

**BE (COMPUTER ENGINEERING MBA) -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	UTA017	COMPUTER PROGRAMMING	CP	3	0	2	4.0
3	UES013	ELECTRICAL ENGINEERING	CF	3	1	2	4.5
4	UEN002	ENERGY AND ENVIRONMENT	CF	3	0	0	3.0
5	UMA003	MATHEMATICS – I	CF	3	1	0	3.5
6	UES009	MECHANICS	CF	2	1	2*	2.5
		TOTAL		17	4	6	22.0

MECHANICS (2\*): 2HOURS LAB ONCE IN SEMESTER

**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	UEC001	ELECTRONICS ENGINEERING	CF	3	1	2	4.5
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		16	7	8	23.5

**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	UES012	ENGINEERING MATERIALS	CF	3	1	2	4.5
5	UMA007	NUMERICAL ANALYSIS	CF	3	0	2	4.0
6		PRACTICAL COMPUTING	CP	1	0	2	2.0
7	UTA013	ENGINEERING DESIGN PROJECT – I	PR	1	0	2	4.0 <sup>++</sup>
		TOTAL		17	2	12	26.0

**SEMESTER-IV**

S. N.	COURSE NO.	TITLE	CODE	L	T	P	CR
1	UTA002	MANUFACTURING PROCESSES	CF	2	0	3	3.5
2	UCS521	ARTIFICIAL INTELLIGENCE	CP	3	0	2	4.0
3	UES034	MEASUREMENT SCIENCE AND TECHNIQUES	CF	3	0	2	4.0
4	UCS310	DATABASE MANAGEMENT SYSTEMS	CP	3	0	2	4.0
5	UCS520	COMPUTER NETWORKS	CP	2	0	2	3.0
6	UCSXXX	DESIGN AND ANALYSIS OF ALGORITHMS	CP	3	0	2	4.0
7	UTA014	ENGINEERING DESIGN PROJECT – II	PR	1	0	4	4.0 <sup>++</sup>
		TOTAL		17	0	17	26.5

**Summer Semester after second year**

S. N.	COURSE NO.	TITLE	CODE	L	T	P	CR
1	UCSXXX	NETWORK PROGRAMMING	CP	2	0	2	3.0
2	UCS503	SOFTWARE ENGINEERING	CP	3	0	2	4.0
3	UCS701	THEORY OF COMPUTATION	CP	3	1	0	3.5
		TOTAL		8	1	4	10.5

**SEMESTER-V**

S. N.	COURSE NO.	TITLE	CODE	L	T	P	CR
1	UCS802	COMPILER CONSTRUCTION	CP	3	0	2	4.0
2	UCSXXX	COMPUTER ARCHITECTURE AND ORGANIZATION	CP	3	0	0	3.0
3	UML501	MACHINE LEARNING	CP	3	0	2	4.0
4	UCS409	PROBABILITY AND STATISTICS	CP	3	0	2	4.0
5	UHU005	HUMANITIES FOR ENGINEERS	CF	2	0	2	3.0
6		ELECTIVE-I	PE	2	0	2	3.0
7		GENERIC ELECTIVE	GE	2	0	0	2.0
8.	UCS794	CAPSTONE PROJECT* – STARTS	PR	0	0	2	-
		TOTAL		18	0	12	23.0

**SEMESTER-VI**

S. N.	COURSE NO.	TITLE	CODE	L	T	P	CR
1	UCSXXX	EMBEDDED SYSTEMS DESIGN	CP	2	0	2	3.0
2	UCSXXX	COMPUTER GRAPHICS	CP	3	0	2	4.0
3	UCSXXX	MICROPROCESSOR-BASED SYSTEMS DESIGN	CP	3	0	2	4.0
4	UMA031	OPTIMIZATION TECHNIQUES	CF	3	0	2	4.0
5		ELECTIVE-II	PE	2	0	2	3.0
6		ELECTIVE-III	PE	2	0	2	3.0
7		ELECTIVE-IV	PE	2	0	2	3.0
8	UTA012	INNOVATION AND ENTREPRENEURSHIP (2 SELF-EFFORTS HOURS)	PR	1	0	2	4.5
9	UCS794	CAPSTONE PROJECT	PR	0	0	2	8.0
		TOTAL		18	0	18	36.5

**SEMESTER-VII**

Ist Semester of MBA program							
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**SEMESTER-VIII**

S. N.	COURSE NO.	TITLE	CODE	L	T	P	CR
1	UCS895	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	UCSXXX	SOCIAL NETWORK ANALYSIS	CP	2	0	2	3.0
2	UCS806	ETHICAL HACKING	CP	3	0	2	4.0
3	UCS896	CAPSTONE PROJECT II	PR	0	0	4	8.0
		TOTAL		5	0	8	15.0

OR

S. N.	COURSE NO.	TITLE	CODE	L	T	P	CR
1	UCS897	START- UP SEMESTER**	PR	-	-	-	15.0
		TOTAL		-	-	-	15.0

\*\* Based on Hands on Work on Innovations and Entrepreneurship

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

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

### LIST OF PROFESSIONAL ELECTIVES

#### ELECTIVE I

S. N.	COURSE NO.	TITLE	CODE	L	T	P	CR
1	UCSXXX	CLOUD COMPUTING	PE	2	0	2	3.0
2.	UCSXXX	COMPUTER VISION	PE	2	0	2	3.0
3.	UCSXXX	DATA ANALYTICS & VISUALIZATION	PE	2	0	2	3.0
4.	UCSXXX	COMPUTER & NETWORK SECURITY	PE	2	0	2	3.0
5.	UCSXXX	CONTINUOUS DELIVERY AND DEVOPS	PE	2	0	2	3.0
6.	UCSXXX	MATHEMATIC MODELING AND SIMULATION	PE	2	0	2	3.0

#### ELECTIVE II

S. N.	COURSE NO.	TITLE	CODE	L	T	P	CR
1	UCSXXX	GPU COMPUTING	PE	2	0	2	3.0
2.	UCSXXX	3D MODELLING AND ANIMATION	PE	2	0	2	3.0
3.	UCSXXX	IMAGE PROCESSING	PE	2	0	2	3.0
4.	UCSXXX	SECURE CODING	PE	2	0	2	3.0
5.	UCSXXX	IT PROJECT MANAGEMENT	PE	2	0	2	3.0
6.	UCSXXX	MATRIX COMPUTATION	PE	2	0	2	3.0

#### ELECTIVE III

S. N.	COURSE NO.	TITLE	CODE	L	T	P	CR
1	UCSXXX	PARALLEL & DISTRIBUTED COMPUTING	PE	2	0	2	3.0
2.	UCSXXX	GAME DESIGN & DEVELOPMENT	PE	2	0	2	3.0
3.	UCSXXX	NATURAL LANGUAGE PROCESSING	PE	2	0	2	3.0
4.	UCSXXX	CYBER FORENSICS	PE	2	0	2	3.0
5.	UCSXXX	ENGINEERING SOFTWARE AS A SERVICE	PE	2	0	2	3.0
6.	UCSXXX	FINANCIAL MATHEMATICS	PE	2	0	2	3.0

#### ELECTIVE IV

S. N.	COURSE NO.	TITLE	CODE	L	T	P	CR
1	UCSXXX	SIMULATION & MODELLING	PE	2	0	2	3.0
2.	UCSXXX	AUGMENTED AND VIRTUAL REALITY	PE	2	0	2	3.0
3.	UCSXXX	DEEP LEARNING AND COMPUTER VISION	PE	2	0	2	3.0
4.	UCSXXX	BLOCKCHAIN TECHNOLOGY AND APPLICATIONS	PE	2	0	2	3.0
5.	UCSXXX	SOFTWARE VERIFICATION AND VALIDATION	PE	2	0	2	3.0
6.	UCSXXX	COMPUTATIONAL NUMBER THEORY	PE	2	0	2	3.0

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

#### Elective Focus

B.E. Computer 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. High Performance Computing
- II. Computer Animation and Gaming
- III. Machine Learning and Data Analytics
- IV. Information and Cyber Security
- V. Software Engineering
- VI. Mathematics and Computing

#### I. High Performance Computing

1. Cloud Computing
2. GPU Computing
3. Parallel & Distributed Computing
4. Simulation & Modelling

#### II. Computer Animation and Gaming

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

#### III. Machine Learning and Data Analytics

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

#### IV. Information and Cyber Security

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

#### V. Software Engineering

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

#### VI. Mathematics and Computing

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