Study & Evaluation Scheme

Of

Bachelor of Technology
Computer Science & Engineering

With Specialization in

Artificial Intelligence
(In Collaboration with iNurture)

(Based on Choice Based Credit System)
[Applicable w.e.f. Academic Session 2019-20]

COLLEGE OF COMPUTING SCIENCES AND INFORMATION TECHNOLOGY
TEERTHANKER MAHAVEERUNIVERSITY
N.H.-24, Delhi Road, Moradabad, UttarPradesh-244001 Website:www.tmu.ac.in

TEERTHANKER MAHAVEERUNIVERSITY

(EstablishedunderGovt.ofU.P.ActNo.30,2008)

Delhi Road, Bagarpur, Moradabad (U.P)

Study & Evaluation Scheme	
SUMMARY	
Institute Name	*College of Computing Sciences and Information Technology (CCSIT), Delhi Road, Moradabad*
Programme	*B.Tech. CSE (**Artificial Intelligence**)*
Duration	*Four Years full time(Eight Semesters)*
Medium	*English*
Minimum Required Attendance	*75%*
Credits	
Maximum Credits	*180*
Minimum Credits Required for Degree	*172*

Assessment:					
Evaluation			**Internal**	**External**	**Total**
Theory			40	60	100
Practical/ Dissertations/ Project Reports/ Viva-Voce			50	50	100
Class Test-1	**Class Test-2**	**Class Test-3**	**Assignment(s)**	**Attendance & Participation**	**Total**
Best two out of three					
10	10	10	10	10	40
Duration of Examination			**External**	**Internal**	
			3 Hours	1.5 Hours	

To qualify the course a student is required to secure a minimum of 45% marks in aggregate including the semester end examination and teachers continuous evaluation.(i.e. both internal and external).A candidate who secures less than 45% of marks in a course shall be deemed to have failed in that course. The student should have at least 45% marks in aggregate to clear the semester.

 # Provision for delivery of 25% content through online mode.

 # Policy regarding promoting the students from semester to semester & year to year. No specific condition to earn the credit for promoting the students from one semester to next semester.

 # Maximum Duration: Maximum no of years required to complete the program: N+2 (N=No of years for program for B.TECH(CSE) N=4)

Teerthanker Mahaveer University Moradabad Registrar

The institute offers **B.Tech CSE with Specialization in Artificial Intelligence** due to the importance of Artificial Intelligence and Machine Learning has been increasing as a growing number of companies are using these technologies to improve their products and services, evaluate their business models, and enhance their decision-making process. This has led to a huge demand for AI specialists all over the globe. Artificial Intelligence degrees prepare specialists who create intelligent machines and systems, which perform tasks that would normally require human intelligence, like playing games or understanding natural language. Thus this degree course help our student to find good and relative job in this field.

Course handouts for students will be provided in every course. A course handout is a thorough teaching plan of a faculty taking up a course. It is a blueprint which will guide the students about the pedagogical tools being used at different stages of the syllabus coverage and more specifically the topic-wise complete plan of discourse, that is, how the faculty members treat each and every topic from the syllabus and what they want the student to do, as an extra effort, for creating an effective learning. It may be a case study, a role-play, a classroom exercise, an assignment- home or field, or anything else which is relevant and which can enhance their learning about that particular concept or topic. Due to limited availability of time, most relevant topics will have this kind of method in course handout.

B.Tech(AI) : Four-Year (8-Semester) CBCS Programme

Basic Structure: Distribution of Courses

S.No.	Type of Course	Credit Hours	Total Credits
1	Basic Science Courses(BSC)	5 Courses of 4 Credit Hrs. each (Total Credit Hrs. 5X4)	20
2	Engineering Science Courses(ESC)	2 Courses of 4 Credit Hrs. each (Total Credit Hrs. 2X4) 3 Courses of 3 Credit Hrs. each (Total Credit Hrs. 2X3)	17
3	Humanities and Social Sciences including Management Courses(HMSC)	5 Courses of 3 Credit Hrs. each (Total Credit Hrs. 5X3) 1 Courses of 4 Credit Hrs. each (Total Credit Hrs. 1X4)	19
4	Professional Core Courses(PCC)	18 Courses of 3 Credit Hrs. each (Total Credit Hrs. 18X3)	54
5	Professional Elective Courses(PEC)	7 Courses of 3 Credit Hrs. each (Total Credit Hrs. 7X3)	21
6	Open Elective Courses(OEC)	2 Course of 3 Credit Hrs. each (Total Credit Hrs.1X3)	6
7	Mandatory Courses(MC)	1 Courses of 3 Credit Hrs. each (Total Credit Hrs. 1X3)	3
8	Laboratory Courses(LC)	9 Course of 2 Credit Hrs. each (Total Credit Hrs.8X2) 7 Course of 1 Credit Hrs. each (Total Credit Hrs.7X1)	25
9	Project(PROJ)	1 Course of 8 Credit Hrs. each (Total Credit Hrs. 1X8) 1 Course of 4 Credit Hrs. each (Total Credit Hrs. 1X4) 3 Course of 1 Credit Hrs. each (Total Credit Hrs. 3X1)	15
Total Credits			**180**

Contact hours include work related to Lecture, Tutorial and Practical (LTP), where our institution will have flexibility to decide course wise requirements.

B. Choice Based Credit System (CBCS)

Choice Based Credit System (CBCS) is a versatile and flexible option for each student to achieve his target number of credits as specified by the UGC and adopted by our University.

The following is the course module designed for the B.Tech program:

Basic Science Courses (BSC): Basic Science courses include compulsory courses. Compulsory courses cater to all departments: it consists of Mathematic courses, Physics course, Chemistry course, Physics and Chemistry laboratories. The basic foundation is important for students because it will not only allow them to build upon existing skills, but they can also set the path for good career options. We offer basic science courses in semester I, II & III during the B.Tech program which common for all B.Tech first year students. There will be total 20 credits for basic science course offered.

Engineering Science Courses (ESC): Engineering Science completely opens the doors to different specializations. The goal of this course is to create engineers of tomorrow who possess the knowledge of all disciplines and can apply their interdisciplinary knowledge in every aspect. Engineering Science Courses including Basic Engineering courses such as Basic Workshop, Engineering Drawing, Engineering Basics of Electrical and Electronics. A strong foundation of engineering skill set is provided through these Engineering Science courses. We offer engineering science courses in semester I & II during the B.Tech program. There will be total 17 credits for engineering science course offered.

Humanities and Social Sciences including Management Courses (HMSC): All the Humanities and Social Science courses should compulsorily be studied by a student. These courses help students to their personal and social development. We offer Humanities and Social Sciences courses in semester I, II, III, IV & VI during the B.Tech program. There will be total 16 credits for Humanities and Social Sciences courses offered.

Professional Core Courses (PCC): Professional Core courses introducing the students to the foundation of engineering topics related to the chosen programme of study comprising of theory and Practical. These core courses are the strong foundation to establish Technical knowledge and provide broad multi-disciplined knowledge can be studied further in depth during the elective phase. The core courses will provide more practical-based knowledge and collaborative learning models. . It will train the students to understand, analyze and implement their knowledge. It help to develop decision-making ability of student and contribute to the industry and community at large. We offer Professional Core courses in semester III, IV, V, VI & VII during the B.Tech program. There will be total 57 credits for Professional Core courses offered.

Professional Elective Courses (PEC): Professional elective course can be chosen from a pool of courses and which may be very specific or specialized or advanced or supportive to the discipline or nurtures the student's proficiency/skill. We offer Professional elective courses in semester IV, V, VI, VII & VIII during the B.Tech program. There will be total 21 credits for Professional elective courses offered.

Open Elective Courses (OEC): An open elective course chosen generally from other discipline/ subject, with an intention to seek interdisciplinary exposure. We offer Open elective courses in semester VII & VIII during the B.Tech program. There will be total 6 credits for Open elective courses offered.

Mandatory Courses (MC): This is a compulsory course that does not have any choice and will be in 3 credits. Each student of B.Tech program has to compulsorily pass the course and acquire 3 credits. We offer Mandatory courses in semester Ist during the B.Tech program.

Laboratory Courses (LC): A laboratory oriented course which will provide a platform to students to enhance their practical knowledge and skills by development of small

Study & Evaluation Scheme
Program: B. Tech. CS&E (Specialization in AI)
SEMESTER – I

S. No.	Course Category	Course Code	Course Title	Periods			Credits	Evaluation Scheme		
				L	T	P		Internal	External	Total
1	BSC	EAS116	Engineering Mathematics-I	3	1	0	4	40	60	100
2	BSC	EAS112	Engineering Physics	3	1	0	4	40	60	100
		EAS113	Engineering Chemistry							
3	ESC	EEE117	Basic Electrical Engineering	3	1	0	4	40	60	100
		EEC111	Basic Electronics Engineering							
4	MC	TMU101	Environmental Studies	2	1	0	3	40	60	100
5	HSMC	TMUGE101	English Communication – I	2	0	2	3	50	50	100
6	ESC	IAI101	Web Designing	2	0	2	3	40	60	100
7	LC	EAS162	Engineering Physics (Lab)	0	0	2	1	50	50	100
		EAS163	Engineering Chemistry (Lab)							
8	LC	EEE161	Basic Electrical Engineering (Lab)	0	0	2	1	50	50	100
		EEC161	Basic Electronics Engineering (Lab)							
9	LC	EME161	Engineering Drawing (Lab)	0	0	4	2	50	50	100
		EME162	Workshop Practice (Lab)							
	Total			**14**	**5**	**12**	**25**	**400**	**500**	**900**

SEMESTER - II

S. No.	Course Category	Course Code	Course Title	Periods			Credits	Evaluation Scheme		
				L	T	P		Internal	External	Total
1	BSC	EAS211	Engineering Mathematics-II	3	1	0	4	40	60	100
2	BSC	EAS212	Engineering Physics	3	1	0	4	40	60	100
		EAS213	Engineering Chemistry							
3	ESC	EEE217	Basic Electrical Engineering	3	1	0	4	40	60	100
		EEC211	Basic Electronics Engineering							
4	ESC	IAI201	Programming in C	3	0	0	3	40	60	100
5	HSMC	TMUGE201	English Communication – II	2	0	2	3	40	60	100
6	LC	EAS262	Engineering Physics (Lab)	0	0	2	1	50	50	100
		EAS262	Engineering Chemistry (Lab)							
7	LC	EEE261	Basic Electrical Engineering (Lab)	0	0	2	1	50	50	100
		EEC261	Basic Electronics Engineering (Lab)							
8	LC	EME261	Engineering Drawing (Lab)	0	0	4	2	50	50	100
		EME262	Workshop Practice (Lab)							
9	LC	IAI251	Programming in C (Lab)	0	0	2	1	50	50	100
	Total			**14**	**3**	**12**	**23**	**400**	**500**	**900**

SEMESTER III

S. No.	Course Category	Course Code	Course Title	Periods			Credits	Evaluation Scheme		
				L	T	P		Internal	External	Total
1	BSC	IAI 301	Mathematics For Computer Science	3	1	0	4	40	60	100
2	PCC	IAI302	Data Structures Using C++	3	0	0	3	40	60	100
3	PCC	IAI 303	Introduction To Artificial Intelligence	3	0	0	3	40	60	100
4	ESC	IAI 304	Computer Architecture and Organizations	3	0	0	3	40	60	100
5	PCC	IAI 305	OOPS with Java	3	0	0	3	40	60	100
6	HSMC	TMUG E301	English Communication-III	2	0	2	3	40	60	100
7	LC	IAI351	Data Structures Using C++ (Lab)	0	0	4	2	50	50	100
8	LC	IAI 352	OOPS with Java (Lab)	0	0	4	2	50	50	100
9	PROJ	IAI353	Project	0	0	2	1	50	50	100
	Total			**17**	**1**	12	**24**	**390**	**510**	**900**

Additional Courses for Lateral Entry Students with Polytechnic/B.Sc background, to be taken in either III[rd] or IV[th] semester or all should pass with minimum of 40% marks if they have not taken these courses in their Polytechnic/B.Sc dgree: credits will not be added.

1	EME161/261	Engineering Drawing Lab	-	-	2	50	50	100
2	EME162/262	Workshop Practice (Lab)	-	-	2	50	50	100
3	TMU101	Environmental Studies	2	0	0	40	60	100

Value Added Course*

S.No.	Course Category	Course Code	Course Name	Periods			Credits	Evaluation Scheme		
				L	T	P		Internal	External	Total
1	VAC-I	TMUGA301	Foundation in Quantitative Aptitude	2	1	0	0	40	60	100

*Value Added Courses (VAC) is an audit course. The result of this course will not be added to overall result of the programme. However, it will be compulsory to pass the course with minimum 45% including both faculty continuous & end semester examination.

Registrar

SEMESTER IV

S. No.	Course Category	Course Code	Course Title	Periods			Credits	Evaluation Scheme		
				L	T	P		Inter-nal	Exter-nal	Total
1	PCC	IAI401	Data Base Management System	3	0	0	3	40	60	100
2	PCC	IAI402	Operating System	3	0	0	3	40	60	100
3	PCC	IAI 403	Python Programming	3	0	0	3	40	60	100
4	PCC	IAI404	Computer Networks	3	0	0	3	40	60	100
5	HSMC	TMUGE401	English Communication – IV	2	0	2	3	50	50	100
6	LC	IAI451	Data Base Management System (Lab)	0	0	4	2	50	50	100
7	LC	IAI452	Python Programming(Lab)	0	0	4	2	50	50	100
8	PEC	-	Professional Elective Courses-I	3	0	0	3	40	60	100
	Total			**17**	**0**	**10**	**22**	**350**	**450**	**800**
****Industrial Training**										

Value Added Course*

S. N	Category code	Course Code	Course Name	Periods			Credits	Evaluation Scheme		
				L	T	P		Internal	External	Total
1	VAC-II	TMUGA401	Analytical Reasoning	2	1	0	0	40	60	100

**At the end of Semester-IV Industrial Training for at least 45 days is mandatory which is to be assessed and evaluated in Semester-V under subject code IAI553 (Industrial Training Seminar).

Registrar

SEMESTER V

S. No.	Course Category	Course Code	Course Title	Periods			Credits	Evaluation Scheme		
				L	T	P		Internal	External	Total
1	PCC	IAI501	Knowledge Representation and Reasoning	3	0	0	3	40	60	100
2	PCC	IAI502	Natural Language Processing	3	0	0	3	40	60	100
3	PCC	IAI503	Theory of Automata and Compiler Design	3	0	0	3	40	60	100
4	PCC	IAI504	Digital Image Processing	3	0	0	3	40	60	100
5	HSMC	EHM501	HUMAN VALUES & PROFESSIONAL ETHICS	3	0	0	3	40	60	100
6	LC	IAI551	Natural Language Processing (Lab)	0	0	4	2	50	50	100
7	LC	IAI552	Digital Image Processing (Lab)	0	0	4	2	50	50	100
8	PROJ	IAI553	Industrial Training Seminar	0	0	2	1	50	50	100
9	PEC	-	Professional Elective Courses-II	3	0	0	3	40	60	100
	Total			**18**	**0**	**10**	**23**	**350**	**450**	**800**

Value Added Course***

S. N	Category code	Course Code	Course Name	Periods			Credits	Evaluation Scheme		
				L	T	P		Internal	External	Total
1	VAC-III	TMUGA501	Modern Algebra and Data Management	2	1	0	0	40	60	100
2	VAC-IV	TMUGS501	Managing Self	2	1	0	0	50	50	100

SEMESTER VI

S. No.	Course Category	Course Code	Course Title	Periods			Credits	Evaluation Scheme		
				L	T	P		Internal	External	Total
1	PCC	IAI601	Artificial Neural Networks	3	0	0	3	40	60	100
2	PCC	IAI602	Big Data Analytics	3	0	0	3	40	60	100
3	PCC	IAI603	Machine Learning	3	0	0	3	40	60	100
4	PCC	IAI604	Genetic Algorithm & Applications	3	0	0	3	40	60	100
5	HSMC	EHM601	Entrepreneurship	3	1	0	4	50	50	100
6	LC	IAI651	Machine Learning (Lab)	0	0	4	2	50	50	100
7	LC	IAI652	Big Data Analytics(Lab)	0	0	2	1	50	50	100
8	PEC	-	Professional Elective Courses-III	3	0	0	3	40	60	100
9	PEC	-	Professional Elective Courses-IV	3	0	0	3	40	60	100
	Total			21	1	6	25	390	510	900
****Industrial Training**										

Value Added Course*

S. N	Category code	Course Code	Course Name	Periods			Credits	Evaluation Scheme		
				L	T	P		Internal	External	Total
1	VAC-V	TMUGA601	Advance Algebra and Geometry	2	1	0	0	40	60	100
2	VAC-VI	TMUGS601	Managing Work and Others	2	1	0	0	50	50	100

**At the end of Semester-VI Industrial Training for at least 45 days is mandatory which is to be assessed and evaluated in Semester-VII under subject code IAI753 (Industrial Training Seminar).

SEMESTER VII

S. No.	Course Category	Course Code	Course Title	Periods			Credits	Evaluation Scheme		
				L	T	P		Internal	External	Total
1	PCC	IAI701	Fuzzy Logic And Application	3	0	0	3	40	60	100
2	PCC	IAI702	Deep Learning	3	0	0	3	40	60	100
3	PCC	IAI703	Expert System	3	0	0	3	40	60	100
4	PROJ	IAI751	Mini Project (Lab)	0	0	8	4	50	50	100
5	LC	IAI752	Deep Learning (Lab)	0	0	2	1	50	50	100
6	PROJ	IAI753	Industrial Training Seminar	0	0	2	1	50	50	100
7	PEC	-	Professional Elective Courses-V	3	0	0	3	40	60	100
8	PEC	-	Professional Elective Courses-VI	3	0	0	3	40	60	100
9	OEC	-	Open Elective Courses - I	3	0	0	3	40	60	100
	Total			**18**	**0**	**12**	**24**	**390**	**510**	**900**

SEMESTER VIII

S. No.	Course Category	Course Code	Course Title	Periods			Credits	Evaluation Scheme		
				L	T	P		Internal	External	Total
1	PROJ	IAI851	Industry Internship	0	0	28	14	130	170	300
OR										
1	PROJ	IAI851	Project	0	0	16	8	50	50	100
2	PEC	-	Professional Elective Courses-VII	3	0	0	3	40	60	100
9	OEC	-	Open Elective Courses - II	3	0	0	3	40	60	100
	Total			**6**	**0**	**16**	**14**	**130**	**170**	**300**