BE (COMPUTERSCIENCE AND ENGINEERING) -2019
Scheme

SEMESTER-I

S. N.	COURSE NO.	TITLE	CODE	L	T	P	CR
1	UCB008	APPLIED CHEMISTRY	CF	3	1	2	4.5
2	UTA003	COMPUTER PROGRAMMING	CP	3	0	2	4.0
3	UES013	ELECTRICAL & ELECTRONICS ENGINEERING	CF	3	1	2	4.5
4	UEN002	ENERGY AND ENVIRONMENT	CF	3	0	0	3.0
5	UMA010	MATHEMATICS – I	CF	3	1	0	3.5
6	UES009	MECHANICS	CF	2	1	2	2.5
		TOTAL		17	4	6	22.0

SEMESTER-II

S. N.	COURSE NO.	TITLE	CODE	L	T	P	CR
1	UPH004	APPLIED PHYSICS	CF	3	1	2	4.5
2	UTA018	OBJECT ORIENTED PROGRAMMING	CP	3	0	2	4.0
3	UTA002	MANUFACTURING PROCESS	CF	2	0	3	3.5
4	UTA015	ENGINEERING DRAWING	CF	2	4	0	4.0
5	UHU003	PROFESSIONAL COMMUNICATION	CF	2	0	2	3.0
6	UMA004	MATHEMATICS – II	CF	3	1	0	3.5
		TOTAL		15	6	9	22.5

SEMESTER-III

S. N.	COURSE NO.	TITLE	CODE	L	T	P	CR
1	UCS303	OPERATING SYSTEMS	CP	3	0	2	4.0
2	UCS405	DISCRETE MATHEMATICAL STRUCTURES	CP	3	1	0	3.5
3	UCS301	DATA STRUCTURES	CP	3	0	2	4.0
4	UCS510	COMPUTER ARCHITECTURE AND ORGANIZATION	CP	3	0	0	3.0
5	UMA011	NUMERICAL ANALYSIS	CF	3	0	2	4.0
6	UCS311	PRACTICAL COMPUTING	CP	1	0	2	2.0
		TOTAL		16	1	8	20.5

SEMESTER-IV

S. N.	COURSE NO.	TITLE	CODE	L	T	P	CR
1	UCS521	ARTIFICIAL INTELLIGENCE	CP	3	0	2	4.0
2	UCS415	DESIGN AND ANALYSIS OF ALGORITHMS	CP	3	0	2	4.0
3	UCS310	DATABASE MANAGEMENT SYSTEMS	CP	3	0	2	4.0
4	UCS503	SOFTWARE ENGINEERING	CP	3	0	2	4.0
5	UCS414	COMPUTER NETWORKS	CP	2	0	2	3.0
6	UMA037	OPTIMIZATION TECHNIQUES	CF	3	0	2	4.0
		TOTAL		17	0	12	23.0

SEMESTER-V

S. N.	COURSE NO.	TITLE	CODE	L	T	P	CR
1	UML501	MACHINE LEARNING	CP	3	0	2	4.0
2	UCS410	PROBABILITY AND STATISTICS	CP	3	0	2	4.0
3	UCS531	CLOUD COMPUTING	CP	2	0	2	3.0
4	UCS413	NETWORK PROGRAMMING	CP	2	0	2	3.0
5		ELECTIVE-I	PE	2	0	2	3.0
		TOTAL		12	0	10	17.0

SEMESTER-VI

S. N.	COURSE NO.	TITLE	CODE	L	T	P	CR
1	UCS701	THEORY OF COMPUTATION	CP	3	1	0	3.5
2	UCS505	COMPUTER GRAPHICS	CP	3	0	2	4.0
3	UCS619	QUANTUM COMPUTING	CP	3	0	2	4.0
4		ELECTIVE-II	PE	2	0	2	3.0
5		ELECTIVE-III	PE	2	0	2	3.0
6		GENERIC ELECTIVE	GE	2	0	0	2.0
7	UCS794	CAPSTONE PROJECT* – STARTS	PR	0	0	2	-
		TOTAL		15	1	8	19.5

SEMESTER-VII

S. N.	COURSE NO.	TITLE	CODE	L	T	P	CR
1	UCS712	COGNITIVE COMPUTING	CP	2	0	0	2.0
2	UCS802	COMPILER CONSTRUCTION	CP	3	0	2	4.0
3	UHU005	HUMANITIES FOR ENGINEERS	CF	2	0	2	3.0
4		ELECTIVE-IV	PE	2	0	2	3.0
5	UCS794	CAPSTONE PROJECT	PR	0	0	2	8.0
		TOTAL		9	0	8	20.0

SEMESTER-VIII

S. N.	COURSE NO.	TITLE	CODE	L	T	P	CR
1	UCS898	PROJECT SEMESTER*	PR	-	-	-	15.0
		TOTAL		-	-	-	15.0

*TO BE CARRIED OUT IN INDUSTRY/RESEARCH INSTITUTION

OR

S. N.	COURSE NO.	TITLE	CODE	L	T	P	CR
1	UCS813	SOCIAL NETWORK ANALYSIS	CP	2	0	2	3.0
2	UCS806	ETHICAL HACKING	CP	3	0	2	4.0
3		PROJECT	PR	-	-	0	8
		TOTAL		5	0	4	15.0

OR

S. N.	COURSE NO.	TITLE	CODE	L	T	P	CR
1	UCS900	START- UP SEMESTER**		-	-	-	15.0
		TOTAL		-	-	-	15.0

** BASED ON HANDS ON WORK ON INNOVATIONS AND ENTREPRENEURSHIP

* From Semester1 Till Semester VI Students Have To Undergo Experiential Learning Activity (ELC).

Semester	ELC Activity
1st	Robotic Arm
2nd	Mobile App for Institute Services
3rd	Unity game design
4th	NN/AI/Block Chain/Char. Recog/Deep Learning
5th	Cyber Security, Internet Security
6th	Smart City Smart Car Parking System

LIST OF PROFESSIONAL ELECTIVES

ELECTIVE I

S. N.	COURSE NO.	TITLE	CODE	L	T	P	CR
1	UCS535	CONTINUOUS DELIVERY AND DEVOPS	PE	2	0	2	3
2	UCS534	COMPUTER & NETWORK SECURITY	PE	2	0	2	3
3	UCS532	COMPUTER VISION	PE	2	0	2	3
4	UCS533	DATA ANALYTICS AND VISUALIZATION	PE	2	0	2	3.0
5	UCS536	COMPUTATIONAL BIOLOGY AND BIOINFORMATICS	PE	2	0	2	3
6	UMC512	MATHEMATICAL MODELING AND SIMULATION	PE	2	0	2	3

ELECTIVE II

S. N.	COURSE NO.	TITLE	CODE	L	T	P	CR
1	UCS639	IT PROJECT MANAGEMENT	PE	2	0	2	3
2	UCS638	SECURE CODING	PE	2	0	2	3
3	UCS636	3D MODELING AND ANIMATION	PE	2	0	2	3
4	UCS637	IMAGE PROCESSING	PE	2	0	2	3
5	UCS651	COMBINATORICS	PE	2	0	2	3
6	UCS622	MATRIX COMPUTATION	PE	2	0	2	3

ELECTIVE III

S. N.	COURSE NO.	TITLE	CODE	L	T	P	CR
1	UCS649	ENGINEERING SOFTWARE AS A SERVICE	PE	2	0	2	3
2	UCS648	CYBER FORENSICS	PE	2	0	2	3
3	UCS752	AUGMENTED AND VIRTUAL REALITY	PE	2	0	2	3
4	UCS647	NATURAL LANGUAGE PROCESSING	PE	2	0	2	3
5	UCS652	COMPUTATIONAL CHEMISTRY	PE	2	0	2	3
6	UMC632	FINANCIAL MATHEMATICS	PE	2	0	2	3

ELECTIVE IV

S. N.	COURSE NO.	TITLE	CODE	L	T	P	CR
1	UCS755	SOFTWARE VERIFICATION AND VALIDATION	PE	2	0	2	3
2	UCS754	BLOCKCHAIN TECHNOLOGY AND APPLICATIONS	PE	2	0	2	3
3	UCS646	GAME DESIGN & DEVELOPMENT	PE	2	0	2	3
4	UCS753	DEEP LEARNING	PE	2	0	2	3
5	UCS756	QUANTUM ALGORITHMS	PE	2	0	2	3
6	UMC742	COMPUTATIONAL NUMBER THEORY	PE	2	0	2	3

Nature of Course	CODE
Core-Foundation Courses	CF
Core-Professional Courses	CP
Generic Electives	GE
Professional Electives	PE
Project Based Courses	PR

GENERIC ELECTIVE

S. N.	COURSE NO.	TITLE	CODE	L	T	P	CR
1		EMPLOYABILITY DEVELOPMENT SKILL	GE	2	0	0	2.0
2		INTRODUCTORY COURSE IN FRENCH/GERMAN/SPANISH	GE	2	0	0	2.0
3		INTRODUCTION TO COGNITIVE SCIENCE	GE	2	0	0	2.0
4		INTRODUCTION TO CORPORATE FINANCE	GE	2	0	0	2.0
5		TECHNOLOGIES FOR SUSTAINABLE DEVELOPMENT	GE	2	0	0	2.0
6		BIOLOGY FOR ENGINEERS	GE	2	0	0	2.0
7		ASTRONOMY AND ASTROPHYSICS	GE	2	0	0	2.0
8		INTELLECTUAL PROPERTY RIGHTS	GE	2	0	0	2.0
9		TOTAL QUALITY MANAGEMENT	GE	2	0	0	2.0
10		INTRODUCTION TO INDIAN CONSTITUTION	GE	2	0	0	2.0
11		ECONOMICS FOR DECISION MAKING	GE	2	0	0	2.0

SEMESTER WISE CREDITS FOR BE: COMPUTER SCIENCE AND ENGINEERING

Nature of Course	Credits to be Earned(As per Choice Based Credit System)								
	Semesters								Total
	I	II	III	IV	V	VI	VII	VIII	
Core-Foundation Courses	18	18.5	4	4	0	0	3	0	47.5
Core-Professional Courses	4	4	16.5	19	14	11.5	6	0	75
Professional & Generic Electives	0	0	0	0	3	8	3	0	14
Project Based Courses	0	0	0	0	0	0	8	15	23
								Total	159.5

Elective Focus

B.E. Computer Science and Engineering Program is designed to offer elective focus as soon as student clears semester IV of the program. Student has to choose EF (Elective Focus) out of the following six choices and shall continue with this group till his study at Thapar Institute of Engineering & Technology. Choices are:

I. Software Engineering
II. Information and Cyber Security
III. Computer Animation and Gaming
IV. Machine Learning and Data Analytics
V. Computational Science
VI. Mathematics and Computing

I. Software Engineering

1. Continuous Delivery And DevOps
2. IT Project Management
3. Engineering Software As A Service
4. Software Verification and Validation

II. Information and Cyber Security

1. Computer & Network Security
2. Secure Coding
3. Cyber Forensics
4. Blockchain Technology and Applications

III. Computer Animation and Gaming

1. Computer Vision
2. 3D Modelling And Animation
3. Game Design & Development
4. Augmented And Virtual Reality

IV. Machine Learning and Data Analytics

1. Data Analytics & Visualization
2. Image Processing
3. Natural Language Processing
4. Deep Learning and Computer Vision

V. Computational Science

1. Computational Biology and Bioinformatics
2. Combinatorics
3. Computational Chemistry
4. Quantum Algorithms

VI. Mathematics and Computing

1. Mathematic Modeling And Simulation
2. Matrix Computation
3. Financial Mathematics
4. Computational Number Theory