CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY(A)

Choice Based Credit System (with effect from 2016-17)

B.E (Civil, EEE, Mech. and Prod.) and B.Tech (Chemical)

S.No	Code	Subject	L	T	P/D	Credits
		I – Semester				
1	16MT C01	Engineering Mathematics - I	3	1	0	4
2	16CY C01	Engineering Chemistry	3	-	0	3
3	16PY C02	Applied Physics	2	-	0	2
4	16CS C01	Programming and Problem Solving	3	1	0	4
5	16ME C01	Elements of Mechanical Engineering	3	-	0	3
6	16EC C01	Elements of Electronics and Communication Engineering	3	-	0	3
7	16CE C03	Professional Ethics and Human Values	1	-	0	1
8	16CS C02	Programming Laboratory	0	-	2	1
9	16ME C03	Mechanical and IT Workshop	0	-	3	2
10	16PY C04	Applied Physics Laboratory	0	-	2	1
11	16CY C03	Engineering Chemistry Laboratory	0	-	2	1
		TOTAL	18	02	09	25

L - Lecture (clock hours) T - Tutorial (clock hours)   P/D - Practical / Drawing (clock hours)

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (A)

Choice Based Credit System (with effect from 2016-17)

B.E (Civil, EEE, Mech. and Prod.) and B.Tech (Chemical)

S.No	Code	Subject	L	T	P/D	Credits
		II - Semester				
1	16MT C02	Engineering Mathematics - II	3*	-	0	3
2	16PY C01	Engineering Physics	3	-	0	3
3	16CY C02	Applied Chemistry	2	-	0	2
4	16EE C01	Elements of Electrical Engineering	3	-	0	3
5	16CE C01	Engineering Mechanics	3	-	0	3
6	16EG C01	Professional Communication in English	3	-	0	3
7	16CE C02	Environmental Studies	1	-	0	1
8	16ME C02	Engineering Graphics	1	-	3	3
9	16PY C03	Engineering Physics Laboratory	0	-	2	1
10	16CY C04	Applied Chemistry Laboratory	0	-	2	1
11	16EG C02	Professional Communication Laboratory	0	-	2	1
		TOTAL	**19**	**--**	**09**	**24**

L - Lecture (clock hours) T - Tutorial (clock hours)   P/D - Practical / Drawing (clock hours)

* One extra hour may be permitted in the timetable

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY(A)
Choice Based Credit System
B.E. (Civil Engineering)

SEMESTER – III

S.No	Course Code	Title of the Course	Hours per week L/T	Hours per week P/D	Duration of SEE in Hours	Maximum Marks CIE	Maximum Marks SEE	Credits
			Scheme of Instruction		Scheme of Examination			
THEORY								
1	16CE C03	Surveying	4	-	3	30	70	4
2	16CE C04	Building Materials Planning&Constructions	3	1	3	30	70	4
3	16CE C05	Strength of Materials-1	3	-	3	30	70	3
4	16CE C06	Engineering Geology	3	-	3	30	70	3
5	16MT C05	Engineering Mathematics III	3	-	3	30	70	3
6	16MB C01	Engineering Economics & Accountancy	3	-	3	30	70	3
PRACTICALS								
7	16CE C07	Surveying Lab - 1	-	3	3	25	50	2
8	16CE C08	Engineering Geology Lab	-	2	2	15	35	1
9	16CE C09	Computer Aided Civil Engineering Drafting Lab	-	2	2	15	35	1
		TOTAL	19	8	-	235	540	24

L: Lecture   T: Tutorial   D: Drawing   P: Practical
CIE – Continuous Internal Evaluation   SEE – Semester End Examination

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CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY(A)
Choice Based Credit System
B.E. (Civil Engineering)

SEMESTER – IV

S.No	Course Code	Title of the Course	Scheme of Instruction Hours per week L/T	P/D	Scheme of Examination Duration of SEE in Hours	Maximum Marks CIE	SEE	Credits
		THEORY						
1	16CE C10	Transportation Engineering	4	-	3	30	70	4
2	16CE C11	Construction Mangaement and administration	3	-	3	30	70	3
3	16CE C12	Water & Waster Water Engineering	4	-	3	30	70	4
4	16CE C13	Strength of Materials-II	3	-	3	30	70	3
5	16CE C14	Fluid Mechanics-I	3	-	3	30	70	3
		PRACTICALS						
6	16CE C15	Strength of Materials Lab	-	3	3	25	50	3
7	16CE C16	Lurvey Lab - II	-	3	3	25	50	2
8	16EG C03	Soft Skills and Employability Enhancement Lab	-	2	2	15	35	1
9	16CE C17	Mini Project-Survey Camp	-	-	-	50	-	1
		TOTAL	18	8	-	265	485	24

L: Lecture   T: Tutorial   D: Drawing   P: Practical
CIE - Continuous Internal Evaluation   SEE - Semester End Examination

24

SCHEME OF INSTRUCTION AND EXAMINATION
B.E. III -YEAR
CIVIL ENGINEERING

SEMESTER V

S. No	Course Code	Title of the Course	Scheme of Instruction Hours per Week L/T	D/P	Scheme of Examination Duration in Hrs	Maximum Marks Continuous Internal Evaluation (CIE)	Semester End Exam (SEE)	Credits
THEORY								
1	16CE C18	Reinforced Concrete Design -I	3/1	-	3	30	70	4
2	16CE C19	Soil Mechanics	3	-	3	30	70	3
3	16CE C20	Theory of Structures-I	3/1	-	3	30	70	4
4	16CE C21	Concrete Technology	3	-	3	30	70	3
5	16CE C22	Fluid Mechanics-II	3	-	3	30	70	3
ELECTIVE – I								
6	16CE E01	Rock Mechanics	3	-	3	30	70	3
	16CE E02	Advanced Surveying						
	16CE E03	Advanced Strength of Materials						
PRACTICAL								
7	16CE C23	Fluid Mechanics Lab	-	3	3	25	50	2
8	16CE C24	Environmental Engg. Lab	-	3	3	25	50	2
9	16CE C25	Concrete Laboratory	-	3	3	25	50	2
Total			20	09		255	570	26

L=Lecture,　　　T=Tutorial,　　　　　D/P= Drawing/ Practicals
CIE - Continuous Internal Evaluation　　SEE - Semester End Examination

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SCHEME OF INSTRUCTION AND EXAMINATION
B.E. III -YEAR
CIVIL ENGINEERING

SEMESTER VI

S.No	Course Code	Title of the Course	Scheme of Instruction Hours per Week L/T	Scheme of Instruction Hours per Week D/P	Scheme of Examination Duration in Hrs	Scheme of Examination Maximum Marks Continuous Internal Evaluation (CIE)	Scheme of Examination Maximum Marks Semester End Exam (SEE)	Credits
THEORY								
1	16CE C26	Theory of Structures - II	3/1	-	3	30	70	4
2	16CE C27	Reinforced Concrete Design-II	3/1	-	3	30	70	4
3	16CE C28	Water Resources Engineering-I	3	-	3	30	70	3
4	16CE C29	Foundation Engineering	3	-	3	30	70	3
ELECTIVE – II								
5	16CE E04	Finite Element Method	3	-	3	30	70	3
	16CE E05	GIS & Remote Sensing						
	16CE E06	Artificial Neural Networks, Fuzzy logic & Expert Systems						
PRACTICALS								
6	16CE C30	Soil Mechanics Laboratory	-	3	3	25	50	2
7	16CE C31	Hydraulics & Hydraulic Machinery Lab	-	3	3	25	50	2
8	16CE C32	Transportation Engineering Lab	-	3	3	25	50	2
9	16CE C33	Industrial Visit	Satisfactory / Unsatisfactory					
Total			17	09		225	500	23

L=Lecture,   T=Tutorial,   D/P= Drawing/ Practical's
CIE - Continuous Internal Evaluation   SEE - Semester End Examination

One extra hour may be permitted in the time table for Reinforced Concrete Design-II and Water Resources Engineering-I.

SCHEME OF INSTRUCTION & EXAMINATION

CIVIL ENGINEERING

SEMESTER VII

S. No.	Course Code	Title of the Course	Scheme of Instruction Hours per Week L/T	Scheme of Instruction Hours per Week DP	Duration in Hrs	Continuous Internal Evaluation (CIE)	Semester End Exam (SEE)	Credits
THEORY								
1	16CE C34	Water Resources Engineering-II	3	-	3	30	70	3
2	16CE C35	Design of Steel Structures - I	3/1	-	3	30	70	4
3	16CE C36	Estimation and Specifications	3/1	-	3	30	70	4
Elective - III								
4	16CE E07	Advanced Reinforced Concrete Design						
5	16CE E08	Advanced Environmental Engineering	3	-	3	30	70	3
6	16CE E09	Ground Improvement Techniques						
Elective - IV								
7	16CE E10	Elements of Earthquake Engineering						
8	16CE E11	Advanced Transportation Engineering	3	-	3	30	70	3
9	16CE E12	Design and Detailing of Irrigation Structure						
Elective - V (open Elective)								
10	16CS O06	Fundamentals of DBMS						
11	16ME O01	Entrepreneurship	3	-	3	30	70	3
12	16EG O01	Technical Writing Skills						
13	16EE O02	Energy Management Systems						
PRACTICAL								
14	16CE C37	Computer Applications Lab	-	3	3	25	50	2
15	16CE C38	Project seminar	-	3	-	50	-	2
		Total	20	6		255	470	24

L=Lecture, T=Tutorial, D/P= Drawing/ Practical's
CIE - Continuous Internal Evaluation   SEE - Semester End Examination

SCHEME OF INSTRUCTION AND EXAMINATION

CIVIL ENGINEERING

SEMESTER VIII

S. No.	Course Code	Title of the Course	Scheme of Instruction Hours per Week L/T	Scheme of Instruction Hours per Week D/P	Scheme of Examination Duration in Hrs	Scheme of Examination Maximum Marks Continuous Internal Evaluation (CIE)	Scheme of Examination Maximum Marks Semester End Exam (SEE)	Credits
		THEORY						
		Elective – VI						
1	16CE E13	Design of Steel Structures-II						
2	16CE E14	Advanced Steel Design	3	-	3	30	70	3
3	16CE E15	Industrial Structures						
		Elective – VII (Open Elective)						
4	16ME O04	Intellectual Property Rights						
5	16EG O02	Gender Sensitization	3	-	3	30	70	3
6	16CS O09	Basics of Artificial Intelligence						
7	16EE O05	Waste Management						
		Elective – VIII						
8	16CE E16	Health Monitoring and Retrofitting of Structures						
9	16CE E17	Ground Water Hydrology	3	-	3	30	70	3
10	16CE E18	Pre-Stressed Concrete						
11	16CE C39	Seminar	–	–	3	50	-	2
12	16CE C40	Project	–	–	6	50	100	6
		Total	**09**	**--**		**190**	**310**	**17**

L=Lecture, T=Tutorial, D/P= Drawing/ Practical's
CIE – Continuous Internal Evaluation   SEE – Semester End Examination

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY(A)

Choice Based Credit System (with effect from 2016-17)

B.E (Civil, EEE, Mech. and Prod.) and B.Tech (Chemical)

S.No	Code	Subject	L	T	P/D	Credits
I – Semester						
1	16MT C01	Engineering Mathematics - I	3	1	0	4
2	16CY C01	Engineering Chemistry	3	-	0	3
3	16PY C02	Applied Physics	2	-	0	2
4	16CS C01	Programming and Problem Solving	3	1	0	4
5	16ME C01	Elements of Mechanical Engineering	3	-	0	3
6	16EC C01	Elements of Electronics and Communication Engineering	3	-	0	3
7	16CE C03	Professional Ethics and Human Values	1	-	0	1
8	16CS C02	Programming Laboratory	0	-	2	1
9	16ME C03	Mechanical and IT Workshop	0	-	3	2
10	16PY C04	Applied Physics Laboratory	0	-	2	1
11	16CY C03	Engineering Chemistry Laboratory	0	-	2	1
TOTAL			18	02	09	25

L - Lecture (clock hours) T - Tutorial (clock hours)   P/D - Practical / Drawing (clock hours)

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (A)

Choice Based Credit System (with effect from 2016-17)

B.E (Civil, EEE, Mech. and Prod.) and B.Tech (Chemical)

S.No	Code	Subject	L	T	P/D	Credits
header: **II - Semester**						
1	16MT C02	Engineering Mathematics - II	3*	-	0	3
2	16PY C01	Engineering Physics	3	-	0	3
3	16CY C02	Applied Chemistry	2	-	0	2
4	16EE C01	Elements of Electrical Engineering	3	-	0	3
5	16CE C01	Engineering Mechanics	3	-	0	3
6	16EG C01	Professional Communication in English	3	-	0	3
7	16CE C02	Environmental Studies	1	-	0	1
8	16ME C02	Engineering Graphics	1	-	3	3
9	16PY C03	Engineering Physics Laboratory	0	-	2	1
10	16CY C04	Applied Chemistry Laboratory	0	-	2	1
11	16EG C02	Professional Communication Laboratory	0	-	2	1
		TOTAL	**19**	**--**	**09**	**24**

L - Lecture (clock hours) T - Tutorial (clock hours)   P/D - Practical / Drawing (clock hours)

* One extra hour may be permitted in the timetable

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY(A)
Choice Based Credit System
B.E (Mechanical Engineering)

SEMESTER – III

S.No.	Course Code	Title of the Course	Scheme of Instruction Hours per week L/T	P/D	Scheme of Examination Duration of See in Hours	Maximum Marks CIE	SEE	Credits
THEORY								
1	16MT C05	Engineering Mathematics-III	3	-	3	30	70	3
2	16ME C04	Material Science and Metallurgy	3	-	3	30	70	3
3	16ME C05	Mechanics of Materials	3/1	-	3	30	70	4
4	16ME C06	Fluid Dynamics	3	-	3	30	70	3
5	16ME C07	Machine Drawing	1	2	3	30	70	2
6	16MB C01	Engineering Economics and Accountancy	3	-	3	30	70	3
PRACTICALS								
6	16ME C08	Material Science and Metallurgy Lab	-	3	3	25	50	2
7	16ME C09	Mechanics of Materials Lab	-	3	3	25	50	2
8	16ME C10	Computer Drafting Lab	-	3	3	25	50	2
		Total	17	11	-	255	570	24

L: Lecture   T: Tutorial   D: Drawing   P: Practical
CIE - Continuous Internal Evaluation   SEE - Semester End amination

2

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY(A)
Choice Based Credit System
B.E (Mechanical Engineering)

SEMESTER – IV

S.No.	Course Code	Title of the Course	Scheme of Instruction Hours per week L/T	P/D	Duration of See in Hours	Scheme of Examination Maximum Marks CIE	SEE	Credits
		THEORY						
1	16ME C14	Kinematics of Machines	3/1	-	3	30	70	4
2	16ME C15	Thermodynamics	4	-	3	30	70	4
3	16ME C16	Hydraulic Machinery and Systems	4	-	3	30	70	4
4	16ME C17	Manufacturing Processes	4	-	3	30	70	4
5	16EE C14	Electrical Machines and Microcontroller Applications	4	-	3	30	70	4
		PRACTICALS						
6	16ME C18	Hydraulic Machinery and Systems Lab	-	3	3	25	50	2
7	16ME C19	Manufacturing Processes Lab	-	3	3	25	50	2
8	16EG C03	Soft Skills and Employability Enhancement Lab	-	2	2	15	35	1
		Total	20	8	-	215	485	25

L: Lecture   T: Tutorial   D: Drawing   P: Practical
CIE - Continuous Internal Evaluation SEE - Semester End Examination

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CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (A)

Choice Based Credit System
B.E (Mechanical Engineering)

SEMESTER – V

S. No.	Course Code	Title of the Course	Scheme of Instruction Hours per week L/T	Scheme of Instruction Hours per week P/D	Scheme of Examination Duration in Hours	Scheme of Examination Maximum Marks CIE	Scheme of Examination Maximum Marks SEE	Credits
		THEORY						
1	16ME C20	Dynamics of Machines	3/1	-	3	30	70	4
2	16ME C21	Applied Thermodynamics and Heat Transfer	3/1	-	3	30	70	4
3	16ME C22	Design of Machine Elements	3/1	-	3	30	70	4
4		Professional Elective-I	3	-	3	30	70	3
5		Professional Elective-II	3	-	3	30	70	3
		PRACTICALS						
6	16ME C23	Dynamics and Vibrations Lab	-	3	3	25	50	2
7	16ME C24	Applied Thermodynamics and Heat Transfer Lab	-	3	3	25	50	2
8	16EE C22	Electrical Machines and Microcontroller Applications Lab	-	3	3	25	50	2
9	16ME C25	Industrial Visit	Excellent / Very Good / Good / Satisfactory / Unsatisfactory					
		Total	18	9	-	225	500	24

L: Lecture   T: Tutorial   D: Drawing   P: Practical
CIE - Continuous Internal Evaluation   SEE - Semester End Examination

1

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY(A)

Choice Based Credit System
B.E (Mechanical Engineering)
SEMESTER – VI

S.No.	Course Code	Title of the Course	Scheme of Instruction Hours per week L/T	Scheme of Instruction Hours per week P/D	Scheme of Examination Duration in Hours	Scheme of Examination Maximum Marks CIE	Scheme of Examination Maximum Marks SEE	Credits
THEORY								
1	16ME C26	CAD and CAM	3	-	3	30	70	3
2	16ME C27	Metal Cutting and Machine Tool Engineering	3	-	3	30	70	3
3	16ME C28	Thermal Turbo Machines	3	-	3	30	70	3
4	16ME C29	Machine Design	3/1	-	3	30	70	4
5		Professional Elective-III	3	-	3	30	70	3
6		Professional Elective-IV	3	-	3	30	70	3
PRACTICALS								
7	16ME C30	CAD and CAM Lab	-	3	3	25	50	2
8	16ME C31	Metal Cutting and Machine ToolEngineering Lab	-	3	3	25	50	2
9	16ME C32	Thermal Engineering Lab	-	3	2	25	50	2
		Total	19	9	-	255	570	25

L: Lecture   T: Tutorial   D: Drawing   P: Practical
CIE - Continuous Internal Evaluation SEE - Semester End Examination

ELECTIVES

		Professional Elective-III (3/3)		Professional Elective-IV (3/3)	
SNo.	Subj Code	Name of the Subject	SNo	Subj. Code	Name of the Subject
1	16ME E04	Advanced IC Engines	5	16ME E07	Heat and Mass Transfer
2	16ME E05	Computational Fluid Dynamics	6	16ME E08	Object Oriented Programming With C++
3	16ME E06	Automobile Engineering	7	16PE E06	Modern Machining and Forming Methods
4	16PE E05	Digital Manufacturing	8	16PE E07	Surface Engineering

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (A)
CHOICE BASED CREDIT SYSTEM
B.E. (MECHANICAL ENGINEERING)

SEMESTER – VII

S. No.	Course Code	Title of the Course	Scheme of instruction Hours per week		Scheme of examination			Credits
			L/T	P/Dg.	Duration in Hours	Maximum Marks CIE	SEE	
THEORY								
1	16ME C33	Metrology and Instrumentation	3	--	3	30	70	3
2	16ME C34	Operations Research	3	--	3	30	70	3
3	16PE C10	Production Drawing	1	2	3	30	70	2
4	16PE C11	Production and Operations Management	3	--	3	30	70	3
5	16ME C35	Finite Element Analysis	3/1	--	3	30	70	4
6		Professional Elective - V	3	--	3	30	70	3
PRACTICALS								
7	16ME C36	Metrology and Instrumentation Lab	--	3	3	25	50	2
8	16ME C37	Computer Aided Engineering Lab	--	3	3	25	50	2
9	16ME C38	Seminar	--	3	--	50	--	2
		TOTAL	17	11		280	520	24

L: Lecture   T: Tutorial   D: Drawing   P: Practical
CIE - Continuous Internal Evaluation   SEE – Semester End Examination

Professional Elective-V (3/3)		
SNO	Subj. Code	Name of the Subject
1	16ME E10	Renewable Energy Sources
2	16ME E11	Energy Conservation, Management and Audit
3	16ME E12	Engineering Research Methodology
4	16ME E13	Environmental Pollution

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (A)
CHOICE BASED CREDIT SYSTEM
B.E. (MECHANICAL ENGINEERING)

SEMESTER – VIII

S. No.	Course Code	Title of the Course	Scheme of instruction		Scheme of examination			Credits
			Hours per week		Duration in Hours	Maximum Marks		
			L/T	P/Dg.		CIE	SEE	
THEORY								
1		Professional Elective – VI	3	--	3	30	70	3
2		Open Elective – I	3	--	3	30	70	3
3		Open Elective – II	3	--	3	30	70	3
PRACTICALS								
4	16ME C39	Project Seminar	--	3	--	50	--	2
5	16ME C40	Project	6	--	--	50	100	6
		TOTAL	15	3		190	310	17

L: Lecture   T: Tutorial   D: Drawing   P: Practical
CIE - Continuous Internal Evaluation   SEE – Semester End Examination

Professional Elective-VI (3/3)		
SNO	Subj. Code	Name of the Subject
1	16ME E15	Power Plant Engineering
2	16ME E16	Principles of Entrepreneurship
3	16ME E17	Innovations, Protection and Legal Aspects
4	16PE E11	Supply Chain Management
5	16ME E18	Nano Science and Technology

Open Elective – I (3/3)			Open Elective – II (3/3)		
SNO	Subj. Code	Name of the Subject	SNO.	Subj. Code	Name of the Subject
1	16CE O02	Disaster Mitigation and Management	1	16IT O01	Object Oriented Programming using JAVA
2	16IT O02	Principles of Internet of Things	2	16PY O01	History of Science and Technology
3	16EE O03	Energy Auditing	3	16EE O05	Waste Management
4	16EC O07	System Automation and Control	4	16EC O05	MEMS and its Applications
5	16CS O09	Basics of Artificial Intelligence	5	16CS O07	Basics of Cyber Security

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (A)

Choice Based Credit System (with effect from 2016-17)

B.E. (Mechanical Engineering)

S. No.	Course Code	Course title	Scheme of instruction			Contact hrs/week	Duration of end exam, (hours)	Scheme of examination		Credits
			L	T	P/Dg.			CIE	SEE	
I – Semester										
1	16MT C01	Engineering Mathematics - I	3	1	--	4	3	30	70	4
2	16CY C01	Engineering Chemistry	3	--	--	3	3	30	70	3
3	16PY C02	Applied Physics	2	--	--	2	2	20	50	2
4	16CS C01	Programming and Problem Solving	3	1	--	4	3	30	70	4
5	16ME C01	Elements of Mechanical Engineering	3	--	--	3	3	30	70	3
6	16EC C01	Elements of Electronics and Communication Engineering	3	--	--	3	3	30	70	3
7	16CE C03	Professional Ethics and Human Values	1	--	--	1	2	--	50	1
Practicals										
8	16CS C02	Programming Laboratory	--	--	2	2	2	15	35	1
9	16ME C03	Mechanical and IT Workshop	--	--	3	3	3	25	50	2
10	16PY C04	Applied Physics Laboratory	--	--	2	2	2	15	35	1
11	16CY C03	Engineering Chemistry Laboratory	--	--	2	2	2	15	35	1
		TOTAL	**18**	**2**	**9**	**29**	**--**	**240**	**605**	**25**

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (A)

Choice Based Credit System (with effect from 2016-17)

B.E. (Mechanical Engineering)

II – Semester											
S. No.	Course Code	Course title	Scheme of instruction			Contact hrs/week	Duration of end exam, (hours)	Scheme of examination		Credits
			L	T	P/Dg.			CIE	SEE	
1	16MT C02	Engineering Mathematics - II	3	--	--	3	3	30	70	3
2	16PY C01	Engineering Physics	3	--	--	3	3	30	70	3
3	16CY C02	Applied Chemistry	2	--	--	2	2	20	50	2
4	16EE C01	Elements of Electrical Engineering	3	--	--	3	3	30	70	3
5	16CE C01	Engineering Mechanics	3	--	--	3	3	30	70	3
6	16EG C01	Professional Communication in English	3	--	--	3	3	30	70	3
7	16CE C02	Environmental Studies	1	--	--	1	2	--	50	1
8	16ME C02	Engineering Graphics	1	--	3	4	3	30	70	3
Practicals										
9	16PY C03	Engineering Physics Laboratory	--	--	2	2	2	15	35	1
10	16CY C04	Applied Chemistry Laboratory	--	--	2	2	2	15	35	1
11	16EG C02	Professional Communication Laboratory	--	--	2	2	2	15	35	1
		TOTAL	19	--	9	28	--	245	625	24

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY(A)
Choice Based Credit System
B.E (Production Engineering)

SEMESTER – III

S.No.	Course Code	Title of the Course	Scheme of Instruction		Scheme of Examination			Credits
			Hours per week		Duration of See in Hours	Maximum Marks		
			L/T	P/D		CIE	SEE	
		THEORY						
1	16MT C05	Engineering Mathematics-III	3	-	3	30	70	3
2	16ME C04	Material Science and Metallurgy	3	-	3	30	70	3
3	16ME C05	Mechanics of Materials	3/1	-	3	30	70	4
4	16ME C06	Fluid Dynamics	3	-	3	30	70	3
5	16ME C07	Machine Drawing	1	2	3	30	70	2
6	16MB C01	Engineering Economics and Accountancy	3	-	3	30	70	3
		PRACTICALS						
7	16ME CO8	Material Science and Metallurgy Lab	-	3	3	25	50	2
8	16ME C09	Mechanics of Materials Lab	-	3	3	25	50	2
9	16ME C10	Computer Drafting Lab	-	3	3	25	50	2
		Total	**17**	**11**	**-**	**255**	**570**	**24**

L: Lecture   T: Tutorial   D: Drawing   P: Practical

CIE - Continuous Internal Evaluation   SEE - Semester End Examination

2

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY(A)
Choice Based Credit System
B.E (Production Engineering)
SEMESTER – IV

S.No.	Course Code	Title of the Course	Scheme of Instruction Hours per week L/T	P/D	Scheme of Examination Duration of See in Hours	Maximum Marks CIE	SEE	Credits
		THEORY						
1	16ME C14	Kinematics of Machines	3/1	-	3	30	70	4
2	16ME C15	Thermodynamics	4	-	3	30	70	4
3	16PE C01	Metal Casting and Welding	4	-	3	30	70	4
4	16PE C02	Metal Forming Technology	4	-	3	30	70	4
5	16EE C14	Electrical Machines and Microcontroller Applications	4	-	3	30	70	4
		PRACTICALS						
6	16PE C03	Metal Casting and Welding Lab	-	3	3	25	50	2
7	16PE C04	Metal Forming Technology Lab	-	3	3	25	50	2
8	16EG C03	Soft Skills and Employability Enhancement Lab	-	2	2	15	35	1
		Total	20	8	-	215	485	25

L: Lecture T: Tutorial D: Drawing P: Practical

CIE - Continuous Internal Evaluation SEE - Semester End Examination

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CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY(A)

Choice Based Credit System (CBCS)

B.E (Production Engineering)

SEMESTER – V

S.No.	Course Code	Title of the Course	Scheme of Instruction		Scheme of Examination			Credits
			Hours per week		Duration in Hours	Maximum Marks		
			L/T	P/D		CIE	SEE	
THEORY							
1	16ME C20	Dynamics of Machines	3/1	-	3	30	70	3
2	16ME C21	Applied Thermodynamics and Heat Transfer	3/1	-	3	30	70	3
3	16ME C22	Design of Machine Elements	3/1	-	3	30	70	3
4		Professional Elective-I	3	-	3	30	70	3
5		Professional Elective-II	3	-	3	30	70	2
PRACTICALS							
6	16ME C23	Dynamics and Vibrations Lab	-	3	3	25	50	2
7	16ME C24	Applied Thermodynamics and Heat Transfer Lab	-	3	3	25	50	2
8	16EE C22	Electrical Machines and Microcontroller Applications Lab	-	3	3	25	50	2
9	16PE C05	Industrial Visit			Excellent/Very Good/Good/Satisfactory/ Not Satisfactory			
	Total		18	9	-	225	500	20

L: Lecture   T: Tutorial   D: Drawing   P: Practical

CIE - Continuous Internal Evaluation   SEE - Semester End Examination

ELECTIVES

		Professional Elective-I (3/3)			Professional Elective-II (3/3)	
SNo.	Subj Code	Name of the Subject	SNo	Subj Code	Name of the Subject	
1	16ME E01	Refrigeration and Air Conditioning	5	16ME E04	Hydraulic Machines	
2	16ME E02	Mechanical Vibrations	6	16PE E03	Non Destructive Testing and Evaluation	
3	16PE E01	Powder Processing	7	16PE E04	Plastics, Ceramics and Composite Materials	
4	16PE E02	Product Design and Process Planning	8	16MT E04	Probability and Numerical Methods	

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY(A)
Choice Based Credit System

B.E (Production Engineering)

SEMESTER – VI

S.No.	Course Code	Title of the Course	Scheme of Instruction Hours per week L/T	Scheme of Instruction Hours per week P/D	Scheme of Examination Duration in Hours	Scheme of Examination Maximum Marks CIE	Scheme of Examination Maximum Marks SEE	Credits
THEORY								
1	16ME C26	CAD and CAM	3	-	3	30	70	3
2	16PE C06	Machine Tool Engineering	3	-	3	30	70	3
3	16PE C07	Additive Manufacturing	3	-	3	30	70	3
4	16ME C29	Machine Design	3/1	-	3	30	70	3
5		Professional Elective-III	3	-	3	30	70	3
6		Professional Elective-IV	3	-	3	30	70	3
PRACTICALS								
6	16ME C30	CAD and CAM Lab	-	3	3	25	50	2
7	16PE C08	Machine Tool Engineering Lab	-	3	3	25	50	2
8	16PE C09	Additive Manufacturing Lab	-	2	2	25	50	2
		Total	19	8	-	255	570	24

L: Lecture   T: Tutorial   D: Drawing   P: Practical

CIE - Continuous Internal Evaluation SEE - Semester End Examination

ELECTIVES

SNo.	Subj Code	Professional Elective-III (3/3) Name of the Subject	S No	Subj Code	Professional Elective-IV (3/3) Name of the Subject
1	16ME E06	Computational Fluid Dynamics	5	16ME E09	Object Oriented Programming With C++
2	16ME E07	Automobile Engineering	6	16ME E10	Turbo Machines
3	16PE E06	Work System Design	7	16PE E08	Modern Machining and Forming Methods
4	16PE E07	Quality and Reliability Engineering	8	16PE E09	Surface Engineering

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (A)
CHOICE BASED CREDIT SYSTEM
B.E. (PRODUCTION ENGINEERING)

SEMESTER – VII

S. No.	Course Code	Title of the Course	Scheme of Instruction Hours per week L/T	Scheme of Instruction Hours per week P/Dg.	Scheme of Examination Duration in Hours	Scheme of Examination Maximum Marks CIE	Scheme of Examination Maximum Marks SEE	Credits
THEORY								
1	16ME C33	Metrology and Instrumentation	3	--	3	30	70	3
2	16ME C34	Operations Research	3	--	3	30	70	3
3	16PE C10	Production Drawing	1	2	3	30	70	2
4	16PE C11	Production and Operations Management	3	--	3	30	70	3
5	16PE C12	Tool Engineering	3/1	--	3	30	70	4
6		Professional Elective - V	3	--	3	30	70	3
PRACTICALS								
7	16ME C36	Metrology and Instrumentation Lab	--	3	3	25	50	2
8	16PE C13	Manufacturing Engineering Lab	--	3	3	25	50	2
9	16PE C14	Project Seminar	--	3	--	50	--	2
TOTAL			17	11		280	520	24

L: Lecture   T: Tutorial   D: Drawing   P: Practical

CIE - Continuous Internal Evaluation   SEE – Semester End Examination

Professional Elective-V (3/3)		
S. No.	Subj. Code	Name of the Subject
1	16ME E10	Renewable Energy Sources
2	16ME E11	Energy Conservation, Management and Audit
3	16ME E12	Engineering Research Methodology
4	16ME E14	Finite Element Methods

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (A)

CHOICE BASED CREDIT SYSTEM

B.E. (PRODUCTION ENGINEERING)

SEMESTER – VIII

S. No.	Course Code	Title of the Course	Scheme of Instruction		Scheme of Examination			Credits
			Hours per week		Duration in Hours	Maximum Marks		
			L/T	P/Dg.		CIE	SEE	
THEORY								
1		Professional Elective – VI	3	--	3	30	70	3
2		Open Elective – I	3	--	3	30	70	3
3		Open Elective – II	3	--	3	30	70	3
PRACTICALS								
7	16PE C15	Seminar	--	3	--	50	--	2
8	16PE C16	Project	6	--	--	50	100	6
		TOTAL	15	3		190	310	17

L: Lecture   T: Tutorial   D: Drawing   P: Practical
CIE - Continuous Internal Evaluation   SEE – Semester End Examination

Professional Elective-VI (3/3)		
SNO	Subj. Code	Name of the Subject
1	16ME E15	Power Plant Engineering
2	16ME E16	Principles of Entrepreneurship
3	16ME E17	Innovations, Protection and Legal Aspects
4	16PE E11	Supply Chain Management
5	16PE E12	Total Quality Management

Open Elective – I (3/3)			Open Elective – II (3/3)		
SNO	Subj. Code	Name of the Subject	SNO	Subj. Code	Name of the Subject
1	16CE O02	Disaster Mitigation and Management	1	16IT O01	Object Oriented Programming using JAVA
2	16IT O02	Principles of Internet of Things	2	16PY O01	History of Science and Technology
3	16EE O03	Energy Auditing	3	16EE O05	Waste Management
4	16EC O07	System Automation and Control	4	16EC O05	MEMS and its Applications
5	16CS O09	Basics of Artificial Intelligence	5	16CS O07	Basics of Cyber Security

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY(A)

Choice Based Credit System (with effect from 2016-17)

B.E (Civil, EEE, Mech. and Prod.) and B.Tech (Chemical)

S.No	Code	Subject	L	T	P/D	Credits
		I – Semester				
1	16MT C01	Engineering Mathematics - I	3	1	0	4
2	16CY C01	Engineering Chemistry	3	-	0	3
3	16PY C02	Applied Physics	2	-	0	2
4	16CS C01	Programming and Problem Solving	3	1	0	4
5	16ME C01	Elements of Mechanical Engineering	3	-	0	3
6	16EC C01	Elements of Electronics and Communication Engineering	3	-	0	3
7	16CE C03	Professional Ethics and Human Values	1	-	0	1
8	16CS C02	Programming Laboratory	0	-	2	1
9	16ME C03	Mechanical and IT Workshop	0	-	3	2
10	16PY C04	Applied Physics Laboratory	0	-	2	1
11	16CY C03	Engineering Chemistry Laboratory	0	-	2	1
		TOTAL	**18**	**02**	**09**	**25**

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (A)

Choice Based Credit System (with effect from 2016-17)

B.E (Civil, EEE, Mech. and Prod.) and B.Tech (Chemical)

S.No	Code	Subject	L	T	P/D	Credits
		II - Semester				
1	16MT C02	Engineering Mathematics - II	3*	-	0	3
2	16PY C01	Engineering Physics	3	-	0	3
3	16CY C02	Applied Chemistry	2	-	0	2
4	16EE C01	Elements of Electrical Engineering	3	-	0	3
5	16CE C01	Engineering Mechanics	3	-	0	3
6	16EG C01	Professional Communication in English	3	-	0	3
7	16CE C02	Environmental Studies	1	-	0	1
8	16ME C02	Engineering Graphics	1	-	3	3
9	16PY C03	Engineering Physics Laboratory	0	-	2	1
10	16CY C04	Applied Chemistry Laboratory	0	-	2	1
11	16EG C02	Professional Communication Laboratory	0	-	2	1
		TOTAL	**19**	**--**	**09**	**24**

L - Lecture (clock hours) T - Tutorial (clock hours)   P/D - Practical / Drawing (clock hours)

* One extra hour may be permitted in the timetable

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY(A)
Choice Based Credit System

B.E (Electrical and Electronics Engineering)

SEMESTER – III

S.No.	Course Code	Title of the Course	Scheme of Instruction Hours per week L/T	Scheme of Instruction Hours per week P/D	Duration of SEE in Hours	Maximum Marks CIE	Maximum Marks SEE	Credits
		THEORY						
1	16MT C05	Engineering Mathematics-III	3	-	3	30	70	3
2	16EE C02	Electrical Circuits-I	3	-	3	30	70	3
3	16EE C03	Electrical Measurements and Instruments	3	-	3	30	70	3
4	16EC C16	Electronics Engineering	4	-	3	30	70	4
5	16ME C11	Prime Movers and Pumps	3	-	3	30	70	3
6	16MB C01	Engineering Economics and Accountancy	3	-	3	30	70	3
		PRACTICALS						
6	16EE C04	Circuits and Measurements Lab	0/1	2	3	25	50	2
7	16EC C17	Electronics Engineering Lab	-	3	3	25	50	2
8	16ME C12	Prime Movers and Pumps Lab	0/1	2	3	35	50	2
		Total	21	7	-	255	570	25

L: Lecture   T: Tutorial   P: Practical   D: Drawing
CIE - Continuous Internal Evaluation SEE - Semester End Examination

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY(A)
Choice Based Credit System
B.E (Electrical and Electronics Engineering)

SEMESTER - IV

S.No.	Course Code	Title of the Course	Scheme of Instruction Hours per week L/T	P/D	Duration of SEE in Hours	Maximum Marks CIE	SEE	Credits
THEORY								
1	16EEC06	Electrical Circuits -II	3	-	3	30	70	3
2	16EE C07	Electrical Machinery - I	3	-	3	30	70	3
3	16EE C08	Power Systems - I	3	-	3	30	70	3
4	16EE C09	Electromagnetic Theory	3/1	-	3	30	70	4
5	16EE C10	Digital Elctronics and Logic Design	3	-	3	30	70	3
6	16EE C11	Linear Integrated Circuits	3	-	3	30	70	3
PRACTICALS								
6	16EE C12	Electrical Machinery - I Lab	0/1	2	3	25	50	2
7	16EE C13	Linear Integrated Circuits Lab	0/1	2	3	25	50	2
8	16EG C03	Soft Skills and Employability Enhancement Lab	-	2	2	15	35	1
		Total	**21**	**6**	**-**	**245**	**555**	**24**

L: Lecture   T: Tutorial   P: Practical   D: Drawing
CIE - Continuous Internal Evaluation   SEE - Semester End Examination

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (A)

Choice Based Credit System (with effect from 2018-19)

B.E (Electrical and Electronics Engineering)

SEMESTER-V

S.No	Course Code	Title of the Course	Scheme of Instruction Hours per week L/T	P/D	Duration in Hours	CIE	SEE	Credits
			THEORY					
1.	16EEC15	Power Systems – II	3/1	-	3	30	70	4
2.	16EEC16	Electrical Machinery – II	3/1	-	3	30	70	4
3.	16EEC17	Power Electronics	4	-	3	30	70	4
4.	16EEC18	Linear Control Systems	3/1	-	3	30	70	4
5.	16EEEXX	Program Specific Elective-1	3	-	3	30	70	3
			PRACTICALS					
6.	16EEC19	Electrical Machinery – II Lab	0/1	2	3	25	50	2
7.	16EEC20	Power Electronics Lab	0/1	2	3	25	50	2
8.	16EEC21	Linear Control Systems Lab	0/1	2	3	25	50	2
			22	06	-	225	500	25

L: Lecture   T: Tutorial   D: Drawing   P: Practical
CIE - Continuous Internal Evaluation   SEE - Semester End Examination

Course Code	Program Specific Elective-1
16EE E01	Non Conventional Energy Sources (NCES)
16EE E02	Electrical Engineering Materials (EEM)
16EE E03	Electronic Instrumentation (EI)
16MT E01	Statistical and Numerical Methods (SNM)
	Courses offered to other Departments
16EE E04	Electrical Technology (for BE3/4, ECE, V-SEM) (Elective)
16EEC22	Electrical Machines and Microcontroller Applications Lab (Core) (for BE3/4, Mech & Prod, V-SEM)

Core Courses offered to other Departments

SEMESTER – V

S.No	Course Code	Title of the Course	Scheme of Instruction		Scheme of Examination			Credits
			Hours per week		Duration of SEE in Hours	Maximum Marks		
			L/T	P/D		CIE	SEE	
		PRACTICALS						
1	**16EE C22**	Electrical Machines and Microcontroller Applications Lab (Core) (for BE3/4, Mech & Prod, V-SEM)	0/1	2	3	25	50	2
	TOTAL		**1**	**2**	**-**	**25**	**50**	**2**

Elective Courses offered to other Departments

SEMESTER – V

S.No	Course Code	Title of the Course	Scheme of Instruction		Scheme of Examination			Credits
			Hours per week		Duration of SEE in Hours	Maximum Marks		
			L/T	P/D		CIE	SEE	
		PRACTICALS						
1	**16EE E04**	Electrical Technology (for BE3/4, ECE, V-SEM)	3/0	0	3	30	70	3
	TOTAL		**3**	**0**	**-**	**30**	**70**	**3**

L: Lecture   T: Tutorial   P: Practical   D: Drawing
CIE - Continuous Internal Evaluation   SEE - Semester End Examination

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (A)
Choice Based Credit System (with effect from 2018-19)
B.E (Electrical and Electronics Engineering)
SEMESTER-VI

S. No	Course Code	Title of the Course	Hours per week L/T	Hours per week P/D	Duration in Hours	Maximum Marks CIE	Maximum Marks SEE	Credits
		THEORY						
1.	16EEC23	Electrical Machinery – III	3/1	-	3	30	70	4
2.	16EEC24	Switchgear and Protection	3	-	3	30	70	3
3.	16EEC25	Power Semiconductor Drives	3	-	3	30	70	3
4.	16EEC26	Microprocessor and Microcontrollers	4	-	3	30	70	4
5.	16EEEXX	Program Specific Elective- 2	3	-	3	30	70	3
6.	16EEEXX	Program Specific Elective - 3	3	-	3	30	70	3
		PRACTICALS						
7.	16EEC27	Microprocessor and Microcontrollers Lab	0/1	2	3	25	50	2
8.	16EEC28	Power Systems Lab	0/1	2	3	25	50	2
9.	16EEC29	Mini Project	-	2	-	50	-	1
10.	16EEC30	Industrial Visit	Satisfactory / Unsatisfactory					
			22	06	-	280	520	25

L: Lecture   T: Tutorial   D: Drawing   P: Practical
CIE - Continuous Internal Evaluation   SEE - Semester End Examination

Course Code	**Program Specific Elective-2**
16EEE05	High Voltage Engineering (HVE)
16EEE06	Artificial Intelligence Techniques in Electrical Engineering (AITEE)
16EEE07	Switch Mode Power Converters (SMPC)
16EEE08	Optimization Techniques (OT)

Course Code	Program Specific Elective-3
16EEE09	Advanced Control System (ACS)
16EEE10	Electrical Distribution Systems & Automation (EDSA)
16EEE11	High Voltage DC Transmission (HVDC)
16EEE12	Simulation Techniques for Electrical Engineering(STEE)

Elective Courses offered to other Departments	
16EE E13	Industrial Electronics (BE ¾ ECE, VIth Sem)

Elective Courses offered to other Departments

SEMESTER – VI

S.No	Course Code	Title of the Course	Scheme of Instruction		Scheme of Examination			Credits
			Hours per week		Duration of SEE in Hours	Maximum Marks		
			L/T	P/D		CIE	SEE	
PRACTICALS								
1	**16EE E13**	**INDUSTRIAL ELECTRONICS (BE 3/4 ECE, VI Sem)**	3/0	0	3	30	70	3
TOTAL			**3**	**0**	**-**	**30**	**70**	**3**

L: Lecture   T: Tutorial   P: Practical   D: Drawing
CIE **-** Continuous Internal Evaluation   SEE **-** Semester End Examination

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (A)
SCHEME OF INSTRUCTION AND EXAMINATION
VII-Semester of B.E/B.Tech under CBCS
B.E. (EEE)

SEMESTER-VII

S. No	Course Code	Title of the Course	Scheme of Instruction Hours per week L/T	Scheme of Instruction Hours per week P/D	Duration in Hours	Maximum Marks CIE	Maximum Marks SEE	Credits
		THEORY						
1.	16EE C31	Power System Operation and Control	4	-	3	30	70	4
2.	16EE C32	Utilization of Electrical Energy	3	-	3	30	70	3
3.	16EE C33	DSP and Embedded Systems	4	-	3	30	70	4
4.	16EE EXX	Program Specific Elective- 4	3	-	3	30	70	3
5.	16XX OYY	Open Elective-I	3	-	3	30	70	3
		PRACTICALS						
6.	16EE C34	Power Systems Simulation Lab	0/1	2	3	25	50	2
7.	16EE C35	Digital Signal Processor and Embedded Systems Lab`	0/1	2	3	25	50	2
8.	16EE C36	Project Seminar	0	3	-	50	-	2
			19	07	-	250	450	23

L: Lecture   T: Tutorial   D: Drawing   P: Practical
CIE - Continuous Internal Evaluation   SEE - Semester End Examination

Course Code	Program Specific Elective-4
16EEE14	Basic VLSI Design
16EEE15	Computer Methods in Power Systems(CMPS)
16EEE16	Power Quality Engineering(PQE)
16EEE17	Special Electrical Machines(SEM)

Course Code	Open Elective-I
16PY O01	History of Science and Technology
16EG O02	Gender Sensitization
16CE O02	Disaster Mitigation and Management (DMM)
16CS O10	Machine Learning Using Phyton
16ME O01	Entrepreneurship

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (A)
SCHEME OF INSTRUCTION AND EXAMINATION
VIII-Semester of B.E/B.Tech under CBCS
B.E. (EEE)

SEMESTER-VIII

S. No	Course Code	Title of the Course	Scheme of Instruction		Scheme of Examination			Credits
			Hours per week		Duration in Hours	Maximum Marks		
			L/T	P/D		CIE	SEE	
THEORY								
1.	16EEEXX	Program Specific Elective - 5	3	-	3	30	70	3
2.	16EEEXX	Program Specific Elective -6	3	-	3	30	70	3
3.	16XXXXX	Open Elective -II	3	-	3	30	70	3
PRACTICALS								
4.	16EE C37	Seminar	-	3	-	50	-	2
5.	16EE C38	Project	-	6	Viva voce	50	100	6
			09	09	-	190	310	17

L: Lecture   T: Tutorial   D: Drawing   P: Practical
CIE - Continuous Internal Evaluation   SEE - Semester End Examination

Course Code	Program Specific Elective-5	Equivalent NPTEL Courses
16EE E18	Electrical Machine Design(EMD)	
16EE E19	Flexible AC Transmission Systems(FACTS)	FACTS Devices
16EE E20	Power System Reliability (PSR)	
16EE E21	Smart Grid(SG)	Introduction to Smart Grids

Course Code	Program Specific Elective-6	Equivalent NPTEL Courses
16EE E22	Embedded System Design (ESD)	Embedded System Design with ARM
16EE E23	Advanced Power System Protection (APSP)	
16EE E24	Power System Operation and Deregulation(PSOD)	
16EE E25	Electrical Estimation and Costing(EEC)	

Course Code	Open Elective-II	Equivalent NPTEL Courses
16EG O01	Technical Writing Skills	
16ME O04	Intellectual Property Rights (IPR)	Intellectual Property Rights
16 ME O08	Industrial Administration and Financial Management (IAFM)	
16CS O03	IOT and Applications	Introduction to IoT
16CS O04	Basics of Data Science Using R	Machine Learning

Note: Student undergoing internship is permitted to take-up Equivalent NPTEL courses with the prior permission from BoS.

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY(A)

Choice Based Credit System (with effect from 2016-17)

B.E (CSE, ECE and IT)

S.No	Code	Subject	L	T	P/D	Credits
		I - Semester				
1	16MT C01	Engineering Mathematics - I	3	1	0	4
2	16PY C01	Engineering Physics	3	-	0	3
3	16CY C02	Applied Chemistry	2	-	0	2
4	16EE C01	Elements of Electrical Engineering	3	-	0	3
5	16CE C01	Engineering Mechanics	3	-	0	3
6	16EG C01	Professional Communication in English	3	-	0	3
7	16CE C02	Environmental Studies	1	-	0	1
8	16ME C02	Engineering Graphics	1	-	3	3
9	16PY C03	Engineering Physics Laboratory	0	-	2	1
10	16CY C04	Applied Chemistry Laboratory	0	-	2	1
11	16EG C02	Professional Communication Laboratory	0	-	2	1
		TOTAL	**19**	**01**	**09**	**25**

L - Lecture (clock hours)   T - Tutorial (clock hours)   P/D - Practical / Drawing (clock hours)

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (A)

Choice Based Credit System (with effect from 2016-17)

B.E (CSE, ECE and IT)

		II – Semester				
S.No	**Code**	**Subject**	**L**	**T**	**P/D**	**Credits**
1	16MT C02	Engineering Mathematics - II	3*	-	0	3
2	16CY C01	Engineering Chemistry	3	-	0	3
3	16PY C02	Applied Physics	2	-	0	2
4	16CS C01	Programming and Problem Solving	3	1	0	4
5	16ME C01	Elements of Mechanical Engineering	3	-	0	3
6	16EC C01	Elements of Electronics and Communication Engineering	3	-	0	3
7	16CE C03	Professional Ethics and Human Values	1	-	0	1
8	16CS C02	Programming Laboratory	0	-	2	1
9	16ME C03	Mechanical and IT Workshop	0	-	3	2
10	16PY C04	Applied Physics Laboratory	0	-	2	1
11	16CY C03	Engineering Chemistry Laboratory	0	-	2	1
		TOTAL	**18**	**01**	**09**	**24**

L - Lecture (clock hours) T - Tutorial (clock hours)   P/D - Practical / Drawing (clock hours)

* One extra hour may be permitted in the timetable

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (A)
Choice Based Credit System
B.E (Electronics and Communication Engineering)
SEMESTER – III

S.No.	Course Code	Title of the Course	Scheme of Instruction Hours per week L/T	P/D	Scheme of Examination Duration of SEE in Hours	Maximum Marks CIE	SEE	Credits
		THEORY						
1	16MT C05	Engineering Mathematics-III	3	-	3	30	70	3
2	16EC C02	Network Theory	4	-	3	30	70	4
3	16EC C03	Electronic Devices and Circuits	4	-	3	30	70	4
4	16EC C04	Signals and Systems	4	-	3	30	70	4
5	16EC C05	Electromagnetic Theory and Transmission Lines	4	-	3	30	70	4
		PRACTICALS						
6	16EC CO6	Electronic Workshop and Network Lab	-	3	3	25	50	2
7	16EC C07	Electronic Devices Lab	-	3	3	25	50	2
8	16EG C03	Soft Skills and Employability Enhancement Lab	-	2	2	15	35	1
		Total	19	8	-	215	485	24

L: Lecture   T: Tutorial   D: Drawing   P: Practical

CIE - Continuous Internal Evaluation   SEE - Semester End Examination

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CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY(A)
Choice Based Credit System
B.E (Electronics and Communication Engineering)

SEMESTER – IV

S.No.	Course Code	Title of the Course	Scheme of Instruction Hours per week		Scheme of Examination			Credits
			L/T	P/D	Duration of SEE in Hours	CIE	SEE	
THEORY							
1	16EC C08	Digital Ligic Design	3	-	3	30	70	3
2	16EC C09	Analog Electronic Circuits	4	-	3	30	70	4
3	16EC C10	Analog Communication	4	-	3	30	70	4
4	16EC C11	Antennas and Wave Propagation	3	-	3	30	70	3
5	16EC C12	Electronic Instrumentation	3	-	3	30	70	3
6	16MB C01	Engg Eco. and Accountancy	3	-	3	30	70	3
PRACTICALS							
7	16EC C13	Digital Logic Design Lab using Verilog	-	2	2	15	35	1
8	16EC C14	Analog Electronic Circuits Lab	-	3	3	25	50	2
9	16EC C15	Analog Communication Lab	-	3	3	25	50	2
		Total	18	8	-	245	555	25

L: Lecture   T: Tutorial   D: Drawing   P: Practical

CIE - Continuous Internal Evaluation   SEE - Semester End Examination

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY(A)

Choice Based Credit System (with effect from 2018-19)

B.E (Electronics and Communication Engineering)

SEMESTER – V

S.No	Course Code	Title of the Course	Scheme of Instruction		Scheme of Examination			Credits
			Hours per week		Duration of SEE in Hours	Maximum Marks		
			L/T	P/D		CIE	SEE	
THEORY								
1	16ECC 18	Digital Communication	4	-	3	30	70	4
2	16ECC 19	Integrated Circuits and Applications	4	-	3	30	70	4
3	16ECC 20	Microprocessors and Microcontrollers	4	-	3	30	70	4
4	16ECC 21	Control Systems	3	-	3	30	70	3
5		Elective-I	3	-	3	30	70	3
PRACTICALS								
6	16ECC 22	Digital Communication Lab	-	3	3	25	50	2
7	16ECC 23	Integrated Circuits and Applications Lab	-	3	3	25	50	2
8	16ECC 24	Microprocessors and Microcontrollers Lab	-	3	3	25	50	2
TOTAL			18	9	-	225	500	24

L: Lecture   T: Tutorial   D: Drawing   P: Practical
CIE - Continuous Internal Evaluation   SEE - Semester End Examination

	Elective-I
16ECE01	Computer Organization and Architecture
16ECE02	Engineering Material Science
16EEE04	Electrical Technology
16EEE13	Industrial Electronics

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (A)
Choice Based Credit System (with effect from 2017-18)
B.E (Electronics and Communication Engineering)

SEMESTER – VI

S.No	Course Code	Title of the Course	Scheme of Instruction		Scheme of Examination			Credits
			Hours per week		Duration of SEE in Hours	Maximum Marks		
			L/T	P/D		CIE	SEE	
THEORY								
1	16ECC25	Embedded System Design	3	-	3	30	70	3
2	16ECC26	Digital Signal Processing	4	-	3	30	70	4
3	16ECC27	Microwave Engineering	3	-	3	30	70	3
4	16ECC28	Wireless Mobile Communication	3	-	3	30	70	3
5		Elective-II	3	-	3	30	70	3
6		Elective-III	3	-	3	30	70	3
PRACTICALS								
7	16ECC29	Embedded System Design Lab	-	3	3	25	50	2
8	16ECC30	Digital Signal Processing Lab	-	3	3	25	50	2
9	16ECC31	Microwave Engineering Lab	-	3	3	25	50	2
TOTAL			19	9	-	255	570	25

L: Lecture   T: Tutorial   D: Drawing   P: Practical

CIE - Continuous Internal Evaluation   SEE - Semester End Examination

Elective-II		Elective-III	
16ECE03	Analog and Mixed Signal Design	16ITE25	Java Programming
16ECE04	Coding Theory and Techniques	16ITE26	Python Programming
16ITE27	Data Structures	16ECE05	CPLD and FPGA Architectures
16MTE03	Numerical methods for Scientific and Engineering Computation	16ECE06	Digital Control systems
		16ECE07	Optical Fiber Communication

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CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (A)
Choice Based Credit System (With Effect from Academic Year 2019-20)
B.E (Electronics and Communication Engineering)

SEMESTER – VII

S.No	Course Code	Title of the Course	Scheme of Instruction Hours per Week		Scheme of Examination			Credits
			L/T	P/D	Duration of SEE in Hours	Maximum Marks CIE	SEE	
THEORY								
1	16EC C32	Data Communication and Computer Networks	3	-	3	30	70	3
2	16EC C33	Principles of GNSS	3	-	3	30	70	3
3	16EC C34	Radar and Satellite Communication	3	-	3	30	70	3
4	16EC C35	VLSI Design	3	-	3	30	70	3
5		Elective – IV	3	-	3	30	70	3
6		Elective – V	3	-	3	30	70	3
PRACTICALS								
7	16EC C36	Advanced Simulation Lab	-	3	3	25	50	2
8	16EC C37	ElectronicDesign and Automation Lab	-	3	3	25	50	2
9	16EC C38	Project Seminar	-	3	-	50	-	2
		Total	18	9	-	280	520	24

Elective –IV		Elective – V	
Course Code	Title of the Course	Course Code	Title of the Course
16EC E08	Principles of Computational Electromagnetics	16EC E12	Applications of IoT in ECE
16EC E09	Real Time Operating Systems	16EC E13	Digital Image Processing
16EC E10	Speech Processing	16EC E14	Principles of Optimization Techniques
16EC E11	Spread Spectrum Communication	16EC E15	Principles of Wireless Sensor Networks

L: Lecture   T: Tutorial   P: Practical   D: Drawing
CIE: Continuous Internal Evaluation   SEE: Semester End Examination

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (A)
Choice Based Credit System (With Effect from Academic Year 2019-20)
B.E (Electronics and Communication Engineering)

SEMESTER – VIII

S.No	Course Code	Title of the Course	Scheme of Instruction		Scheme of Examination			Credits
			Hours per Week		Duration of SEE in Hours	Maximum Marks		
			L/T	P/D		CIE	SEE	
THEORY								
1		Elective – VI	3	-	3	30	70	3
2		Elective – VII (Open)	3	-	3	30	70	3
3		Elective – VIII (Open)	3	-	3	30	70	3
PRACTICALS								
4	16EC C39	Seminar	-	3	-	50	-	2
5	16EC C40	Project	-	6	Viva- Voce	50	100	6
		Total	9	9	-	190	310	17

Elective –VI		Elective – VII (Open)		Elective – VIII (Open)	
Course Code	Title of the Course	Course Code	Title of the Course	Course Code	Title of the Course
16EC E16	DSP Processors and Architectures	16CS O10	Basics of Machine Learning Using Python	16CE O02	Disaster Mitigation and Management
16EC E17	Software Defined Radio	16ME O01	Entrepreneurship	16CS O06	Fundamentals of DBMS
16E CE18	VLSI Technology	16EG O02	Gender Sensitization	16ME O04	Intellectual Property Rights
16EC E19	Voice over IP	16PY O01	History of Science and Technology	16CS O05	Principles of Virtual Reality
		16ME O02	Robotics	16EG O01	Technical Writing Skills

Note: Students undergoing internships during the semester processed through training and placement office are permitted to take up equivalent courses through NPTEL / MOOCS /SWAYAM to earn required credits. However such students should seek a prior permission from the Chairman, BoS.

L: Lecture   T: Tutorial   P: Practical   D: Drawing
CIE: Continuous Internal Evaluation   SEE: Semester End Examination

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (AUTONOMOUS)
SCHEME OF INSTRUCTION AND EXAMINATION
I-Semester of B.E under CBCS
COMPUTER SCIENCE AND ENGINEERING
B.E (CSE, ECE and IT)

S. No	Course Code	Title of the Course	Scheme of Instruction – Hours per week L/T	Scheme of Instruction – Hours per week P/D	Duration of SEE in Hours	Maximum Marks CIE	Maximum Marks SEE	Credits
THEORY
1	16MT C01	Engineering Mathematics - I	3/1	0	3	30	70	4
2	16PY C01	Engineering Physics	3	0	3	30	70	3
3	16CY C02	Applied Chemistry	2	0	3	30	70	2
4	16EE C01	Elements of Electrical Engineering	3	0	3	30	70	3
5	16CE C01	Engineering Mechanics	3	0	3	30	70	3
6	16EG C01	Professional Communication in English	3	0	3	30	70	3
7	16CE C02	Environmental Studies	1	0	3	30	70	1
8	16ME C02	Engineering Graphics	1	3	3	30	70	3
PRACTICALS
9	16PY C03	Engineering Physics Laboratory	-	2	3	25	50	1
10	16CY C04	Applied Chemistry Laboratory	-	2	3	25	50	1
11	16EG C02	Professional Communication Laboratory	-	2	3	25	50	1
		TOTAL	19/1	09	-	255	570	25

L - Lecture (clock hours)   T - Tutorial (clock hours)   P/D - Practical / Drawing (clock hours)

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (AUTONOMOUS)
SCHEME OF INSTRUCTION AND EXAMINATION
II-Semester of B.E under CBCS
COMPUTER SCIENCE AND ENGINEERING
B.E (CSE, ECE and IT)

S. No	Course Code	Title of the Course	Hours per week L/T	Hours per week P/D	Duration of SEE in Hours	Maximum Marks CIE	Maximum Marks SEE	Credits
			Scheme of Instruction		**Scheme of Examination**			
THEORY								
1	16MT C02	Engineering Mathematics - II	3*	0	3	30	70	3
2	16CY C01	Engineering Chemistry	3	0	3	30	70	3
3	16PY C02	Applied Physics	2	0	3	30	70	2
4	16CS C01	Programming and Problem Solving	3/1	0	3	30	70	4
5	16ME C01	Elements of Mechanical Engineering	3	0	3	30	70	3
6	16EC C01	Elements of Electronics and Communication Engineering	3	0	3	30	70	3
7	16CE C03	Professional Ethics and Human Values	1	0	3	30	70	1
PRACTICALS								
8	16CS C02	Programming Laboratory	-	2	3	25	50	1
9	16ME C03	Mechanical and IT Workshop	-	3	3	25	50	2
10	16PY C04	Applied Physics Laboratory	-	2	3	25	50	1
11	16CY C03	Engineering Chemistry Laboratory	-	2	3	25	50	1
	TOTAL		18/1	09	-	255	570	24

L - Lecture (clock hours) T - Tutorial (clock hours) P/D - Practical / Drawing (clock hours)

* One extra hour may be permitted in the timetable

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (A)
Choice Based Credit System
B.E (Computer Science and Engineering)

SEMESTER – III

S. No	Course Code	Title of the Course	Scheme of Instruction Hours per week L/T	P/D	Duration of SEE in Hours	CIE	SEE	Credits
THEORY								
1	16MT C05	Engineering Mathematics –III	3	-	3	30	70	3
2	16CS C03	Data Structures	3	-	3	30	70	3
3	16CS C04	Object Oriented Programming using Java	3	-	3	30	70	3
4	16CS C05	Logic and Switching Theory	3/1	-	3	30	70	4
5	16CS C06	Discrete Structures	3/1	-	3	30	70	4
PRACTICALS								
6	16CS C07	Data Structures Lab	-	3	3	25	50	2
7	16CS C08	Object Oriented Programming Lab Using Java	-	3	3	25	50	2
8	16EG C03	Soft Skills and Employ- ability Enhancement Lab	-	2	2	15	35	1
9	16CS C09	Mini Project-I	-	2	2	50	-	1
		TOTAL	17	10	-	265	485	23

L: Lecture   T: Tutorial   D: Drawing   P: Practical
CIE - Continuous Internal Evaluation   SEE - Semester End Examination

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY(A)
Choice Based Credit System
B.E (Computer Science and Engineering)

SEMESTER – IV

S. No	Course Code	Title of the Course	Scheme of Instruction Hours per week L/T	Scheme of Instruction Hours per week P/D	Duration of SEE in Hours	Maximum Marks CIE	Maximum Marks SEE	Credits
THEORY								
1	16CS C10	Data Base Management Systems	3	-	3	30	70	3
2	16CS C11	Web Technologies	3	-	3	30	70	3
3	16CS C12	Computer Architecture and Micro Processors	3/1	-	3	30	70	4
4	16CS C13	Probability and Statistics Using R	3	-	3	30	70	3
5	16CS E01/02/03	ELECTIVE - I	3	-	3	30	70	3
6	16MB C01	Engineering Economics and Accountancy	3	-	3	30	70	3
PRACTICALS								
7	16CS C14	Data Base Management Systems Lab	-	3	3	25	50	2
8	16CS C15	Web Technologies Lab	-	3	3	25	50	2
9	16CS C16	CA and MP Lab	-	3	3	25	50	2
	TOTAL		19	9	-	255	570	25

ELECTIVE-I

S.No.	Course Code	Title of the Course
1	16CS E01	Linux Programming and Scripting Languages
2	16CS E02	Principle of Programming Languages
3	16CS E03	Shell Scripting

L: Lecture   T: Tutorial   D: Drawing   P: Practical
CIE - Continuous Internal Evaluation   SEE - Semester End Examination

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (AUTONOMOUS)

SCHEME OF INSTRUCTION AND EXAMINATION
V-Semester of B.E under CBCS
COMPUTER SCIENCE AND ENGINEERING

SEMESTER-V

Sl.No	Course Code	Title of the Course	Hours per week L/T	Hours per week P/D	Duration of SEE in Hours	Maximum Marks CIE	Maximum Marks SEE	Credits
THEORY								
1	16CSC17	Design and Analysis of Algorithms	3/1	-	3	30	70	3
2	16CSC18	Automata Languages and Computation	3/1	-	3	30	70	3
3	16CSC19	Operating Systems	3	-	3	30	70	3
4	16CSC20	Data Communication and Computer Networks	3	-	3	30	70	3
5	16CSC21	Software Engineering	3	-	3	30	70	3
6	16CSE 04/05/06	Elective - II	3	-	3	30	70	3
PRACTICALS								
7	16CSC22	Operating Systems Lab	-	3	3	25	50	2
8	16CSC23	Data Communication and Computer Networks Lab	-	3	3	25	50	2
9	16CSC24	Software Engineering Lab	-	3	3	25	50	2
TOTAL			20	9	-	255	570	24

Elective-II:
16CSE 04 - Mobile Application Development
16CSE 05 - Computer Graphics
16CSE 06 - Advanced Computer Architecture

L: Lecture   T: Tutorial   D: Drawing   P: Practical
CIE - Continuous Internal Evaluation   SEE - Semester End Examination

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (AUTONOMOUS)
SCHEME OF INSTRUCTION AND EXAMINATION
VI-Semester of B.E under CBCS
COMPUTER SCIENCE AND ENGINEERING

SEMESTER-VI

Sl.No	Syllabus Ref. No	SUBJECT	Scheme of Instruction		Scheme of Examination			Credits
			Periods per Week		Duration Credits of SEE in Hours	Maximum Marks		
			L/T	P/D		CIE	SEE	
THEORY								
1	16CSC25	Compiler Construction	3	-	3	30	70	3
2	16CSC26	Artificial Intelligence	3	-	3	30	70	3
3	16CSC27	Mobile Computing	3	-	3	30	70	3
4	16CSC28	Information and Network Security	3	-	3	30	70	3
5	16CSC29	Internet of Things	3	-	3	30	70	3
6	16CSE 07/08/09	Elective-III	3	-	3	30	70	3
PRACTICALS								
7	16CSC30	Information and Network security Lab	-	3	3	25	50	2
8	16CSC31	Internet of Things Lab	-	3	3	25	50	2
9	16CSC32	Mini Project-II	-	3	3	50	-	1
		TOTAL	18	9	-	280	520	23

Elective-III:
16CSE07 – Computer Vision
16CSE08 – Soft Computing
16CSE09 – Data Mining

L: Lecture   T: Tutorial   D: Drawing   P: Practical
CIE - Continuous Internal Evaluation   SEE - Semester End Examination

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY(A)
SCHEME OF INSTRUCTION AND EXAMINATION
VII-Semester of B.E under CBCS
COMPUTER SCIENCE AND ENGINEERING

SEMESTER-VII

Sl.No	Course Code	Title of the Course	Scheme of Instruction		Scheme of Examination			Credits
			Hours per week		Duration of SEE in Hours	Maximum Marks		
			L/T	P/D		CIE	SEE	
THEORY								
1	16CSC 33	Data Science and Big Data Analytics	3	-	3	30	70	3
2	16CSC 34	Free and Open Source Software	3	-	3	30	70	3
3	16CSC 35	Distributed and Cloud Computing	3	-	3	30	70	3
4	16CSC 36	Machine Learning	3/1	-	3	30	70	4
5		Elective-IV	3	-	3	30	70	3
6		Elective-V	3	-	3	30	70	3
PRACTICALS								
7	16CSC 37	DSBDA Lab	-	3	3	25	50	2
8	16CSC 38	ML Lab	-	3	3	25	50	2
9	16CSC 39	Project Seminar	-	3	3	50	-	2
TOTAL			19	9		280	520	25

ELECTIVE-IV	
16CSE 10	Deep Learning
16CSE 11	Design Patterns
16CSE 12	Nature Inspired Algorithm
16CSE 13	System and Network Administration

ELECTIVE-V (OE1)	
16CEO 02	Disaster Mitigation and Management
16MEO 01	Entrepreneurship
16MEO 06	Research Methodologies
16EGO 02	Gender Sensitization

L: Lecture　　　　T: Tutorial　　　D: Drawing　　　P: Practical
CIE - Continuous Internal Evaluation　　　　SEE - Semester End Examination

NPTEL Courses (Enrollment :15-05-2019 to 29-07-2019)				
Exam Registration (Open and Close Dates) : 1-Jun-19 to 23-09-2019 10.00 am				
Courses	Elective	Course Start Date	Course End Date	Exam Date
Software Project Management	Elective - IV	29-07-2019	18-10-2019	02-11-2019
Ethical Hacking		29-07-2019	18-10-2019	02-11-2019
Natural Language Processing		29-07-2019	18-10-2019	02-11-2019
Block Chain Architecture Design and Use cases	Elective - V	29-07-2019	18-10-2019	03-11-2019
Social Networks		29-07-2019	18-10-2019	02-11-2019
Computer Vision		29-07-2019	18-10-2019	02-11-2019

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY(A)
SCHEME OF INSTRUCTION AND EXAMINATION
VIII-Semester of B.E under CBCS
COMPUTER SCIENCE AND ENGINEERING

SEMESTER-VIII

Sl.No	Syllabus Ref. No	SUBJECT	Scheme of Instruction Periods per Week		Scheme of Examination Duration Credits of SEE in Hours	Scheme of Examination Maximum Marks		Credits
			L/T	P/D		CIE	SEE	
THEORY								
1	16CSE XX	Elective-VI	3	-	3	30	70	3
2	16CSE XX	Elective-VII	3	-	3	30	70	3
3	6MT/ME/PY OXX	Elective-VIII	3	-	3	30	70	3
PRACTICALS								
7	16CSC 40	Seminar	-	3	3	50	-	2
8	16CSC 41	Project	-	6	3	50	100	6
		TOTAL	9	9		190	310	17

ELECTIVE-VI		ELECTIVE-VII	
16CSE 14	Cyber Security	16CSE 18	Bioinformatics
16CSE 15	Optimization Techniques	16CSE 19	Human Computer Interaction
16CSE 16	Natural Language Processing	16CSE 20	Social Networking and its Impact
16CSE 17	Virtual Reality	16CSE 21	Blockchain Technology

ELECTIVE-VIII (OE2)	
16MTO 04	Quantum Computing
16MEO 02	Robotics
16MEO 04	Intellectual Property Rights
16PYO 01	History of Science and Technology

L: Lecture   T: Tutorial   D: Drawing   P: Practical
CIE - Continuous Internal Evaluation   SEE - Semester End Examination

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (AUTONOMOUS)

Scheme of Instructions of I Semester of B.E. – CSE (Artificial Intelligence and Machine Learning) as per AICTE Model Curriculum 2020-21

DEPARTMENT OF CSE (ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING)

SEMESTER – I

S. No	Course Code	Title of the Course	Scheme of Instruction Hours per Week L	T	P/D	Scheme of Examination Duration of SEE in Hours	Maximum Marks CIE	SEE	Credits
THEORY									
1	20MT C01	Linear Algebra & Calculus	3	-	-	3	40	60	3
2	20EG C01	English	2	-	-	3	40	60	2
3	20PY C01	Optics and Semiconductor Physics	3	-	-	3	40	60	3
4	20CS C01	Programming for Problem Solving	3	-	-	3	40	60	3
PRACTICAL									
5	20MT C02	Linear Algebra & Calculus Lab	-	-	2	3	50	50	1
6	20EG C02	English lab	-	-	2	3	50	50	1
7	20PY C03	Optics and Semiconductor Physics Lab	-	-	4	3	50	50	2
8	20CS C02	Programming for problem Solving Lab	-	-	4	3	50	50	2
9	20ME C01	CAD AND DRAFTING	-	1	3	3	50	50	2.5
10	20MB C02	Community Engagement	30 field + 2P/W			-	50	-	1.5
		TOTAL	11	1	15	-	460	490	21

L: Lecture   **T: Tutorial**   **P: Practical**

CIE - Continuous Internal Evaluation   **SEE - Semester End Examination**

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (AUTONOMOUS)

Scheme of Instructions of II Semester of B.E. – CSE (Artificial Intelligence and Machine Learning) as per AICTE Model Curriculum 2020-21

DEPARTMENT OF CSE (ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING)

SEMESTER -II

S. No	Course Code	Title of the Course	Scheme of Instruction			Scheme of Examination			Credits
			Hours per Week			Duration of SEE in Hours	Maximum Marks		
			L	T	P/D		CIE	SEE	
THEORY									
1	20MT C03	Differential Equations & Transform Theory	3	-	-	3	40	60	3
2	20CY C01	Chemistry	3	-	-	3	40	60	3
3	20CS C05	Industry 4.0	3	-	-	3	40	60	3
4	20CS C03	Object Oriented Programming	3	-	-	3	40	60	3
PRACTICAL									
5	20MT C04	Differential Equations & Transform Theory Lab	-	-	2	3	50	50	1
6	20CY C02	Chemistry Lab	-	-	4	3	50	50	2
7	20CS C04	Object Oriented Programming Lab	-	-	2	3	50	50	1
8	20ME C02	Workshop / Manufacturing Practice			5	3	50	50	2.5
9	20ME C03	Engineering Exploration	90 Hours / 4P			-	50	-	1.5
		TOTAL	12	-	13	-	410	440	20

L: Lecture   T: Tutorial   P: Practical

CIE - Continuous Internal Evaluation   SEE - Semester End Examination

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY(A)
SCHEME OF INSTRUCTIONS AND EXAMINATION
Model Curriculum(R-20) 2021-22

B.E. (CSE - Artificial Intelligence and Machine Learning)

SEMESTER -III

S. No	Course Code	Title of the Course	Scheme of Instruction Hours per Week			Scheme of Examination Duration of SEE in Hours	Maximum Marks		Credits
			L	T	P/D		CIE	SEE	
THEORY									
1	20EEC01	Basic Electrical Engineering	3	0	0	3	40	60	3
2	20ECC35	Basic Electronics	3	0	0	3	40	60	3
3	20CSC08	Data Structures	3	0	0	3	40	60	3
4	20CSC09	Discrete Mathematics	3	1	0	3	40	60	4
5	20CSC10	Digital Logic Design	3	0	0	3	40	60	3
6	20CAC01	Fundamentals of Data Science	2	0	0	3	40	60	2
PRACTICAL									
7	20EEC02	Basic Electrical Engineering Lab	0	0	2	3	50	50	1
8	20ECC36	Basic Electronics Lab	0	0	2	3	50	50	1
9	20CSC11	Data Structures Lab	0	0	4	3	50	50	2
10	20CAC02	Fundamentals of Data Science Lab	0	0	2	3	50	50	1
11	20CAI01	MOOCs / Training / Internship	0	0	4	-	-	-	2
12	20ACT	Activity Points	-	-	-	-	-	-	-
		TOTAL	17	1	10+4	-	440	610	25

L: Lecture   T: Tutorial   D: Drawing   P: Practical
CIE - Continuous Internal Evaluation   SEE - Semester End Examination

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY(A)
SCHEME OF INSTRUCTIONS AND EXAMINATION
Model Curriculum(R-20) 2021-22

B.E. (CSE - Artificial Intelligence and Machine Learning)

SEMESTER –IV

S. No	Course Code	Title of the Course	Scheme of Instruction Hours per Week			Scheme of Examination Duration of SEE in Hours	Scheme of Examination Maximum Marks CIE	Scheme of Examination Maximum Marks SEE	Credits
			L	T	P/D				
THEORY									
1	20MTC13	Mathematical Foundation for Data Science & Security	3	0	0	3	40	60	3
2	20CSC13	Computer Architecture and Microprocessor	3	0	0	3	40	60	3
3	20CSC14	Data Base Management Systems	3	0	0	3	40	60	3
4	20CSC15	Internet and Web Technologies	2	0	0	3	40	60	2
5	20CAC03	Artificial Intelligence	3	1	0	3	40	60	4
6	20MBC01	Engineering Economics & Accountancy	3	0	0	3	40	60	3
PRACTICAL									
7	20MTC14	Mathematical Foundation for Data Science & Security Lab	0	0	2	3	50	50	1
8	20CSC17	Data Base Management Systems Lab	0	0	2	3	50	50	1
9	20CSC18	Internet and Web Technologies Lab	0	0	4	3	50	50	2
10	20ACT	Activity Points	-	-	-	-	-	-	-
		TOTAL	17	1	8	-	390	510	22

L: Lecture   T: Tutorial   D: Drawing   P: Practical
CIE - Continuous Internal Evaluation   SEE - Semester End Examination

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY(A)
SCHEME OF INSTRUCTIONS AND EXAMINATION
Model Curriculum(R-20)
B.E. (CSE - Artificial Intelligence and Machine Learning)

SEMESTER - V

S. No	Course Code	Title of the Course	Scheme of Instruction Hours per Week			Scheme of Examination Duration of SEE in Hours	Maximum Marks		Credits
			L	T	P/D		CIE	SEE	
THEORY									
1.	20CSC12	Design and Analysis of Algorithms	3	-	-	3	40	60	3
2.	20CSC20	Operating Systems	3	-	-	3	40	60	3
3.	20CSC22	Software Engineering	3	-	-	3	40	60	3
4.	20CAC04	Machine Learning	3	-	-	3	40	60	3
5.		Professional Elective – I	3	-	-	3	40	60	3
6.		Open Elective-I	3	-	-	3	40	60	3
PRACTICAL									
7.	20CSC16	Design and Analysis of Algorithms Lab	-	-	2	3	50	50	1
8.	20CSC23	Operating Systems Lab	-	-	3	3	50	50	1.5
9.	20CSC25	Case Studies Lab using UML	-	-	2	3	50	50	1
10.	20CAC05	Machine Learning Lab	-	-	3	3	50	50	1.5
11.	20CAI02	Internship-II (Industrial/ Rural Internship)	3-4 weeks/ 90 hours			-	50	-	2
		TOTAL	18	-	10	-	490	560	25

L: Lecture   T: Tutorial   D: Drawing   P: Practical
CIE - Continuous Internal Evaluation   SEE - Semester End Examination

Professional Elective – I		Open Elective-I	
20CSE03	System Modeling and Simulation	20ECO10	Fundamentals of Wireless Communication
20CSE12	Embedded Systems	20EEO05	Waste Management
20CSE24	Blockchain Technology	20MEO09	Organizational Behaviour
20CSE26	Human Computer Interaction	20MTO03	Quantum Computing
20CAE01	Reinforcement Learning	20BTO04	Bioinformatics
20CAE02	Digital Image Processing		

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY(A)
SCHEME OF INSTRUCTIONS AND EXAMINATION
Model Curriculum(R-20)
B.E. (CSE - Artificial Intelligence and Machine Learning)
SEMESTER –VI

S. No	Course Code	Title of the Course	Scheme of Instruction Hours per Week L	T	P/D	Scheme of Examination Duration of SEE in Hours	Maximum Marks CIE	SEE	Credits
		THEORY							
1.	20CSC21	Data Communication and Computer Networks	3	-	-	3	40	60	3
2.	20CAC06	Deep Learning for Computer Vision	3	-	-	3	40	60	3
3.	20CIC07	Theory of Computation & Compilers	3	-	-	3	40	60	3
4.		Professional Elective – II	3	-	-	3	40	60	3
5.		Professional Elective – III	3	-	-	3	40	60	3
6.		Open Elective-II	3	-	-	3	40	60	3
7.	20EGM03	Universal Human Values-II: Understanding Harmony	3	-	-	3	40	60	3
		PRACTICAL							
8.	20CAC07	Deep Learning for Computer Vision Lab	-	-	2	3	50	50	1
9.		Professional Elective – II Lab	-	-	2	3	50	50	1
10.	20EGC03	Employability Skills	-	-	2	2	50	50	1
		TOTAL	21	-	6	-	430	570	24

L: Lecture   T: Tutorial   D: Drawing   P: Practical
CIE - Continuous Internal Evaluation   SEE - Semester End Examination

Professional Elective – II	
20CSC30	Cryptography and Network Security
20CSE06	Soft Computing
20CSE07	Internet of Things
20CSE11	Natural Language Processing
20CAE03	Computer Vision

Professional Elective – II Lab	
20CSC31	Cryptography and Network Security Lab
20CSE15	Soft Computing Lab
20CSE16	Internet of Things Lab
20CSE20	Natural Language Processing Lab
20CAE07	Computer Vision Lab

Professional Elective – III	
20CSE05	Optimization Techniques
20CSE25	Social Computing
20CAE04	Algorithmic Game Theory
20CAE05	Multi Agent Intelligent Systems
20CAE06	Data and Visual Analytics

Open Elective-II	
20ECO01	Remote Sensing and GIS
20MTO01	Financial Mathematics
20EEO02	Energy Management Systems
20EGO01	Technical Writing Skills
20CEO02	Disaster Risk Reduction and Management
20CHO04	Environmental and Sustainable Development

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY(A)
SCHEME OF INSTRUCTIONS AND EXAMINATION
Model Curriculum(R-20)
B.E. (CSE - Artificial Intelligence and Machine Learning)

SEMESTER –VII

S. No	Course Code	Title of the Course	Scheme of Instruction Hours per Week			Duration of SEE in Hours	Maximum Marks		Credits
			L	T	P/D		CIE	SEE	
THEORY									
1.	20CAC08	Cloud Technologies	3	-	-	3	40	60	3
2.		Professional Elective-IV	3	-	-	3	40	60	3
3.		Open Elective-III	3	-	-	3	40	60	3
4.	20EGM01	Indian Constitution and Fundamental Principles	2	-	-	2	-	50	No Credits
5.	20EGM02	Indian Traditional Knowledge	2	-	-	2	-	50	No Credits
PRACTICAL									
6.		Professional Elective-IV Lab	-	-	2	3	50	50	1
7.	20CAC09	Technical Seminar	-	-	2	-	50	-	1
8.	20CAC10	Project Part- 1	-	-	4	-	50	-	2
9.	20CAI03	Internship-III	5-6 weeks / 135 hours			-	50	-	3
		TOTAL	13	-	8	-	320	330	16

L: Lecture   T: Tutorial   D: Drawing   P: Practical
CIE - Continuous Internal Evaluation   SEE - Semester End Examination

Professional Elective – IV	
20CSE10	Devops
20CSE37	High Performance Computing
20CSE36	Cyber Security
20CSE08	Enterprise Application Development
20CAE08	Big Data Frameworks

Professional Elective – IV Lab	
20CSE19	Devops Lab
20CSE40	High Performance Computing Lab
20CSE39	Cyber Security Lab
20CSE17	Enterprise Application Development Lab
20CAE13	Big Data Frameworks Lab

Open Elective-III	
20PYO01	History of Science and Technology
20MEO03	Research Methodologies
20MEO04	Entrepreneurship
20ECO05	System Automation and Control
20EEO03	Energy Auditing

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY(A)
SCHEME OF INSTRUCTIONS AND EXAMINATION
Model Curriculum(R-20)

B.E. (CSE - Artificial Intelligence and Machine Learning)

SEMESTER –VIII

S. No	Course Code	Title of the Course	Scheme of Instruction Hours per Week			Scheme of Examination Duration of SEE in Hours	Maximum Marks CIE	SEE	Credits
			L	T	P/D				
THEORY									
1.		Professional Elective-V	3	-	-	3	40	60	3
2.	20CEM01	Environmental Science	2	-	-	2	-	50	No Credits
3.	20EGM04	Gender sensitization	2	-	-	2	-	50	No Credits
PRACTICAL									
4.	20CAC11	Project Part – 2	-	-	8	-	100	100	4
		TOTAL	7	-	8	-	140	260	7

L: Lecture   T: Tutorial   D: Drawing   P: Practical
CIE - Continuous Internal Evaluation   SEE - Semester End Examination

Professional Elective – V	
20CAE09	Planning and estimation of Autonomous Systems
20CAE10	Computational Neuroscience
20CSE35	Augmented Reality and Virtual Reality
20CAE11	Network and System Administration
20CAE12	Parallel Computing

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (AUTONOMOUS)

**Scheme of Instructions of I Semester of B.E. –CSE (IOT & Cyber Security including Block Chain Technology)
as per AICTE Model Curriculum 2020-21**

DEPARTMENT OF CSE (IOT & CYBER SECURITY INCLUDING BLOCK CHAIN TECHNOLOGY)

SEMESTER – I

S. No	Course Code	Title of the Course	Scheme of Instruction Hours per Week			Scheme of Examination Duration of SEE in Hours	Scheme of Examination Maximum Marks		Credits
			L	T	P/D		CIE	SEE	
THEORY									
1	20MT C01	Linear Algebra & Calculus	3	-	-	3	40	60	3
2	20EG C01	English	2	-	-	3	40	60	2
3	20PY C01	Optics and Semiconductor Physics	3	-	-	3	40	60	3
4	20CS C01	Programming for Problem Solving	3	-	-	3	40	60	3
PRACTICAL									
5	20MT C02	Linear Algebra & Calculus Lab	-	-	2	3	50	50	1
6	20EG C02	English lab	-	-	2	3	50	50	1
7	20PY C03	Optics and Semiconductor Physics Lab	-	-	4	3	50	50	2
8	20CS C02	Programming for problem Solving Lab	-	-	4	3	50	50	2
9	20ME C01	CAD AND DRAFTING	-	1	3	3	50	50	2.5
10	20MB C02	Community Engagement	30 field + 2P/W			-	50	-	1.5
		TOTAL	**11**	**1**	**15**	**-**	**460**	**490**	**21**

L: Lecture   **T: Tutorial**   **P: Practical**

CIE - Continuous Internal Evaluation   **SEE - Semester End Examination**

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (AUTONOMOUS)

Scheme of Instructions of II Semester of B.E. –CSE (IOT & Cyber Security including Block Chain Technology)
as per AICTE Model Curriculum 2020-21

DEPARTMENT OF CSE (IOT & CYBER SECURITY INCLUDING BLOCK CHAIN TECHNOLOGY)

SEMESTER -II

S. No	Course Code	Title of the Course	Scheme of Instruction Hours per Week			Scheme of Examination			Credits
			L	T	P/D	Duration of SEE in Hours	CIE	SEE	
THEORY									
1	20MT C03	Differential Equations & Transform Theory	3	-	-	3	40	60	3
2	20CYC01	Chemistry	3	-	-	3	40	60	3
3	20CS C05	Industry 4.0	3	-	-	3	40	60	3
4	20CS C03	Object Oriented Programming	3	-	-	3	40	60	3
PRACTICAL									
5	20MT C04	Differential Equations &Transform Theory Lab	-	-	2	3	50	50	1
6	20CY C02	Chemistry Lab	-	-	4	3	50	50	2
7	20CS C04	Object Oriented Programming Lab	-	-	2	3	50	50	1
8	20ME C02	Workshop / Manufacturing Practice			5	3	50	50	2.5
9	20ME C03	Engineering Exploration	90 Hours / 4P			-	50	-	1.5
		TOTAL	12	-	13	-	410	440	20

L: Lecture   **T: Tutorial**   **P: Practical**

CIE - Continuous Internal Evaluation   **SEE - Semester End Examination**

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY(A)
SCHEME OF INSTRUCTION AND EXAMINATION
Model Curriculum(R-20) 2021-22

B.E. (CSE - IOT & Cyber Security including Blockchain Technology)

SEMESTER -III

S. No	Course Code	Title of the Course	Scheme of Instruction Hours per Week L	T	P/D	Scheme of Examination Duration of SEE in Hours	Maximum Marks CIE	SEE	Credits
THEORY									
1	20EEC01	Basic Electrical Engineering	3	-	-	3	40	60	3
2	20ECC35	Basic Electronics	3	-	-	3	40	60	3
3	20CSC08	Data Structures	3	-	-	3	40	60	3
4	20CSC09	Discrete Mathematics	3	1	-	3	40	60	4
5	20CSC10	Digital Logic Design	3	-	-	3	40	60	3
6	20CIC01	Fundamentals of Cyber Security and Tools	2	-	-	3	40	60	2
PRACTICAL									
7	20EEC02	Basic Electrical Engineering Lab	-	-	2	3	50	50	1
8	20CSC11	Data Structures Lab	-	-	4	3	50	50	2
9	20CIC02	Fundamentals of Cyber Security and Tools Lab	-	-	2	3	50	50	1
10	20CII01	MOOCs / Training / Internship	0	0	4	-	-	-	2
11	20ACT	Activity Points	-	-	-	-	-	-	-
		TOTAL	17	1	12	-	390	510	24

L: Lecture   T: Tutorial   D: Drawing   P: Practical
CIE - Continuous Internal Evaluation   SEE - Semester End Examination

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY(A)
SCHEME OF INSTRUCTION AND EXAMINATION
Model Curriculum(R-20) 2021-22

B.E. (CSE - IOT & Cyber Security including Blockchain Technology)

SEMESTER –IV

S. No	Course Code	Title of the Course	Scheme of Instruction Hours per Week			Duration of SEE in Hours	Scheme of Examination Maximum Marks		Credits
			L	T	P/D		CIE	SEE	
THEORY									
1	20MTC13	Mathematical Foundation for Data Science & Security	3	-	-	3	40	60	3
2	20CSC13	Computer Architecture and Microprocessor	3	-	-	3	40	60	3
3	20CSC14	Data Base Management Systems	3	-	-	3	40	60	3
4	20CSC15	Internet & Web Technologies	2	-	-	3	40	60	2
5	20CSC36	Introduction to AI Tools, Techniques and Applications	1	1	-	3	40	60	2
6	20MBC01	Engineering Economics & Accountancy	3	-	-	3	40	60	3
PRACTICAL									
7	20MTC14	Mathematical Foundation for Data Science & Security Lab	-	-	2	3	50	50	1
8	20CSC17	Data Base Management Systems Lab	-	-	2	3	50	50	1
9	20CSC18	Internet & Web Technologies Lab	-	-	4	3	50	50	2
10	20CSC37	Introduction to AI Tools, Techniques and Applications Lab	-	-	2	3	50	50	1
11	20ACT	Activity Points	-	-	-	-	-	-	-
		TOTAL	15	1	10	-	440	560	21

L: Lecture   T: Tutorial   D: Drawing   P: Practical
CIE - Continuous Internal Evaluation   SEE - Semester End Examination

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY(A)
SCHEME OF INSTRUCTION AND EXAMINATION
Model Curriculum(R-20) 2022-23
B.E. (CSE - IOT & Cyber Security including Blockchain Technology)
SEMESTER –V

S. No	Course Code	Title of the Course	Scheme of Instruction Hours per Week			Scheme of Examination Duration of SEE in Hours	Maximum Marks		Credits
			L	T	P/D		CIE	SEE	
THEORY									
1	20CSC12	Design and Analysis of Algorithms	3	-	-	3	40	60	3
2	20CSC20	Operating Systems	3	-	-	3	40	60	3
3	20CIC03	IoT Development, Applications and Practice	3	-	-	3	40	60	3
4	20CIC04	Computer Networks	3	-	-	3	40	60	3
5		Professional Elective - I	3	-	-	3	40	60	3
6		Open Elective – I	3	-	-	3	40	60	3
PRACTICAL									
7	20CSC23	Operating Systems Lab	-	-	3	3	50	50	1.5
8	20CIC05	IoT Development, Applications and Practice Lab	-	-	3	3	50	50	1.5
9	20CIC06	Computer Networks Lab	-	-	3	3	50	50	1.5
10	20CII02	Internship-II (Industrial/ Rural Internship)	3-4 weeks/ 90 hours			-	50	-	2
TOTAL			18	-	9	-	440	510	24.5

L: Lecture   T: Tutorial   D: Drawing   P: Practical
CIE - Continuous Internal Evaluation   SEE - Semester End Examination

PROFESSIONAL ELECTIVE-I	
20CIE01	Linux Kernel Internals and Programming
20CIE02	Image Processing
20CIE03	Artificial Intelligence and Machine Learning
20CSE05	Optimization Techniques
20CSE12	Embedded Systems

OPEN ELECTIVE – I	
20ECO10	Fundamentals of Wireless Communication
20EEO05	Waste Management
20MEO09	Organizational Behaviour
20MTO03	Quantum Computing
20BTO04	Bioinformatics

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY(A)
SCHEME OF INSTRUCTION AND EXAMINATION
Model Curriculum(R-20) 2022-23
B.E. (CSE - IOT & Cyber Security including Blockchain Technology)
SEMESTER –VI

S. No	Course Code	Title of the Course	Scheme of Instruction Hours per Week L	T	P/D	Scheme of Examination Duration of SEE in Hours	Maximum Marks CIE	SEE	Credits
			THEORY						
1	20CIC07	Theory of Computation and Compilers	3	-	-	3	40	60	3
2	20CSC22	Software Engineering	3	-	-	3	40	60	3
3	20CIC08	Blockchain Platforms and Applications	3	-	-	3	40	60	3
4		Professional Elective – II	3	-	-	3	40	60	3
5		Open Elective-II	3	-	-	3	40	60	3
6	20EGM03	Universal Human Values-II Understanding Harmony	3	-	-	3	40	60	3
			PRACTICAL						
7	20CSC25	Case Studies using UML Lab	-	-	2	3	50	50	1
8	20CIC09	Blockchain Platforms and Applications Lab	-	-	3	3	50	50	1.5
9		Professional Elective – II Lab	-	-	2	3	50	50	1
10	20EGC03	Employability Skills	-	-	2	2	50	50	1
	TOTAL		18	-	09	-	440	560	22.5

L: Lecture   T: Tutorial   D: Drawing   P: Practical
CIE - Continuous Internal Evaluation   SEE - Semester End Exam

PROFESSIONAL ELECTIVE-II	
20CIE04	Sensors and Sensing Technologies
20CIE05	Vulnerability Analysis and Penetration Testing
20CSE06	Soft Computing
20CSE23	Mobile Application Development
20CSE37	High Performance Computing

OPEN ELECTIVE-II	
20ECO01	Remote Sensing and GIS
20MTO01	Financial Mathematics
20EEO02	Energy Management Systems
20EGO01	Technical Writing Skills
20CEO02	Disaster Risk Reduction and Management
20CHO04	Environmental and Sustainable Development

PROFESSIONAL ELECTIVE-II LAB	
20CIE06	Sensors and Sensing Technologies Lab
20CIE07	Vulnerability Analysis and Penetration Testing Lab
20CSE15	Soft Computing Lab
20CSE32	Mobile Application Development Lab
20CSE40	High Performance Computing Lab

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY(A)
SCHEME OF INSTRUCTION AND EXAMINATION
Model Curriculum(R-20) 2023-24
B.E. (CSE - IOT & Cyber Security including Blockchain Technology)

SEMESTER –VII

S. No	Course Code	Title of the Course	Scheme of Instruction Hours per Week L	T	P/D	Scheme of Examination Duration of SEE in Hours	Maximum Marks CIE	SEE	Credits
		THEORY							
1	20CSC30	Cryptography and Network Security	3	-	-	3	40	60	3
2		Professional Elective-III	3	-	-	3	40	60	3
3		Professional Elective-IV	3	-	-	3	40	60	3
4		Open Elective-III	3	-	-	3	40	60	3
5	20EGM01	Indian Constitution and Fundamental Principles	2	-	-	2	-	50	No Credit
6	20EGM02	Indian Traditional Knowledge	2	-	-	2	-	50	No Credit
		PRACTICAL							
7	20CSC31	Cryptography and Network Security Lab	-	-	2	3	50	50	1
8		Professional Elective-IV Lab	-	-	2	3	50	50	1
9	20CIC10	Technical Seminar	-	-	2	-	50	-	1
10	20CIC11	Project Part - 1	-	-	4	-	50	-	2
11	20CII03	Internship-III	5-6 weeks / 135 hours			-	50	-	3
		TOTAL	16	-	10	-	410	440	20

L: Lecture   T: Tutorial   D: Drawing   P: Practical
CIE - Continuous Internal Evaluation   SEE - Semester End Examination

PROFESSIONAL ELECTIVE-III	
20CIE08	IoT Automation and Security
20CIE09	Social Engineering
20CIE10	Crypto Currencies
20CSE11	Natural Language Processing
20CSE22	Big Data Analytics

PROFESSIONAL ELECTIVE-IV	
20CIE11	Malware Analysis
20CIE12	Building Secure and Reliable Systems
20CSE08	Enterprise Application Development
20CSE21	Deep Learning
20CSE34	Cloud Computing

OPEN ELECTIVE-III	
20PYO01	History of Science and Technology
20MEO03	Research Methodologies
20MEO04	Entrepreneurship
20ECO05	Systems Automation and Control
20EEO03	Energy Auditing

PROFESSIONAL ELECTIVE-IV Lab	
20CIE13	Malware Analysis Lab
20CIE14	Building Secure and Reliable Systems Lab
20CSE17	Enterprise Application Development Lab
20CSE30	Deep Learning Lab
20CSE38	Cloud Computing Lab

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY(A)
SCHEME OF INSTRUCTION AND EXAMINATION
Model Curriculum(R-20) 2022-23
B.E. (CSE - IOT & Cyber Security including Blockchain Technology)

SEMESTER –VIII

S. No	Course Code	Title of the Course	Scheme of Instruction Hours per Week			Scheme of Examination Duration of SEE in Hours	Maximum Marks CIE	SEE	Credits
			L	T	P/D				
THEORY									
1		Professional Elective-V	3	-	-	3	40	60	3
2	20EGM04	Gender Sensitization	2	-	-	2	-	50	No Credits
3	20CEM01	Environmental Science	2	-	-	2	-	50	No Credits
PRACTICAL									
4	20CIC12	Project Part – 2	0	0	8	-	100	100	4
	TOTAL		7	-	8	-	140	260	7

L: Lecture   T: Tutorial   D: Drawing   P: Practical
CIE - Continuous Internal Evaluation   SEE - Semester End Exam

Professional Elective-V	
20CIE15	Cognitive IoT
20CIE16	Blockchain Security and Privacy
20CIE17	Blockchain Policy: Legal, Economic and Social Impact
20CSE04	Free and Open Source Technologies
20CSE35	Augmented Reality and Virtual Reality

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (AUTONOMOUS)

Scheme of Instructions of I Semester of
B.E.-Artificial Intelligence & Machine Learning
as per AICTE Model Curriculum 2022-23

SEMESTER – I

S. No	CourseCode	Title of the Course	Scheme of Instruction			Scheme of Examination			Credits
			Hours per Week			Durationof SEE in Hours	Maximum Marks		
			L	T	P/D		CIE	SEE	
THEORY									
1	20MTC01	Linear Algebra & Calculus (M-I)	3	1	0	3	40	60	3
2	20PY C01	Optics and Semiconductor Physics	3	0	0	3	40	60	3
3	20CSC01	Problem Solving and Programming	3	1	0	3	40	60	3
4	20EGC 01	English	2	0	0	3	40	60	2
PRACTICAL									
5	20MT C02	Linear Algebra & Calculus Lab	0	0	3	3	50	50	1
6	20EG C02	English lab	0	0	2	3	50	50	1
7	20PY C03	Optics and Semiconductor Physics Lab	0	0	4	3	50	50	2
8	20CS C02	Programming Lab-1	0	0	4	3	50	50	2
9	20MEC01	CAD/Drafting	0	1	3	3	50	50	2.5
10	20MB C02	Community Engagement	30 field + 2P/W			3	50	50	1.5
		TOTAL	11	1	15	-	460	540	21

L: Lecture   T: Tutorial   P: Practical
CIE - Continuous Internal Evaluation   SEE - Semester End Examination

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (AUTONOMOUS)

Scheme of Instructions of II Semester of
B.E.-Artificial Intelligence & Machine Learning
as per AICTE Model Curriculum 2022-23

SEMESTER – II

S. No	CourseCode	Title of the Course	Scheme of Instruction			Scheme of Examination			Credits
			Hours per Week			Durationof SEE in Hours	Maximum Marks		
			L	T	P/D		CIE	SEE	
THEORY									
1	20MT C03	Differential Equations & Transform Theory	3	-	-	3	40	60	3
2	20CYC01	Chemistry	3	-	-	3	40	60	3
3	20CS C05	Industry 4.0	3	-	-	3	40	60	3
4	21CSC03	Object Oriented Programming	3	-	-	3	40	60	3
PRACTICAL									
5	20MT C04	Differential Equations &Transform Theory Lab	0	0	3	3	50	50	1
6	20CYC02	Chemistry Lab	0	0	3	3	50	50	2
7	20CSC04	Object Oriented Programming Lab	0	0	2	3	50	50	1
8	20ME C02	Workshop / Manufacturing Practice	0	2	3	3	50	50	2.5
9	20ME C03	Engineering Exploration	0	0	2	-	50	-	1.5
		TOTAL	**12**	**-**	**13**	**-**	**410**	**440**	**20**

L: Lecture   T: Tutorial   P: Practical
CIE - Continuous Internal Evaluation   SEE - Semester End Examination

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (AUTONOMOUS)

Scheme of Instructions of III Semester of
B.E.-Artificial Intelligence & Machine Learning
as per AICTE Model Curriculum 2022-23

SEMESTER – III

S. No	CourseCode	Title of the Course	Scheme of Instruction			Scheme of Examination			Credits
			Hours per Week			Durationof SEE in Hours	Maximum Marks		
			L	T	P/D		CIE	SEE	
THEORY									
1	20AMC01	Introduction to Algorithms & Data Structures	3	0	0	3	40	60	3
2	20AMC02	Discrete Mathematical Structures	2	1	0	3	40	60	3
3	20AMC03	Group Theory and Applications	2	1	0	3	40	60	3
4	20AMC04	Digital Logic Design	2	1	0	3	40	60	3
5	20EEC01 (R20)/ 20BTO05 R22)	Basic Electrical Engineering / Cognitive Neuroscience	2	1	0	3	40	60	3
6	20EGM03	Universal Human Values-II: Understanding Harmony	2	1	0	3	40	60	3
PRACTICAL									
7	20AMC05	Algorithms Lab-1	0	0	3	3	50	50	1.5
8	20AMC06	Introduction to Inference and Interpretation	0	1	3	3	50	50	2.5
9	20AMI01	Internship – I				3	50	50	2
		TOTAL	13	6	6	-	390	510	24

L: Lecture   T: Tutorial   P: Practical
CIE - Continuous Internal Evaluation   SEE - Semester End Examination

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (AUTONOMOUS)

Scheme of Instructions of IV Semester of
B.E.-Artificial Intelligence & Machine Learning
as per AICTE Model Curriculum 2022-23

SEMESTER – IV

S. No	CourseCode	Title of the Course	Scheme of Instruction Hours per Week L	T	P/D	Scheme of Examination Durationof SEE in Hours	Maximum Marks CIE	SEE	Credits
THEORY									
1	20AMC07	Modern Computer System Architecture	3	0	0	3	40	60	3
2	20AMC08	Database Systems	2	1	0	3	40	60	3
3	20AMC09	Linear Regression Modeling for Data Analysis	2	1	0	3	40	60	3
4	21MBC03	Strategic Entrepreneurship	2	1	0	3	40	60	3
5	20EEC38	Signal Processing	2	1	0	3	40	60	3
6	20MEC39	Robotics and Automation	2	1	0	3	40	60	3
PRACTICAL									
7	20MEC40	Robotics and Automation	0	0	3	3	50	50	1.5
8	20AMC10	Database Systems Lab	0	0	3	3	50	50	1.5
9	20AMC11	Building Large, Reliable Software Systems	0	2	2	3	50	50	3
		TOTAL	13	7	8	-	390	510	24

L: Lecture   **T: Tutorial**   **P: Practical**
CIE - Continuous Internal Evaluation   **SEE - Semester End Examination**

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY(A)

Choice Based Credit System (with effect from 2016-17)

B.E (CSE, ECE and IT)

I - Semester						
S.No	Code	Subject	L	T	P/D	Credits
1	16MT C01	Engineering Mathematics - I	3	1	0	4
2	16PY C01	Engineering Physics	3	-	0	3
3	16CY C02	Applied Chemistry	2	-	0	2
4	16EE C01	Elements of Electrical Engineering	3	-	0	3
5	16CE C01	Engineering Mechanics	3	-	0	3
6	16EG C01	Professional Communication in English	3	-	0	3
7	16CE C02	Environmental Studies	1	-	0	1
8	16ME C02	Engineering Graphics	1	-	3	3
9	16PY C03	Engineering Physics Laboratory	0	-	2	1
10	16CY C04	Applied Chemistry Laboratory	0	-	2	1
11	16EG C02	Professional Communication Laboratory	0	-	2	1
TOTAL			19	01	09	25

L - Lecture (clock hours)   T - Tutorial (clock hours)   P/D - Practical / Drawing (clock hours)

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (A)

Choice Based Credit System (with effect from 2016-17)

B.E (CSE, ECE and IT)

S.No	Code	Subject	L	T	P/D	Credits
		II – Semester				
1	16MT C02	Engineering Mathematics - II	3*	-	0	3
2	16CY C01	Engineering Chemistry	3	-	0	3
3	16PY C02	Applied Physics	2	-	0	2
4	16CS C01	Programming and Problem Solving	3	1	0	4
5	16ME C01	Elements of Mechanical Engineering	3	-	0	3
6	16EC C01	Elements of Electronics and Communication Engineering	3	-	0	3
7	16CE C03	Professional Ethics and Human Values	1	-	0	1
8	16CS C02	Programming Laboratory	0	-	2	1
9	16ME C03	Mechanical and IT Workshop	0	-	3	2
10	16PY C04	Applied Physics Laboratory	0	-	2	1
11	16CY C03	Engineering Chemistry Laboratory	0	-	2	1
		TOTAL	**18**	**01**	**09**	**24**

L - Lecture (clock hours) T - Tutorial (clock hours)   P/D - Practical / Drawing (clock hours)

* One extra hour may be permitted in the timetable

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (A)
Choice Based Credit System
B.E (Information Technology)
SEMESTER – III

S.No.	Course Code	Title of the Course	Scheme of Instruction Hours per week L/T	Scheme of Instruction Hours per week P/D	Duration of SEE in Hours	Maximum Marks CIE	Maximum Marks SEE	Credits
		THEORY						
1	16MT C05	Engineering Mathematics-III	3	-	3	30	70	3
2	16IT C01	Discrete Structures and Applications	3	-	3	30	70	3
3	16IT C02	Data Structures and Algorithms	3/1	-	3	30	70	4
4	16IT C03	Object Oriented Programming	3/1	-	3	30	70	4
5	16IT C04	Digital Electronics and Logic Design	3	-	3	30	70	3
		PRACTICALS						
6	16IT C05	Data Structures and Algorithms Lab	-	3	3	25	50	2
7	16IT CO6	Object Oriented Programming Lab	-	3	3	25	50	2
8	16IT C07	Mini Project - I	-	2	-	50	-	1
9	16EG C03	Soft Skills and Employability Enhancement Lab	-	2	3	15	35	1
		Total	17	10	-	265	485	23

L: Lecture   T: Tutorial   D: Drawing   P: Practical
CIE-Continuous Internal Evaluation   SEE-Semester End Examination

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CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (A)
Choice Based Credit System
B.E (Information Technology)

SEMESTER – IV

S.No.	Course Code	Title of the Course	Scheme of Instruction Hours per week L/T	Scheme of Instruction Hours per week P/D	Duration of SEE in Hours	Maximum Marks CIE	Maximum Marks SEE	Credits
		THEORY						
1	16IT C08	Design and Analysis of Algorithms	3/1	-	3	30	70	4
2	16IT C09	Data Communications	3	-	3	30	70	3
3	16IT C10	Java Programming	3	-	3	30	70	3
4	16IT C11	Computer Organization and Microprocessors	4	-	3	30	70	4
5	16IT C12	Electrical Machines and Microcontroller Applications	3	-	3	30	70	3
6	16MB C01	Engineering Economics and Accountancy	3	-	3	30	70	3
		PRACTICALS						
7	16IT C13	Java Programming Lab	-	3	3	25	50	2
8	16IT C14	Microprocessors Lab	-	3	3	25	50	2
9	16IT C15	Mini Project - II	-	2	-	50	-	1
		Total	20	8	-	280	520	25

L: Lecture   T: Tutorial   D: Drawing   P: Practical
CIE - Continuous Internal Evaluation   SEE - Semester End Examination

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CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY(A)
Choice Based Credit System (with effect from 2018-19)
B.E (Information Technology)

SEMESTER – V

S.No	Course Code	Title of the Course	Scheme of Instruction		Scheme of Examination			Credits
			Hours per week		Duration of SEE in Hours	Maximum Marks		
			L/T	P/D		CIE	SEE	
THEORY							
1	16ITC16	Principles of Operating Systems	3	-	3	30	70	3
2	16ITC17	Database Systems	3/1	-	3	30	70	4
3	16ITC18	Software Engineering	3	-	3	30	70	3
4	16ITC19	Web Technology	3	-	3	30	70	3
5	16ITC20	Theory of Automata	3/1	-	3	30	70	4
		Elective - I	3	-	3	30	70	3
PRACTICALS							
6	16ITC21	Operating Systems and Web Technology Lab	-	3	3	25	50	2
7	16ITC22	Database Systems Lab	-	3	3	25	50	2
8	16ITC23	Mini Project-III	-	2	-	50	-	1
	TOTAL		20	8	-	280	520	25

L: Lecture T: Tutorial D: Drawing P: Practical
CIE - Continuous Internal Evaluation SEE - Semester End Examination

Elective-I

S.No.	Subject Code	Subject Name
1.	16ITE01	Python Programming
2.	16ITE02	UNIX and Shell Programming
3.	16ITE03	Scripting Languages

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY(A)
Choice Based Credit System (with effect from 2018-19)

B.E (Information Technology)

SEMESTER – VI

S.No	Course Code	Title of the Course	Scheme of Instruction		Scheme of Examination			Credits
			Hours per week		Duration of SEE in Hours	Maximum Marks		
			L/T	P/D		CIE	SEE	
THEORY								
1	16ITC24	Computer Networks & Socket Programming	3/1	-	3	30	70	4
2	16ITC25	Data Warehousing and Data Mining	3	-	3	30	70	3
3	16ITC26	Artificial Intelligence	3	-	3	30	70	3
4	16ITC27	Principles of Compiler Design	3/1	-	3	30	70	4
5		Elective – II	3	-	3	30	70	3
6		Elective – III	3	-	3	30	70	3
PRACTICALS								
7	16ITC28	Network Programming Lab	-	3	3	25	50	2
8	16ITC29	Data Mining Lab	-	3	3	25	50	2
9	16ITC30	Mini Project-IV	-	2	-	50	-	1
TOTAL			20	8	-	280	520	25

L: Lecture   T: Tutorial   D: Drawing   P: Practical
CIE - Continuous Internal Evaluation   SEE - Semester End Examination

Elective-II

S.No.	Subject Code	Subject Name
1.	16ITE04	Principles of Computer Graphics
2.	16ITE05	File Structures
3.	16ITE06	Object Oriented System Development using UML

Elective-III

S.No.	Subject Code	Subject Name
1.	16ITE07	Digital Image Processing
2.	16ITE08	Information Retrieval Systems
3.	16ITE09	E-Commerce

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CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY(A)
Choice Based Credit System (with effect from 2019-20)
B.E. (Information Technology)

Semester– VII

S.No	Course Code	Title of the Course	Scheme of Instruction		Scheme of Examination			Credits
			Hours per Week		Duration of SEE in Hours	Maximum Marks		
			L/T	P/D		CIE	SEE	
THEORY								
1	16IT C31	Embedded Systems and Internet of Things	3	-	3	30	70	3
2	16IT C32	Distributed Systems	3	-	3	30	70	3
3	16IT C33	Information Security	3	-	3	30	70	3
4	16IT C34	Big Data Analytics	3	-	3	30	70	3
5		Elective -IV	3	-	3	30	70	3
6		Elective -V	3	-	3	30	70	3
PRACTICALS								
7	16IT C35	Big Data Analytics Lab	-	3	3	25	50	2
8	16IT C36	Embedded Systems and IoT Lab	-	3	3	25	50	2
9	16IT C37	Project Seminar	-	3	-	50	-	2
		TOTAL	18	9	-	280	520	24

L: Lecture   T: Tutorial   D: Drawing   P: Practical
CIE-Continuous Internal Evaluation   SEE-Semester End Examination

Elective-IV		
S.No.	Subject Code	Subject Name
1.	16IT E10	Human Computer Interaction
2.	16IT E11	Soft Computing
3.	16IT E12	VLSI Technology

Elective -V		
S.No.	Subject Code	Subject Name
1.	16IT E13	Natural Language Processing
2.	16IT E14	Mobile Computing
3.	16IT E15	Business Intelligence

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY(A)
Choice Based Credit System (with effect from 2019-20)
B.E. (Information Technology)

Semester– VIII

S.No	Course Code	Title of the Course	Scheme of Instruction Hours per Week		Scheme of Examination			Credits
			L/T	P/D	Duration of SEE in Hours	Maximum Marks CIE	SEE	
THEORY								
1		Elective-VI	3	-	3	30	70	3
2		Open Elective-I	3	-	3	30	70	3
3		Open Elective-II	3	-	3	30	70	3
4	16ITC 38	Seminar	3	-	-	50	-	2
5	16ITC 39	Project	-	6	Viva-Voce	50	100	6
		TOTAL	12	6	-	190	310	17

L: Lecture   T: Tutorial   D: Drawing   P: Practical
CIE-Continuous Internal Evaluation   SEE-Semester End Examination

Elective-VI		
S.No.	Subject Code	Subject Name
1.	16ITE 16	Virtual Reality
2.	16ITE 17	Social Media Analytics
3.	16ITE 18	Cloud Computing

Open Elective-I		
S.No.	Subject Code	Subject Name
1.	16MEO 02	Robotics
2.	16MEO 04	Intellectual Property Rights
3.	16MEO 06	Research Methodologies
4.	16MEO 07	Introduction to Operations Research

Open Elective-II		
S.No.	Subject Code	Subject Name
1.	16MEO 01	Entrepreneurship
2.	16MEO 03	Human Rights and Legislature Procedures
3.	16CEO 02	Disaster Mitigation and Management
4.	16EGO 02	Gender Sensitization

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (AUTONOMOUS)

Scheme of Instructions of I Semester of B.E. – Artificial Intelligence and Data Science
as per AICTE Model Curriculum 2020-21

DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

SEMESTER – I

S. No	Course Code	Title of the Course	Scheme of Instruction Hours per Week			Scheme of Examination			Credits
			L	T	P/D	Duration of SEE in Hours	Maximum Marks CIE	SEE	
THEORY									
1	20MT C01	Linear Algebra & Calculus	3	-	-	3	40	60	3
2	20EG C01	English	2	-	-	3	40	60	2
3	20PY C01	Optics and Semiconductor Physics	3	-	-	3	40	60	3
4	20CS C01	Programming for Problem Solving	3	-	-	3	40	60	3
PRACTICAL									
5	20MT C02	Linear Algebra & Calculus Lab	-	-	2	3	50	50	1
6	20EG C02	English lab	-	-	2	3	50	50	1
7	20PY C03	Optics and Semiconductor Physics Lab	-	-	4	3	50	50	2
8	20CS C02	Programming for problem Solving Lab	-	-	4	3	50	50	2
9	20ME C01	CAD and Drafting	-	1	3	3	50	50	2.5
10	20MB C02	Community Engagement	30 field + 2P/W			-	50	-	1.5
		TOTAL	11	1	15	-	460	490	21

L: Lecture   **T: Tutorial**   **P: Practical**

CIE - Continuous Internal Evaluation   **SEE - Semester End Examination**

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (AUTONOMOUS)

Scheme of Instructions of II Semester of B.E. – Artificial Intelligence and Data Science as per AICTE Model Curriculum 2020-21

DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

SEMESTER -II

S. No	Course Code	Title of the Course	Scheme of Instruction Hours per Week			Scheme of Examination			Credits
			L	T	P/D	Duration of SEE in Hours	CIE	SEE	
THEORY									
1	20MT C03	Differential Equations &Transform Theory	3	-	-	3	40	60	3
2	20CYC01	Chemistry	3	-	-	3	40	60	3
3	20IT C01	Data Structures and Algorithms	3	-	-	3	40	60	3
4	20IT C02	Object Oriented Programming using Python	2	-	-	3	40	60	2
PRACTICAL									
5	20MT C04	Differential Equations &Transform Theory Lab	-	-	2	3	50	50	1
6	20CYC02	Chemistry Lab	-	-	4	3	50	50	2
7	20IT C03	Data Structures and Algorithms Lab	-	-	2	3	50	50	1
8	20IT C04	Object Oriented Programming using Python Lab	-	-	2	3	50	50	1
9	20ME C02	Workshop / Manufacturing Practice			5	3	50	50	2.5
10	20ME C03	Engineering Exploration	90 Hours / 4P			-	50	-	1.5
		TOTAL	11	0	15	-	460	490	20

L: Lecture   **T: Tutorial**   **P: Practical**

CIE - Continuous Internal Evaluation   **SEE - Semester End Examination**

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (AUTONOMOUS)

Scheme of Instruction of III Semester of B.E. - Artificial Intelligence and Data Science as per AICTE Model Curriculum with effect from 2022-23

DEPARTMENT OF INFORMATION TECHNOLOGY

SEMESTER - III

S. No	Course Code	Title of the Course	Scheme of Instruction — Hours per Week L/T	Scheme of Instruction — Hours per Week P/D	Scheme of Examination — Duration of SEE in Hours	Scheme of Examination — Maximum Marks CIE	Scheme of Examination — Maximum Marks SEE	Credits
THEORY								
1	20ECC34	DC Circuits, Sensors and Transducers	3	-	3	40	60	3
2	20MTC09	Probability and Statistics	3/1	-	3	40	60	4
3	20ITC08	Database Management Systems	3	-	3	40	60	3
4	20ADC01	Java Programming	3	-	3	40	60	3
5	20ITC05	Digital Logic and Computer Architecture	3	-	3	40	60	3
6	20EGM01	Indian Constitution and Fundamental Principles	2	-	2	-	50	NC
7	20EGM02	Indian Traditional Knowledge	2	-	2	-	50	NC
PRACTICALS								
8	20ITC10	DBMS Lab	-	2	3	50	50	1
9	20ADC02	Java Programming Lab	-	2	3	50	50	1
10	20ADC03	Artificial Intelligence & Machine Learning Tools, Techniques and Applications	-	2	3	50	50	1
11	20ITC12	Mini Project - I	-	2	-	50	-	1
12	20ADI01	MOOCs/Training/Internship	2-3 Weeks/ 90 Hours	-	-	-	-	2
\multicolumn{3}{c}{**TOTAL**}	20	8		400	550	22

L: Lecture   **T: Tutorial**   **D: Drawing**   **P: Practical**
CIE – Continuous Internal Evaluation   **SEE - Semester End Examination**

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (AUTONOMOUS)

Scheme of Instruction of IV Semester of B.E. - Artificial Intelligence and Data Science as per AICTE Model Curriculum with effect from 2022-23

DEPARTMENT OF INFORMATION TECHNOLOGY

SEMESTER - IV

S.No	Course code	Title of the Course	Scheme of Instruction		Scheme of Examination			Credits
			Hours per week		Duration of SEE in Hours	Maximum Marks		
			L/T	P/D		CIE	SEE	
THEORY								
1	20MTC10	Stochastic Process and Queueing Theory	3	-	3	40	60	3
2	20ITC06	Discrete Mathematics and Applications	3	-	3	40	60	3
3	20ITC15	Design and Analysis of Algorithms	3	-	3	40	60	3
4	20ADC 04	Machine Learning	3	-	3	40	60	3
5		Professional Elective – I	3	-	3	40	60	3
6	20MBC01	Engineering Economics and Accountancy	3	-	3	40	60	3
7	20CEM01	Environmental Science	2	-	2	-	50	NC
PRACTICALS								
8	20MTC11	Stochastic Process and Queueing Theory Lab	-	2	3	50	50	1
9	20ITC17	Design and Analysis of Algorithms Lab	-	2	3	50	50	1
10	20ADC 05	Machine Learning Lab	-	2	3	50	50	1
11	20ITC18	Mini Project – II	-	2	-	50	-	1
		TOTAL	21	8	-	440	560	22

L:Lecture   **T: Tutorial**   **P: Practical**
CIE – Continuous Internal Evaluation   **SEE - Semester End Examination**

Professional Elective #1	Image Processing 20ITE01	Data Analysis and Visualization 20ADE01	Mobile Application Development with Android and Kotlin 20ITE02	Fundamentals of Cryptography 20ITE03	Theory of Automata 20ADE02	Data Warehousing and Data Mining 20ITE04

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (AUTONOMOUS)

Scheme of Instruction of V Semester of B.E. – Artificial Intelligence and Data Science
as per AICTE Model Curriculum, with effective from 2022-23

SEMESTER - V

S. No	Course Code	Title of the Course	Scheme of Instruction		Scheme of Examination			Credits
			Hours per Week		Duration of SEE in Hours	Maximum Marks		
			L/T	P/D		CIE	SEE	
THEORY								
1	20ADC06	Artificial Intelligence	3	-	3	40	60	3
2	20ITC24	Embedded Systems and IoT	3	-	3	40	60	3
3	20ITC19	Operating Systems	3	-	3	40	60	3
4	20ADC07	Full Stack Development	3	-	3	40	60	3
5	20ITC20	Computer Networks	3	-	3	40	60	3
6		Professional Elective – 2	3	-	3	40	60	3
PRACTICALS								
7	20ADC08	Artificial Intelligence Lab	-	2	3	50	50	1
8	20ITC26	Embedded Systems and IoT Lab	-	3	3	50	50	1.5
9	20ADC09	Minor Project - I (Full Stack Development)	-	3	-	50	-	1.5
10		Industrial / Rural Internship	90 Hours		-	-	-	2
		TOTAL	18	8	24	390	460	24

L: Lecture   T: Tutorial   D: Drawing   P: Practical
CIE – Continuous Internal Evaluation   SEE - Semester End Examination

Professional Elective #2	Natural Language Processing 20ADE03	NoSQL Databases 20ADE04	Computer Vision 20ITE13	Cyber Security 20ITE08	Compiler Design 20ADE05	Augmented Reality and Virtual Reality 20ITE07

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (AUTONOMOUS)

Scheme of Instruction of VI Semester of B.E. – Artificial Intelligence and Data Science
as per AICTE Model Curriculum, with effective from 2022-23

SEMESTER – VI

S.No	Course code	Title of the Course	Scheme of Instruction Hours per week L/T	Scheme of Instruction Hours per week P/D	Scheme of Examination Duration of SEE in Hours	Scheme of Examination Maximum Marks CIE	Scheme of Examination Maximum Marks SEE	Credits
THEORY								
1.	20ITC13	Software Engineering	3	-	3	40	60	3
2.	20ADC10	Deep Learning	3/1		3	40	60	4
3.	20ADC11	Data Science with R	3	-	3	40	60	3
4.	20ITC25	Cloud Computing	3		3	40	60	3
5.		Professional Elective – 3	3	-	3	40	60	3
PRACTICALS								
6.	20ITC16	Software Engineering Lab	-	3	3	50	50	1.5
7.	20ADC12	Deep Learning Lab	-	3	3	50	50	1.5
8.	20ADC13	Minor Project -II (Data Science)	-	3	-	50	-	1.5
9.	20EGC03	Employability Skills	-	2	-	50	50	1
TOTAL			**16**	**11**	**21**	**400**	**450**	**21.5**

L: Lecture   T: Tutorial   D: Drawing   P: Practical
CIE – Continuous Internal Evaluation   SEE - Semester End Examination

Professional Elective #3	Micro Services with Springboot 20ADE06	Explainable AI 20ADE07	Applied Predictive Analytics 20ITE14	Fundamentals of Block Chain Technology 20ITE16	Agile Project Management 20ADE08	Social Network Analytics 20ADE09

1.

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (AUTONOMOUS)

Scheme of Instruction of VII Semester of B.E. – Artificial Intelligence and Data Science
as per AICTE Model Curriculum, with effective from 2022-23

DEPARTMENT OF ARTIFICIAL INTELLIGENCE & DATA SCIENCE

SEMESTER –VII

S. No	Course code	Title of the Course	Scheme of Instruction		Scheme of Examination			Credits
			Hours per week		Duration of SEE in Hours	Maximum Marks		
			L/T	P/D		CIE	SEE	
THEORY								
1	20ADC14	Big Data Analytics	3		3	40	60	3
2		Professional Elective – 4	3	-	3	40	60	3
3		Open Elective – 1	3	-	3	40	60	3
4	20EGM03	Universal Human Values II: Understanding Harmony	3	-	3	40	60	3
5	20EGMO4	Gender Sensitization	2	-	2	-	50	NC
PRACTICALS								
1	20ADC15	Big Data Analytics Lab		3	3	50	50	1.5
2	20ADC16	Project Part – 1	-	4	-	50	-	2
3		Internship	4-6 Weeks 135 Hours	-	-	-	-	3
TOTAL			14	7	17	260	340	18.5

L: Lecture   T: Tutorial   D: Drawing   P: Practical
CIE – Continuous Internal Evaluation   SEE - Semester End Examination

Professional Elective #4	Unmanned Aerial Vehicles 20ITE15	Robotic Process Automation 20ADE10	Business Intelligence 20ADE11	Server Less Computing 20ADE12	Digital Forensics 20ITE26	Reinforcement Learning 20ADE13

Open Elective- 1 (VII Semester)		
S.No.	Course Code	Course Name
1.	20MEO03	Research Methodologies
2.	20MEO12	3D Printing
3.	20ME O15	Principles of Industry 4.0
4.	20ECO14	Neural Networks and Fuzzy Logic
5.	20EGO01	Technical Writing Skills

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (AUTONOMOUS)

Scheme of Instruction of VIII Semester of B.E. – Artificial Intelligence and Data Science
as per AICTE Model Curriculum, with effective from 2022-23

DEPARTMENT OF ARTIFICIAL INTELLIGENCE & DATA SCIENCE

SEMESTER –VIII

S.No	Course code	Title of the Course	Scheme of Instruction		Scheme of Examination			Credits
			Hours per week		Duration of SEE in Hours	Maximum Marks		
			L/T	P/D		CIE	SEE	
THEORY								
1		Open Elective – 2	3	-	3	40	60	3
2		Open Elective – 3	3		3	40	60	3
PRACTICALS								
3	20ADC17	Technical Seminar	-	2	-	50	-	1
4	20ADC18	Project Part -2	08 Hours per week /180 Hours Industry		-	100	100	4
		TOTAL	6	2	6	230	220	11

L: Lecture   T: Tutorial   D: Drawing   P: Practical
CIE – Continuous Internal Evaluation SEE - Semester End Examination

Open Elective- 2 (VIII Semester)			Open Elective- 3 (VIII Semester)		
S.No.	Subject Code	Subject Name	S.No.	Subject Code	Subject Name
1	20MEO04	Principles of Entrepreneurship	1	20MTO03	Quantum Computing
2	20BTO04	Bioinformatics	2	20MEO07	Intellectual Property Rights
3	20MEO10	Introduction to Operations Research	3	20ECO01	Remote Sensing and GIS
4	20ECO06	Principle of VLSI	4	20CEO02	Disaster Risk Reduction and Management
5	20EEO04	Energy Conservation	5	20BTO05	Cognitive Neuro Science

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY(A)

Choice Based Credit System (with effect from 2016-17)

B.E (Civil, EEE, Mech. and Prod.) and B.Tech (Chemical)

		I – Semester				
S.No	Code	Subject	L	T	P/D	Credits
1	16MT C01	Engineering Mathematics - I	3	1	0	4
2	16CY C01	Engineering Chemistry	3	-	0	3
3	16PY C02	Applied Physics	2	-	0	2
4	16CS C01	Programming and Problem Solving	3	1	0	4
5	16ME C01	Elements of Mechanical Engineering	3	-	0	3
6	16EC C01	Elements of Electronics and Communication Engineering	3	-	0	3
7	16CE C03	Professional Ethics and Human Values	1	-	0	1
8	16CS C02	Programming Laboratory	0	-	2	1
9	16ME C03	Mechanical and IT Workshop	0	-	3	2
10	16PY C04	Applied Physics Laboratory	0	-	2	1
11	16CY C03	Engineering Chemistry Laboratory	0	-	2	1
		TOTAL	18	02	09	25

L - Lecture (clock hours) T - Tutorial (clock hours)   P/D - Practical / Drawing (clock hours)

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (A)

Choice Based Credit System (with effect from 2016-17)

B.E (Civil, EEE, Mech. and Prod.) and B.Tech (Chemical)

S.No	Code	Subject	L	T	P/D	Credits
		II - Semester				
1	16MT C02	Engineering Mathematics - II	3*	-	0	3
2	16PY C01	Engineering Physics	3	-	0	3
3	16CY C02	Applied Chemistry	2	-	0	2
4	16EE C01	Elements of Electrical Engineering	3	-	0	3
5	16CE C01	Engineering Mechanics	3	-	0	3
6	16EG C01	Professional Communication in English	3	-	0	3
7	16CE C02	Environmental Studies	1	-	0	1
8	16ME C02	Engineering Graphics	1	-	3	3
9	16PY C03	Engineering Physics Laboratory	0	-	2	1
10	16CY C04	Applied Chemistry Laboratory	0	-	2	1
11	16EG C02	Professional Communication Laboratory	0	-	2	1
		TOTAL	**19**	**--**	**09**	**24**

L - Lecture (clock hours) T - Tutorial (clock hours)   P/D - Practical / Drawing (clock hours)

* One extra hour may be permitted in the timetable

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY(A)
Choice Based Credit System
B.Tech (Chemical Engineering)

SEMESTER – III

S.No.	Course Code	Title of the Course	Scheme of Instruction Hours per week L/T	P/D	Duration of See in Hours	CIE	SEE	Credits
		THEORY						
1	16MT C03	Engineering Mathematics-III	3	-	3	30	70	3
2	16CH C01	Chemical Technology	3	-	3	30	70	3
3	16CH C02	Fluid Mechanics	3	-	3	30	70	3
4	16CH C03	Material and Energy Balance	3	-	3	30	70	3
5	16CY C07	Physical Chemistry	3	-	3	30	70	3
6	16MB C01	Engineering Economics and Accountancy	3	-	3	30	70	3
		PRACTICALS						
7	16CH CO4	Chemical Technology Lab	-	3	3	25	50	2
8	16CY C08	Physical Chemistry Lab	-	3	3	25	50	2
9	16ME C13 /16EE C05	Basics of Mechanical and Electrical Engg. Lab	-	3	3	25	50	2
		Total	18	9	-	255	570	24

L: Lecture　　　T: Tutorial　　　D: Drawing　　　P: Practical

CIE – Continuous Internal Evaluation　　SEE – Semester and Examination

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY(A)
Choice Based Credit System
B.Tech (Chemical Engineering)

SEMESTER – IV

S.No.	Course Code	Title of the Course	Scheme of Instruction Hours per week L/T	Scheme of Instruction Hours per week P/D	Scheme of Examination Duration of See in Hours	Scheme of Examination Maximum Marks CIE	Scheme of Examination Maximum Marks SEE	Credits
THEORY
1	16CH C05	Chemical Engineering Thermodynamics - I	3	-	3	30	70	3
2	16CH C06	Chemical Reaction Engineers - I	3	-	3	30	70	3
3	16CH C07	Material Science for Chemical Engineers	3	-	3	30	70	3
4	16CH C08	Mechanical Unit Operations	3/1	-	3	30	70	4
5	16CH C09	Process Heat Transfer	3/1	-	3	30	70	4
6	---	**Elective - I**	3	-	3	30	70	3
PRACTICALS
7	16CH C10	Fluid Mechanics Lab	-	3	3	25	50	2
8	16MT C07	Programming Laboratory for Numerical Methods	-	2	2	15	35	1
9	16EG C03	Soft Skills and Employability Enhancement Lab	-	2	2	15	35	1
		Total	20	7	-	235	540	24

S.No.	Elective-I Course Code	Title of Elective-I Course (Inter Disciplinary and program specific Elective options)
1.	16CY E01	Advanced Organic Chemistry
2.	16MT E01	Numerical Techniques and Statistical Methods
3.	16CH E01	Fertilizer Technology

L: Lecture   T: Tutorial   D: Drawing   P: Practical

CIE - Continuous Internal Evaluation   SEE - Semester End Examination

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (A)

Choice Based Credit System (with effect from 2018-19)

B.Tech (Chemical Engineering)

SEMESTER -V

S.N	Course Code	Title of the Course	Scheme of Instruction		Scheme of Examination			
			Periods per week		Duration in Hours	Maximum Marks		Credits
			L/T	P/D		CIE	SEE	
THEORY								
1.	16CH C11	Chemical Reaction Engineering - II	4	--	3	30	70	4
2.	16CH C12	Mass Transfer Operations – I	4	--	3	30	70	4
3.	16CH C13	Process Instrumentation	3	--	3	30	70	3
4.	--	Elective-II	3	--	3	30	70	3
5.	--	Elective-III	3	--	3	30	70	3
PRACTICALS								
6.	16CH C14	Mechanical Unit Operations Lab	--	3	3	25	50	2
7.	16CH C15	Process Heat Transfer Laboratory	--	3	3	25	50	2
Elective-II Labs.								
8.	16CH E 06	Surface Coating Technology Lab.	--	3	3	25	50	2
	16CH E07	Technology Of Vegetable Oils And Fats Lab.	--	3	3	25	50	2
Total			17	9	--	225	500	23

L: Lecture, T: Tutorial, D: Drawing, P: Practical

SNO	ELECTIVE-II Course Code	Title of Elective –II Course
1	16CH E 02	Surface Coating Technology
2	16CH E 03	Technology of Vegetable Oils and Fats

SNO	ELECTIVE-III Course Code	Title of Elective –III Course
1	16CH E 04	Corrosion Engineering
2	16CH E 05	Mineral Processing Technology

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (A)

Choice Based Credit System (with effect from 2018-19)

B.Tech (Chemical Engineering)

SEMESTER -VI

S.NO	Course Code	Title of the Course	Scheme of Instruction		Scheme of Examination			
			Periods per week		Duration in Hours	Maximum Marks		Credits
			L/T	P/D		CIE	SEE	
THEORY								
1.	16CH C16	Bio Chemical Engineering	3	--	3	30	70	3
2.	16CHC 17	Chemical Engineering Thermodynamics – II	4	--	3	30	70	4
3.	16CH C18	Chemical Process Safety	3	--	3	30	70	3
4.	16CH C19	Process Dynamics and Control	4	--	3	30	70	4
5.	16CH C20	Process Modeling Simulation And Optimization	4	--	3	30	70	4
6.	--	Elective-IV	3	--	3	30	70	3
PRACTICALS								
7.	16CH C 21	Chemical Reaction Engineering Laboratory	--	3	3	25	50	2
8.	16CH C 22	Process Dynamics And Control Laboratory		3	3	25	50	2
9.	16CH C23	Process Modeling Simulation Laboratory	--	3	3	25	50	2
		Total	**21**	**9**	**--**	**255**	**570**	**27**

L: Lecture, T: Tutorial, D: Drawing, P: Practical

SNO	ELECTIVE–IV Course Code	Title of Elective –II Course
1	16CH E 08	Energy Engineering.
2	16CH E 09	Fluidization Engineering.
3	16CH E 10	Pharmaceutical Technology

L: Lecture T: Tutorial D: Drawing P: Practical

CIE - Continuous Internal Evaluation SEE - Semester End Examination

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (A)
Choice Based Credit System (with effect from 2019-20)
B.TECH (Chemical Engineering)

SEMESTER – VII

S. No.	Course Code	Title of the Course	Scheme of Instruction Hours per week L/T	Scheme of Instruction Hours per week P/D	Duration of SEE in Hours	Maximum Marks CIE	Maximum Marks SEE	Credits
THEORY								
1	16CH C 24	Mass Transfer Operations –II	3	-	3	30	70	3
2	16CH C 25	Petrochemical Engineering	3	-	3	30	70	3
3	16CH C 26	Process Equipment Design	3	-	3	30	70	3
4	16CH C 27	Transport Phenomena	3	-	3	30	70	3
5		Core Elective-V	3	-	3	30	70	3
6		Open Elective-I	3	-	3	30	70	3
PRACTICALS								
7	16CH C 28	Equipment Design and Drawing Lab	-	3	3	25	50	2
8	16CH C 29	Mass Transfer Operations Lab	-	3	3	25	50	2
9	16CH C 30	Seminar	-	3	-	50	-	2
		TOTAL	**18**	**9**	**-**	**280**	**520**	**24**

L: Lecture   T: Tutorial   D: Drawing   P: Practical
CIE - Continuous Internal Evaluation   SEE - Semester End Examination

Core Elective-V	
16CH E 11	Polymer Technology
16CH E 12	Pulp and Paper Technology
16CH E 13	Pollution Control in Process Industries

Open Elective-I	
16CE O 02	Disaster Mitigation and Management
16ME O 01	Entrepreneurship
16ME O 04	Intellectual Property Rights
16EG O 01	Technical Writing Skills

SEMESTER – VIII

S. No.	Course Code	Title of the Course	Scheme of Instruction		Scheme of Examination			Credits
			Hours per week		Duration of SEE in Hours	Maximum Marks		
			L/T	P/D		CIE	SEE	
THEORY								
1.	16CH C 31	Plant Design Economics	3	-	3	30	70	3
2.	-	Core Elective-VI	3	-	3	30	70	3
3.	-	Open Elective-II	3	-	3	30	70	3
4.	16CH C 32	Project Seminar	-	3	-	50	-	2
5.	16CH C 33	Project	-	6	viva	50	100	6
Total			9	9	--	190	310	17

L: Lecture   T: Tutorial   D: Drawing   P: Practical
CIE – Continuous Internal Evaluation   SEE - Semester End Examination

Core Elective-VI	
16CH E 14	Membrane Separation Technology
16CH E 15	Sugar Technology
16CH E 16	Food Technology

Open Elective-II	
16ME O 05	Nano Materials and Technology
16CS O 03	iOT and application
16PY O 01	History of Science and Technology
16EG O 02	Gender Sensitization

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY(A)

Choice Based Credit System (with effect from 2016-17)

B.Tech (Bio-Technology)

S.No	Code	Subject	L	T	P/D	Credits
		I - Semester				
1	16MT C02/ 16BT C01	Mathematics - I / Basics of Biology - I	3	1	0	4
2	16PY C01	Engineering Physics	3	-	0	3
3	16CY C01	Engineering Chemistry	3	-	0	3
4	16EE C01	Elements of Electrical Engineering	3	-	0	3
5	16BT C02	Elements of Bio-Technology	3	-	0	3
6	16EG C01	Professional Communication in English	3	-	0	3
7	16ME C02	Engineering Graphics	1	-	3	3
8	16PY C03	Engineering Physics Laboratory	0	-	2	1
9	16CY C03	Engineering Chemistry Laboratory	0	-	2	1
10	16EG C02	Professional Communication Laboratory	0	-	2	1
		TOTAL	**19**	**01**	**09**	**25**

L – Lecture (clock hours) T - Tutorial (clock hours)   P/D - Practical / Drawing (clock hours)

16MT C02

MATHEMATICS – I (for BPC Stream)

Instruction	3L + 1T Periods per week
Duration of End Examination	3 Hours
End Examination	70 Marks
Sessional	30 Marks
Credits	4

Course Objectives:
1. The purpose of E.T is to learn simple steps and its derivatives.
2. It is also essential to learn how to calculate steps, Evaluations and height of High tower buildings.
3. Limits, continuity and differentiability is very essential to function any system or organization.
4. To learn matrices is very important on day to day life in the form of Minimization or Maximization of price etc.
5. To assess the system of Thing for period of short time or long time the curve fitting is very useful.
6. These elementary operations very important to grow further and achieve results in the form of
    Research and Development.

Course Outcomes: On successful completion of this course the students shall be able to
1. Basics of elementary trigonometry is very essential to solve Engineering problems.
2. Very useful to find out Slopes, Heights and Distances.
3. Basics of limits, continuity and differentiability are must to develop the mathematical modeling.
4. Applications of matrices are abundantly used in Industry as well as Research and Development.
5. It is very useful to find constant co-efficient of straight line and curved equations by curve fitting methods and it uses are
    plenty at surveying agricultural fields.
6. It is a live wire for Research and Development..

UNIT-I
Trigonometry: Trigonometric ratios and compound angles, trigonometric ratios of multiple and sub multiple angles. Transformations-sum and product rules. Hyperbolic and Inverse Hyperbolic functions.

UNIT-II
Limits, Continuity: Intervals and neighborhoods, limits and concept of a limit. Standard limits and related problems.

UNIT-III
Differentiation: Derivatives of a function, Elementary properties. Derivatives of Trigonometric, Inverse Trigonometric, Hyperbolic and inverse Hyperbolic functions. Methods of differentiation, second and higher order derivatives.

UNIT-IV
 Matrices: Types of matrices, multiplication of matrices, scalar multiplication. Inverse of matrix-determinant, singular, non-singular, minor, cofactors, adjoint, Rank-Echelon form, consistency, inconsistency Solutions of simultaneous linear equations.

UNIT-V
Curve Fitting: Residues, Principle of Least squares and Curve fitting by the method of least squares, Fitting of a straight line, parabola, Fitting of the curves of the form ab^x, ae^{bx} .

Text Books:

1. Text Book of Mathematics Telugu Academy Papers-I (A&B) & II (A&B)
2. B.S.Grewal "Numerical Methods for Scientists and Engineers ".

Suggested Reading:

1. A.R.Vasistha "Matrices" , Krishna Prakashan Media (P) Ltd. (2014)
2. P.N.Chatterji / A.R.Vasistha "Differential calculus "
3.   TOM M.APOSTOL Calculus Volume -I

16BT C01

BASICS OF BIOLOGY– I (for MPC Stream)

Instruction	3L + 1T Periods per week
Duration of End Examination	3 Hours
End Examination	70 Marks
Sessional	30 Marks
Credits	4

Course Objectives:
1. To provide knowledge on basic concepts of Biology to mathematic background students.
2. To give understanding fundamentals of origin of life onwards and various theories of evolution.
3. To provide an insight into classification of plants and their propagation mode.
4. To give the students an understanding of knowledge on microbes and their economic importance.
5. To impart theoretical knowledge on various physiological aspects of plants.

Course Outcomes: At the end of the course student should
1. Be able to understand the theories behind the origin of life and evolution studies.
2. Be able to classify plants based on the habit and habitat of plants.
3. The study can understand the mechanism of reproduction and development of seed in plants.
4. Be able to understand the basic structure and function of various organelles of plant cell.
5. Be able to have a basic knowledge of various microbes and their economic importance.
6. Be able to follow basic physiological aspects in plants.

UNIT-I
HISTORY OF LIFE AND EVOLUTION
History of earth, evolutionary concepts of origin of life. Experimental verification of chemical origin of life - Miller's Experiment. Darwinism, Natural selection, Sexual selection, Artificial selection, Mendelism, Hugo de Vries mutation theory, neo-darwinism

UNIT-II
PLANT SYSTEMATIC AND REPRODUCTION
Plant kingdom, salient features of classification. Alternation of generation of the plants. Type studies of Algae (Spirogyra), Fungi (Rhizopus), Bryophytes (Pteris), Gymnosperms (Cycas) and general characteristics and life cycle of Angiosperms. Overview of modes of reproduction-Asexual: vegetative propagation, budding, sporulation, binary fission; Sexual reproduction: pollination, fertilization, development of embryo, endosperm, fruit and seed formation. Apomixes, pathenocarpy, polyembrony type of reproduction

UNIT-III
CELL STRUCTURE AND INTERNAL ORGANIZATION OF PLANTS
Cell as basic unit of life, overview of the plant cell, cell cycle, cell division, mitosis and meiosis. Concept of Growth, meristems (apical, intercalary and lateral) their functions. Simple tissue (parenchyma, collenchyma and sclerenchyma), complex tissues (xylem and phloem). Tissue systems (epidermal, ground and vascular)

UNIT-IV
MICROBIOLOGY
Introduction and importance of classification – five kingdoms. General account of prokaryotes, bacterial viruses - T4, plant viruses – TMV, animal viruses – HIV, Protista, Fungi, Plantae and Animalia. Reproduction in bacteria (asexual - binary fission and sexual - conjugation) and viruses (lytic and lysogenic). Economic importance of beneficial bacteria (agriculture, industry, medicine and biotechnology).

UNIT-V:
PLANT PHYSIOLOGY AND CONCEPTS IN PLANT BIOTECHNOLOGY
Absorption of water – soil water, water potential, diffusion, imbibitions, osmosis, plasmolysis, absorption of water, ascent of sap, transportation. Crop improvement - Heterosis and mutation breeding. Plant tissue culture techniques and their applications. Plant growth regulators.

Text Books:
1. Text book of Botany I and II year, Vignan Publishers .
2. Text book of Botany, I and II year, Telugu Akademi, Hyderabad 2012.
3. Biology. Raven, Johnson, Losos, Mason, Singer. Tata Mc Graw Hill Publishing Co. Pvt. Ltd 9th edition, 2010.

Suggested Reading:
1. Beginning Science: Biology. B.S. Beckett. Oxford University Press.1 st edition, 1983.
2. Campbell, N.A. and Reece, J.B. (2008) Biology. 8th edition, Pearson Benjamin Cummings, San Francisco.

16PY C01
ENGINEERING PHYSICS

Instruction	3L Periods per week
Duration of End Examination	3 Hours
End Examination	70 Marks
Sessional	30 Marks
Credits	3

Course Objectives: The objective of the course is to make the student
1. Understand the general concepts of physics
2. Acquire knowledge of different kinds of waves and their behavior
3. Familiar with crystal physics and materials
4. To introduce the general concepts of physics

Course Outcomes: At the end of the course, the student will be able to
1. Describe the types of oscillations and analyze them
2. Demonstrate the wave nature of the light
3. Develop the concepts related to electromagnetic behavior
4. Identify the various crystal systems and defects
5. Explain the origin of magnetism and dielectric polarization and applications of these materials in the field of engineering & technology

UNIT – I Waves and Oscillations: Review of free oscillations - Superposition of two mutually perpendicular linear SHMs of same frequency and 1:2 ratio frequency – Lissajous figures – Damped vibrations – Differential equation and its solution – Logarithmic decrement - Relaxation time – Quality factor – Forced vibrations – Differential equation and its solution – Amplitude resonance- Torsional pendulum.
Ultrasonics: Production of ultrasonics by piezoelectric and magnetostriction methods – Detection of ultrasonics – Determination of ultrasonic velocity in liquids – Applications.

UNIT – II Interference: Division of amplitude – Interference in thin films (reflected light) – Newton's rings – & division of wavefront – Fresnel's biprism.
Diffraction: Distinction between Fresnel and Fraunhoffer diffraction – Diffraction at single slit – Diffraction grating (N Slits) – Resolving power of grating.

UNIT – III Polarization: Malus's law – Double refraction – Nicol's prism – Quarter & Half wave plates – Optical activity – Laurent's half shade polarimeter.
Electromagnetic Theory: Review of steady and varying fields – Conduction and displacement current – Maxwell's equations in differential and integral forms – Electromagnetic wave propagation in free space, dielectric and conducting media – Poynting theorem.

UNIT – IV Crystallography: Space lattice - Crystal systems and Bravais lattices – Crystal planes and directions (Miller indices) – Interplanar spacing – Bragg's law – Lattice constant of cubic crystals by powder diffraction method.
Crystal Imperfections: Classification of defects – Point defects – Concentration of Schottky and Frenkel defects – Line defects – Edge dislocation – Screw dislocation – Burger's vector.

UNIT – V Magnetic Materials: Classification of magnetic materials – Langevin theory of paramagnetism – Weiss molecular field theory – Domain theory – Hysteresis curve – Structure of ferrites (spinel & Inverse spinel) – Soft and hard magnetic materials.
Dielectric Materials: Dielectric polarization – Types of dielectric polarization: electronic, ionic, orientation and space-charge polarization (Qualitative) – Frequency and temperature dependence of dielectric polarization – Determination of dielectric constant (Schering bridge method) – Ferroelectricity – Barium titanate – Applications of ferroelectrics.

Text Books:
1. B.K. Pandey and S. Chaturvedi, "Engineering Physics", Cengage Publications, 2012
2. M.N. Avadhanulu and P.G. Kshirsagar, "A Text Book Engineering Physics", S. Chand Publications, 2014.
3. M. Arumugam, "Materials Science", Anuradha Publications, 2015.
4. S.L. Gupta and Sanjeev Gupta, Modern Engineering Physics, Dhanpat Rai Publications, 2011.

Suggested Reading:
1. R. Murugeshan and Kiruthiga Sivaprasath, "Modern Physics", S. Chand Publications S. Chand Publications, 2014
2. V. Rajendran, "Engineering Physics", McGahill Education Publications, 2013
3. P.K. Palanisamy, Engineering Physics", Scitech Publications, 2012
4. V. Raghavan, "Materials Science and Engineering", Prentice Hall India Learning Private Ltd., 6th Revised edition, 2015

16CY C01
<center>ENGINEERING CHEMISTRY</center>

Instruction	3L Periods per week
Duration of End Examination	3 Hours
End Examination	70 Marks
Sessional	30 Marks
Credits	3

Course Objectives

The syllabus has sought to fulfill the objective of making the student of engineering and technology realize that chemistry is the real base of his profession and that therefore he must have a good understanding of chemistry before he can use it in his profession.

" the study of chemistry is profitable not only in as much as it promotes the material interest of mankind ,but also because it furnishes us with insight into the wonders of creation , which immediately surround us and with which our existence, life and development, are most closely connected." ----- Justus Von Leibig (German Chemist)

The various units of the syllabus is so designed to fulfill the following objectives.

1. This syllabus helps at providing the necessary introduction of the chemical principles involved and devices in a comprehensive manner understandable to the students aspiring to become practicing engineers.
2. The aim of framing the syllabus is to impart intensive and extensive knowledge of the subject so that students can understand the role of chemistry in the field of engineering.
3. Thermodynamics and Electrochemistry units give conceptual knowledge about spontaneous processes and how can they be harnessed for producing electrical energy and efficiency of systems.
4. Fuels have been taught with a view to give awareness as to materials which can be used as sources of energy
5. To understand importance of analytical instrumentation for different chemical analysis.

Course Outcome

1. This syllabus gives necessary theoretical aspects required for understanding intricacies of the subject and also gives sufficient exposure to the chemistry aspects in different disciplines of engineering
2. The above knowledge also helps students to carry out inter disciplinary research such that the findings benefit the common man.
3. This syllabus imparts a sound knowledge on the principles of chemistry involving the different application oriented topics required for all engineering branches.

UNIT – I

Chemical Thermodynamics : Introduction and definition of the terms, the concept of reversible and irreversible processes, Work done in isothermal and adiabatic processes, Success and limitations of First law of thermodynamics, need for second law of thermodynamics, statements of second law of thermodynamics, Carnot cycle, heat engine and its efficiency, Carnot theorem, concept of Entropy - Entropy changes in reversible and irreversible processes, physical significance of entropy criteria of spontaneity in terms of entropy and Gibb's free energy function , Gibb's-Helmholtz equation and applications, Numericals.

UNIT – II

Phase rule & Chemical Equilibria

Phase rule : Statement , definition of the terms - phases, components , degrees of freedom with examples, Phase diagram - one component system (water system), two component system (siver-lead system) , desilverisation of lead.

Chemical Equilibria - Homogenous and Heterogenous Equilibria - applications

UNIT – III

Fuels: Classification, requirements of a good fuel, calorific value, types of calorific value, calculation of CV using Dulong's formula, Combustion - calculation of air quantities by weight and volume, Numericals.

Solid fuels: coal - analysis of coal – proximate and ultimate analysis - importance.

Liquid fuels - crude oil - fractional distillation, cracking - Fixed bed catalytic cracking, knocking, antiknocking agents (TEL, MTBE), octane number, cetane number, unleaded petrol.

Gaseous fuels - LPG, CNG - composition and uses

UNIT – IV

Electrochemistry Introduction, construction of electrochemical cell, sign convention, cell notation, cell emf, SOP and SRP, electrochemical series and its applications, Nernst equation and applications, Types of Electrodes - Standard Hydrogen Electrode, Saturated Calomel Electrode, Quinhydrone electrode and Ion selective electrode (Glass electrode), construction, Numericals

UNIT –V

Instrumental Techniques in Chemical Analysis: Principle, method and applications of Conductometry (acid-base titration), Potentiometry (acid-base, redox titration), pH- metry (acid – base titration), Colorimetry (Beer Lambert's law)

Green Chemistry - outlines and Principles

Text Books:

16EE C 01

ELEMENTS OF ELECTRICAL ENGINEERING

Instruction	3L Periods per week
Duration of End Examination	3 Hours
End Examination	70 Marks
Sessional	30 Marks
Credits	3

Course Objectives:
1. To understand the basic concepts of electrical circuits.
2. To understand the principles of electromagnetic induction.
3. To know about different types of batteries, charging and discharging of batteries and types of fuel cells etc.
4. To know about different types of electrical wires and cables, domestic and industrial wiring.
5. To understand safety rules and methods of earthing.

Course Outcomes: After completion of the course, the student will be able to:
1. Acquire the knowledge of basic concepts of electrical circuits such as Ohm's law, Kirchhorff's laws etc.
2. Acquire the knowledge of basic Faraday's laws of electromagnetic induction.
3. Acquire the knowledge to solve the problem of AC circuits.
4. Acquire the knowledge of specifications of batteries, types of cells and sources of renewable energy.
5. Acquire the knowledge of electrical wiring and cables and their types and electrical equipment and their specification.
6. Acquire the knowledge of safety precautions in handling electrical appliances, importance of grounding and methods of earthing.

UNIT-I DC Circuits
Current, voltage, power and energy, sources of electrical energy, independent and dependent sources, source conversion, circuit elements, Resistor, Inductor, Capacitor Ohm's law, Kirchhoff's laws, analysis of series, parallel and series-parallel circuits, star-delta conversion, Node and Mesh analysis (with independent sources only).

UNIT-II : Electromagnetism & AC Circuits Electric charge, electric field, lines of force, electric field intensity, electric flux and flux density, Faraday's laws of electromagnetic induction, static and dynamically induced EMF.
A.C. Circuits: Generation of alternating voltage and current, equation of alternating voltage and current, average and rms values of sinusoidal quantities, form and peak factors, phasor representation of sinusoidal quantities, AC through pure resistance pure Inductance, pure capacitance, RL,RC,RLC circuits.

UNIT-III: Batteries and Fuel Cell
Introduction to batteries, simple cell, EMF and internal resistance of a cell, primary and secondary cells, cell capacity, types and specifications of batteries, charging and discharging of battery, safe disposal of batteries; fuel cell, principle and types of fuel cell, different sources of renewable energy.

UNIT-IV: Electrical Wiring
Types of wires and cables, types of connectors and switches, system of wiring, domestic and industrial wiring, simple control circuit in domestic installation, electrical equipment and their specifications

UNIT-V: Safety & Protection
Safety precautions in handling electrical appliances, electric shock, first aid for electric shock, other electrics hazards, safety rules, importance of grounding and earthing of electrical equipment, methods of earthing, circuit protection devices: Fuses, MCB, ELCB and Relays.

Text Books:
1. Edward Hughes, "Electrical and Electronics Technology", 10th Edition, Peasson Publishers 2010.
2. V.K. Mehta & Rohit Mehta, "Principles of Electrical Engineering", S.Chand Company Limited 2008
3. B.L. Theraja & A.K. Theraja, "Electrical Technology", Vol.I, S.Chand Company Limited 2008.

Suggested Reading:
1. P.V.Prasad & S. Siva Nagraju, "Electrical Engineering: Concepts & Applications", Cengage Learning, 2012.
2. S. Rao, "Electrical Safety, fire safety engineering & Safety Management", Khanna publications, 1998.
3. Surjit singh & Ravi Deep Singh, "Electrical Estimating and Costing", Dhanapath Rai & Co., 1997.

16BT C02

ELEMENTS OF BIOTECHNOLOGY

Instruction	3L Periods per week
Duration of University Examination	3 Hours
University Examination	70 Marks
Sessional	30 Marks
Credits	3

Course Objectives:
1. Define biotechnology and identify some basic applications.
2. Structure and functions of the basic biomolecules of life.
3. Learns the emerging potential of bioinformatics.
4. Understand the role of biotechnology in production of recombinant products.
5. Introduce the medical applications of biotechnology.
6. Basic understanding of biotechnology and industry.

Course Outcomes:
1. Cite examples of current applications of biotechnology and advances in the different areas like medical, microbial, environmental etc.
2. Familiarize with the use of computers in applied biotechnology.
3. Define terms associated with downstream processing and the process.
4. Understanding of the ethical issues related to biotech products.
5. Familiarize with the medical applications of Biotechnology.
6. Get a broad insight into the multidisciplinary field of biotechnology.

UNIT-I
INTRODUCTION TO BIOTECHNOLOGY
Historical perspectives, Classical vs Modern Biotechnology. Applications of Biotechnology in different fields. Introduction to prokaryotic cell and eukaryotic cell and its differences. The beneficial and harmful role of microorganisms

UNIT –II
INTRODUCTION TO BIOMOLECULES AND BIOINFORMATICS
Structure and functions of nucleic acids, lipids, carbohydrates, amino acids in brief. Introduction to Bioinformatics, role of bioinformatics in biotechnology, types of biological databases and their applications, Human Genome project.

UNIT –III
MOLECULAR BASIS OF BIOTECHNOLOGY
Identification of genetic material- classical experiments, structure of DNA and chromosome and its functions, Central dogma of molecular biology- from genes to proteins, a brief view on transcription and translation. Basics of rDNA technology- basic steps in rDNA technology (Case study of Insulin production). Bioethical issues in biotechnology.

UNIT –IV
MEDICAL BIOTECHNOLOGY.
Elements of Immunology - Types of immunity (Acquired and Innate), structure and functions of antigen, types of antibodies, monoclonal antibodies – hybridoma technology, Etiology of cancer. Introduction to stem cells -types, characteristics and applications

UNIT –V
PROCESS BIOTECHNOLOGY
Upstream process - basic structure of fermenter, types of fermentation processes, aerobic and anaerobic process, Batch and Continuous fermentation. Downstream process - overview and importance. Characteristics of bioproducts (intracellular and extracellular)

Text Books:
1. Cell Biology. C.B. Powar. Himalaya publication. 2nd edition, 1981.
2. Principles of Genetics. John Gardner, Simmons and Snustad. John wiley and sons. 8th edition, 2006.
3. Principles of Genetics. P.K. Gupta. Rastogi Publication, Meerut, 2000.
4. Principles of Genetics. Simmons, Snustad and Jenkins. John wiley and sons. 8th Edition, 1997.
5. Bioinformatics: Methods and Applications. SC Rastogi, N Mendiratta & P Rastogi. PHI, New Delhi. 4th edition, 2005.
6. Bioseparations: Downstream processing for biotechnology. Paul A.Belter, E. L. Cussler and Wei-Shou Hu. Wiley, 1988.
7. Kuby Immunology. Richard A. Goldsby, Thomas J.Kindt, Barbara A. Osborne. WH freeman company. 6th edition, 2006.
8. Introduction to the cellular and molecular biology of cancer. Edited by L.M. Franks, N.M.Teich. Oxford university press. 4th edition, 2005.

Suggested Reading:

16EG C01

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PROFESSIONAL COMMUNICATION IN ENGLISH
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Instruction	3L Periods per week
Duration of End Examination	3 Hours
End Examination	70 Marks
Sessional	30 Marks
Credits	3

Course Objectives:
1. To enable the students to understand the role and importance of communication and to develop their basic communication skills in English.
2. To strengthen the students' usage of grammar and to develop their vocabulary.
3. To improve the students' listening skills and introduce them to different reading strategies.
4. To equip the students with appropriate writing skills.
5. To enhance imaginative and critical thinking through literary texts and book review.

Course Outcomes: The students will
1. Understand the nature, process and types of communication and will communicate effectively without barriers.
2. Understand the nuances of listening and will learn to make notes
3. Read different texts, comprehend and draw inferences and conclusions.
4. Write effective paragraphs, letters and reports
5. Critically analyze texts and write book reviews

UNIT- I
Understanding Communication in English: Introduction, nature and importance of communication. Process of communication. Basic types of communication - verbal and non verbal. One way vs. Two way communication. Barriers to communication. Intrapersonal and interpersonal communication. Johari Window.
Grammar & Vocabulary: Parts of speech, figures of speech – Euphemism, Hyperbole, Irony, Metaphor, Onomatopoeia, Oxymoron, Paradox, Personification, Pun & Simile

UNIT- II
Developing Listening Skills: Exposure to recorded and structured talks, class room lectures- problems in comprehension and retention. Types of listening, barriers to listening, effective listening strategies. Note –taking.
Grammar & Vocabulary: Articles, Prepositions, Phrasal verbs, Idioms.

UNIT- III:
Developing Writing Skills: Sentence structure. Brevity and clarity in writing. Cohesion and coherence. Paragraph writing. Letter writing - form and structure, style and tone. Kinds of Letters –Apology and request letters. Email etiquette. Report writing.
Grammar & Vocabulary: Tense, Conditionals, homonyms, homophones.

UNIT - IV: Developing Reading Skills: The reading process, purpose, different kinds of texts. Reading comprehension. Techniques of comprehension – skimming, scanning, drawing inferences and conclusions. Note-making
Grammar &Vocabulary: Concord, Connectives, Active and Passive voice, Words often confused.

UNIT- V: Reading for Enrichment
1.	The Road Not Taken	Robert Frost
2.	Goodbye Party For Miss Pushpa T. S	Nissim Ezekiel
3.	The Open Window	Saki
4.	The Romance Of A Busy Broker	O. Henry

Book reviews -Oral and written review of a chosen / novel/ play - a brief written analysis including summary and appreciation. Oral presentation of the novel/play
Grammar & Vocabulary: Indianisms, Common errors, Parallelisms.

Text Books:
1. Vibrant English, Orient Blackswan Ltd,

Suggested Reading:
1. M .Ashraf Rizvi, Effective Technical Communication, Tata Mc Graw- Hill, New Delhi
2. Meenakshi Raman and Sangeetha Sharma, Technical Communication - Principles and Practice, Oxford Univ. Press, New Delhi.
3. Sunil Solomon, English for Success, Oxford University Press, 2015
4. Krishna Mohan, Meera Banerji, Developing Communication Skills, McMillan India Ltd.
5. Michael McCarthy, English Vocabulary in Use.

16ME C02
ENGINEERING GRAPHICS

Instruction   1L + 3D Periods per week
Duration of End Examination   3 Hours
End Examination   70 Marks
Sessional   30 Marks
Credits   3

Course Objectives:
1. To provide an exposure in understanding the drawings during a multidisciplinary approach towards a problem
2. To train up in perception and imagination of a three dimensional scenario.

Course Outcomes:
1. To understand theory of projections
2. Ability to improve visualization skills
3. Ability to sketch Engineering Objects

UNIT – I
Introduction to Engineering Drawing: Drawing Instruments and their uses, types of lines, use of pencils, Lettering, Rules of dimensioning
Conic Sections: Ellipse, Parabola, Hyperbola including the Rectangular Hyperbola (General method only)
Cycloidal curves: Construction of cycloid, epi-cycloid, hypo-cycloid & involutes

UNIT – II
Orthographic Projections: Principles of Orthographic Projections – Conventions , Projection of Points, Projection of Lines - inclined to both planes.

UNIT – III
Projections of Planes: Projections of regular Planes – Perpendicular planes and Oblique planes.

UNIT – IV
Projections of Solids: Projections of Regular Solids – Regular Polyhedra, solids of revolution, (Simple position only)
Sections of Solids: Types of cutting planes – their representation – sections of solids in simple position.

UNIT – V
Introduction to Graphic packages: Getting started, Basic drawing and editing commands, creating lines, planes and solids.

Note: Syllabus for external examination will be from unit 1 to unit 4 only & unit-5 is exempted from external examination. Unit 5 is for internal examination only.

Text Books:
1. N.D.Bhatt," Elementary Engineering Drawing", Charotar Publishers, 2012
2. Basanth Agrawal and C M Agrawal "Engineering Drawing 2e ", McGraw-Hill Education(India) Pvt. Ltd.

Suggested Reading:
1. K.L.Narayana and P.K.Kannaiah, "Text Book of Engineering Drawing", Scitech Publications, 2011
2. P.S.Gill' "Engineering Graphics", Kataria Publications, 2011
3. K.Veenugopal, "Engineering Drawing and Graphics + Autocad", New Age International Pvt. Ltd, 2011
4. Shaw M.B and Rana B.C., "Engineering drawing", Pearson, 2nd edition, 2009
5. P I Varghees, " Engineering Graphics ",Tata McGraw-Hill publications, 2013
6. Bhattacharya. B, "Engineering Graphics", I. K. International Pvt. Ltd, 2009
7. Dhawan R.K., "Principles of Engineering Graphics and Drawing", S. Chand, 2011

16PY C03

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ENGINEERING PHYSICS LABORATORY

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Instruction	2P Periods per week
Duration of End Examination	2 Hours
End Examination	35 Marks
Sessional	15 Marks
Credits	1

Course Objectives: The objectives of the course is to make the student
1. Apply theoretical physics knowledge in doing experiments
2. Understand the behavior of the light experimentally
3. Analyze the behavior of magnetic and dielectric materials

Course Outcomes: At the end of the course, the student will be able to
1. Understand the concept of errors and find the ways to minimize the errors
2. Demonstrate interference and diffraction phenomena experimentally
3. Distinguish between polarized and unpolarized light
4. Determine the loss of energy of a ferromagnetic material and its uses in electrical engineering
5. Understand the suitability of dielectric materials in engineering applications

List of Experiments:
1. Error Analysis – Estimation of errors in the determination of time period of a torsional pendulum
2. Newton's Rings – Determination of wavelength of given monochromatic source
3. Single Slit Diffraction – Determination of wavelength of given monochromatic source
4. Diffraction Grating – Determination of wavelengths of two yellow lines of mercury light
5. Malus's Law – Verification of Malus's law
6. Double Refraction – Determination of refractive indices of O-ray and E-ray of given calcite crystal
7. Polarimeter – Determination of specific rotation of glucose
8. B-H Curve – Determination of hysteresis loss of given specimen
9. Dielectric Constant – Determination of dielectric constant of given PZT sample
10. Ultrasonic Interferometer – Determination of velocity of ultrasonics in given liquid

Note: A student must perform a minimum of eight experiments.

Suggested Reading:
1. "Engineering Physics" - Manual by Department of Physics, CBIT, 2016
2. S.K. Gupta, "Engineering Physics Practical", Krishna's Educational Publishers, 2014
3. O.P. Singh, V. Kumar and R.P. Singh, "Engineering Physics Practical Manual", Ram Prasad & Sons Publications, 2009

16CY C03

ENGINEERING CHEMISTRY LABORATORY

Instruction   2P Periods per week
Duration of End Examination   2 Hours
End Examination   35 Marks
Sessional   15 Marks
Credits   1

Course Objectives
1. To impart fundamental knowledge in handling the equipment / glassware and chemicals in chemistry laboratory
2. For practical understanding of theoretical concept of chemistry

Course Outcomes:
1. This syllabus helps the student to understand importance of analytical instrumentation for different chemical analysis.
2. The above knowledge also helps students to carry out inter disciplinary research such that the findings benefit the common man.

List of Experiments:

1. Introduction to chemical analysis.

2. Preparation of standard solution of oxalic acid and Standardization of NaOH

3. Estimation of amount of Fe^{+2} in the given solution using Mohr's salt and $KMnO_4$

4. Estimation of amount of Fe^{+2} in the given solution using Mohr's salt and $K_2Cr_2O_7$

5. Estimation of amount of copper in the given solution using hypo solution.

6. Estimation of amount of HCl pH metrically using NaOH solution

7. Estimation of amount of CH_3COOH pH metrically using NaOH solution

8. Determination of concentration of given KMnO4 solution Colorimetrically

9. Determination of concentration of given $K_2Cr_2O_7$ solution Colorimetrically

10. Distribution of acetic acid between n-butanol and water.

11. Distribution of benzoic acid between benzene and water

12. Preparation of urea – formaldehyde / phenol- formaldehyde resin.

Suggested Reading:

1. Vogel' S text book of quantitative chemical analysis by J. Mendham and Thomas,Person education Pvt.Ltd New Delhi ,6th ed. 2002
2. Laboratory Manual on Engineering Chemistry by Dr. Subdharani (Dhanpat Rai Publishing)
3. A Textbook on experiment and calculation in engineering chemistry by S.S. Dara S.Chand
4. Instrumental methods of Chemical Analysis, MERITT & WILLARD East-West Press).

16EG C02

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PROFESSIONAL COMMUNICATION LABORATORY

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Instruction	2P Periods per week
Duration of End Examination	2 Hours
End Examination	35 Marks
Sessional	15 Marks
Credits	1

Course Objectives:
1. To introduce students to phonetics and the different sounds in English.
2. To familiarize the students with the software and give them sufficient practice in correct pronunciation.
3. To enable students to speak English correctly with focus on stress and intonation.
4. To help students overcome their inhibitions while speaking in English and to build their confidence. The focus shall be on fluency rather than accuracy.
5. To understand team work, role behavior and to develop the ability to analyze, evaluate, construct and refute arguments.

Course Outcomes:
1. The students will understand the speech sounds in English and the nuances of pronunciation.
2. The students will understand tone, intonation and rhythm and apply stress correctly.
3. The students will be able to participate in group discussions with clarity and confidence.
4. The students will speak confidently on stage with appropriate body language.
5. The students will debate on various issues and learn to work in teams.

Exercises
1. **Introduction to English Phonetics**: Introduction to auditory, acoustic and articulatory phonetics, organs of speech: the respiratory, articulatory and phonatory systems.
2. **Sound system of English**: Phonetic sounds and phonemic sounds, introduction to international phonetic alphabet, classification and description of English phonemic sounds, minimal pairs. The syllable: types of syllables, consonant clusters.
3. **Aspects of connected speech**: Strong forms, weak forms, contracted forms, elision.
4. **Word stress**: Primary stress, secondary stress, functional stress, rules of word stress.
5. **Rhythm & Intonation**: Introduction to Rhythm and Intonation. Major patterns, intonation of English with the semantic implications.
6. **Listening skills** – practice with IELTS and TOEFL material
7. **Situational dialogues and role play**
8. **Public speaking** is to be shown by incorporating narrative examples and extracts from speeches.
9. **Group Discussions**– videos to be shown and practice sessions
10. **Poster making** – preparation and presentation
11. **Debate -** Differences between a debate and a group discussion. Essentials of a debate, conducting a debate.

Suggested Reading:

1. E Suresh kumar et al, . English for Success (with CD), Cambridge University Press India Pvt Ltd. 2010.
2. Aruna Koneru, Professional Speaking Skills, Oxford University Press, 2016
3. T Balasubramanian. A Textbook of English Phonetics for Indian Students, Macmillan, 2008.
4. J Sethi et al. A Practical Course in English Pronunciation (with CD), Prentice Hall India, 2005.
5. Edgar Thorpe. Winning at Interviews, Pearson Education, 2006
6. Priyadarshi Patnaik. Group Discussions and Interviews, Cambridge University Press Pvt Ltd 2011

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (A)
Choice Based Credit System (with effect from 2016-17)

B.Tech (Bio-Technology)

		II – Semester				
S.No	Code	Subject	L	T	P/D	Credits
1	16MT C04/ 16BT C03	Mathematics - II / Basics of Biology - II	3*	-	0	3
2	16CY C05	Bio Organic Chemistry	3	-	0	3
3	16PY C05	Bio Physics	3	-	0	3
4	16CS C01	Programming and Problem Solving	3	1	0	4
5	16BT C04	Introduction to Anatomy and Physiology of Humans	4	-	0	4
6	16CE C03	Professional Ethics and Human Values	1	-	0	1
7	16CE C02	Environmental Studies	1	-	0	1
8	16CS C02	Programming Laboratory	0	-	2	1
9	16ME C03	Mechanical and IT Workshop	0	-	3	2
10	16PY C06	Bio Physics Laboratory	0	-	2	1
11	16CY C06	Bio Organic Chemistry Laboratory	0	-	2	1
		TOTAL	18	01	09	24

L – Lecture (clock hours) T - Tutorial (clock hours)   P/D - Practical / Drawing (clock hours)

* One extra hour may be permitted in the timetable

16 MT C03
MATHEMATICS – II (for BPC Stream)

Instruction	3L Periods per week + 1 (extra hour)
Duration of End Examination	3 Hours
End Examination	70 Marks
Sessional	30 Marks
Credits	3

Course Objectives:
1. The student is expected to know the behavior of single valued functions of partial fractions and Rational functions.
2. Master the methods and techniques of integration and definite integrals.
3. Expected to know learn the basics of formation of First Order Differential equations and identifying the Nature of equations.
4. Expected to learn Higher Order Linear Differential Equations and its solutions by various methods.
5. Expected to learn system of Linear Equations and its solutions by various methods.
6. Students enable to learn formation of Differential Equations and modeling of Algebraic Equations and its solutions.

Course Outcomes: On successful completion of this course the students shall be able to
1. To find out Areas, Surface Areas, Volumes can be obtained by definite integrals.
2. Any complicated fraction can be decomposed by using partial fractions, then it makes integrable.
3. Model the First-Order Differential Equations and solve it for various Engineering Branches ECE, EEE, etc. (Such as L-R, L-R-C, Newton's laws of delay and growth problems)
4. Model the Higher Order Linear Differential Equations and solve it for various Engineering branches Mech, Civil, ECE, EEE and etc.
5. To learn how to find out approximate values of Multivariable Algebraic Equations by various methods.
6. All above serial numbers are live wire of Research and Development.

UNIT- I: Partial Fractions: Resolving f(x)/g(x) in to partial fractions, g(x) contains non repeated linear factors, g(x) contains repeated and non repeated linear factors, g(x) contains non repeated irreducible factors, g(x) contains repeated and not repeated irreducible factors.

UNIT - II Integration: Integration considered as converse of differentiation, simple integrations of algebraic, trigonometric and exponential etc. Methods of integration, integration by parts, integration of rational, irrational and Trigonometric functions, definite integrals

UNIT- III Differential Equations: Differential equations of First order and first degree, Variable separable, Homogeneous, linear, Bernoulli's equations, Exact differential Equations.

UNIT- IV Differential Equations of Higher Order: Differential equations of higher order with constant coefficients, Complimentary functions and particular Integrals, Particular Integrals of $e^{ax}, \sin ax, \cos ax, x^m, e^{ax} \sin bx, e^{ax} \cos bx$ Differential equations of higher order with variable coefficients Cauchy linear equations.

UNIT- V Linear Algebra: Solution of system of Linear equations by Inverse, Gauss Jordan and Cramer"s Rule. Cayley Hamilton Theorem (without proof)

Text Books:
1. Text Book of Mathematics Telugu Academy Papers-I (A&B) & II (A&B)

2. B.S. Grewal "Higher Engineering Mathematics"

Suggested Reading:
1. A.R.Vasistha "Matrices" , Krishna Prakashan Media (P) Ltd. (2014)

16BT C03

BASICS OF BIOLOGY– II (for MPC Stream)

Instruction	3L Periods per week + 1 (extra hour)
Duration of End Examination	3 Hours
End Examination	70 Marks
Sessional	30 Marks
Credits	3

Course Objectives:
1. This course aims at providing knowledge on basic concepts of Biology to mathematic background students.
2. The course is designed to give understanding salient features of animal kingdom classification.
3. This course aims at providing an insight into animal tissues and their types.
4. To provide knowledge on various parasites, lifecycle and diseases caused by them.
5. The course aims at imparting theoretical knowledge on various biotic interactions in nature.

Course Outcomes:
By the end of the course students be able to
1. Explain the criteria for classification of various organisms in animal kingdom.
2. Identify the basic structure and function of various organelles of animal cell
3. Discuss the organization symmetry and tissue types in animal system.
4. Outline various biotic interactions in nature.
5. Demonstrate the basic information on gene, alleles and its inheritance.
6. Compare the gene regulation system in prokaryotes and eukaryotes.

UNIT- I
ANIMAL KINGDOM CLASSIFICATION
Classification of animal kingdom. Phylogeny of invertebrate and vertebrate phyla. Salient features of nonchordates up to phyla, and chordates up to class level. Binomial and trinomial nomenclature. Concept of species and genus

UNIT- II
CELL AND TISSUES: STRUCTURE AND FUNCTIONS
Structure of animal cell and its organelles. Differences between plant and animal cell. Level of organization, multicellularity, diploblastic and triploblastic conditions. Asymmetry, symmetry: radial symmetry and bilateral symmetry. Acoelomates, pseudocoelomates and eucoelomates in brief. Animal tissues structure and functions. Different types of animal tissues and their functions. Epithelial, Connective, Muscular and Nervous tissues in brief

UNIT- III
PARASITOLOGY: PARASITISM AND PARASITIC ADAPTATION
Health and disease: introduction, life cycle, pathogenecity, treatment and prevention; *Entamoeba histolytica*, *Plasmodium vivax*, *Ascaris lumbricoides* and *Wuchereria bancrofti*. Brief account of pathogencity, treatment and prevention of typhoid, pneumonia, common cold and ring worm.

UNIT - IV
ECOLOGY AND ENVIRONMENT
Organism and environment, habitat and niche. Population and ecological adaptations, population interactions. Abiotic environmental factors – light, temperature, water and radiation
Biotic environmental factors –neutralism, competition, mutualism, commensalism, parasitism, predation. Attributes, growth, birth rate and death rate, age distributions

UNIT - V
GENETICS
Structure and Functions of chromosome. Concept of gene and alleles, multiple alleles, ABO blood groups. Sex chromosomes, sex linked inheritance, gene expression and regulation in prokaryotes and eukaryotes.

Text Books:
1. Text book of Zoology, I and II year, Vignan publisher, Guntur
2. Biology. Raven, Johnson, Losos, Mason, Singer. Tata Mc Graw Hill Publishing Co. Pvt. Ltd 9th edition, 2010

Suggested Reading:
1. Beginning Science: Biology. B.S. Beckett. Oxford University Press.1ˢᵗ edition, 1983
2. Barnes, R.S.K., Calow, P., Olive, P.J.W., Golding, D.W. & J.I., Spicer (2002) The Invertebrates: A New Synthesis.III

16CY C05

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BIO ORGANIC CHEMISTRY

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Instruction	3L Periods per week
Duration of End Examination	3 Hours
End Examination	70 Marks
Sessional	30 Marks
Credits	3

Course Objectives:
Biotechnology students should have a fundamental knowledge in chemistry from which they develop core expertise in organic chemistry like structure of compounds, reactivity and functions of various bio-molecules.
1. Student is made to understand the basics of Bio–Organic chemistry, i.e. an understanding of the importance and reason for course
2. To understand the structure and function of the basic molecules found in living cells.
3. To understand carbohydrates, lipids structures and functions.
4. Student is able to understand the structure, Preparation and classification of amino acids and protein synthesis
5. To understand DNA and RNA structure and function
6. To understand the characterization of Bio-products

Course Outcomes:
1. To prepare graduates for employments as chemists and have mastered a broad range of basic lab skills applicable to biochemistry and biotechnology.
2. Bio-Organic Chemistry majors will have a firm foundation in chemical principles as well as higher level of understanding in each of the chemistry sub disciplines: analytical, biochemistry, organic etc.
3. Understand the mechanism involved in various chemical reactions.
4. Understand the structure and functions of bio-molecules like carbohydrates, lipids, amino acids etc.
5. Understand a broad range of basic Bio-Organic and biological concepts, and can apply and analyze these in at least one specialty area
6. Be aware of the role of bio-molecules in Biotechnology

UNIT – I
Introduction to Organic Chemistry: Nomenclature of organic compounds, Hybridization; Functional Group properties- Carbonyl, carboxylic acid, Ester, Hydroxyl and Amine Functional Groups; Isomerism- structural (keto-enol-tautomerism) and Stereoisomerism-l, geometrical and conformational isomerism, Optical isomerism-enantiomers, diastereomers, meso compounds, Racemic mixture. Sequence rules for R, S-configuration and Fisher projections of Lactic acid

UNIT-II
Structure Reactivity Correlations of Organic Molecules: Electron displacements in a molecule-Inductive and mesomeric effect, resonance, hyper conjugation and electromeric effects; rules and effects of Organic reactions – Saytzeff's Rule and Markonikoff's Rule, Kharash effect, Orientation Effect and Functional Group effect and stearic effect

UNIT-III
Types of Organic Reactions and Some Name Reactions: Types of Organic reactions- Nucleophilic Substitution reactions (SN^1 & SN^2), Electrophilic substitution, free radical Substitution, Addition reactions, Elimination (E^1 & E^2) and Rearrangement (Oxime - rearrangement) reactions. Concepts of Aromaticity-Huckel's Rule. Name Reactions – Aldol Condensation, Hoffman bromamide degradation, Perkin reaction

UNIT – IV
Biomolecules – Chemistry of Carbohydrates : Classification and Structure of Carbohydrates- glucose, fructose, maltose, cellulose and starch; determination of Open chain structure of glucose and fructose , Hawarth (cyclic) structure of glucose and fructose, General reactions of glucose and fructose, and their inter conversions-mutarotation.
Chemistry of Lipids – Fatty Acids-saturated and unsaturated fatty acids, Oils- Properties of oils, Tests to check the purity of oils - acid value, saponification value, Iodine Value, Reichert-Meisel value

UNIT-V
Biomolecules -Amino acids: Chemistry of Amino acids-Classification, structure and reactivity. Synthesis of amino acids- amination of α-halogen acids, Gabriel phthalimide synthesis, strecker synthesis
Chemistry of Nucleic Acids: Proteins-Introduction, structure of proteins, peptide bond. Nucleic acids-Structure of DNA and RNA

Text Books:
1. Organic chemistry. Robert. T. Morrison and Robert N. Boyd, Prentice Hall India, Delhi. 6th edition,2002

16PY C05
BIO PHYSICS

Instruction	3L Periods per week
Duration of End Examination	3 Hours
End Examination	70 Marks
Sessional	30 Marks
Credits	3

Course objectives:
The objective of the course is to make the student:
1. Understand basic electrical properties of cell, light and electron microscopy techniques
2. Learn Physical phenomenon involved in the functioning of eye and ear sensory systems
3. Get knowledge of the nature of ionizing radiation and its action on biomolecules
4. Understand of some biomedical instrumentation techniques
5. Gain the knowledge of measurement of viscosity and surface tension

Course outcomes:
At the end of the course, the student will be able to
1. Make use of appropriate microscope for the analysis of bio sample based on their nature. They also understand electrical properties of cell.
2. Understand Biophysics of sound and light in ear and eye.
3. Understand damages by ionizing radiation to different bio molecules such as proteins, nucleic acids, chromosomes, cells and tissues and to measure radiation.
4. Apply different imaging and diagnostic techniques of human body.
5. Describe transport phenomenon osmosis and its effect in blood.

UNIT – I
Introduction: Definition of Biophysics– Cell theory and Atomic theory – Electrical properties of cell and tissues–Electrical oscillatory phenomenon associated with cell division(Cellular spin resonance).
Microscopes: Structure, construction and functions of a compound microscope– Types and functions of different Microscopes: Phase Contrast Microscope, Interference Microscope, Polarizing Microscope and Electron Microscope – High Resolution Optical Imaging.
UNIT – II
Human Eye: Structure of retina and its biometrics– Optics of the Eye– Camera principle & its application to the Eye– Mechanism of accommodation–Visual acuity– Colors and its recognition – Defects of vision and their correction: Myopia, Hyperopia, Presbyopia and Astigmatism.
Human Ear: Structure and mechanics of hearing–Auditory receptors and Genesis of different potential charges in the Ear– Determination of pitch, Loudness and quality of sound.

UNIT – III
Radiation and Light Action: Nature of Ionizing Radiation – Target theory– Inactivation of proteins and nucleic acids through radiation effects – Radiation Effects on cells and tissues – Action of ionizing radiation on Chromosomes– GM counter and dosimetry of radiation – Photosynthesis.

UNIT – IV
Biomedical Instrumentation: Principle, working and biological applications of ultrasonic imaging–Endoscopy – Computational Tomography (CT)– Nuclear Magnetic Resonance (NMR) – Magnetic Resonance Imaging (MRI)– Positron Emission Tomography (PET) – Electrocardiograph (ECG) Electroencephalograph (EEG)-Determination of Blood pressure.

UNIT – V
Osmosis Phenomenon: Osmosis – Osmotic fragility of red blood cells – Transport through membrane – Solute Transport: Artificial kidney.
Methods of Determination of Viscosity and Surface Tension of Bioliquids: Viscosity Specific and intrinsic viscosities and their determination by Ostwald's method – Experimental determination of viscosity and surface tension of bioliquids by capillary flow method.

Text Books:
1. Text Book of Medical Physiology by Guyton and Hall, Elsevier Publications, 2013
2. Fundamentals of Polymer Physics and Molecular Biophysics by Himadri B. Bohidar, Cambridge University Press, 2015
3. Physics for Diagnostic Radiology by P.P. Dendy and B. Heaton, CRC Press, 2011
4. A Text of Biophysics by Dr. R. N. Roy New Central Book Agency (P) Ltd., 2009

Suggested Reading:

16CS C01

<div align="center">

PROGRAMMING AND PROBLEM SOLVING

</div>

Instruction   3L + 1T Periods per week
Duration of End Examination   3 Hours
End Examination   70 Marks
Sessional   30 Marks
Credits   4

Course Objective:
1. To acquire problem solving Skills.
2. To be able to write Algorithms.
3. To understand structured programming Approach.
4. To understand Memory structure.
5. To implement I/O Programming.
6. To be able to write program in C Language.

Course Outcomes: Student will be able to:
1. Develop algorithms for scientific problems.
2. Explore algorithmic approaches to problem solving.
3. Understand the components of computing systems.
4. Choose data types and structure to solve mathematical problem.
5. Develop modular programs using control structure, arrays and structures.
6. Write programs to solve real world problems using structured features.

UNIT – I Introduction to Computers: Computer Systems, Computing Environments, Computer Languages, Creating and Running Programs, Software Development, Flow charts.
Introduction to C Language: Background, C Programs, Identifiers, Data Types, Variables, Constants, Input / Output Statements Arithmetic Operators and Expressions: Evaluating Expressions, Precedence and Associativity of Operators, Type Conversions.

UNIT – II Control Statements: Bitwise Operators, Relational and Logical Operators, If, If-Else, Switch-Statement and Examples. Loop Control Statements: For, While, Do-While and Examples. Continue, Break and goto statements.
Functions: Function Basics, User-defined Functions, Inter Function Communication, Standard Functions, Parameter Passing-Call-by-value, call-by-reference, Recursion**.**

UNIT – III Storage Classes: Auto, Register, Static, Extern, Scope Rules, and Type Qualifiers.
Arrays: Concepts, Using Arrays in C, Array Applications, Two- Dimensional Arrays, Multidimensional Arrays.
Searching and Sorting: Linear and Binary Search, Selection Sort and Bubble Sort.

UNIT – IV Pointers: Introduction, Pointers to Pointers, Compatibility, Arrays and Pointers, Pointer Arithmetic and Arrays, Passing an Array to a Function, Memory Allocation Functions, Array of Pointers, Programming Applications, Pointers to void, Pointers to Functions, Command-line Arguments.
Strings: Concepts, String Input /Output Functions, Arrays of Strings, String Manipulation Functions.

UNIT – V Structures: Definition and Initialization of Structures, Accessing Structures, Nested Structures, Arrays of Structures, Structures and Functions, Pointers to Structures, Unions, Type Definition (typedef), Enumerated Types.
Input and Output: Introduction to Files, Modes of Files, Streams, Standard Library Input/output Functions, Character Input/output Functions
Preprocessors: Preprocessor Commands.

Text Books:
1. Pradip Dey and Manas Ghosh "Programming in C 2/e" Oxford University Press , 2nd Edition 2011.
2. B. W. Kernighan and D.M. Ritchie, "The 'C' Programming Language" Prentice Hall India, 2nd Edition. 1990.
3. B.A.Forouzan and R.F. Gilberg A Structured Programming Approach in C, Cengage Learning,2007.

Suggested Reading:
1. Rajaraman V. "The Fundamentals of Computers" 4th Edition, Prentice Hall of India, 2006.
2. R S Bichker "programming in c" University Press ,2012.

16 BT C04

INTRODUCTION TO ANATOMY AND PHYSIOLOGY OF HUMANS

Instruction	4L Periods per week
Duration of University Examination	3 Hours
University Examination	70Marks
Sessionals	30 Marks
Credits	4

Course Objectives:
1. Student gets an overview of the human body tissues and endocrine system.
2. The various organs associated with digestion and excretion is taught.
3. Heart structure and functioning is detailed, including the gaseous exchange occurring through the respiratory system.
4. Knowledge of Spinal cord, the associated nerves and the different sense organs are imparted.
5. Reproductive physiology is explained.
6. Importance of blood pressure is emphasized.

Course Outcomes:
By the end of the course students be able to
1. Outline the structure of Human body.
2. Explain the appropriate terminology related to anatomy and physiology.
3. Discuss the anatomical structures and the physiological functions of body's main systems.
4. Apply the interrelationships within and between anatomical and physiological systems of the human body.
5. Identify the importance of homeostasis and the use of feedback loops to control physiological systems in the human body.
6. Apply the knowledge of monitoring vital parameters for proper body functioning.

UNIT – I INTRODUCTION TO ANATOMICAL TERMS AND ENDOCRINE GLANDS
Definition of Anatomy and Physiology; Major types of human tissues. Various systems of human body and their general roles. Homeostasis. Types of endocrine glands- anatomy and physiological of pituitary, thyroid, pancreas

UNIT- II ANATOMY OF SKELETAL, DIGESTIVE AND EXCRETORY SYSTEMS
Structure and function of bones and muscles Digestive system- organs and functions; role of liver and pancreas, Excretory system- kidney and urinary bladder; physiology of excretory system- urine formation

UNIT- III ANATOMY OF CIRCULATORY AND RESPIRATORY SYSTEMS
Circulatory system- anatomy of heart, heart beat, blood circulation Anatomy of blood vessels- arteries and veins. Respiratory system- anatomy of lungs and mechanism of respiration

UNIT- IV ANATOMY OF NERVOUS SYSTEM AND OTHER SENSORY SYSTEMS
Nervous system- peripheral and autonomous nervous system; Spinal nerves and Cranial nerves, transmission of nerve impulse, reflex arc. Special senses- eye, ear, tongue and nose

UNIT- V REPRODUCTIVE SYSTEM AND BLOOD PHYSIOLOGY
Mechanism of blood oxygenation, Blood pressure recording and regulating techniques, Reproductive system- male and female reproductive organs and physiology. Menstrual cycle

Text Books:
1. Charles E. Tobin, Basic Human Anatomy, McGraw Hill, 1980.
2. An Introduction to Human Physiology. Third Edition. By J. H. Green. Oxford University Press, New York, 1972.

Suggested Reading:
1. Human Physiology- the Mechanism of body functions, McGraw-Hill Science/Engineering/Math; 11th edition 2007.
2. Essentials of Human Anatomy and Physiology by .Elaine.N. Marieb, 8th Ed, Pearson Education, New Delhi

16CE C03
PROFESSIONAL ETHICS AND HUMAN VALUES

Instruction	1L Periods per week
Duration of End Examination	2 Hours
End Examination	50 Marks
Sessional	- - -
Credits	1

Course Objectives:
1. To develop the critical ability among students to distinguish between what is of value and what is superficial in life
2. To enable the students, understand the values, the need for value adoption and prepare them meet the challenges
3. To enable the students, develop the potential to adopt values, develop a good character and personality and lead a happy life
4. To motivate the students, practice the values in life and contribute for the society around them and for the development of the institutions /organisation around they are in.
5. To make the students understand the professional ethics and their applications to engineering profession

Course Outcomes:
1. Students develop the capability of shaping themselves into outstanding personalities, through a value based life.
2. Students turn themselves into champions of their lives.
3. Students take things positively, convert everything into happiness and contribute for the happiness of others.
4. Students become potential sources for contributing to the development of the society around them and institutions/ organisations they work in.
5. Students shape themselves into valuable professionals, follow professional ethics and are able to solve their ethical dilemmas.

UNIT-I Concepts and Classification of Values –Need and challenges for value Adoption -Definition of Values – Concept of Values – Classification of Values – Hierarchy of Values – Types of Values – Interdependence of Values
Need for value education – Lack of education in values – Benefits of value education- Challenges for Value adoption – Cultural, Social, Religious, Intellectual and Personal challenges

UNIT – II: Personal Development and Values in Life
Personal Development: – Accountability and responsibility – Desires and weaknesses – Character development – Good relationships, self-restraint, Spirituality and Purity - Integrating values in everyday life

UNIT – III: Practicing Values for the development of Society
Resentment Management and Self-analysis – Positive Thinking and Emotional Maturity – The importance of Women , Children and Taking care of them – Helping the poor and needy – Fighting against addictions and atrocities – Working for the Sustainable development of the society
Principles of Integrity-Institutional Development - Vision for better India.

UNIT – IV: Basic Concepts of Professional Ethics
Ethics, Morals and Human life , Types of Ethics, Personal Ethics, Professional Ethics, Ethical dilemmas, Science – Religion - Ethics, Case Studies on Professional Ethics, Exemplary life sketches of prominent Indian personalities like Sri.M.Visweshwarayya, Dr.APJ Abdul Kalam and JRD Tata

UNIT-V: Ethics in Engineering Profession
Engineering Profession-Technology and Society- Ethical obligations of Engineering Professionals-Role and responsibility of Engineers - A few Case Studies on Risk management safety and Risk Management
Plagiarism-Self plagiarism- -Ethics Standards and Bench Marking

Text Books:
1. Subramanian R, " Professional Ethics " , Oxford University Press , 2013
2. Nagarajan R S, " A Text Book on Human Values and Professional Ethics " New Age Publications , 2007
3. Dinesh Babu S, " Professional Ethics and Human Values " , Laxmi Publications , 2007

Suggested Reading:
1. SantoshAjmera and Nanda Kishore Reddy , "Ethics , Integrity and Aptitude",McGrawhill Education Private Limited, 2014
2. Govinda Rajan M, Natarajan S, Senthil Kumar V S,"Professional Ethics and Human Values", Prentice Hall India, Private Limited,2012
3. Course Material for Post Graduate Diploma In "Value Education & Spirituality" Prepared by Annamalai University in Collaboration with Brahma Kumaris, 2010

16CE C02
ENVIRONMENTAL STUDIES

Instruction	1L Periods per week
Duration of End Examination	2 Hours
End Examination	50 Marks
Sessional	- - -
Credits	1

Course Objectives:
1. To equip the students with inputs on the environment, natural resources and their conservation.
2. To study the interrelationship between the living organisms and the natural environment and also to enable the students to understand the structure and functioning of the ecosystems.
3. To understand the importance of biodiversity and create awareness on its threats and conservation strategies.
4. To enable the students become aware of pollution of various environmental segments including their causes, effects and control measures.
5. To create awareness about environmental legislations in the context of national conventions.

Course Outcomes: At the end of the course, the student should have learnt
1. To understand the scope and importance of environmental studies, identify the natural resources and ecosystems and contribute for their conservation.
2. To understand the ecological services of biodiversity and contribute for their conservation.
3. To develop skills to solve the problems of environmental pollution and contribute for the framing of legislation for protection of environment.
4. To relate the social issues and the environment and contribute for the sustainable development.
5. To understand the essence of the ethical values of the environment for conserving depletable resources and pollution control.

UNIT – I
Environmental Studies: Definition, Scope and importance, need for public awareness.
Natural resources: Water resources- hydrological cycle, use and over utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems. Food resources- Changes caused by modern agriculture, fertilizers-pesticide problems, water logging and salinity. Forest resources- use and over exploitation, deforestation. Mineral resources- Use and exploitation, effects of mining. Energy resources- Growing energy needs, various renewable and non-renewable energy sources. Land resources- land as a resource, land degradation- causes and effects, Role of individuals in conservation of natural resources.

UNIT – II
Ecosystems: Concept of an ecosystem, structure and function of an ecosystem, concept of food chains, food webs, ecological pyramids.

UNIT – III
Biodiversity: Types/classification of biodiversity, India as a mega diversity nation, values of biodiversity, threats to biodiversity, Conservation of biodiversity.

UNIT – IV
Environmental Pollution: Cause, effects and control measures of air pollution, water pollution, Soil pollution, Noise pollution and Thermal pollution.
Environmental Legislations: Environment protection act, Air, Water, Forest & Wild life acts.

UNIT – V
Social issues and the environment: Water conservation methods: Rain water harvesting and watershed management, Environmental ethics, Sustainable development, Population explosion and Climate change: Global warming, Acid rain, Ozone layer depletion.

Text Books:
1. P. D.Sharma, "Ecology & Environment", Ashish publications, 1994
2. Y. Anjaneyulu, "Introduction to Environmental Science", B S Publications, 2004

Suggested Reading:
1. Dr. Suresh K. Dhameja, "Environmental Studies", S. K. Kataria & Sons, 2009
2. C. S. Rao, "Environmental Pollution Control Engineering", Wiley, 1991
3. S. S. Dara, "A Text Book of Enviromental Chemistry & Polution Control", S. Chand Limited, 2006

16CS C02
PROGRAMMING LABORATORY

Instruction	2P Periods per week
Duration of End Examination	2 Hours
End Examination	35 Marks
Sessional	15 Marks
Credits	1

1. Demonstration of control structures.

2. Demonstration of switch case (menu driven).

3. Demonstration of Parameter passing Methods.

4. Demonstration of Functions using Recursion.

5. Demonstration of arrays Operations on Matrix.

6. Implementation of bubble sort.

7. Implementation of selection sort.

8. Implementation of Linear and Binary Search.

9. Implementation of string manipulation operations with and without library function.

10. Demonstration using Pointers.

11. Demonstration of Array of Structures.

12. Sequential file operations.

Text Books:

1. Pradip Dey and Manas Ghosh "Programming in C 2/e" Oxford University Press, 2nd Edition 2011
2. B. W. Kernighan and D.M. Ritchie, "The 'C' Programming Language" Prentice Hall India, 2nd Edition. 1990

16ME C03
MECHANICAL AND IT WORKSHOP

Instruction	3P Periods per week
Duration of End Examination	3 Hours
End Examination	50 Marks
Sessional	25 Marks
Credits	2

Mechanical Workshop

Trades for Practice   1. Fitting   2. Tin Smithy   3. Carpentry   4. House Wiring Exercises in Fitting

1. To make a perfect rectangular MS flat
2. To do parallel cuts using Hack saw
3. To drill a hole and tap it
4. To make male and female fitting using MS flats-Assembly1
5. To make male and female fitting using MS flats-Assembly2

Exercises in Tin smithy
1. To make a square tray from the given sheet metal.
2. To make a rectangular box from the given sheet metal with base and top open. Solder the corners.
3. To make a scoop.
4. To make a dust pan from the given sheet metal.
5. To make a pamphlet box.

Exercises in Carpentry
1. To plane the given wooden piece to required size
2. To make a cross lap joint on the given wooden piece according to the given dimensions.
3. To make a Tee lap joint on the given wooden piece according to the given dimensions.
4. To make a dove tail-joint on the given wooden piece according to the given dimensions.
5. To make a bridle joint on the given wooden piece according to the given dimensions.

Exercises in House Wiring
1. Wiring of one light point controlled by one single pole switch, a three pin socket controlled by a single pole switch, and wiring of one buzzer controlled by a bell push.
2. Wiring of two light points connected in series and controlled by single pole switch. Verify the above circuit with different bulbs.
3. Wiring of two light points connected in parallel from two single pole switches and a three pin socket
4. Stair case wiring-wiring of one light point controlled from two different places independently using two 2-way switches.
5. Go-down wiring.

Demonstration of plumbing and welding trades

Note: *A minimum of 12 exercises from the above need to be done*

Suggested Reading:
1. Workshop Technology -- Hazra chowdary

IT Workshop

List of Tasks:
Task 1: MS Word: Formatting text, inserting images, tables, equations and hyperlinks
          Document Management: Page layout techniques and printing
Task 2: MS Excel: Functions and formulas and graph plotting
Task 3: MS Power point presentation: Guidelines for effective presentation, inserting objects, charts, hyperlinks and navigation
          between slides
Task 4: Essentials Search Engines & Net etiquette, Plagiarism, Open source tools and other utility tools

Suggested Reading:
1. Scott Mueller's Upgrading and Repairing PCs, 18/e, Scott. Mueller, QUE, Pearson, 2008.
2. The Complete Computer upgrade and repair book, 3/e, Cheryl A Schmidt, Dreamtech

16PY C06

BIO PHYSICS LABORATORY

Instruction	2P Periods per week
Duration of End Examination	2 Hours
End Examination	35 Marks
Sessional	15 Marks
Credits	1

Course Objectives:

The objectives of the course is to make the student
1. Understand physical techniques for studying the physical properties of biomaterials
2. Know the interaction of radiation with biomaterials
3. Develop the knowledge of measurement of viscosity and surface tension of biomaterials

Course Outcomes:

At the end of the course, the student will be able to
1. Apply the techniques for the measurement of some physical properties of biomaterials
2. Measure radiation absorption measurements
3. Study physical properties of blood
4. Measure absorption wavelengths in photosynthesis
5. Assess BP and physical state of the lungs

List of Experiments:
1. Determination of Blood Pressure at different postures using sphygmomanometer
2. Estimation of chlorophyll in the given leaves
3. Determination of mass absorption coefficient of the given biomaterial using GM counter
4. Determination of molecular weight of given polymer using Ostwald Viscometer
5. Study of osmotic fragility of blood
6. Determination of specific gravity of blood
7. Determination of size and shape of blood cells using laser diffraction technique
8. Determination of viscosity and dynamic surface tension of bio-liquid using capillary flow technique
9. Determination of peak flow rate using peak flow meter
10. Determination of inspired volume using sustained maximal inspiration technique
11. Determination of auto catalytic ion efflux constant for the process of germination of seeds using conductivity meter

Note: A student must perform a minimum of eight experiments

Suggested Reading:

1. Biophysics Manual by Department of Physics, CBIT, 2016
2. S.K. Gupta, Engineering Physics Practical, Krishna's Educational Publishers, 2014
3. O.P. Singh, V. Kumar and R.P. Singh, Engineering Physics Practical Manual, Ram Prasad & Sons Publications, 2009

16CY C06
<div align="center">**BIO ORGANIC CHEMISTRY LABORATORY**</div>

Instruction	2P Periods per week
Duration of End Examination	2 Hours
End Examination	35 Marks
Sessional	15 Marks
Credits	1

Course Objectives:
1. Understand the basic practical issues involved in the analysis of organic molecules.
2. To prepare a organic compounds and their derivatives
3. Chemistry majors will have a working knowledge of chemical instrumentation and laboratory techniques and be able to use those skills to design and conduct independent work
4. To find the structure and characterization of the basic organic functional groups.

Course Outcomes:
1. An ability to think critically and to analyze chemical analysis.
2. An ability to work effectively in a laboratory environment and to use modern chemical/biochemical instrumentation and procedures
3. Understand the basics of laboratory safety

I. Identification of Organic Functional Groups and Preparation of their Derivatives
1. Aldehyde functional group
2. Ketone functional group
3. Amine functional group
4. Monosaccharides
5. Carboxylic acid functional group
6. Phenol

II. Preparation of Organic Compounds
7. Preparation of nitro Benzene
8. Preparation of m-di nitro Benzene
9. Preparation of Acetanilide
10. Preparation of Aspirin
11. Preparation of soap
12. Preparation of phenol formaldehyde resin

Suggested Reading:
1. Vogel's text book of quantitative chemical analysis by J.Mendham and Thomas, Person education. Pvt. Ltd. New Delhi, 6th.ed, 2002.
2. Senior practical physical chemistry by B.D.Khosla, A.Ghulati,V.C.Garg;R.Chand and CD New Delhi

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (A)
Choice Based Credit System (with effect from 2016-17)

B.Tech (Bio-Technology)

S.No	Code	Subject	L	T	P/D	Credits
		II – Semester				
1	16MT C04/ 16BT C03	Mathematics - II / Basics of Biology - II	3*	-	0	3
2	16CY C05	Bio Organic Chemistry	3	-	0	3
3	16PY C05	Bio Physics	3	-	0	3
4	16CS C01	Programming and Problem Solving	3	1	0	4
5	16BT C04	Introduction to Anatomy and Physiology of Humans	4	-	0	4
6	16CE C03	Professional Ethics and Human Values	1	-	0	1
7	16CE C02	Environmental Studies	1	-	0	1
8	16CS C02	Programming Laboratory	0	-	2	1
9	16ME C03	Mechanical and IT Workshop	0	-	3	2
10	16PY C06	Bio Physics Laboratory	0	-	2	1
11	16CY C06	Bio Organic Chemistry Laboratory	0	-	2	1
		TOTAL	**18**	**01**	**09**	**24**

L – Lecture (clock hours) T - Tutorial (clock hours)   P/D - Practical / Drawing (clock hours)

* One extra hour may be permitted in the timetable

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY(A)
Choice Based Credit System
B.Tech (Bio-Technology)

SEMESTER – III

S.No	Course Code	Title of the Course	Scheme of Instruction Hours per week L/T	P/D	Scheme of Examination Duration of SEE in Hours	Maximum Marks CIE	SEE	Credits
		THEORY						
1	16MT C06	Mathematics –III	3	-	3	30	70	3
2	16BT C05	Process Principles and Reaction Engineering	4	-	3	30	70	4
3	16BT C06	Biochemistry	4	-	3	30	70	4
4	16BT C07	Cell Biology	3	-	3	30	70	3
5	16BT C08	Microbiology	3	-	3	30	70	3
6	16BT C09	Genetics	3	-	3	30	70	3
		PRACTICALS						
7	16BT C10	Biochemistry Lab	-	3	3	25	50	2
8	16BT C11	Microbiology Lab	-	3	3	25	50	2
9	16EG C03	Soft Skills and Employability Enhancement Lab	-	2	2	15	35	1
		TOTAL	20	8	-	245	555	25

L: Lecture   T: Tutorial   D: Drawing   P: Practical
CIE – Continuous Internal Evaluation   SEE – Semester End Examination

2

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY(A)
Choice Based Credit System
B.Tech (Bio-Technology)

SEMESTER – IV

S.No	Course Code	Title of the Course	Scheme of Instruction Hours per week		Scheme of Examination Duration of SEE in Hours	Scheme of Examination Maximum Marks		Credits
			L/T	P/D		CIE	SEE	
THEORY								
1	16BT C12	Chemical and Biochemical Thermodynamics	4	-	3	30	70	4
2	16BT C13	Molecular Biology	3	-	3	30	70	3
3	16BT C14	Immunology	3	-	3	30	70	3
4	16BT C15	Instrumental Methods in Biotechnolgy	3	-	3	30	70	3
5	16BT C16	Industrial Biotechnology	3	-	3	30	70	3
6	16MB C01	Engineering Economics and Accountancy	3	-	3	30	70	3
PRACTICALS								
7	16BT C17	Immunology Lab	-	3	3	25	50	2
8	16BT C18	Instrumental Methods in Biotechnology Lab	-	3	3	25	50	2
	TOTAL		19	6	-	230	520	23

L: Lecture   T: Tutorial   D: Drawing   P: Practical
CIE – Continuous Internal Evaluation   SEE – Semester End Examination

CHAITANYA BHARATHI INSTITUTE OF

TECHNOLOGY (A)

Choice Based Credit System (with effect from 2018-19)
B.Tech (Bio-Technology)

S.No	Course Code	Title of the Course	Scheme of Instruction Hours per week		Scheme of Examination			Credits
			L/T	P/D	Duration of SEE in Hours	CIE	SEE	
THEORY								
1	16MT C08	Biostatistics	3	-	3	30	70	3
2	16BT C19	Fluid Mechanics and Heat Transfer	3	-	3	30	70	3
3	16BT C20	Protein Engineering and Enzyme Technology	4	-	4	30	70	4
4	16BT C21	Genetic Engineering and rDNA Technology	3	-	3	30	70	3
5	16BT E22 16BT E23 16MT E02	**Elective-I** 1.Environmental Biotechnology 2. Food Biotechnology 3. Computational Numerical Methods	3	-	3	30	70	3
6	18CS E02 16BT E24 16BT E25	**Elective-II** 1. Python for Bioinformatics 2. Virology 3. Metabolic Engineering	3	-	3	30	70	3
PRACTICALS								
7	16BT C26	Fluid Mechanics and Heat Transfer Lab	-	3	3	25	50	2
8	16BT C27	Enzyme Technology Lab	-	3	3	25	50	2
9	16BT C28	Genetic Engineering Lab		3	3	25	50	2
TOTAL			**19**	**9**	**28**	**255**	**570**	**25**

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (A)

Choice Based Credit System (with effect from 2018-19)
B.Tech (Bio-Technology)

SEMESTER – VI

S.No	Course Code	Title of the Course	Scheme of Instruction Hours per week L/T	Scheme of Instruction Hours per week P/D	Scheme of Examination Duration of SEE in Hours	Scheme of Examination Maximum Marks CIE	Scheme of Examination Maximum Marks SEE	Credits
THEORY								
1	16BT C29	Fermentation Technology	4	-	4	30	70	4
2	16BT C30	Mass Transfer Operations	4	-	4	30	70	4
3	16BT C31	Bioinformatics	4	-	4	30	70	4
4	18CS E02 16BT E32 16BT E33	**Elective – III** 1. JAVA Programming and Bio-Java 2. Medical Biotechnology 3. Phyto Chemicals and Herbal Products	3	-	3	30	70	3
5	16BT E34 16BT E35 16BT E36	**Elective – IV** 1.Developmental Biology 2.Pharamceutical Biotechnology 3.Bioprocess Economics & Plant Design	3	-	3	30	70	3
PRACTICALS								
7	16BT C37	Bioprocess Lab	-	3	3	25	50	2
8	16BT C38	Mass Transfer Operations Lab	-	3	3	25	50	2
9	16BT C39	Bioinformatics Lab	-	3	3	25	50	2
10	16BT C40	Mini Project	-	1	1	50	-	1
	TOTAL		18	10	28	225	500	25

L: Lecture   T: Tutorial   D: Drawing   P: Practical
CIE - Continuous Internal Evaluation   SEE - Semester End Examination

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY(A)

Choice Based Credit System (with effect from 2019-20)
B.Tech (Biotechnology)

SEMESTER–VII

S.No	Course Code	Title of the Course	Scheme of Instruction Hours per week L/T	Scheme of Instruction Hours per week P/D	Duration of SEE in Hours	Maximum Marks CIE	Maximum Marks SEE	Credits
		THEORY						
1	16BT C41	Down Stream Processing	3	-	3	30	70	3
2	16BT C42	Plant Biotechnology	3	-	3	30	70	3
3	16BT C43	Animal Biotechnology	3	-	3	30	70	3
4	16BT C44	Bioprocess Dynamics & Control	3	-	3	30	70	3
5	16BT C45	Computer Applications in Bioprocess Industries	3	-	3	30	70	3
6	16BT E46 16BT E47 16BT E48	**Elective-V (Core)** Genomics & Proteomics Cancer Biology Intellectual Property Rights Regulatory Affairs & Clinical Trials	3	-	3	30	70	3
		PRACTICALS						
7	16BT C49	Down Stream Processing Lab	-	3	3	25	50	2
8	16BT C50	Tissue Culture Lab	-	3	3	25	50	2
9	16BT C51	Project Seminar	-	3	-	50	-	2
		TOTAL	18	9	24	280	520	24

L: Lecture   T: Tutorial   D: Drawing   P: Practical

CIE - Continuous Internal Evaluation   SEE - Semester End Examination

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (A)
Choice Based Credit System (with effect from 2019-20)
B.Tech (Biotechnology)

SEMESTER – VIII

S.No	Course Code	Title of the Course	Scheme of Instruction		Scheme of Examination			Credits
			Hours per week		Duration of SEE in Hours	Maximum Marks		
			L/T	P/D		CIE	SEE	
THEORY								
1	16BT E52 16BT E53 16BT E54	Elective-VII (Core) Tissue Engineering Immunodiagnostics Molecular Modeling & Drug Design	3	-	3	30	70	3
2	16ME O06 16EC O02 16EG O01	Elective-VIII (Open) Research Methodologies Biomedical Instrumentation Technical Writing Skills	3	-	3	30	70	3
3	16CS O03 16CS O04 16ME O01	Elective- IX (Open) IOT and Applications Basics of Data Science Using R Entrepreneurship	3	-	3	30	70	3
4	16BT C55	Seminar	3	-	3	50	-	2
5	16BT C56	Project	6	-	3	50	100	6

L: Lecture   T: Tutorial   D: Drawing   P: Practical
CIE - Continuous Internal Evaluation   SEE - Semester End Examination

M.E. (Structural Engineering) – Civil Engineering - 4 Semesters (Full Time) (CBCS)

Semester - I

Sl. No	Subject	No. of Hrs. per week Lecture	T/P/S	Duration (Hrs)	Internal Assessment	End Exam	Total Mark	Credits
1.	Core	3	1	4	30	70	100	4
2.	Core	3	1	4	30	70	100	4
3.	Core	3	1	4	30	70	100	4
4.	Elective	3	--	3	30	70	100	3
5.	Elective	3	--	3	30	70	100	3
6.	Elective	3	--	3	30	70	100	3
7.	Laboratory-I	--	3	3	50	--	50	2
8.	Seminar - I	--	3	3	50	--	50	2
9.	Soft Skills	--	2	--	--	--	--	--
	Total	**18**	**11**		**340**	**360**	**700**	**25**

Semester - II

Sl. No	Subject	No. of Hrs. per week Lecture	T/P/S	Duration	Internal Assessment	End Exam	Total Mark	Credits
1.	Core	3	1		30	70	100	4
2.	Core	3	1		30	70	100	4
3.	Core	3	1		30	70	100	4
4.	Elective	3	--		30	70	100	3
5.	Elective	3	--		30	70	100	3
6.	Elective	3	--		30	70	100	3
7.	Laboratory - II	--	3		50	--	50	2
8.	Seminar - II	--	3		50	--	50	2
9.	Mini Project	--	2		50	--	50	1
	Total	**18**	**11**		**390**	**360**	**750**	**26**

Semester - III

Sl. No	Subject	Internal Assessment	End Exam	Total Marks	Credits
1	Project Seminar* (i)Problem formulation and submission of synopsis within 8 weeks from the commencement of 3rd Semester. (50 Marks) (ii) Preliminary work on	100	--	100	6
	Total	**100**		**100**	**6**

Semester - IV

Sl. No	Subject	Internal Assessment	End Exam	Total Marks	Credits
1	Project Work	**100**	**100**	**200**	**12**

Note: Six core subjects, Six elective subjects, Two Laboratory Courses and Two Seminars, Mini Project and Soft Skills should normally be completed by the end of semester II.

* Project seminar presentation on the topic of Dissertation only, 50 marks awarded by the project guide and 50 marks by the internal committee

Credit requirements for the award of degree, lower limit and upper limit of credits for registration by a student in a semester Credit Requirement for the award of M.E/M. Tech. Degree is 69

Department of Civil Engineering
Scheme of Instructions Earthquake Engineering

S. no	Code No	Subjects	Period per week		Duration of exam in Hrs.	Marks			Credits
			L	T/P		Main Exam	Internal Ses	Ass	
Core Subjects									
1.	16CEC201	Earthquake Resistant design of Buildings	3	1	3	70	20	10	4
2.	16CEC202	Seismic Hazard Assessment	3	1	3	70	20	10	4
3.	16CEC203	Earthquake Resistant design of Special structures	3	1	3	70	20	10	4
4.	16CEC204	Seismic Evaluation & Retrofitting of Structures	3	1	3	70	20	10	4
5.	16CEC103	Finite Element Methods	3	1	3	70	20	10	4
6.	16CEC106	Structural Dynamics	3	1	3	70	20	10	4
Elective Subjects									
7.	16CEE201	Advanced Structural Dynamics	3		3	70	20	10	3
8.	16CEE202	Advanced Mechanics of Materials	3		3	70	20	10	3
9.	16CEE203	Reliability based design	3		3	70	20	10	3
10	16CEE204	Earthquake Resistant Design of Bridges	3		3	70	20	10	3
11	16CEE205	Strong motion Seismology	3		3	70	20	10	3
12	16CEE206	Instrumentation and model testing techniques	3		3	70	20	10	3
13	16CEE207	Soil Dynamics & Machine Foundations	3		3	70	20	10	3
14	16CEE208	Earthquake Resistant Design of Masonry Structures	3		3	70	20	10	3
15	16CEE102	Theory of Shells & Folded Plates	3		3	70	20	10	3
16	16CEE103	Neural, Fuzzy & Expert Systems	3		3	70	20	10	3
17	16CEC104	Theory of plates	3		3	70	20	10	3
18	16CEC105	Tall Buildings	3			70	20	10	3
19	16CEE106	Structural Optimization	3		3	70	20	10	3
20	16CEE107	Advanced Steel Design	3		3	70	20	10	3
21	16MTE101	Statistics and Numerical Methods.	3		3	70	20	10	3
DEPARTMENTAL REQUIREMENTS									
22	16CEC107	Structural Engineering Lab		3	3		50		2
23	16CEC108	Computer Aided Analysis & Design Lab		3	3		50		2
24	16CEC205	Seminar – I (ISem)		3			50		2
25	16CEC206	Seminar – II (II Sem)		3			50		2
26	16EG104	Soft Skills Lab		2	Satisfactory/ unsatisfactory				
27	16CEC207	Mini Project		2			50		1
28	16CEC208	Project Seminar (III Sem)		3			100		6
29	16CEC209	Dissertation(III & IV Sem)			#		*		12

M.E. (Structural Engineering) – Civil Engineering - 4 Semesters (Full Time) (CBCS)

Sl. No	Subject	No. of Hrs. per week		Duration (Hrs)	Marks for		Total Mark	Credits
		Lecture	T/P/S		Internal Assessment	End Exam		
				Semester - I				
1.	Core	3	1	4	30	70	100	4
2.	Core	3	1	4	30	70	100	4
3.	Core	3	1	4	30	70	100	4
4.	Elective	3	--	3	30	70	100	3
5.	Elective	3	--	3	30	70	100	3
6.	Elective	3	--	3	30	70	100	3
7.	Laboratory-I	--	3	3	50	--	50	2
8.	Seminar - I	--	3	3	50	--	50	2
9.	Soft Skills	--	2	--	--	--	--	--
	Total	**18**	**11**		**340**	**360**	**700**	**25**

Sl. No	Subject	No. of Hrs. per week		Duration	Marks for		Total Mark	Credits
		Lecture	T/P/S		Internal Assessment	End Exam		
				Semester - II				
1.	Core	3	1		30	70	100	4
2.	Core	3	1		30	70	100	4
3.	Core	3	1		30	70	100	4
4.	Elective	3	--		30	70	100	3
5.	Elective	3	--		30	70	100	3
6.	Elective	3	--		30	70	100	3
7.	Laboratory - II	--	3		50	--	50	2
8.	Seminar - II	--	3		50	--	50	2
9.	Mini Project	--	2		50	--	50	1
	Total	**18**	**11**		**390**	**360**	**750**	**26**

Semester - III

Sl. No	Subject	Marks for		Total Marks	Credits
		Internal Assessment	End Exam		
1	Project Seminar* (i)Problem formulation and submission of synopsis within 8 weeks from the commencement of 3rd Semester. (50 Marks) (ii) Preliminary work on	100	--	100	6
	Total	**100**		**100**	**6**

Semester - IV

Sl. No	Subject	Marks for		Total Marks	Credits
		Internal Assessment	End Exam		
1	Project Work	**100**	**100**	**200**	**12**

Note: Six core subjects, Six elective subjects, Two Laboratory Courses and Two Seminars, Mini Project and Soft Skills should normally be completed by the end of semester II.

* Project seminar presentation on the topic of Dissertation only, 50 marks awarded by the project guide and 50 marks by the internal committee

Credit requirements for the award of degree, lower limit and upper limit of credits for registration by a student in a semester Credit Requirement for the award of M.E/M. Tech. Degree is 69

Department of Civil Engineering
Scheme of Instructions Earthquake Engineering

S. no	Code No	Subjects	Period per week		Duration of exam in Hrs.	Marks			Credits
			L	T/P		Main Exam	Internal Ses	Ass	
Core Subjects									
1.	16CEC201	Earthquake Resistant design of Buildings	3	1	3	70	20	10	4
2.	16CEC202	Seismic Hazard Assessment	3	1	3	70	20	10	4
3.	16CEC203	Earthquake Resistant design of Special structures	3	1	3	70	20	10	4
4.	16CEC204	Seismic Evaluation & Retrofitting of Structures	3	1	3	70	20	10	4
5.	16CEC103	Finite Element Methods	3	1	3	70	20	10	4
6.	16CEC106	Structural Dynamics	3	1	3	70	20	10	4
Elective Subjects									
7.	16CEE201	Advanced Structural Dynamics	3		3	70	20	10	3
8.	16CEE202	Advanced Mechanics of Materials	3		3	70	20	10	3
9.	16CEE203	Reliability based design	3		3	70	20	10	3
10	16CEE204	Earthquake Resistant Design of Bridges	3		3	70	20	10	3
11	16CEE205	Strong motion Seismology	3		3	70	20	10	3
12	16CEE206	Instrumentation and model testing techniques	3		3	70	20	10	3
13	16CEE207	Soil Dynamics & Machine Foundations	3		3	70	20	10	3
14	16CEE208	Earthquake Resistant Design of Masonry Structures	3		3	70	20	10	3
15	16CEE102	Theory of Shells & Folded Plates	3		3	70	20	10	3
16	16CEE103	Neural, Fuzzy & Expert Systems	3		3	70	20	10	3
17	16CEC104	Theory of plates	3		3	70	20	10	3
18	16CEC105	Tall Buildings	3			70	20	10	3
19	16CEE106	Structural Optimization	3		3	70	20	10	3
20	16CEE107	Advanced Steel Design	3		3	70	20	10	3
21	16MTE101	Statistics and Numerical Methods.	3		3	70	20	10	3
DEPARTMENTAL REQUIREMENTS									
22	16CEC107	Structural Engineering Lab		3	3		50		2
23	16CEC108	Computer Aided Analysis & Design Lab		3	3		50		2
24	16CEC205	Seminar – I (ISem)		3			50		2
25	16CEC206	Seminar – II (II Sem)		3			50		2
26	16EG104	Soft Skills Lab		2	Satisfactory/ unsatisfactory				
27	16CEC207	Mini Project		2			50		1
28	16CEC208	Project Seminar (III Sem)		3			100		6
29	16CEC209	Dissertation(III & IV Sem)			#		*		12

Scheme of Instruction & Examination
M.E. (CAD/CAM) – Mechanical Engineering - 4 Semesters (Full Time)

SI. No	Subject	No. of Hrs. per week		Duration (Hrs)	Marks for		Total Marks	Credits
		Lecture	T/P/S		Internal Assessment	End Exam		
					Semester - I			
1.	Core	3	1	4	30	70	100	4
2.	Core	3	1	4	30	70	100	4
3.	Core	3	1	4	30	70	100	4
4.	Elective	3	--	3	30	70	100	3
5.	Elective	3	--	3	30	70	100	3
6.	Elective	3	--	3	30	70	100	3
7.	Laboratory	--	3	3	50	--	50	2
8.	Seminar - I	--	3	3	50	--	50	2
9.	Soft Skills	--	--	--	--	--	--	--
	Total	**18**	**09**		**340**	**360**	**700**	**25**

Semester - II

SI. No	Subject	No. of Hrs. per week		Duration (Hrs)	Marks for		Total Marks	Credits
		Lecture	T/P/S		Internal Assessment	End Exam		
1.	Core	3	1		30	70	100	4
2.	Core	3	1		30	70	100	4
3.	Core	3	1		30	70	100	4
4.	Elective	3	--		30	70	100	3
5.	Elective	3	--		30	70	100	3
6.	Elective	3	--		30	70	100	3
7.	Laboratory - II	--	3		50	--	50	2
8.	Seminar - II	--	3		50	--	50	2
9.	Mini Project	--	2		50	--	50	1
	Total	**18**	**11**		**390**	**360**	**750**	**26**

Semester - III

SI. No	Subject	Marks for		Total Marks	Credits
		Internal Assessment	End Exam		
1	Project Seminar* (i)Problem formulation and submission of synopsis within 8 weeks from the commencement of 3rd Semester. (50 Marks) (ii) Preliminary work on Project implementation. (50 Marks)	100	--	100	6
	Total	**100**		**100**	**6**

Semester - IV

SI. No	Subject	Marks for		Total Marks	Credits
		Internal Assessment	End Exam		
1	Project Work	**100**	**100**	**200**	**12**

Note: Six core subjects, Six elective subjects, Two Laboratory Courses and Two Seminars, Mini Project
        and Soft Skills should normally be completed by the end of semester II.

        * Project seminar presentation on the topic of Dissertation only, 50 marks awarded by the project guide
          and 50 marks by the internal committee

Credit requirements for the award of degree, lower limit and upper limit of credits for registration by

a student in a semester Credit Requirement for the award of M.E/M. Tech. Degree is 69

Scheme of Instruction & Examination Post Graduate course in Mechanical Engineering

with specialization in **CAD/CAM**

Course duration: 4 Semesters (Full – Time)

Sl. No	Syllabus Ref.No.	Subject	Scheme of Instruction Hours per week		Scheme of Examination			Credits
			L	T/P	Duration in Hours	End Exam	Internal Assessment	
CORE SUBJECTS								
1.	16MEC101	Automation	3	1	4	70	30	4
2.	16MEC102	Computer Aided Modeling and Design	3	1	4	70	30	4
3.	16MEC103	Computer Integrated Manufacturing	3	1	4	70	30	4
4.	16MEC104	Computer Aided Mechanical Design and Analysis	3	1	4	70	30	4
5.	16MEC105	Finite Element Techniques	3	1	4	70	30	4
6.	16MEC205	Computational Fluid Dynamics	3	1	4	70	30	4
ELECTIVES								
1	16MEE101	Failure Analysis and Design	3	--	3	70	30	3
2.	16MEE102	Integrated Mechanical Design	3	--	3	70	30	3
3.	16MEE103	Robotic Engineering	3	--	3	70	30	3
4.	16MEE104	Programming Methodology and Data Structures	3	--	3	70	30	3
5.	16MEE105	Optimization Techniques	3	--	3	70	40	3
6.	16MEE106	Vibrations Analysis and Condition Monitoring	3	--	3	70	30	3
7.	16MEE107	Engineering Research Methodology	3	--	3	70	30	3
8.	16MEE108	Tribology In Design	3	--	3	70	30	3
9.	16MEE109	Advanced Mechanics of Materials	3	--	3	70	30	3
10.	16MEE110	Mechanics of Composite Materials	3	--	3	70	30	3
11.	16MEE111	Theory of Elasticity and Plasticity	3	--	3	70	30	3
12.	16MEE112	Experimental Techniques and Data Analysis	3	--	3	70	30	3
13.	16MEE113	Design for Manufacture	3	--	3	70	30	3
14.	16MEE114	Data Base Management Systems	3	--	3	70	30	3
15.	16MEE115	Fracture Mechanics	3	--	3	70	30	3
16.	16MEE116	Design of Press Tools	3	--	3	70	30	3
17.	16MEE117	Design of Dies	3	--	3	70	30	3
18.	16MEE118	Rapid Prototyping Principles & Applications	3	--	3	70	30	3
19.	16MEE119	Flexible Manufacturing Systems	3	--	3	70	30	3
20.	16MEE120	Non-Traditional Machining & Forming	3	--	3	70	30	3
21	16MEE121	Product Design and Process Planning	3	--	3	70	30	3
DEPARTMENTAL REQUIREMENTS								
1.	16MEC106	CAD/CAM Lab (Lab –I)	--	3	--	--	50	2
2.	16MEC107	Computation Lab (Lab –II)	--	3	--	--	50	2
3.	16MEC108	Seminar – I	--	3	--	--	50	2
4.	16MEC109	Seminar – II	--	3	--	--	50	2
5	16MEC110	Mini Project		2	--	--	50	1
6	16MEC111	Project Seminar	--	6	--	--	100	6
7	16MEC112	Project work	--	6	--	100	100	12

Scheme of Instruction & Examination
M.E. (THERMAL ENGINEERING) – 4 Semesters (Full Time)

Semester - I								
Sl. No	Subject	No. of Hrs. per week		Duration (Hrs)	Marks for		Total Marks	Credits
		Lecture	T/P/S		Internal Assessment	End Exam		
1.	Core	3	1	4	30	70	100	4
2.	Core	3	1	4	30	70	100	4
3.	Core	3	1	4	30	70	100	4
4.	Elective-1	3	--	3	30	70	100	3
5.	Elective-2	3	--	3	30	70	100	3
6.	Elective-3	3	--	3	30	70	100	3
7.	Laboratory - I	--	3	3	50	--	50	2
8.	Seminar - I	--	3	3	50	--	50	2
9.	Soft Skills	--	--	--	--	--	--	--
	Total	18	09		340	360	700	25

Semester - II								
Sl. No	Subject	No. of Hrs. per week		Duration (Hrs)	Marks for		Total Marks	Credits
		Lecture	T/P/S		Internal Assessment	End Exam		
1.	Core-4	3	1		30	70	100	4
2.	Core-5	3	1		30	70	100	4
3.	Core-6	3	1		30	70	100	4
4.	Elective-4	3	--		30	70	100	3
5.	Elective-5	3	--		30	70	100	3
6.	Elective-6	3	--		30	70	100	3
7.	Laboratory - II	--	3		50	--	50	2
8.	Seminar - II	--	3		50	--	50	2
9.	Mini Project	--	2		50	--	50	1
	Total	18	11		390	360	750	26

Semester - III					
Sl. No	Subject	Marks for			Credits
		Internal Assessment	End Exam	Total Marks	
1	Project Seminar* (i) Problem formulation and submission of synopsis within 8 weeks from the commencement of 3rd Semester. (50 Marks) (ii) Preliminary work on Project implementation. (50 Marks)	100	--	100	6
	Total	100		100	6

Semester - IV					
Sl. No	Subject	Marks for		Total Marks	Credits
		Internal Assessment	End Exam		
1	Project Work	100	100	200	12

Note : Six core subjects, Six elective subjects, Two Laboratory Courses and Two Seminars, Mini Project and Soft Skills should normally be completed by the end of semester II.

* Project seminar presentation on the topic of Dissertation only, 50 marks awarded by the project guide and
 50 marks by the internal committee

Credit requirements for the award of degree, lower limit and upper limit of credits for registration by

a student in a semester Credit Requirement for the award of M.E/M. Tech. Degree is 69

Scheme of Instruction & Examination of Post Graduate course in

Mechanical Engineering with specialization in **Thermal Engineering**

Course duration: 4 Semesters (Full Time)

Sl. No	Syllabus Ref. No.	Subject	Scheme of Instruction Hours per week		Scheme of Examination			Credits
					Duration	Max. Marks		
			L	T/P	in Hours	End Exam	Internal Assessment	
		CORE SUBJECTS						
1.	16MEC 105	Finite Element Techniques	3	1	4	70	30	4
2.	16MEC 201	Fluid Flow and Gas Dynamics	3	1	4	70	30	4
3.	16MEC 202	Advanced Thermodynamics	3	1	4	70	30	4
4.	16MEC 203	Advanced Heat & Mass Transfer	3	1	4	70	30	4
5.	16MEC 204	Advanced I.C. engines	3	1	4	70	30	4
6	16MEC 205	Computational Fluid Dynamics	3	1	4	70	30	4
		ELECTIVES						
1.	16MEE105	Optimization Techniques	3	--	3	70	30	3
2.	16MEE107	Engineering Research Methodology	3	--	3	70	30	3
3.	16MEE201	Computer Aided Graphics and Design	3	--	3	70	30	3
4.	16MEE 202	Turbo Machines	3	--	3	70	30	3
5.	16MEE203	Fluid Power Systems	3	--	3	70	30	3
6.	16MEE 204	Design of Thermal Systems	3	--	3	70	30	3
7.	16MEE 205	Design of Gas Turbines	3	--	3	70	30	3
8.	16MEE 206	Advanced Energy Systems	3	--	3	70	30	3
9.	16MEE 207	Fuels and Combustion	3	--	3	70	30	3
10.	16MEE 208	Power Plant Control and Instrumentation	3	--	3	70	30	3
11.	16MEE 209	Design of Pumps and Compressors	3	--	3	70	30	3
12.	16MEE 210	Numerical Methods	3	--	3	70	30	3
13.	16MEE 211	Environmental Engineering and Pollution Control	3	--	3	70	30	3
14.	16MEE 212	Refrigeration Machinery & Components	3	--	3	70	30	3
15.	16MEE 213	Energy Management	3	--	3	70	30	3
16.	16MEE 214	Convective Heat Transfer	3	--	3	70	30	3
17.	16MEE 215	Thermal & Nuclear Power Plants	3	--	3	70	30	3
		DEPARTMENTAL REQUIREMENTS						
1.	16MEC 206	Thermal Systems Laboratory (Lab – I)	--	3	--	--	50	2
2.	16MEC 207	CFD Laboratory (Lab –II)	--	3	--	--	50	2
3.	16MEC 208	Seminar – I	--	3	--	--	50	2
4.	16MEC 209	Seminar – II	--	3	--	--	50	2
5	16MEC 210	Mini Project	--	2	--	--	50	1
6.	16MEC 211	Project Seminar	--	6	--	--	100	6
7.	16MEC 212	Project work	--	6	--	100	100	12

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY

(Autonomous) (Affiliated to Osmania University)

Scheme of Instruction & Examination

M.E. (Power Systems & Power Electronics) Four-Semester Course (Full-Time) 2016-17

S. No	Subject	Periods Per Week L	T/P	Semester Exam Duration(Hrs.)	Max. Marks Internal Assessment	End Exam	Credits
				SEMESTER-I			
1	Core 1	3	1	3	30	70	4
2	Core 2	3	1	3	30	70	4
3	Core 3	3	1	3	30	70	4
4	Elective 1	3	-	3	30	70	3
5	Elective 2	3	-	3	30	70	3
6	Elective 3	3	-	3	30	70	3
7	Lab-1	-	3	-	50	-	2
8	Seminar-I	-	3	-	50	-	2
9	Soft Skills	--	2	--	* Non-Credit		
	Total	**18**	**11**		**280**	**420**	**25**
*Internal Assessment only and awarded with "Satisfactory/Not Satisfactory							
				SEMESTER-II			
1	Core 4	3	1	3	30	70	4
2	Core 5	3	1	3	30	70	4
3	Core 6	3	1	3	30	70	4
4	Elective 4	3	-	3	30	70	3
5	Elective 5	3	-	3	30	70	3
6	Elective 6	3	-	3	30	70	3
7	Lab-2	-	3	-	50	-	2
8	Seminar-II	-	3	-	50	-	2
9	Mini Project	-	2		50	-	1
	Total	**18**	**11**		**330**	**420**	**26**
				SEMESTER-III			
1	Project Seminar (i) Problem formulation & submission of synopsis within 8 weeks from the commencement of 3rd sem. (50 Marks) (ii). Preliminary work on Project implementation (50 Marks)				100	-	**6**
	Total				**100**	**-**	**6**
				SEMESTER-IV			
1	Project Work & Dissertation				100	100	**12**
	Total				**100**	**100**	**12**

M.E (Power Systems and Power Electronics)

List of Theory and Practical Subjects

Sl.No	Code No	Core Subjects
1	16EEC101	Power Semi-Conductor Devices and Circuits
2	16EEC102	Distribution System Planning and Automation
3	16EEC103	Advanced Computer Methods in Power Systems
4	16EEC104	Power System Stability
5	16EEC105	Advanced Electric Drives
6	16EEC106	Flexible AC Transmission Systems
		Practicals
7	16EEC107	Power Systems Lab
8	16EEC108	Power Electronics Lab
9	16 EG 104	Soft Skills Lab
10	16EEC109	Seminar-I
11	16EEC110	Seminar- II
12	16EEC111	Mini Project
13	16EEC112	Project Seminar
14	16EEC113	Project Work & Dissertation
		Elective Subjects
15	16EEE101	Machine Modeling and Analysis
16	16EEE102	Modern Control Theory
17	16EEE103	Advanced Power System Protection
18	16EEE104	Real Time Applications in Power Systems
19	16EEE105	Deregulation of Power Systems
20	16EEE106	Soft Computing Techniques to Power Systems
21	16EEE107	Renewable Energy Sources
22	16EEE108	Reliability Modeling in Power Systems
23	16EEE109	Power Quality Engineering
24	16EEE110	Energy Management
25	16EEE111	Advanced Microprocessor Systems
26	16EEE112	Digital Control Systems
27	16EEE113	HVDC Transmission
28	16EEE114	Research Methodology & Professional Ethics

Scheme of Instruction & Examination
M.E Four Semester Course (Regular) 2016-2017

I- SEMESTER

Course Code	Subject	No. of Hrs./Week		Marks for		Total Marks	Credits
		Lecture	T/P/S	Internal Assessment	End Exam		
	Core 1	3	1	30	70	100	4
	Core 2	3	1	30	70	100	4
	Core 3	3	1	30	70	100	4
	Elective 1	3	--	30	70	100	3
	Elective 2	3	--	30	70	100	3
	Elective 3	3	--	30	70	100	3
16ECC107	Communication Lab	---	3	50	-	50	2
16ECC109	Seminar 1	---	3	50	-	50	2
16 EG 104	Soft Skills	---	2	--	-	-	-
Total		18	11	280	420	700	25

Soft Skills is included as a non-credit course in the I-semester

II-SEMESTER

Course Code	Subject	No. of Hrs./Week		Marks for		Total Marks	Credits
		Lecture	T/P/S	Internal Assessment	End Exam		
	Core 4	3	1	30	70	100	4
	Core 5	3	1	30	70	100	4
	Core 6	3	1	30	70	100	4
	Elective 4	3	---	30	70	100	3
	Elective 5	3	---	30	70	100	3
	Elective 6	3	---	30	70	100	3
16ECC108	CCN Lab	---	3	50	-	50	2
16ECC110	Seminar 2	---	3	50	-	50	2
16ECC111	Mini Project	---	2	50	-	50	1
Total		18	11	330	420	750	26

III-SEMESTER

Course Code	Subject	Marks for		Total Marks	Credits
		Internal Assessment	End Exam		
16EC C112	Project Work-Project Seminar (i) Problem formulation and submission of synopsis within 8 weeks from the commencement of 3rd semester. (50 Marks) (ii)Preliminary work on Project Implementation. (50 Marks)	100	----	100	6
	Total	100		100	6

IV-SEMESTER

Course Code	Subject	Marks for		Total Marks	Credits
		Internal Assessment	End Exam		
16ECC113	Project Work and Dissertation	100	100	200	12
	Total	100	100	200	12

List of Subjects for ME (ECE) Course with specialization in
COMMUNICATION ENGINEERING W.E.F. 2016-2017

S.No	Syllabus Ref. No	Subject	Hours per week
		Core Subjects	
1	16ECC101	Data and Computer Communication Networks	4
2	16ECC102	Modern Digital Signal Processing	4
3	16ECC103	Detection and Estimation Theory	4
4	16ECC104	Wireless Mobile Communication Systems	4
5	16ECC105	Probability and Random Processes	4
6	16ECC106	Coding Theory and Techniques	4
7	16ECC107	Communications Lab	3
8	16ECC108	Computer Communication Networks Lab	3
9	16ECC109	Seminar – 1	3
10	16ECC110	Seminar – 2	3
11	16 EG 104	Soft Skills	2
12	16ECC111	Mini project	2
13	16ECC112	Project work - Project Seminar	--
14	16ECC113	Project Work - Dissertation	--
		Elective Subjects	
15	16ECE101	Radar Signal Processing	3
16	16ECE102	Global Navigational Satellite Systems	3
17	16ECE103	Optimization Techniques	3
18	16ECE104	Image and Video Processing	3
19	16ECE105	Satellite and Microwave Communications	3
20	16ECE106	Optical Fiber Communication Systems	3
21	16ECE107	Statistical Signal Processing	3
22	16ECE108	Smart Antennas for Mobile Communications	3
23	16ECE109	Voice Over Internet Protocols	3
24	16ECE110	Modern Digital Communication Systems	3
25	16ECE111	Embedded System Design	3
26	16ECE112	Data Compression	3
27	16ECE113	Software Defined and Cognitive Radio	3
28	16ECE114	Engineering Research Methodology	3
29	16ECE115	Real Time Signal Processing	3
30	16ECE116	Speech Signal Processing	3
31	16ECE117	Multimedia Information Systems	3
32	16ECE118	Adaptive Signal Processing	3
33	16ECE119	Selected Topics in Strategic Electronics	3

Scheme of Instruction & Examination
M.E Four Semester Course (Regular) 2016-2017

I- SEMESTER

Course Code	Subject	No. of Hrs./Week		Marks for		Total Marks	Credits
		Lecture	T/P/S	Internal Assessment	End Exam		
	Core 1	3	1	30	70	100	4
	Core 2	3	1	30	70	100	4
	Core 3	3	1	30	70	100	4
	Elective 1	3	--	30	70	100	3
	Elective 2	3	--	30	70	100	3
	Elective 3	3	--	30	70	100	3
16EC C207	Lab 1	---	3	50	-	50	2
16EC C209	Seminar 1	---	3	50	-	50	2
16 EG 104	Soft Skills	---	2	--	-	-	-
Total		18	11	280	420	700	25

Soft Skills is included as a non-credit course in the I-semester

II-SEMESTER

Course Code	Subject	No. of Hrs./Week		Marks for		Total Marks	Credits
		Lecture	T/P/S	Internal Assessment	End Exam		
	Core 4	3	1	30	70	100	4
	Core 5	3	1	30	70	100	4
	Core 6	3	1	30	70	100	4
	Elective 4	3	---	30	70	100	3
	Elective 5	3	---	30	70	100	3
	Elective 6	3	---	30	70	100	3
16EC C208	Lab 2	---	3	50	-	50	2
16EC C210	Seminar 2	---	3	50	-	50	2
16EC C211	Mini Project	---	2	50	-	50	1
Total		18	11	330	420	750	26

III-SEMESTER

Course Code	Subject	Marks for		Total Marks	Credits
		Internal Assessment	End Exam		
16EC C212	Project work-Project Seminar (i) Problem formulation and submission of synopsis within 8 weeks from the commencement of 3rd semester. (50 Marks) (ii)Preliminary work on Project Implementation. (50 Marks)	100	----	100	6
	Total	100		100	6

IV-SEMESTER

Course Code	Subject	Marks for		Total Marks	Credits
		Internal Assessment	End Exam		
16EC C213	Project work and Dissertation	100	100	200	12
	Total	100	100	200	12

Industrial Training / Internship

The students may undergo Industrial training/Internship during summer / winter vacation. In this case the training has to be undergone continuously for the entire period.

The students may undergo Internship at Research organization / University (after due approval from the Head of the Department) during summer / winter vacation or during semester break.

Duration of Training/ Internship	Credits
2 Weeks	1
4 Weeks	2

**CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY
(AUTONOMOUS)
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
M.TECH (CSE)
SCHEME OF INSTRUCTION & EXAMINATIONS**

SEMESTER–I

S. No	Course Code	Title of the Course	Scheme of Instruction Hours per Week			Duration of SEE in Hours	Scheme of Examination Maximum Marks		Credits
			L	T	P/ D		CIE	SEE	
THEORY									
1	19CSC 101	Mathematical Foundation of Computer Science	3	0	0	3	30	70	3
2	19CSC 102	Advanced Data Structures	3	0	0	3	30	70	3
3	19CSEXXX	Elective -I	3	0	0	3	30	70	3
4	19CSEXXX	Elective -II	3	0	0	3	30	70	3
5	19MEC 103	Research Methodology and IPR	2	0	0	2	20	50	2
6	19XXXXXX	Audit Courses-1	2	0	0	2		50	0
PRACTICAL									
7	19CSC 103	Laboratory 1 (Advanced Data Structures)	0	0	4	3	25	50	2
8	19CSEXXX	Laboratory 2 (Based on Elective-I,III)	0	0	4	3	25	50	2
		TOTAL	16	0	8	-	190	480	18

L: Lecture   T: Tutorial   D: Drawing   P: Practical
CIE - Continuous Internal Evaluation   SEE - Semester End Examination

ELECTIVE-I,III	
19CSE101	Machine Learning
19CSE102	Internet of Things
19CSE103	Introduction to Intelligent Systems
19CSE104	Data Preparation and Analysis
19CSE105	Secure Software Design & Enterprise Computing (SSDEC)
19CSE106	Computer Vision

ELECTIVE-II,IV,V	
19CSE113	Data Science & Big Data Analytics
19CSE114	Distributed Database Systems
19CSE115	Advanced Wireless and Mobile Networks
19CSE116	Human and Computer Interaction
19CSE117	GPU Computing
19CSE118	Digital Forensics
19CSE119	Mobile Applications and Services
19CSE120	Compiler for HPC
19CSE121	Open Source Technologies

ELECTIVE -I ,III LAB	
19CSE107	Machine Learning Lab
19CSE108	Internet of Things Lab
19CSE109	Introduction to Intelligent Systems Lab
19CSE110	Data Preparation and Analysis Lab
19CSE111	SSDE Lab
19CSE112	Computer Vision Lab

II-SEMESTER

SNO	Course Code	Title of the Course	Scheme of Instruction Hours per Week			Duration of SEE in Hours	Scheme of Examination Maximum Marks		Credits
			L	T	P		CIE	SEE	
THEORY									
1	19CSC 104	Advanced Algorithms	3	0	0	3	30	70	3
2	19CSC 105	Soft Computing	3	0	0	3	30	70	3
3	19CSEXXX	Elective -III	3	0	0	3	30	70	3
4	19CSEXXX	Elective -IV	3	0	0	3	30	70	3
5	19XXXXXX	Audit Course 2	2	0	0	2	-	50	0
PRACTICAL									
7	19CSC 106	Laboratory 3 (AA & Soft Computing)	-	-	4	3	25	50	2
8	19CSEXXX	Laboratory 4 (Based on Electives-III)	-	-	4	3	25	50	2
9	19CSC 107	Mini Projects with Seminar	-	-	4		50		2
		TOTAL	14	0	12	-	220	430	18

*   Students be encouraged to go to Industrial Training/Internship for at least 2-3 months during semester break. **List of Audit Courses -1&2**

Code	Subjects
19EGA101	English for research paper writing
19CEA101	Disaster mitigation and management
19EEA101	Sanskrit for technical knowledge
19ECA101	Value education
19EGA102	Indian constitution & fundamental rights
19ITA101	Pedagogy studies
19EGA103	Stress Management by Yoga
19 EGA104	Personality Development through Life Enlightenment Skills.

III-SEMESTER

S.No	Course Code	Title of the Course	Scheme of Instruction Hours per Week			Duration of SEE in Hours	Scheme of Examination Maximum Marks		Credits
			L	T	P		CIE	SEE	
THEORY									
1	19CSEXXX	Elective V	3	0	0	3	30	70	3
2	19CSXXX	Open Elective	3	0	0	3	30	70	3
3	19CSC 108	Dissertation Phase – I	0	0	20		100		10
		TOTAL	6	0	20	-	160	140	16

ELECTIVE-V	
19CSE119	Mobile Applications and Services
19CSE120	Compiler for HPC
19CSE121	Open Source Technologies
NPTEL Courses**	Software Project Management
	Natural Language Processing
	Block Chain Architecture Design and Use cases
	Social Networks
	Virtual Reality

Open ELECTIVE-VI	
19CSO 101	Business Analytics
19MEO 101	Industrial Safety
19MEO 102	Introduction to Optimization Techniques
19CEO101	Cost Management of Engineering Projects
19MEO103	Composite Materials
19EEO101	Waste to Energy
19PYO 01	History of Science and Technology

Students going for Internship / Industrial project, may complete these courses through NPTEL/ MOOCs

IV - SEMESTER

S.No	Course Code	Title of the Course	Scheme of Instruction Hours per Week			Duration of SEE in Hours	Scheme of Examination Maximum Marks		Credits
			L	T	P		CIE	SEE	
THEORY									
1	19CSC 109	Dissertation Phase – II	0	0	32	3	100	100	16
		TOTAL	0	0	32	-	100	100	16

SCHEME OF INSTRUCTION AND EXAMINATION

M.Tech – I YEAR

COMPUTER NETWORKS AND INFORMATION SECURITY

SEMESTER-I

Sl. No.	Syllabus Ref. No.	Subject	Scheme of Instruction Period per Week		Scheme of Examination	Maximum Marks	
			L/T	D/P	Duration in Hours	Univ. Exam	Sessi-onals
		THEORY					
1.		CORE-I	3		3	80	20
2.		CORE-II	3		3	80	20
3.		CORE-III	3		3	80	20
4.		CORE-IV	3		3	80	20
5.		ELECTIVE-I	3		3	80	20
6.		ELECTIVE-II	3		3	80	20
		PRACTICALS					
1.	IT 5131	Software Lab- I (Cryptography and Networks)	-	3	-	-	50
2.	IT 5132	Seminar-I	-	3	-	-	50
		TOTAL	18	6	-	480	220

Core Subjects
IT 5101 Number Theory
IT 5102 Advanced Algorithms
IT 5103 Advanced Computer Networks
IT 5104 Cryptography and Network Security
IT 5105 Information Systems Security
IT 5106 Database Security

Elective I & II
IT 6101 Advanced Operating Systems
IT 6102 Distributed Databases
IT 6103 Machine Learning
IT 6104 Distributed Systems
IT 6105 Information Retrieval Systems
IT 6106 Web Engineering
IT 6107 Software Reuse Techniques
IT 6108 Human Computer Interaction

SCHEME OF INSTRUCTION AND EXAMINATION

M.Tech – I YEAR

COMPUTER NETWORKS AND INFORMATION SECURITY

SEMESTER-II

Sl. No.	Syllabus Ref. No.	Subject	Scheme of Instruction		Scheme of Examination		
			Period per Week		Duration in Hours	Maximum Marks	
			L/T	D/P		Univ. Exam	Sessi-onals
		THEORY					
1.		CORE-V	3		3	80	20
2.		CORE-VI	3		3	80	20
3.		ELECTIVE-III	3		3	80	20
4.		ELECTIVE-IV	3		3	80	20
5.		ELECTIVE-V	3		3	80	20
6.		ELECTIVE-VI	3		3	80	20
		PRACTICALS					
1.	IT 5141	Software Lab- II (Advanced Algorithms &Database Security)	-	3	-	-	50
2.	IT 5142	Seminar-II	-	3	-	-	50
		TOTAL	18	6	-	480	220

Elective III & IV
IT 6111 Data Hiding
IT 6112 Electronic Commerce
IT 6113 Soft Computing
IT 6114 Data Mining
IT 6115 Grid Computing
IT 6116 Semantic Web
IT 6117 Mobile Adhoc and Sensor networks
IT 6118 Storage Management

Elective V & VI
IT 6121 Cloud Computing
IT 6122 Biometric Security
IT 6123 Forensic Computing
IT 6124 Software Quality & Testing
IT 6125 Simulation & Modeling
IT 6126 Digital Image Processing and
        Computer Vision
IT 6127 Web Mining
IT 6128 Software Project Management

SCHEME OF INSTRUCTION AND EXAMINATION

M.Tech – II YEAR

COMPUTER NETWORKS AND INFORMATION SECURITY

SEMESTER-III

Sl. No.	Syllabus Ref. No.	Subject	Scheme of Instruction		Scheme of Examination		
			Period per Week		Duration in Hours	Maximum Marks	
			L/T	D/P		Univ. Exam	Sessi-onals
1.	IT 9101	Dissertation+ Project Seminar	-	6	-	-	100*

* 50 Marks to be given by the guide
* 50 Marks to be give by Viva Committee which includes Head, Guide and an Examiner

With effect from Academic Year 2015 - 2016

SCHEME OF INSTRUCTION AND EXAMINATION

M.Tech – II YEAR

COMPUTER NETWORKS AND INFORMATION SECURITY

SEMESTER-IV

Sl. No.	Syllabus Ref. No.	Subject	Scheme of Instruction		Scheme of Examination		
			Period per Week		Duration in Hours	Maximum Marks	
			L/T	D/P		Univ. Exam	Sessi-onals
1.	IT 9102	Dissertation	-	6	-	*Grade	-

* Grade: Excellent/Very Good/Good/Satisfactory/Unsatisfactory

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY(A)
AICTE Model Curriculum (with effect from 2020-21)
M.Tech. (Artificial Intelligence and Data Science)

SEMESTER– I

S.No	Course Code	Title of the Course	Scheme of Instruction Hours per Week L/T	Scheme of Instruction Hours per Week P/D	Scheme of Examination Duration of SEE in Hours	Scheme of Examination Maximum Marks CIE	Scheme of Examination Maximum Marks SEE	Credits
THEORY								
1		Program Core-1	3	-	3	40	60	3
2		Program Core-2	3	-	3	40	60	3
3		Program Elective-1	3	-	3	40	60	3
4		Program Elective-2	3	-	3	40	60	3
5	20MEM103	Research Methodology and IPR	2	-	3	40	60	2
6		Audit Course-1	2	-	2	-	50	Non-Credit
PRACTICALS								
7		Laboratory-1 (Based on Core-1)	-	2	-	50	-	1
8		Laboratory-2 (Based on Core-2)	-	2	-	50	-	1
9		Laboratory-3 (Based on Elective-2)	-	4	-	50	-	2
		TOTAL	16	08	17	350	350	18

L: Lecture   T: Tutorial   D: Drawing   P: Practical
CIE - Continuous Internal Evaluation   SEE-Semester End Examination

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (A)
AICTE Model Curriculum (with effect from 2020-21)
M.Tech. (Artificial Intelligence and Data Science)

SEMESTER-II

S.No	Course Code	Title of the Course	Scheme of Instruction — Hours per Week — L/T	P/D	Scheme of Examination — Duration of SEE in Hours	Maximum Marks — CIE	SEE	Credits
THEORY								
1		Program Core-3	3	-	3	40	60	3
2		Program Core-4	3	-	3	40	60	3
3		Program Elective-3	3	-	3	40	60	3
4		Program Elective-4	3	-	3	40	60	3
5		Audit Course-2	2	-	2	-	50	Non-Credit
PRACTICALS								
6		Laboratory-4 (Based on Core-3)	-	2	-	50	-	1
7		Laboratory-5 (Based on Core-4)	-	2	-	50	-	1
8		Laboratory-6 (Based on Elective-4)	-	4	-	50	-	2
9	20ITC107	Mini Project with Seminar	-	4	-	50	-	2
		TOTAL	**14**	**12**	**14**	**360**	**290**	**18**

L: Lecture   T: Tutorial   D: Drawing   P: Practical
CIE-Continuous Internal Evaluation   SEE-Semester End Examination

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (A)
AICTE Model Curriculum (with effect from 2020-21)
M.Tech. (Artificial Intelligence and Data Science)

SEMESTER–III

S.No	Course Code	Title of the Course	Scheme of Instruction		Scheme of Examination			Credits
			Hours per Week		Duration of SEE in Hours	Maximum Marks		
			L/T	P/D		CIE	SEE	
THEORY								
1		Program Elective-5	3	-	3	40	60	3
2		Open Elective	3	-	3	40	60	3
PRACTICALS								
3	20ITC108	Dissertation/Phase-I	-	20	-	100	-	10
TOTAL			6	20	6	180	120	16

SEMESTER–IV

S.No	Course Code	Title of the Course	Scheme of Instruction		Scheme of Examination			Credits
			Hours per Week		Duration of SEE in Hours	Maximum Marks		
			L/T	P/D		CIE	SEE	
PRACTICALS								
1	20ITC109	Dissertation/Phase-II	-	32	Viva-Voce	100	100	16
TOTAL			-	32	-	100	100	16

L: Lecture   T: Tutorial   D: Drawing   P: Practical
CIE-Continuous Internal Evaluation   SEE-Semester End Examination

Total No. of Credits: 68

LIST OF COURSES

S.No	Code	Course	Credits
Program Core Courses			
1.	20MTC101	Mathematical Foundations of Data Science	3
2.	20ITC101	Artificial Intelligence	3
3.	20ITC102	Introduction to Data Science	3
4.	20ITC103	Machine Learning	3
Mandatory Courses			
5.	20MEM103	Research Methodology and IPR	2
Program Elective-1, Elective-3 and Elective-5 Courses (without Lab)			
6.	20ITE101	Soft Computing	3
7.	20ITE102	Cloud Computing	3
8.	20ITE103	Information Retrieval Systems	3
9.	20ITE104	Time Series Analysis & Forecasting	3
10.	20ITE105	Social Network Analytics	3
11.	20ITE106	Block Chain Technology	3
12.	20ITE107	Intelligent Bio Informatics	3
13.	20ITE108	Recommender Systems	3
14.	20ITE109	Reinforcement Learning	3
15.	20ITE110	GPU Computing	3
16.	20ITE111	Scalable Algorithms and Systems for Data Analysis	3
Program Elective-2 and Elective-4 Courses (with Lab)			
17.	20ITE112	Digital Image Processing and Analysis	3
18.	20ITE113	Cyber Security	3
19.	20ITE114	Big Data Analytics	3
20.	20ITE115	Augmented and Virtual Reality	3
21.	20ITE116	Predictive Analytics with R	3
22.	20ITE117	Natural Language Processing	3
23.	20ITE118	Robotic Process Automation	3
24.	20ITE119	Deep Learning	3
25.	20ITE120	Internet of Things	3
26.	20ITE121	Advanced Algorithms	3
Audit Course – 1 and 2			
27.	20EGA101	English for Research Paper Writing	0
28.	20CEA101	Disaster Mitigation and Management	0
29.	20EEA101	Sanskrit for Technical Knowledge	0
30.	20ECA101	Value Education	0
31.	20EGA102	Indian Constitution and Fundamental Rights	0
32.	20ITA101	Pedagogy Studies	0
33.	20EGA103	Stress Management by Yoga	0
34.	20EGA104	Personality Development Through Life's Enlightenment Skills	0
Open Elective Courses			
35.	20CSO101	Business Analytics	3
36.	20MEO102	Introduction to Optimization Techniques	3
37.	20CEO101	Cost Management of Engineering Projects	3
38.	20MEO101	Industrial Safety	3
39.	20MEO103	Composite Materials	3
40.	20EEO101	Waste to Energy	3
Labs, Seminars & Projects			
Laboratory-1 and Laboratory-3 (Based on Core Courses)			
41.	20MTC102	Mathematical Foundations of Data Science Lab	1
42.	20ITC104	Artificial Intelligence Lab	1
43.	20ITC105	Introduction to Data Science Lab	1
44.	20ITC106	Machine Learning Lab	1

Laboratory-2 and Laboratory-4 **(Based on Elective-2 and Elective-4 Courses)***			
45.	20ITE122	Digital Image Processing and Analysis Lab	2
46.	20ITE123	Cyber Security Lab	2
47.	20ITE124	Big Data Analytics Lab	2
48.	20ITE125	Augmented and Virtual Reality Lab	2
49.	20ITE126	Predictive Analytics in R Lab	2
50.	20ITE127	Natural Language Processing Lab	2
51.	20ITE128	Robotic Process Automation Lab	2
52.	20ITE129	Deep Learning Lab	2
53.	20ITE130	Internet of Things Lab	2
54.	20ITE131	Advanced Algorithms Lab	2
Seminar and Projects			
55.	20ITC107	Mini Project with Seminar	2
56.	20ITC108	Dissertation Phase-I	10
57.	20ITC109	Dissertation Phase-II	16

* Lab courses for Laboratory-2 and Laboratory-4 must be in one-to-one correspondence with the Elective courses opted in Program Elective-2 and Program Elective-4, respectively.

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY(A)
Choice Based Credit System (with effect from 2016-17)
MCA (Master of Computer Applications)

SEMESTER - I

S.No	Course Code	Title of the Course	Scheme of Instruction Hours per week L/T	Scheme of Instruction Hours per week P/S	Scheme of Examination Duration of SEE in Hours	Scheme of Examination Maximum Marks CIE	Scheme of Examination Maximum Marks SEE	Credits
THEORY
1	16MCC101	Discrete Mathematics	3/1	-	3	30	70	4
2	16MCC102	Computer Programming and Problem Solving	3/1	-	3	30	70	4
3	16MCC103	Elements Of Information Technology	3/1	-	3	30	70	4
4	16MBC128	Managerial Economics and Financial Analysis	3	-	3	30	70	3
5	16EGC101	Professional Communication in English	3	-	3	30	70	3
PRACTICALS
6	16MCC104	Computer Programming Lab Using C	-	3	3	25	50	2
7	16MCC105	Elements of Information Technology Lab	-	3	3	25	50	2
8	16EGC102	Professional Communication Lab	-	3	3	25	50	2
		TOTAL	18	9	-	225	500	24

L: Lecture   T: Tutorial   P: Practical   S: Seminar
CIE: Continuous Internal Evaluation   SEE: Semester End Examination

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY(A)
Choice Based Credit System (with effect from 2016-17)
MCA (Master of Computer Applications)

SEMESTER-II

S.No	Course Code	Title of the Course	Scheme of Instruction Hours per week L/T	Scheme of Instruction Hours per week P/S	Scheme of Examination Duration of SEE in Hours	Scheme of Examination Maximum Marks CIE	Scheme of Examination Maximum Marks SEE	Credits
THEORY
1	16MCC106	Object Oriented Programming(OOP)	3/1	-	3	30	70	4
2	16MCC107	Computer Organization	3/1	-	3	30	70	4
3	16MCC108	Software Engineering	3/1	-	3	30	70	4
4	16MCC109	Data Structures Using C++	3/1	-	3	30	70	4
5	16MCC110	Operations Research	3/1		3	30	70	4
6	16MTC102	Probability and Statistics	3/1	-	3	30	70	4
PRACTICALS
7	16MCC111	Object Oriented Programming Lab Using Java	-	3	3	25	50	2
8	16MCC112	Data Structures Lab Using C++	-	3	3	25	50	2
\multicolumn{3}{c}{TOTAL}	24	6	-	230	520	28

L: Lecture   T: Tutorial   P: Practical   S: Seminar
CIE: Continuous Internal Evaluation   SEE: Semester End Examination

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SEMESTER - III

S.No	Course Code	Title of the Course	Scheme of Instruction Hours per week L/T	Scheme of Instruction Hours per week P/S	Scheme of Examination Duration of SEE in Hours	Scheme of Examination Maximum Marks CIE	Scheme of Examination Maximum Marks SEE	Credits
		THEORY						
1	16MCC113	Database Management Systems	3/1	-	3	30	70	4
2	16MCC114	Web Technologies	3/1	-	3	30	70	4
3	16MCC115	Design and Analysis of Algorithms	3/1	-	3	30	70	4
4	16MCC116	Operating Systems	3/1	-	3	30	70	4
5	16MBC04/ 16CEC03 / 16MEE20/ 16CEE21	Open Elective	3	-	3	30	70	3
		PRACTICALS						
6	16MCC117	Database Management Systems Lab	-	3	3	25	50	2
7	16MCC118	Web Technologies Lab	-	3	3	25	50	2
8	16MCC119	Operating Systems Lab	-	3	3	25	50	2
	TOTAL		19	9	-	225	500	25

L: Lecture   T: Tutorial   P: Practical   S: Seminar
CIE: Continuous Internal Evaluation   SEE: Semester End Examination

Open Elective	
16MB C04	Organizational Behavior
16CE C03	Human Values and Professional Ethics
16ME E20	Entrepreneurship
16CE E21	Disaster Mitigation and Management

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SEMESTER - IV

S.No	Course Code	Title of the Course	Scheme of Instruction		Scheme of Examination			Credits
			Hours per week		Duration of SEE	Maximum Marks		
			L/T	P/S	in Hours	CIE	SEE	
THEORY								
1	16MCC120	Computer Networks	3/1	-	3	30	70	4
2	16MCC121	Data warehousing and Data Mining	3/1	-	3	30	70	4
3	16MCC122	Advanced Java Programming	3/1	-	3	30	70	4
4	16MCE101 / 102/103/104	Elective-I	3	-	3	30	70	3
5	16MCE105/ 106/107/108	Elective-II	3	-	3	30	70	3
PRACTICALS								
6	16MCC123	Computer Networks Lab	-	3	3	25	50	2
7	16MCC124	Data warehousing and Data Mining Lab	-	3	3	25	50	2
8	16MCC125	Mini Projects	-	3	3	25	50	2
TOTAL			18	9	-	225	500	24

L: Lecture   T: Tutorial   P: Practical   S: Seminar
CIE: Continuous Internal Evaluation   SEE: Semester End Examination

Elective – I	
16MCE101	Microprocessor
16MCE102	Software Testing
16MCE103	Artificial Neural Networks
16MCE104	Principles of Multimedia

Elective – II	
16MCE105	Advanced Operating Systems
16MCE106	Cloud Computing
16MCE107	Software Project Management
16MCE108	Pattern Recognition

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V-SEMESTER

S. No	Course Code	Title of Course	Scheme of Instruction		Scheme of Examination			Credits
			Hours per week		Duration of SEE in Hours	Maximum Marks		
			L/T	P/S		CIE	SEE	
THEORY								
1.	16MC C126	Object Oriented System Development(OOSD)	3/1	--	3	30	70	4
2.	16MC C127	Machine Learning	3/1	--	3	30	70	4
3.	16MC C128	Cryptography & Network Security	3/1	--	3	30	70	4
4.	16MC E109/ 110/ 111 /112	Elective-3	3	--	3	30	70	3
5.	16MC E113/ 114/ 115 /116	Elective-4	3	--	3	30	70	3
PRACTICALS								
6.	16MC C129	Object Oriented System Development Lab	--	3	3	25	50	2
7.	16MC C130	Machine Learning Lab using Python	--	3	3	25	50	2
8.	16MC C131	Seminar	--	3	--	50	--	2
		Total	**18**	**9**		**250**	**450**	**24**

CIE: Continuous Internal Evaluation　　　SEE: Semester End Examination
L: Lecture　　　　　　T: Tutorial　　　P: Practical　　　S: Seminar

Elective – 3

Subject Code	Subject Title
16MC E109	Distributed Systems
16MC E110	Internet of Things
16MC E111	Business Intelligence and Analytics
16MC E112	Middleware Technologies

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Elective – 4

Subject Code	Subject Title
16MC E113	Big Data Analytics
16MC E114	E-Commerce
16MC E115	Mobile Computing
16MC E116	Cyber Forensics

VI-SEMESTER

S. No	Course Code	Title of Course	Scheme of Examination Maximum Marks		Credits
			CIE	SEE	
1.	16MC C132	Major Project Work	100	100	12
		Total	**100**	**100**	**12**

CIE: Continuous Internal Evaluation   SEE: Semester End Examination
L: Lecture   T: Tutorial   P: Practical   S: Seminar

SCHEME OF INSTRUCTION AND EXAMINATION

MBA COURSE
I SEMESTER

S. No.	Course Code	Title of the Course	Scheme of Instruction Hours per week L/T	Scheme of Instruction Hours per week P/D	Scheme of Examinations Duration in Hour	Scheme of Examinations Maximum Marks CIE	Scheme of Examinations Maximum Marks SEE	Credits
1.	16MB C101	Principles of Management	3	-	3	30	70	3
2.	16MB C102	Managerial Economics	3	-	3	30	70	3
3.	16MB C103	Financial Accounting and Analysis	3	-	3	30	70	3
4.	16MB C104	Marketing Management	3	-	3	30	70	3
5.	16MB C105	Statistics for Management	3	-	3	30	70	3
6.	16MB C106	Business Communication	3	-	3	30	70	3
7.	16MB C107	Business Law	3	-	3	30	70	3
8.	16MB C108	Information Technology Applications for Business	3	-	3	30	70	3
9.	16MB C109	InformationTechnology (IT) Lab		2	2	15	35	1
10.	16EG C103	Soft Skills Lab	-	2	2	15	35	1
			24	4	28	270	630	26

L:Lecture   T:Tutorial   D:Drawing   P:Practical

CIE- Continous Internal Evaluation   SEE:Semester End Examination

SCHEME OF INSTRUCTION AND EXAMINATION
MBA COURSE
II- SEMESTER

S. No.	Course Code	Title of the Course	Scheme of Instruction Hours per week		Scheme of Examinations			Credits
			L/T	P/D	Duration in Hour	Maximum Marks		
						CIE	SEE	
1.	16MB C110	Organisation Behaviour	3	-	3	30	70	3
2.	16MB C111	Business Environment and Ethics	3	-	3	30	70	3
3.	16MB C112	Human Resource Management	3	-	3	30	70	3
4.	16MB C113	Financial Management	3	-	3	30	70	3
5.	16MB C114	Business Research Methods	3	-	3	30	70	3
6.	16MB C115	Operations Research	3	-	3	30	70	3
7.	16MB C116	Operations Management	3	-	3	30	70	3
8.	16MB C117	Business Analytics	3	-	3	30	70	3
9.	16MB C118	Statistical Software Lab		2	2	15	35	1
10.	16MB C119	Seminar	-	2	2	15	35	1
			24	4	28	270	630	26

L:Lecture   T:Tutorial   D:Drawing   P:Practical
CIE- Continous Internal Evaluation   SEE: Semester End Examination

SCHEME OF INSTRUCTION AND EXAMINATION
MBA COURSE
III- SEMESTER

S.No.	Course Code	Title of the Course	Scheme of Instruction Hours per week L/T	Scheme of Instruction Hours per week P/D	Scheme of Examination Duration in Hours	Scheme of Examination Maximum Marks CIE	Scheme of Examination Maximum Marks SEE	Credits
1.	16MB C120	Strategic Management Accounting	3	-	3	30	70	3
2.	16MB C121	International Business	3	-	3	30	70	3
3.	16MB C122	Strategic Management	3	-	3	30	70	3
4.	16MB E101 to 110	*Elective-1						
5.		Subject-1	3	-	3	30	70	3
6.		Subject-2	3	-	3	30	70	3
7.		*Elective-2						
8.		Subject-1	3	-	3	30	70	3
9.		Subject-2	3	-	3	30	70	3
10.	16EG C123	Project Proposal		2	2	50	-	1
			21	2	23	260	490	22

Note: * Electives are given in separate table

III SEMESTER ELECTIVES

Elective	Code	Subjects	Remarks
Finance (F)	16MB E101	Investment Management	Student, who would like to choose OM/ Systems as elective; should choose either OM or Systems.
	16MB E102	International Finance	
Human Resource (HR)	16MB E103	Performance and Compensation Management	
	16MB E104	Organizational Development and Change Management	
Marketing (M)	16MB E105	Product and Brand Management	
	16MB E106	Promotion and Distribution Management	
Operations Management (OM)	16MB E107	Total Quality Management	
	16MB E108	Technology Management	
Systems (SYS)	16MB E109	Relational Database Management System (* provision for 1 hr lab must be made out of 3 hrs)	
	16MB E110	E-Business	

SCHEME OF INSTRUCTION AND EXAMINATION
MBA COURSE
IV- SEMESTER

S.No.	Course Code	Title of the Course	Scheme of Instruction Hours per week		Scheme of Examination			Credits
			L/T	P/D	Duration in Hours	Maximum Marks CIE	SEE	
1.	16MB C124	Logistics and Supply Chain Management	3	-	3	30	70	3
2.	16MB C125	Entrepreneurial Development	3	-	3	30	70	3
3.	16MB E111 to E119	*Elective-1						
4.		Subject-1	3	-	3	30	70	3
5.		Subject-2	3	-	3	30	70	3
6.		*Elective-2						
7.		Subject-1	3	-	3	30	70	3
8.		Subject-2	3	-	3	30	70	3
9.	16MB C126	Comprehensive Viva	-	-	-	-	50	1
10.	16MB C127	Project Work	-	6	-	50	100	6
			18	6	18	230	570	25

Note : * Electives are given in separate table.

IV SEMESTER ELECTIVES

Elective	Code	Subjects	Remarks
Finance (F)	16MB E111	Financial Risk Management	Student, who
	16MB E112	Banking and Insurance	would like to
Human Resource (HR)	16MB E113	Industrial Relations and Labour Laws	choose OM/ Systems as
	16MB E114	Talent and Knowledge Management	elective, should choose either
Marketing (M)	16MB E115	Consumer Behaviour	OM or Systems.
	16MB E116	Services and Retail Marketing	
Operations	16MB E117	Service Operations Management	
Management(OM)	16MB E118	*Enterprise Resource Planning (ERP)	
Systems (SYS)	16MB E118	*Enterprise Resource Planning (ERP)	
	16MB E119	Cloud Computing and Internet of Things	

Note: * Enterprise Resource Planning (ERP): common subject for 'Operations Management' and 'Systems' Elective.