Intelligence technologies in organizations.
3. CS643.CO.2: To understand articulate the crucial role that Business Intelligence plays in careers as well as in business and society in the 21st century.

4. CS643.CO.4: To understand articulate modern concepts, theories, and research in the field of Business Intelligence.
5. CS643.CO.5: To apply BI enabling technologies in organizational settings.

THEORY:

Introduction: BI Definitions & Concepts, BI Infrastructure Components, The Architecture of BI and its types, Development of a business intelligence system, Role of Data Warehousing in BI, Business Applications of BI.

Definition of system: Representation of the decision-making process, Types of decisions, Approaches to the decision-making process, Evolution of information systems, Definition of decision support system, Development of a decision support system.

Structure of mathematical models: Data exploration, Bivariate analysis, Graphical analysis, Regression, Significance of the coefficients Analysis of variance, Multi-colinearity of the independent variables, Confidence and prediction limits.

Definition of time series: Evaluating time series models Distortion measures Dispersion measures, Decomposition of a time series, Exponential smoothing models, , Removal of trend and seasonality,

Relational marketing: Motivations and objectives, An environment for relational marketing analysis, Lifetime value, The effect of latency in predictive models, Market basket analysis, Web mining, Response functions, Business case studies, Retention in telecommunications, Acquisition in the automotive industry, Cross-selling in the retail industry

TEXT BOOKS:

1. Carlo Vercellis, "Business Intelligence", John Wiley & sons 2009 edition , ISBN 978-0-470-51138-1

REFERENCES:

1. Elizabeth Vitt, Michael Luckevich, "Business Intelligence: Making Better Decision", Microsoft Press, 2002 edition, ISBN 0-7356-1627-2
2. Larissa T. Moss, Shaku Atre, "Business Intelligence Roadmap: The Complete Project Life cycle for Decision Support systems", Addison – Wesley Information Technology Series 2008, ISBN 0-201-78420-3

MIT | Academy of Engineering (An Autonomous Institute)	COURSE SYLLABI (2020-2022)		
SCHOOL OF COMPUTER ENGINEERING AND TECHNOLOGY	**W.E.F.**	**:**	2021-22
SECOND YEAR MASTER OF TECHNOLOGY IN COMPUTER ENGINEERING	**COURSE NAME**	**:**	Ad-hoc network
	COURSE CODE	**:**	CS643
	COURSE CREDITS	**:**	03
RELEASE DATE : 01/07/2020	**REVISION NO.**	**:**	1.0

TEACHING SCHEME :		EVALUATION SCHEME :				
LECTURE	**PRACTICAL**	**THEORY**		**PRACTICAL**	**PRESENTATION/ DEMONSTRATION**	**TOTAL**
		ECE	**IA**			
3	NIL	60	40	NIL	NIL	100

PRE-REQUISITE:

1. CS323   Computer Networks
2. CS412   Wireless and Mobile Network

COURSE OBJECTIVES:

1. CS643.CEO.1: To illustrate principles of different types of Ad hoc network
2. CS643.CEO.2: To design MAC and Routing protocol of Ad hoc network
3. CS643.CEO.3: To explain the importance of QOS and Energy efficiency in Ad hoc network

COURSE OUTCOMES:

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

1. CS643.CO.1: To explain the concept of ad hoc network in real time applications
2. CS643.CO.2: To design various protocols with Ad hoc network constraints
3. CS643.CO.3: To analyze the issues in ad-hoc networks
4. CS643.CO.4: To develop ad hoc wireless network for enhancement in protocols.

Contents

Introduction: Fundamentals of WLANS, IEEE 802.11 Standard, HIPERLAN Standard, Introduction to Ad hoc Wireless Networks and its applications, Cellular and Ad hoc wireless networks, Issues in Ad hoc Wireless Networks, Ad hoc Wireless Internet.

MAC Protocols: Design Issues and goals of MAC protocol for Ad hoc Wireless Networks, Classifications of MAC Protocols, contention Based MAC Protocols with Scheduling Mechanisms, MAC Protocols using Directional Antennas, Other MAC Protocols and applications

Routing Protocols**:** Design Issues and goals of Routing Protocol for Ad hoc Wireless Networks, Classification of Routing Protocols, secure Routing in Ad hoc Wireless Networks, Energy Management in Ad hoc Networks and applications.

Transport Layer and Security Protocols**:** Design Goals and issues of Transport Layer Protocol for Ad hoc Wireless Networks, Classification of Transport Layer protocols, TCP Over Ad hoc Wireless Networks, Security in Ad hoc Wireless Networks, Issues in Security Provisioning, Network Security Attacks, Key Management, Ad-hoc Application of Secure communication in MANET and VANET

Quality of Service**:** Issues and Challenges in Providing QOS in Ad Hoc Wireless Networks, QOS Parameters in Ad Hoc Wireless Network ,Classification of QOS Solutions, MAC Layer Solutions, Network Layer Solutions, QOS Frameworks for Ad Hoc Wireless Networks. Application & Case Study

Wireless Sensor Networks: Wireless Sensor Network Architecture, Data Dissemination, Data Gathering, MAC Protocols for Sensor Networks, Location Discovery, Quality of a Sensor Network, Evolving Standards, IOT with WSN. Energy Management in WSN, Application of energy efficient routing protocol in Agriculture Environment Sensing.

TEXT BOOKS:

1. C D M Cordeiro, D. P. Agarwal, "Ad hoc and Sensor Networks: Theory and applications", World Scientific, 2006, ISBN: 981-4-338-885
2. Jagannathan Sarangapani, "Wireless Ad hoc and Sensor Networks: Protocols, Performance and Control", CRC Press, 2007, ISBN: 978-0-8247-2675-1
3. Asoke K Talukder and Roopa R. Yavagal, "Mobile Computing – Technology, Applications and Service Creation", 2nd Edition, TMH Publication,2006, ISBN:978-0-07-014457-6
4. C. Siva Ram Murthy & B. S. Manoj,"Ad hoc Wireless Networks", Pearson Education, Pearson Education India, 2006, 978-8131706886.

REFERENCES:

1. C.K. Toh, "Ad- Hoc Mobile Wireless Networks: Protocols & Systems", 1st Edition, Pearson Education, ISBN: 9780132442046.
2. C. S. Raghavendra, Krishna M. Sivalingam,"Wireless Sensor Networks", Springer, 2004, ISBN: 978-3-540-77689-5.
3. Stefano Basagni, Marco Conti, Silvia Giordano and Ivan stojmenovic, "Mobile ad hoc networking", Wiley-IEEE press, 2004, ISBN: 978-0-471-65688-3.
4. Senthilnathan Palaniappan, Kalaiarasan Chellan, "Energy-efficient stable routing using QOS monitoring agents in MANET", In: Journal of Wireless and Communication and Networking, Springer, 2015.

	COURSE SYLLABI
MIT | **Academy of Engineering** (An Autonomous Institute)	**COURSE SYLLABI** **(2020-2022)**

SCHOOL OF COMPUTER ENGINEERING AND TECHNOLOGY		W.E.F.	:	2021-22
SECOND YEAR MASTER OF TECHNOLOGY IN COMPUTER ENGINEERING		**COURSE NAME**	:	Project - II
		COURSE CODE	:	CS651
		COURSE CREDITS	:	04
RELEASE DATE	: 01/07/2019	**REVISION NO.**	:	2.0

TEACHING SCHEME :		EVALUATION SCHEME :				
LECTURE	**PRACTICAL**	**THEORY**		**TERMWORK**	**PRESENTATION/ DEMONSTRATION**	**TOTAL**
		ECE	**IA**			
--	08	--	--	50	50	100

PRE-REQUISITE

1. CS545- PROJECT-I

COURSE OBJECTIVES

1. CS651 CEO. 1: To analyze and design the idea/ real time industrial problem/ current application from engineering domain
2. CS651 CEO. 2: To evaluate an alternative approaches and justify the use of selected tools and methods
3. CS651 CEO 3: To inculcate skills in engineering product design and development process, budgeting, Planning, testing, effective trouble-shooting practices.
4. CS651 CEO. 4: To understand the roles and responsibility, accountability and learn team work ethics.

COURSE OUTCOMES

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

1. CS651 CO 1: Design the real life problems by applying the knowledge and problem solving ability.
2. CS651 CO 2: Analyze alternative approaches, find feasible solution and apply most appropriate one.
3. CS651 CO 3: Use standard engineering tools and processes for analysis, design, simulation, testing, implementation and deployment of idea into practice.

4. CS651 CO 4: Participate effectively in multidisciplinary and heterogeneous teams exhibiting team work.

CONTENTS

Project Stage II is related with Goals and Objectives, System Architecture, Algorithm/Methodology. Project report submission and mid trimester presentation will be conducted by department based on following points,

- Literature survey
- Motivation and Problem Statement
- Goals and Objectives
- Problem statement
- System Architecture
- System Analysis and Design
- UML, DFD, Design Details
- Proposed Algorithm
- Expected Outcome and Result

Preparation of manuscript (paper) on Literature survey

Final Project Stage II Report submission and Presentation shall be conducted at the end of the trimester. End-Trimester Assessment (ETA) presentation shall be conducted in front of eminent expert from Academics or Industry.

SCHOOL OF COMPUTER ENGINEERING AND TECHNOLOGY		W.E.F.	:	2021-22
SECOND YEAR MASTER OF TECHNOLOGY IN COMPUTER ENGINEERING		**COURSE NAME**	:	Project - III
		COURSE CODE	:	CS652
		COURSE CREDITS	:	10
RELEASE DATE	: 01/07/2019	**REVISION NO.**	:	2.0

TEACHING SCHEME :		EVALUATION SCHEME :				
LECTURE	**PRACTICAL**	**THEORY**		**TERMWORK**	**PRESENTATION/ DEMONSTRATION**	**TOTAL**
		ECE	**IA**			
--	20	--	--	150	50	200

PRE-REQUISITE

1. CS545- PROJECT-I
2. CS651- PROJECT-II

COURSE OBJECTIVES

1. CS652 CEO 1: To inculcate skills in engineering product design and development process, budgeting, Planning, testing, effective trouble-shooting practices.
2. CS652 CEO. 2: To follow the standard guideline to meet the objective for development of Project
3. CS652 CEO. 3: To understand the roles and responsibility, accountability and learn team work ethics.

COURSE OUTCOMES

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

1. CS651 CO 1: Design the real life problems by applying the knowledge and problem solving ability.
2. CS651 CO 2: Use standard engineering tools and processes for analysis, design, simulation, testing, implementation and deployment of idea into practice.
1. CS651 CO 3: Show the evidence of independent evaluation
2. CS652 CO 4: Critically analyzed the result and their implementation methodology

CONTENTS

Project Stage III is related with Design, Algorithm /Methodology Implementation Results. Project report submission and mid trimester presentation will be conducted by department based on following points,

- Literature survey
- Motivation and Problem Statement
- Goals and Objectives
- Problem statement
- System Architecture
- System Analysis and Design (UML, DFD, Design Details)
- Proposed Algorithm
- Methodology/Approach
- Implementation
- Results
- Preparation of manuscript (paper) on Literature survey as mentioned in Project Work II
- Preparation of manuscript (paper) on analysis and design
- Publication details of paper on Literature survey and Design (Peer reviewed International conference like IEEE, ACM, Elsevier, Springer etc)

Final Project Stage III Report submission and Presentation shall be conducted at the end of the trimester. End-Trimester Assessment (ETA) presentation shall be conducted in front of eminent expert from Academics or Industry

		COURSE SYLLABI
MIT | Academy of Engineering (An Autonomous Institute)		**COURSE SYLLABI** **(2020-2022)**

SCHOOL OF COMPUTER ENGINEERING AND TECHNOLOGY		**W.E.F.**	**:**	2021-22
SECOND YEAR MASTER OF TECHNOLOGY IN COMPUTER ENGINEERING		**COURSE NAME**	**:**	Project - IV
		COURSE CODE	**:**	CS653
		COURSE CREDITS	**:**	10
RELEASE DATE	**:** 01/07/2019	**REVISION NO.**	**:**	2.0

TEACHING SCHEME :		EVALUATION SCHEME :				
LECTURE	**PRACTICAL**	**THEORY**		**TERMWORK**	**PRESENTATION/ DEMONSTRATION**	**TOTAL**
		ECE	**IA**			
--	20	--	--	200	100	300

PRE-REQUISITE

1. CS545- PROJECT-I
2. CS651- PROJECT-II
3. CS651- PROJECT-III

COURSE OBJECTIVES

1. CS653 CEO.1: To follow the standard guideline to meet the objective for development of Project
2. CS653 CEO 2: To test rigorously before deployment of Systems
3. CS653 CEO 3: To Verify and Validate the work Undertaken
4. CS653 CEO 4. To Consolidate the work and preparation of final report

COURSE OUTCOMES

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

1. CS653 CO 1: Show the evidence of independent evaluation
2. CS653 CO 2: Critically analyzed the result and their implementation methodology
3. CS653 CO 3: Validate the results with standard tools and techniques.

4. CS653 CO 4: Understand the importance of documentation and report writing.

CONTENTS

Project work IV is related with Analysis Design, algorithm/methodology, implementation, Results, Result analysis using various charts/graphs, Project report submission and end trimester presentation will be conducted by department based in following points.

- Literature survey
- Motivation and Problem Statement
- Goals and Objectives
- System architecture
- System analysis and design (UML, DFD, Design Details)
- Proposed Algorithm
- Methodology/Approach
- Implementation
- Result Analysis and discussions
- Conclusions and future scope

- Preparation of manuscript (paper) on literature survey as mentioned in project work –II.
- Preparation on manuscript (paper) on design as mentioned in Project work –III.
- Publication details of paper on Literature survey and Design (Peer reviewed International conference like IEEE, ACM, Elsevier, Springer etc. as mentioned in project Work – III)

Publication details of paper on Result analysis (Peer reviewed / free International Journal)
Final Project Stage IV Report submission and Presentation shall be conducted at the end of the trimester. End-Trimester Assessment (ETA) presentation shall be conducted in front of eminent expert from Academics or Industry.