ACADEMIC REGULATIONS
AND
SYLLABUS

CHOICE BASED CREDIT SYSTEM

MLR20

ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

for

Bachelor of Technology (B.Tech)

For the batches admitted from 2020-21

B. Tech. - Regular Four Year Degree Program
(For batches admitted from the academic year 2020 - 21)
&
B. Tech. - Lateral Entry Scheme
(For batches admitted from the academic year 2021 - 22)

MLR Institute of Technology

(Autonomous)
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COURSE STRUCTURE

ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

I B.Tech.- I-Semester

Course Code	Course Title	Course Area	Hours per Week			Credits	Scheme of Examination Maximum Marks		
			L	T	P		Internal (CIE)	External (SEE)	Total
A5BS02	Linear Algebra and Calculus	BSC	3	1	0	4	30	70	100
A5BS08	Physics for Computing Science	BSC	3	1	0	4	30	70	100
A5EE01	Basic Electrical Engineering	ESC	3	1	0	4	30	70	100
A5AE02	Engineering Drawing	ESC	1	0	4	3	30	70	100
A5BS11	Engineering Physics Laboratory	BSC	0	0	3	2	30	70	100
A5EC01	Introduction to Internet of Things	ESC	0	0	3	2	30	70	100
A5AE71	Engineering Workshop	ESC	0	0	2	1	30	70	100
		TOTAL	**10**	**03**	**12**	**20**	**210**	**490**	**700**
Mandatory Course (Non-Credit)									
A5MC01	**Technical Seminar-I**		**0**	**0**	**2**	**0**	**30**	**70**	**100**

I B.Tech.- II-Semester

Course Code	Course Title	Course Area	Hours per Week			Credits	Scheme of Examination Maximum Marks		
			L	T	P		Internal (CIE)	External (SEE)	Total
A5BS04	Advanced Calculus	BSC	3	1	0	4	30	70	100
A5BS12	Chemistry of Materials	BSC	4	0	0	4	30	70	100
A5CS01	Programming for Problem Solving	ESC	3	0	0	3	30	70	100
A5HS01	Communicative English	HSMC	2	0	0	2	30	70	100
A5CS02	Programming for Problem Solving Laboratory	ESC	0	0	4	2	30	70	100
A5BS14	Engineering Chemistry Laboratory	BSC	0	0	3	2	30	70	100
A5HS02	English Language and Communication Skills Laboratory	HSMC	0	0	3	2	30	70	100
		TOTAL	**12**	**01**	**10**	**19**	**210**	**490**	**700**
Mandatory Course (Non-Credit)									
A5MC02	**Technical Seminar-II**		**0**	**0**	**2**	**0**	**30**	**70**	**100**

II B.TECH.- I SEMESTER									
Course Code	Course Title	Course Area	Hours per Week			Credits	Scheme of Examination Maximum Marks		
			L	T	P		Internal (CIE)	External (SEE)	Total
A5BS05	Probability and Statistics	BSC	2	1	-	3	30	70	100
A5BS19	Discrete Mathematics	BSC	3	1	-	4	30	70	100
A5CS08	Computer Organization And Architecture	PCC	3	1	-	4	30	70	100
A5CS05	Database Management Systems	PCC	3	-	-	3	30	70	100
A5IT03	Python Programming	PCC	3	-	-	3	30	70	100
A5IT05	Python Programming Lab	PCC	-	-	3	2	30	70	100
A5CS06	Database Management Systems Lab	PCC	-	-	3	2	30	70	100
Total			**14**	**3**	**6**	**21**	**210**	**490**	**700**
Mandatory Course (Non-Credit)									
A5MC03	Environmental Studies	MC	2	-	-	-	30	70	100

II B.Tech.- II SEMESTER									
Course Code	Course Title	Course Area	Hours per Week			Credits	Scheme of Examination Maximum Marks		
			L	T	P		Internal (CIE)	External (SEE)	Total
A5EC71	Digital Electronics	ESC	3	-	-	3	30	70	100
A5AI01	Data structures using Python	PCC	3	1	-	4	30	70	100
A5IT01	Object Oriented Programming	PCC	3	1	-	4	30	70	100
A5CS09	Design and Analysis of Algorithms	PCC	3	1	-	4	30	70	100
A5AI03	Data Mining Algorithms	PCC	3	1	-	3	30	70	100
A5AI02	Data structures using Python Lab	PCC	-	-	3	2	30	70	100
A5IT02	Object Oriented Programming Lab	PCC	-	-	3	2	30	70	100
Total			**15**	**3**	**6**	**22**	**210**	**490**	**700**
Mandatory Course (Non-Credit)									
A5HS03	Gender Sensitization	HSMC	-	-	2	-	30	70	100

III B.Tech.- I SEMESTER

Course Code	Course Title	Course Area	Hours per Week			Credits	Scheme of Examination Maximum Marks		
			L	T	P		Internal (CIE)	External (SEE)	Total
A5CS15	Operating Systems	PCC	3	1	-	4	30	70	100
A5CS14	Formal Language and Automata Theory	PCC	3	-	-	3	30	70	100
A5DS03	Web Programming with Djangoframework	PCC	3	1	-	3	30	70	100
PEC	Professional Elective-I	PEC	3	-	-	3	30	70	100
OEC	Open Elective-I	OEC	3	-	-	3	30	70	100
A5DS04	Web Programming with Django Lab	PCC	-	-	3	2	30	70	100
A5IT07	Linux Programming Lab	PCC	-	-	3	2	30	70	100
A5AI13	Internship/Certifications*	PWC	-	-	-	2	-	100	100
Total			**15**	**2**	**6**	**23**	**210**	**590**	**800**
Mandatory Course (Non-Credit)									
A5MC04	Constitution of India	MC	2	-	-	-	30	70	100

Note:- Certifications* MOOCS/ Any Industry related certifications

III B.Tech.- II SEMESTER

Course Code	Course Title	Course Area	Hours per Week			Credits	Scheme of Examination Maximum Marks		
			L	T	P		Internal (CIE)	External (SEE)	Total
A5IT08	Machine Learning	PCC	3	1	-	4	30	70	100
A5CS18	Computer Networks	PCC	3	-	-	3	30	70	100
A5CS20	Big Data Analytics	PCC	3	-	-	3	30	70	100
PEC	Professional Elective-II	PEC	3	-	-	3	30	70	100
OEC	Open Elective-II	OEC	3	-	-	3	30	70	100
A5IT09	Machine Learning Lab	PCC	-	-	3	2	30	70	100
A5CS21	Big Data Analytics Lab	PCC	-	-	3	2	30	70	100
A5AI14	Comprehensive Viva	PWC	-	-	-	1	-	100	100
Total			**15**	**1**	**6**	**21**	**210**	**590**	**800**

IV B.Tech.- I SEMESTER									
Course Code	Course Title	Course Area	Hours per Week			Credits	Scheme of Examination Maximum Marks		
			L	T	P		Internal (CIE)	External (SEE)	Total
A5AI04	Deep Learning	PCC	3	-	-	3	30	70	100
PEC	Professional Elective-III	PEC	3	-	-	3	30	70	100
PEC	Professional Elective-IV	PEC	3	-	-	3	30	70	100
PEC	Professional Elective-V	PEC	3	-	-	3	30	70	100
OEC	Open Elective-III	OEC	3	-	-	3	30	70	100
A5AI05	Deep learning Lab	PCC	-	-	4	2	30	70	100
A5AI15	Project Phase - 1	PWC	-	-	8	4	100	-	100
Total			**15**	**-**	**12**	**21**	**280**	**420**	**700**

IV B.Tech. - II SEMESTER									
Course Code	Course Title	Course Area	Hours per Week			Credits	Scheme of Examination Maximum Marks		
			L	T	P		Internal (CIE)	External (SEE)	Total
PEC	Professional Elective-VI	PEC	3	-	-	3	30	70	100
A5HS12	Intellectual Property Rights	HSMC	3	-	-	3	30	70	100
OEC	Open Elective-IV	OEC	3	-	-	3	30	70	100
A5AI16	Project Phase - II	PWC	-	-	16	8	50	150	200
Total			**9**	**-**	**16**	**17**	**140**	**360**	**500**

PROFESSIONAL ELECTIVES			
PE-I		PE-II	
A5DS07	Exploratary Data Analytics	A5AI06	Genetic Algorithms & Fuzzy Logic systems
A5CS26	Software Engineering	A5CS27	Cloud Computing
A5IT12	Artificial Intelligence	A5AI07	Reinforcement Learning
PE-III		PE-IV	
A5AI08	Image Processing	A5AI10	Computer vision
A5IT18	Neural Networks	A5CS36	Preditive Analytics
A5AI09	Introduction to Complexity theory	A5IT16	Natural Language Processing
PE-V		PE-VI	
A5IT25	Information Retrieval System	A5DS10	BigData Tools
A5AI11	Recurrent Neural Networks	A5CS29	Cryptography and Information Security
A5CY16	Bitcoins and Cryptocurrencies	A5AI12	AI in Speech Processing

OPEN ELECTIVE COURSES

OPEN ELECTIVE COURSE-I			
S. No.	**Course Code**	**Course Name**	**Offering Department**
1	A5AE61	Fabrication Processes	Aeronautical Engineering
2	A5AE62	Fundamentals of Avionics	
3	A5AE63	Principles of Flight	
4	A5CS37	Core Java Programming	Computer Science and Engineering
5	A5CS26	Software Engineering	
6	A5CS23	Data Analytics	
7	A5EC53	Logic Design	Electronics & Communication Engineering
8	A5EC54	Principles of Communications	
9	A5EC55	Measurements and Instruments	
10	A5EE53	Electrical Wiring and Safety Measures	Electrical & Electronics Engineering
11	A5EE54	Electrical Materials	
12	A5EE55	New trends in Electrical Energy	
13	A5IT20	Fundamentals of Data Structures	Information Technology
14	A5IT27	Software Engineering Principles	
15	A5IT28	Operating System Principles	
16	A5ME71	Elements of Mechanical Engineering	Mechanical Engineering
17	A5ME72	Fundamentals of Engineering Materials	
18	A5HS06	Business Economics and Financial Analysis	HS
19	A5HS07	Basics of Entrepreneurship	
20	A5HS08	Human Values and Professional Ethics	

OPEN ELECTIVE COURSE-II			
S. No.	**Course Code**	**Course Name**	**Offering Department**
1	A5AE64	Introduction to Aircraft Industry	Aeronautical Engineering
2	A5AE65	Non-Destructive Testing Methods	
3	A5AE66	Fundamentals of Finite Element Method	
4	A5CS38	Fundamentals of DBMS	Computer Science and Engineering
5	A5CS35	Introduction to Machine Learning	
6	A5CS09	Design & Analysis of Algorithms	
7	A5EC56	Fundamentals of Integrated Circuits	Electronics & Communication

8	A5EC57	Introduction of Microprocessors and Microcontrollers	Engineering
9	A5EC58	Fundamentals of VLSI Design	
10	A5EE56	Power Plant Engineering	Electrical & Electronics Engineering
11	A5EE57	Analysis of Linear Systems	
12	A5EE58	Neural Networks and Fuzzy Logic	
13	A5IT29	Basics of Python Programming	Information Technology
14	A5IT30	Human Computer Interaction	
15	A5IT31	Software Testing Fundamentals	
16	A5ME73	Fundamentals of Mechatronics	Mechanical Engineering
17	A5ME74	Basics of Thermodynamics	
18	A5HS09	Advanced Entrepreneurship	HS

OPEN ELECTIVE COURSE-III

S. No.	Course Code	Course Name	Offering Department
1	A5AE67	Unmanned Aerial Vehicles	Aeronautical Engineering
2	A5AE68	Fundamentals of Wind Power Technology	
3	A5AE69	Introduction to Wind Tunnel Techniques	
4	A5CS39	Introduction to Cloud Computing	Computer Science and Engineering
5	A5CS40	Computer Organization and Operating Systems	
6	A5CS32	Agile Software Development	
7	A5EC59	Signal Transmission through linear systems	Electronics & Communication Engineering
8	A5EC60	Fundamentals of Image processing	
9	A5EC61	TV Engineering	
10	A5EE59	Illumination Engineering	Electrical & Electronics Engineering
11	A5EE60	Non-Conventional Power Generation	
12	A5EE61	Solar Energy and Applications	
13	A5IT32	Cyber Forensics	Information Technology
14	A5IT33	Discrete Mathematical Structures	
15	A5IT34	Introduction to AI	
16	A5ME75	Basics of Robotics	Mechanical Engineering
17	A5ME76	Fundamentals of Operation Research	
18	A5HS10	Indian Ethos & Business Ethics	HS

OPEN ELECTIVE-IV

S. No.	Course Code	Course Name	Offering Department
1	A5HS11	Management Science	HS
2	A5HS12	Intellectual Property Rights	
3	A5BS15	Number Theory	
4	A5BS16	Physics and Technology of Thin films	
5	A5BS17	Polymer chemistry	
7	A5CS22	Distributed Databases	Computer Science and Engineering
8	A5CS41	Fundamentals of Software Testing	
9	A5CS29	Cryptography and Network Security	
10	A5EC62	Introduction to Computer Vision	Electronics & Communication Engineering
11	A5EC63	Introduction to mobile communication	
12	A5EC64	Basic Embedded systems Design	
13	A5EE62	Instrumentation and Control	Electrical & Electronics

14	A5EE63	Energy Audit and Management Systems	Engineering
15	A5EE64	Energy Storage Systems	
16	A5IT35	Introduction to Mobile Application Development	Information Technology
17	A5IT36	Big Data	
18	A5ME77	Introduction to Material Handling	Mechanical Engineering
19	A5ME78	Non Conventional Energy Sources	