FOUR YEAR DEGREE COURSE IN CIVIL ENGINEERING
SEMESTER PATTERN (CREDIT GRADE SYSTEM)
SEMESTER - FIFTH

Appendix - A

			TEACHING SCHEME					EXAMINATION SCHEME								
			HOURS / WEEK			Total HOURS/WEEK	CREDITS		THEORY					PRACTICAL		
Sr. No.	Subject Code	Subject	Lecture	Tutorial	P/D			DURATION OF PAPER (Hr.)	MAX. MARKS THEORY PAPER	MAX. MARKS COLLEGE ASSESMENT	TOTAL	MIN. PASSING MARKS	MAX. MARKS		TOTAL	MIN. PASSING MARKS
													EXTERNAL	INTERNAL		
THEORY																
01	5CE01	Reinforced Cement Concrete-II	3	1	-	4	4	4	80	20	100	40	-	-	-	-
02	5CE02	Fluid Mechanics-II	3	1	-	4	4	3	80	20	100	40	-	-	-	-
03	5CE03	Building Planning & CAD	2	-	-	2	2	4	80	20	100	40	-	-	-	-
04	5CE04	Surveying-II	4	-	-	4	4	3	80	20	100	40	-	-	-	-
05	5FECE05	Free Elective-I	3	-	-	3	3	3	80	20	100	40	-	-	-	-
06	5CE06	Communication Skills	2	-	-	2	2	2	40	10	50	20	-	-	-	-
PRACTICALS / DRAWING / DESIGN																
07	5CE07	Fluid Mechanics-II - Lab	-	-	2	2	1	-	-	-	-	-	25	25	50	25
08	5CE08	Building Planning & CAD-lab	-	-	4	4	2	-	-	-	-	-	25	25	50	25
09	5CE09	Surveying-II - Lab	-	-	2	2	1	-	-	-	-	-	25	25	50	25
10	5CE10	Communication Skills-Lab	-	-	2	2	1	-	-	-	-	-	25	25	50	25
		Total	17	2	10	29	24				550				200	

GRAND TOTAL : 750

Free Elective I : (i) Introduction To Earthquake Engineering   (ii) Basics of Building Construction   (iii) Watershed Management

SEMESTER : SIXTH

THEORY																
01	6CE01	Numerical Methods & Computer Programming	4	-	-	4	4	3	80	20	100	40	-	-	-	-
02	6CE02	Structural Design-I	4	-	-	4	4	4	80	20	100	40	-	-	-	-
03	6CE03	Water Resources Engineering-I	3	-	-	3	3	3	80	20	100	40	-	-	-	-
04	6CE04	Transporation Engineering-II	3	1	-	4	4	3	80	20	100	40	-	-	-	-
05	6FECE05	Free Elective-II	3	-	-	3	3	3	80	20	100	40	-	-	-	-
06	6CE06	Estimating & Costing	3	1	-	4	4	4	80	20	100	40	-	-	-	-
PRACTICALS / DRAWING / DESIGN																
07	6CE07	Numerical Methods & Computer Programming - Lab	-	-	2	2	1	-	-	-	-	-	25	25	50	25
08	6CE08	Structural Design-I - Lab	-	-	2	2	1	-	-	-	-	-	25	25	50	25
09	6CE09	Estimating & Costing-Lab	-	-	2	2	1	-	-	-	-	-	25	25	50	25
10	6CE10	Minor Project - Lab	-	-	2	2	1	-	-	-	-	-	25	25	50	25
		Total	18	2	10	30	26				600				200	

GRAND TOTAL : 800

Free Elective II : (i) Disaster Management   (ii) Environmental Management

Note: Students will have to opt the Free Electives offered from other courses of their College / Institution / University Department.

FOUR YEAR DEGREE COURSE IN MECHANICAL ENGINEERING
SEMESTER PATTERN (CREDIT GRADE SYSTEM)
SEMESTER - FIFTH

Appendix - B

Sr. No.	Subject Code	Subject	Lecture	Tutorial	P/D	Total HOURS/WEEK	CREDITS	DURATION OF PAPER (Hr.)	MAX. MARKS THEORY PAPER	MAX. MARKS COLLEGE ASSESMENT	TOTAL	MIN. PASSING MARKS	EXTERNAL	INTERNAL	TOTAL	MIN. PASSING MARKS
			TEACHING SCHEME					EXAMINATION SCHEME								
			HOURS / WEEK					THEORY					PRACTICAL			
													MAX. MARKS			
THEORY																
01	5ME01	Production Technology	4	-	-	4	4	3	80	20	100	40	-	-	-	-
02	5ME02	Heat Transfer	4	1	-	5	5	3	80	20	100	40	-	-	-	-
03	5ME03	Measurement Systems	4	-	-	4	4	3	80	20	100	40	-	-	-	-
04	5ME04	Theory of Machines-I	3	1	-	4	4	3	80	20	100	40	-	-	-	-
05	5FEME05	Free Elective-I	3	-	-	3	3	3	80	20	100	40	-	-	-	-
PRACTICALS / DRAWING / DESIGN																
06	5ME06	Production Technology-Lab	-	-	2	2	1	-	-	-	-	-	25	25	50	25
07	5ME07	Heat Transfer-Lab	-	-	2	2	1	-	-	-	-	-	25	25	50	25
08	5ME08	Measurement Systems-Lab	-	-	2	2	1	-	-	-	-	-	-	25	25	12
09	5ME09	Theory of Machines-I-Lab	-	-	2	2	1	-	-	-	-	-	25	25	50	25
10	5ME10	Computer Software Applications-I-Lab	-	-	2	2	2	-	-	-	-	-	25	25	50	25
		Total	18	2	10	30	26				500				225	

GRAND TOTAL : 725

Free Elective-I 1) Manufacturing Techniques 2) Ergonomics 3) Production Management 4) Project Management

SEMESTER : SIXTH

Sr. No.	Subject Code	Subject	Lecture	Tutorial	P/D	Total HOURS/WEEK	CREDITS	DURATION OF PAPER (Hr.)	MAX. MARKS THEORY PAPER	MAX. MARKS COLLEGE ASSESMENT	TOTAL	MIN. PASSING MARKS	EXTERNAL	INTERNAL	TOTAL	MIN. PASSING MARKS
THEORY																
01	6ME01	Fluid Power-II	4	1	-	5	5	3	80	20	100	40	-	-	-	-
02	6ME02	Computer Software Applications	3	-	-	3	3	3	80	20	100	40	-	-	-	-
03	6ME03	Control System Engineering	4	-	-	4	4	3	80	20	100	40	-	-	-	-
04	6ME04	Theory of Machines-II	4	1	-	5	5	3	80	20	100	40	-	-	-	-
05	6FEME05	Free Elective-II	3	-	-	3	3	3	80	20	100	40	-	-	-	-
06	6ME06	Communication Skills	2	-	-	2	2	2	40	10	50	20	-	-	-	-
PRACTICALS / DRAWING / DESIGN																
07	6ME07	Fluid Power-II-Lab	-	-	2	2	1	-	-	-	-	-	25	25	50	25
08	6ME08	Computer Software Applications-II-Lab	-	-	2	2	1	-	-	-	-	-	25	25	50	25
09	6ME09	Theory of Machines-II-Lab	-	-	2	2	1	-	-	-	-	-	25	25	50	25
10	6ME10	Communication Skills-Lab	-	-	2	2	2	-	-	-	-	-	25	25	50	25
		Total	20	2	8	30	26				550				200	

GRAND TOTAL : 750

Free Elective-II 1) Automobile Engineering 2) Non-conventional Energy Systems 3) Energy Management

Note : Students will have to opt the free electives offered from other courses of their College / Institution / University Department

FOUR YEAR DEGREE COURSE IN BACHELOR OF ENGINEERING
BRANCH : INFORMATION TECHNOLOGY - SEMESTER PATTERN (CREDIT GRADE SYSTEM)
SEMESTER - FIFTH

Appendix - G

Sr. No.	Subject Code	Subject	TEACHING SCHEME					EXAMINATION SCHEME									
			HOURS / WEEK			Total HOURS/WEEK	CREDITS	THEORY					PRACTICAL				
			Lecture	Tutorial	PID			DURATION OF PAPER (Hr.)	MAX. MARKS THEORY PAPER	MAX. MARKS COLLEGE ASSESMENT	TOTAL	MIN. PASSING MARKS	MAX. MARKS		TOTAL	MIN. PASSING MARKS
													EXTERNAL	INTERNAL		
THEORY																
01	5IT01	Operating Systems	4	–	–	4	4	3	80	20	100	40	–	–	–	–
02	5IT02	Digital Integrated Circuits	4	–	–	4	4	3	80	20	100	40	–	–	–	–
03	5IT03	Computer Architecture & Organisation	4	–	–	4	4	3	80	20	100	40	–	–	–	–
04	5IT04	Communication Skills	2	–	–	2	2	2	40	10	50	20	–	–	–	–
05	5FEIT05	Free Elective I*	3			3	3	3	80	20	100	40	–	–	–	–
PRACTICALS / DRAWING / DESIGN																
06	5IT06	Operating Systems-Lab	–	–	2	2	1	–	–	–	–	–	25	25	50	25
07	5IT07	Digital Integrated Circuits-Lab	–	–	2	2	1	–	–	–	–	–	25	25	50	25
08	5IT08	Communication Skills-Lab	–	–	2	2	1	–	–	–	–	–	25	25	50	25
09	5IT09	Computer Lab-III (VC++)	1	––	2	3	2	–	–	–	–	–	25	25	50	25
		TOTAL	18	––	8	26	22				450				200	
														TOTAL	650	

Free Elective I* (i) Introduction to Computer Networks (ii) IT Ethics & Practices

		Semester : SIXTH														
THEORY																
01	6IT01	Principles of Management	4	–	–	4	4	3	80	20	100	40	–	–	–	–
02	6IT02	Database Management Systems	4	–	–	4	4	3	80	20	100	40	–	–	–	–
03	6IT03	Theory of Computation	4	–	–	4	4	3	80	20	100	40	–	–	–	–
04	6IT04	Computer Networks	4	–	–	4	4	3	80	20	100	40	–	–	–	–
05	6FEIT05	Free Elective II*	3	–	–	3	3	3	80	20	100	40	–	–	–	–
PRACTICALS / DRAWING / DESIGN																
06	6IT06	Database Management Systems-Lab	–	–	2	2	1	–	–	–	–	–	25	25	50	25
07	6IT07	Computer Networks-Labs	–	–	2	2	1	–	–	–	–	–	25	25	50	25
08	6IT08	Computer Lab-IV (UML)	1	–	2	3	2	–	–	–	–	–	25	25	50	25
		TOTAL	20	–	6	26	23				500				150	
														TOTAL	650	

Free Elective II* (i) E Commerce (ii) Knowledge Management

Note : Students will have to opt the free electives offered from other courses of their College / Institution / University Department

FOUR YEAR DEGREE COURSE IN BACHELOR OF ENGINEERING
BRANCH - CIVIL ENGINEERING -SEMESTER PATTERN(CREDIT GRADE SYSTEM)

SEMESTER- SEVENTH   **Appendix - A**

Sr. No.	Subject Code	Subject	Lecture	Tutorial	P/D	Total HOURS/WEEK	CREDITS	DURATION OF PAPER (Hr.)	MAX. MARKS THEORY PAPER	MAX. MARKS COLLEGE ASSESMENT	TOTAL	MIN. PASSING MARKS	EXTERNAL	INTERNAL	TOTAL	MIN. PASSING MARKS
THEORY																
01	7CE01	Theory of Stuctures-II	3	1	-	4	4	3	80	20	100	40	-	-	-	-
02	7CE02	Geotechnical Engineering-II	3	1	-	4	4	3	80	20	100	40	-	-	-	-
03	7CE03	Structural Design-II	4	-	-	4	4	4	80	20	100	40	-	-	-	-
04	7CE04	Environmental Engineering-I	4	-	-	4	4	3	80	20	100	40	-	-	-	-
05	7CE05	Professional Electve-I	4	-	-	4	4	3	80	20	100	40	-	-	-	-
PRACTICALS / DRAWING / DESIGN																
06	7CE06	Theory of Stuctures-II - Lab	-	-	2	2	1	-	-	-	-	-	25	25	50	25
07	7CE07	Geotechnical Engineering-II - Lab	-	-	2	2	1	-	-	-	-	-	25	25	50	25
08	7CE08	Structural Design-II - Lab	-	-	2	2	1	-	-	-	-	-	25	25	50	25
09	7CE09	Project & Seminar	-	-	2	2	4	-	-	-	-	-	-	50	50	25
		Total	18	2	8	28	27				500				200	
											GRAND TOTAL : 700					

Professional Electve-I (i) Advanced Water Treatment (ii) Advanced Geotechnical Engineering (iii) Water Power Engineering (iv) Prestressed Concrete (v) Artificial Neural Network & Fuzzy Logic (vi) Advanced Concrete Technology (vii) Environmental Pollution & Rural Sanitation (viii) Advanced Earthquake Engineernig

SEMESTER : EIGHTH

Sr. No.	Subject Code	Subject	Lecture	Tutorial	P/D	Total HOURS/WEEK	CREDITS	DURATION OF PAPER (Hr.)	MAX. MARKS THEORY PAPER	MAX. MARKS COLLEGE ASSESMENT	TOTAL	MIN. PASSING MARKS	EXTERNAL	INTERNAL	TOTAL	MIN. PASSING MARKS
THEORY																
01	8CE01	Water Resources Engineering-II	3	-	-	3	3	3	80	20	100	40	-	-	-	-
02	8CE02	Environmental Engineering-II	3	-	-	3	3	3	80	20	100	40	-	-	-	-
03	8CE03	Project Planning & Management	3	-	-	3	3	3	80	20	100	40	-	-	-	-
04	8CE04	Professional Electve-II	4	-	-	4	4	3	80	20	100	40	-	-	-	-
PRACTICALS / DRAWING / DESIGN																
05	8CE05	Water Resources Engineering-II-Lab	-	-	2	2	1	-	-	-	-	-	25	25	50	25
06	8CE06	Environmental Engineering-II - Lab	-	-	2	2	1	-	-	-	-	-	25	25	50	25
07	8CE07	Project & Seminar	-	-	6	6	12	-	-	-	-	-	75	75	150	75
		Total	13		10	23	27				400				250	
											GRAND TOTAL : 650					

Professional Electve-II *(i) Advanced Design of Steel Structures (ii) Advanced Waste Water and Industrial Waste Treatment (iii) Finite Element Method (iv) Dam Engineering (v) Advanced Engineering Geology (vi) Matrix Computer Analysis of Structures (vii) Advanced Structural Analysis (viii) Rock Mechanics *(ix) Advanced Design of RCC Structures
PAPER 4 HOURS DURATION.

FOUR YEAR DEGREE COURSE IN BACHELOR OF ENGINEERING
BRANCH - MECHANICAL ENGINEERING - SEMESTER PATTERN (CREDIT GRADE SYSTEM)

SEMESTER - SEVENTH
Appendix - B

			TEACHING SCHEME					EXAMINATION SCHEME								
			HOURS / WEEK					THEORY					PRACTICAL			
														MAX. MARKS			
Sr. No.	Subject Code	Subject	Lecture	Tutorial	P/D	Total HOURS/WEEK	CREDITS	DURATION OF PAPER (Hrs.)	MAX. MARKS THEORY PAPER	MAX. MARKS COLLEGE ASSESSMENT	TOTAL	MIN. PASSING MARKS	EXTERNAL	INTERNAL	TOTAL	MIN. PASSING MARKS
THEORY																
01	7ME01	Machine Design & Drawing-II	3	-	-	3	3	4	80	20	100	40	-	-	-	-
02	7ME02	Energy Conversion-II	3	1	-	4	4	3	80	20	100	40	-	-	-	-
03	7ME03	Industrial Management and Costing	3	1	-	4	4	3	80	20	100	40	-	-	-	-
04	7ME04	Automation Engineering	3	1	-	4	4	3	80	20	100	40	-	-	-	-
05	7ME05	Professional Elective-I	3	1	-	4	4	3	80	20	100	40	-	-	-	-
PRACTICALS / DRAWING / DESIGN																
06	7ME06	Project & Seminar	-	-	2	2	4	-	-	-	-	-	-	50	50	25
07	7ME07	Machine Design & Drawing-II-Lab.	-	-	2	2	1	-	-	-	-	-	25	25	50	25
08	7ME08	Energy Conversion-II-Lab	-	-	2	2	1	-	-	-	-	-	25	25	50	25
09	7ME09	Automation Engineering-Lab	-	-	2	2	1	-	-	-	-	-	25	25	50	25
10	7ME10	Professional Elective-I - Lab	-	-	2	2	1	-	-	-	-	-	25	25	50	25
		Total	15	4	10	29	27				500					250	

GRAND TOTAL : 750

Professional Elective-I (1) Non Conventional Energy System (2) Tool Engineering (3) Artificial Intelligence & Expert Systems (4) Mechatronics

SEMESTER : EIGHTH

THEORY																
01	8ME01	Elective-II	3	-	-	3	3	3	80	20	100	40	-	-	-	-
02	8ME02	Elective-III	3	-	-	3	3	3	80	20	100	40	-	-	-	-
03	8ME03	I.C. Engines	3	-	-	3	3	3	80	20	100	40	-	-	-	-
04	8ME04	Opertaions Research Techniques	3	-	-	3	3	3	80	20	100	40	-	-	-	-
PRACTICALS / DRAWING / DESIGN																
05	8ME05	Project & Seminar	-	-	6	6	12	-	-	-	-	-	75	75	150	75
06	8ME06	Professional Elective-III-Lab	-	-	2	2	1	-	-	-	-	-	25	25	50	25
07	8ME07	I.C. Engines-Lab	-	-	2	2	1	-	-	-	-	-	25	25	50	25
08	8ME08	Opertaions Research Techniques-Lab	-	-	2	2	2	-	-	-	-	-	25	25	50	25
		Total	12	-	12	24	27				400					300	

GRAND TOTAL : 700

Professional Elective-II (1) Automobile Engineering (2) Production Planning & Control (3) Management Information Systems (4) Advanced Manufacturing Systems
Professional Elective-III 1) Refrigeration & Air Conditioning 2) Machine Tool Design 3) Finite Element Methods 4) Robotics

FOUR YEAR DEGREE COURSE IN BACHELOR OF ENGINEERING
BRANCH : INFORMATION TECHNOLOGY - SEMESTER PATTERN (CREDIT GRADE SYSTEM)

Appendix - H

SEMESTER - SEVENTH

			TEACHING SCHEME					EXAMINATION SCHEME								
			HOURS / WEEK						THEORY					PRACTICAL			
Sr. No.	Subject Code	Subject	Lecture	Tutorial	P/D	Total HOURS/WEEK	CREDITS	DURATION OF PAPER (Hr.)	MAX. MARKS THEORY PAPER	MAX. MARKS COLLEGE ASSESMENT	TOTAL	MIN. PASSING MARKS	MAX. MARKS		TOTAL	MIN. PASSING MARKS
													EXTERNAL	INTERNAL		
THEORY																
01	7IT01	Digital Signal Processing	4	_	_	4	4	3	80	20	100	40	_	_	_	_
02	7IT02	Object Oriented System Analysis & Design	4	_	_	4	4	3	80	20	100	40	_	_	_	_
03	7IT03	Web Technology	4	_	_	4	4	3	80	20	100	40	_	_	_	_
04	7IT04	Real Time Embedded Systems	4	_	_	4	4	3	80	20	100	40	_	_	_	_
05	7IT05	Professional Elective I*	4	_	_	4	4	3	80	20	100	40	_	_	_	_
PRACTICALS / DRAWING / DESIGN																
06	7IT06	Digital Signal Processing-Lab	_	_	2	2	1	_	_	_	_	_	25	25	50	25
07	7IT07	Web Technology-Lab	_	_	2	2	1	_	_	_	_	_	25	25	50	25
08	7IT08	Real Time Embedded Systems-Lab	_	_	2	2	1	_	_	_	_	_	25	25	50	25
09	7IT09	Project & Seminar	_	_	2	2	4	_	_	_	_	_	_	50	50	25
		TOTAL	20	_	8	28	27				500				200	
														TOTAL	700	

Professional Elective I* (i) Distributed DBMS (ii) Modelling & Simulation (iii)Artificial Intelligence & Expert Systems (iv) Multimedia Technologies

			Semester :EIGHTH													
THEORY																
01	8IT01	Digital & Wireless Communication	3	_	_	3	3	3	80	20	100	40	_	_	_	_
02	8IT02	Network Administration & Security	3	_	_	3	3	3	80	20	100	40	_	_	_	_
03	8IT03	Software Engineering	3	_	_	3	3	3	80	20	100	40	_	_	_	_
04	8IT04	Professional Elective II*	3	_	_	3	3	3	80	20	100	40	_	_	_	_
PRACTICALS / DRAWING / DESIGN																
05	8IT05	Network Administration & Security-Lab	_	_	2	2	1	_	_	_	_	_	25	25	50	25
06	8IT06	Software Engineering-Lab	_	_	2	2	1	_	_	_	_	_	25	25	50	25
07	8IT07	Computer Lab-V (Content Management System)	_	_	2	2	1	_	_	_	_	_	25	25	50	25
08	8IT08	Project & Seminar	_	_	6	6	12	_	_	_	_	_	75	75	150	75
		TOTAL	12	_	12	24	27				400				300	
														TOTAL	700	

Professional Elective II* (i) Data Warehousing & Data Mining (ii) Web-Commerce (iii) Cloud Computing (iv) Neural Networks & Fuzzy Logics

Appendix-B

A Guide to Induction Program

1 Introduction

(Induction Program was discussed and approved for all colleges by AICTE in March 2017. It was discussed and accepted by the Council of IITs for all IITs in August 2016. It was originally proposed by a Committee of IIT Directors and accepted at the meeting of all IIT Directors in March 2016.1 This guide has been prepared based on the Report of the Committee of IIT Directors and the experience gained through its pilot implementation in July 2016 as accepted by the Council of IITs. Purpose of this document is to help institutions in understanding the spirit of the accepted Induction Program and implementing it.)

Engineering colleges were established to train graduates well in the branch/department of admission, have a holistic outlook, and have a desire to work for national needs and beyond.

The graduating student must have knowledge and skills in the area of his study. However, he must also have broad understanding of society and relationships. Character needs to be nurtured as an essential quality by which he would understand and fulfill his responsibility as an engineer, a citizen and a human being. Besides the above, several meta-skills and underlying values are needed.

There is a mad rush for engineering today, without the student determining for himself his interests and his goals. This is a major factor in the current state of demotivation towards studies that exists among UG students.

The success of gaining admission into a desired institution but failure in getting the desired branch, with peer pressure generating its own problems, leads to a peer environment that is demotivating and corrosive. Start of hostel life without close parental supervision at the same time, further worsens it with also a poor daily routine.

To come out of this situation, a multi-pronged approach is needed. One will have to work closely with the newly joined students in making them feel comfortable, allow them to explore their academic interests and activities, reduce competition and make them

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1A Committee of IIT Directors was setup in the 152nd Meeting of IIT Directors on 6th September 2015 at IIT Patna, on how to motivate undergraduate students at IITs towards studies, and to develop verbal ability. The Committee submitted its report on 19th January 2016. It was considered at the 153rd Meeting of all IIT Directors at IIT Mandi on 26 March 2016, and the accepted report came out on 31 March 2016. The Induction Program was an important recommendation, and its pilot was implemented by three IITs, namely, IIT(BHU), IIT Mandi and IIT Patna in July 2016. At the 50th meeting of the Council of IITs on 23 August 2016, recommendation on the Induction Program and the report of its pilot implementation were discussed and the program was accepted for all IITs.

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work for excellence, promote bonding within them, build relations between teachers and students, give a broader view of life, and build character.

2 Induction Program :

When new students enter an institution, they come with diverse thoughts, backgrounds and preparations. It is important to help them adjust to the new environment and inculcate in them the ethos of the institution with a sense of larger purpose. Precious little is done by most of the institutions, except for an orientation program lasting a couple of days.

We propose a 3-week long induction program for the UG students entering the institution, right at the start. Normal classes start only after the induction program is over. Its purpose is to make the students feel comfortable in their new environment, open them up, set a healthy daily routine, create bonding in the batch as well as between faculty and students, develop awarness, sensitivity and understanding of the self, people around them, society at large, and nature. 2

The time during the Induction Program is also used to rectify some critical lacunas, for example, English background, for those students who have deficiency in it.

The following are the activities under the induction program in which the student would be fully engaged throughout the day for the entire duration of the program.

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2Induction Program as described here borrows from three programs running earlier at different institutions: (1) Foundation Program running at IIT Gadhinagar since July 2011, (2) Human Values course running at IIIT Hyderabad since July 2005, and (3) Counselling Service or mentorship running at several IITs for many decades. Contribution of each one is described next.

(1) IIT Gandhinagar was the first IIT to recognize and implement a special 5-week Foundation Program for the incoming 1st year UG students. It took a bold step that the normal classes would start only after the five week period. It involved activities such as games, art, etc., and also science and other creative workshops and lectures by resource persons from outside.

(2) IIIT Hyderabad was the first one to implement a compulsary course on Human Values. Under it, classes were held by faculty through discussions in small groups of students, rather than in lecture mode. Moreover, faculty from all departments got involved in conducting the group discussions under the course. The content is non-sectarian, and the mode is dialogical rather than sermonising or lecturing. Faculty were trained beforehand, to conduct these discussions and to guide students on issues of life.

(3) Counselling at some of the IITs involves setting up mentor-mentee network under which 1st year students would be divided into small groups, each assigned a senior student as a student guide, and a faculty member as a mentor. Thus, a new student gets connected to a faculty member as well as a senior student, to whom he/she could go to in case of any difficulty whether psychological, financial, academic, or otherwise.

The Induction Program defined here amalgamates all the three into an integrated whole, which leads to its high effectiveness in terms of building physical activity, creativity, bonding, and character. It develops sensitivity towards self and one's relationships, builds awareness about others and society beyond the individual, and also in bonding with their own batch-mates and a senior student besides a faculty member. Scaling up the above amalgamation to an intake batch of 1000 plus students was done at IIT(BHU), Varanasi starting from July 2016.

2.1 Physical Activity :
This would involve a daily routine of physical activity with games and sports. It would start with all students coming to the field at 6 am for light physical exercise or yoga. There would also be games in the evening or at other suitable times according to the local climate. These would help develop team work. Each student should pick one game and learn it for three weeks. There could also be gardening or other suitably designed activity where labour yields fruits from nature.

2.2 Creative Arts :
Every student would chose one skill related to the arts whether visual arts or performing arts. Examples are painting, sculpture, pottery, music, dance etc. The student would pursue it everyday for the duration of the program.

These would allow for creative expression. It would develop a sense of aesthetics and also enhance creativity which would, hopefully, flow into engineering design later.

2.3 Universal Human Values :
It gets the student to explore oneself and allows one to experience the joy of learning, stand up to peer pressure, take decisions with courage, be aware of relationships with colleagues and supporting staff in the hostel and department, be sensitive to others, etc. Need for character building has been underlined earlier. A module in Universal Human Values provides the base.

Methodology of teaching this content is extremely important. It must not be through do's and dont's, but get students to explore and think by engaging them in a dialogue. It is best taught through group discussions and real life activities rather than lecturing. The role of group discussions, however, with clarity of thought of the teachers cannot be over emphasized. It is essential for giving exposure, guiding thoughts, and realizing values.

The teachers must come from all the departments rather than only one department like HSS or from outside of the Institute. Experiments in this direction at IIT(BHU) are noteworthy and one can learn from them.3

Discussions would be conducted in small groups of about 20 students with a faculty mentor each. It is to open thinking towards the self. Universal Human Values discussions could even continue for rest of the semester as a normal course, and not stop with the induction program.

Besides drawing the attention of the student to larger issues of life, it would build relationships between teachers and students which last for their entire 4-year stay and possibly beyond.

3The Universal Human Values Course is a result of a long series of experiments at educational institutes starting from IIT-Delhi and IIT Kanpur in the 1980s and 1990s as an elective course, NIT Raipur in late 1990s as a compulsory one-week off campus program. The courses at IIT(BHU) which started from July 2014, are taken and developed from two compulsory courses at IIIT Hyderabad first introduced in July 2005.

2.4 Literary
Literary activity would encompass reading, writing and possibly, debating, enacting a play etc.

2.5 Proficiency Modules
This period can be used to overcome some critical lacunas that students might have, for example, English, computer familiarity etc. These should run like crash courses, so that when normal courses start after the induction program, the student has overcome the lacunas substantially. We hope that problems arising due to lack of English skills, wherein students start lagging behind or failing in several subjects, for no fault of theirs, would, hopefully, become a thing of the past.

2.6 Lectures by Eminent People
This period can be utilized for lectures by eminent people, say, once a week. It would give the students exposure to people who are socially active or in public life.

2.7 Visits to Local Area
A couple of visits to the landmarks of the city, or a hospital or orphanage could be organized. This would familiarize them with the area as well as expose them to the under privileged.

2.8 Familiarization to Dept./Branch & Innovations

The students should be told about different method of study compared to coaching that is needed at IITs. They should be told about what getting into a branch or department means what role it plays in society, through its technology. They should also be shown the laboratories, workshops & other facilties.

3 Schedule

The activities during the Induction Program would have an Initial Phase, a Regular Phase and a Closing Phase. The Initial and Closing Phases would be two days each.

3.1 Initial Phase

Time	*Activity*
Day 0	
Whole day	*Students arrive - Hostel allotment. (Preferably do preallotment)*
Day 1 *09:00 am - 03:00 pm*	*Academic registration*
04:30 pm - 06:00 pm	Orientation
Day 2 09:00 am - 10:00 am	Diagnostic test (for English etc.)
10:15 am - 12:25 pm	Visit to respective depts. `
12:30 pm - 01:55 pm	*Lunch*
02:00 pm - 02:55 pm	Director's address
03:00 pm - 05:00 pm	Interaction with parents
03:30 pm - 05:00 pm	Mentor-mentee groups - Introduction within group. (Same as Universal Human Values groups)

Four Year Degree Course in Bachelor of Engineering Branch: **CIVIL ENGINEERING**
Semester Pattern (Choice Based Credit Grade System)

Sr. No.	Subject Code	Subject	TEACHING SCHEME					EXAMINATION SCHEME									
			HOURS / WEEK			Total HOURS/WEEK	CREDITS	THEORY					PRACTICAL			
			Lecture	Tutorial	P/D			Duration Of Paper (Hr.)	Max. Marks Theory Paper	Internal Marks	Total	Min. Passing Marks	Max. Marks		Total	Min. Passing Marks
													Int.	Ext.		
THEORY																
01	3CE01	Engineering Mathematics-III	3	1	--	4	4	3	80	20	100	40	--	--	--	--
02	3CE02	Strength of Materials	3	--	--	3	3	3	80	20	100	40	--	--	--	--
03	3CE03	Building Construction & Engineering. Geology	3	--	--	3	3	3	80	20	100	40	--	--	--	--
04	3CE04	Transportation Engineering	3	--	--	3	3	3	80	20	100	40	--	--	--	--
05	3CE05	Concrete Technology & RCC	3	--	--	3	3	3	80	20	100	40	--	--	--	--
06	4ES06	**Environmental Science	2	--	--	2	--	--	--	--	--	--	-	-	-	-
PRACTICALS / DRAWING / DESIGN																
07	3CE07	Strength of Materials- lab	--	--	2	2	1	--	--	--	--	--	25	25	50	25
08	3CE08	Building Construction & Engineering. Geology-lab	--	--	2	2	1	--	--	--	--	--	25	25	50	25
09	3CE09	Transportation Engineering-lab	--	--	2	2	1	--	--	--	--	--	25	25	50	25
10	3CE10	Concrete Technology & RCC-lab	--	--	2	2	1	--	--	--	--	--	25	25	50	25
		Total	17	1	8	26	20	--	--	--	500	--	--	--	200	--
											Grand Total				700	

SEMESTER : THIRD

Note: **The Examination of Mandatory Subject Environmental Science shall be conducted in IV Semester.

<div align="center">

SEMESTER : FOURTH

</div>

Sr. No.	Subject Code	Subject	Lecture	Tutorial	P/D	Total HOURS/WEEK	CREDITS	Duration Of Paper (Hr.)	Max. Marks Theory Paper	Internal Marks	Total	Min. Passing Marks	Int.	Ext.	Total	Min. Passing Marks
			TEACHING SCHEME					**EXAMINATION SCHEME**								
			HOURS / WEEK					**THEORY**					**PRACTICAL**			
THEORY																
01	4CE01	Building Planning Designing & CAD	3	--	--	3	3	4	80	20	100	40	--	--	--	--
02	4CE02	Hydrology & Water Resource Engg.	3	--	--	3	3	3	80	20	100	40	--	--	--	--
03	4CE03	Surveying	3	--	--	3	3	3	80	20	100	40	--	--	--	--
04	4CE04	Geotechnical Engineering- I	3	--	--	3	3	3	80	20	100	40	--	--	--	--
05	4CE05	Structural Analysis - I	3	1	--	4	4	3	80	20	100	40	--	--	--	--
06	4ES06	**Environmental Science	2	--	--	2	2	3	**80**	**20**	**100**	**40**	-	-	-	-
PRACTICALS / DRAWING / DESIGN																
07	4CE07	Building Planning Designing & CAD -lab	--	--	2	2	1	--	--	--	--	--	25	25	50	25
08	4CE08	Hydrology & Water Resource Engg. – lab.	--	--	2	2	1	--	--	--	--	--	25	25	50	25
09	4CE09	Surveying – lab.	--	--	2	2	1	--	--	--	--	--	25	25	50	25
10	4CE10	Geotechnical Engineering- I- lab.	--	--	2	2	1	--	--	--	--	--	25	25	50	25
		Total	17	1	8	26	22	--	--	--	500	--	--	--	200	--
											Grand Total				700	

Note: **The Examination of Subject Environmental Science shall be conducted in IV Semester.

Sr. No.	Subject Code	Subject	HOURS / WEEK Lecture	HOURS / WEEK Tutorial	HOURS / WEEK P/D	Total HOURS/WEEK	CREDITS	THEORY Duration Of Paper (Hr.)	THEORY Max. Marks Theory Paper	THEORY Internal Marks	THEORY Total	THEORY Min. Passing Marks	PRACTICAL Max. Marks Int.	PRACTICAL Max. Marks Ext.	PRACTICAL Total	PRACTICAL Min. Passing Marks
THEORY																
01	5CE01	Design of Reinforced & Prestressed Concrete Structures	3	1	--	4	4	3	80	20	100	40	--	--	--	--
02	5CE02	Surveying & Geomatics	3	--	--	3	3	3	80	20	100	40	--	--	--	--
03	5CE03	Numerical Methods &Computer Programming	3	--	--	3	3	3	80	20	100	40	--	--	--	--
04	5CE04	Professional Elective –I	3	--	--	3	3	3	80	20	100	40	--	--	--	--
05	5CE05	Open Elective – I	3	--	--	3	3	3	80	20	100	40	--	--	--	--
PRACTICALS / DRAWING / DESIGN																
06	5CE06	Design of Reinforced & Prestressed Concrete Structures- lab	--	--	2	2	1	--	--	--	--	--	25	25	50	25
07	5CE07	Surveying & Geomatics -lab	--	--	2	2	1	--	--	--	--	--	25	25	50	25
08	5CE08	Numerical Methods &Computer Programming -lab	--	--	2	2	1	--	--	--	--	--	25	25	50	25
09	5CE09	Professional Elective –I -lab	--	--	2	2	1	--	--	--	--	--	25	25	50	25
		Total	15	1	8	24	20	--	--	--	500	--	--	--	200	--
											Grand Total				700	

Note : Open Elective – I to be opted from the Courses offered by the other Engineering & Technology courses from the College / Deptts. of the University.

5CE04 & 5CE09 Prof. Elective I : (i) Highway Construction & Management (ii) Repairs & Rehabilitation of Structures (iii) Sustainable Construction Methods iv) Watershed Engg. & Management

5CE05: Open Elective I : (i) Basic to Building Construction (ii) Disaster Management (iii) Soft Skills and Interpersonal Communication

SEMESTER : SIXTH	
TEACHING SCHEME	EXAMINATION SCHEME

Sr. No.	Subject Code	Subject	Lecture	Tutorial	P/D			Duration Of Paper (Hr.)	Max. Marks Theory Paper	Internal Marks	Total	Min. Passing Marks	Int.	Ext.	Total	Min. Passing Marks
			HOURS / WEEK					**THEORY**					**PRACTICAL**			
THEORY																
01	6CE01	Design of Steel Structures	3	1	--	4	4	3	80	20	100	40	--	--	--	--
02	6CE02	Environmental Engineering - I	3	--	--	3	3	3	80	20	100	40	--	--	--	--
03	6CE03	Fluid Mechanics	3	--	--	3	3	3	80	20	100	40	--	--	--	--
04	6CE04	Prof. Elective - II	3	--	--	3	3	3	80	20	100	40	--	--	--	--
05	6CE05	Open Elective - II	3	--	--	3	3	3	80	20	100	40	--	--	--	--
PRACTICALS / DRAWING / DESIGN																
06	6CE06	Design of Steel Structures-lab.	--	--	2	2	1	--	--	--	--	--	25	25	50	25
07	6CE07	Environmental Engineering – I-lab	--	--	2	2	1	--	--	--	--	--	25	25	50	25
08	6CE08	Fluid Mechanics-lab.	--	--	2	2	1	--	--	--	--	--	25	25	50	25
09	6CE09	Mini Project	--	--	2	2	1	--	--	--	--	--	25	25	50	25
		Total	15	1	8	24	20	--	--	--	500	--	--	--	200	--
											Grand Total				**700**	

Note : i) **Open Elective – II** to be opted from the Courses offered by the other Engineering & Technology courses from the College / Deptts. of the University.

ii) Students need to do compulsory Two (2) weeks Internship after 6th Semester and that shall be monitored by allotted Final year Project Guides.

6CE04 : PE (II) : (i) Advanced Construction Materials (ii) Geographic Information Systems & Science (iii) Masonry Structures (iv) Solid & Hazardous Waste Management **(v)** Traffic Engineering & Management

6CE05 : OE (II) : (i) Environmental Management (ii) Human Resource Development & Organizational Behavior (iii) Introduction to Earthquake Engineering

Sr. No.	Subject Code	Subject	TEACHING SCHEME					EXAMINATION SCHEME									
			HOURS / WEEK					THEORY						PRACTICAL			
			Lecture	Tutorial	P/D	Total HOURS/WEEK	CREDITS	Duration Of Paper (Hr.)	Max. Marks Theory Paper	Internal Marks	Total	Min. Passing Marks	Max. Marks		Total	Min. Passing Marks
													Int.	Ext.		
THEORY																
01	7CE01	Structural Analysis - II	3	--	--	3	3	3	80	20	100	40	--	--	--	--
02	7CE02	Geotechnical Engineering - II	3	--	--	3	3	3	80	20	100	40	--	--	--	--
03	7CE03	Hydraulic Engineering	3	--	--	3	3	3	80	20	100	40	--	--	--	--
04	7CE04	Environmental Engineering -II	3	--	--	3	3	3	80	20	100	40	--	--	--	--
05	7CE05	Professional Elective- III	3	--	--	3	3	3	80	20	100	40	--	--	--	--
PRACTICALS / DRAWING / DESIGN																
06	7CE06	Computational Structure Analysis –lab.	--	--	2	2	1	--	--	--	--	--	25	25	50	25
07	7CE07	Geotechnical Engineering – II- lab.	--	--	2	2	1	--	--	--	--	--	25	25	50	25
08	7CE08	Environmental Engineering –II- lab.	--	--	2	2	1	--	--	--	--	--	25	25	50	25
09	7CE09	Project & Seminar	--	--	8	8	4	--	--	--	--	--	50	--	50	25
		Total	**15**	**0**	**14**	**29**	**22**	**--**	**--**	**--**	**500**	**--**	**--**	**--**	**200**	**--**
													Grand Total		**700**	

7CE05 Prof Elect. III : (i) Analysis & Design of Structures for Earthquake & Wind **(ii)** Environmental Impact Assessment & Life Cycle **(iii)** Pavement Design **(iv)** Water Power Engineering

			TEACHING SCHEME					EXAMINATION SCHEME								

SEMESTER : EIGHT

Sr. No.	Subject Code	Subject	HOURS / WEEK			Total HOURS/WEEK	CREDITS	THEORY					PRACTICAL		Total	Min. Passing Marks
			Lecture	Tutorial	P/D			Duration Of Paper (Hr.)	Max. Marks Theory Paper	Internal Marks	Total	Min. Passing Marks	Max. Marks			
													Int.	Ext.		
THEORY																
01	8CE01	Construction Project Management	3	--		3	3	3	80	20	100	40	--	--	--	--
02	8CE02	Construction Economics & Estimating - Costing	3	--		3	3	3	80	20	100	40	--	--	--	--
03	8CE03	Professional Elective- IV	3	--		3	3	3	80	20	100	40	--	--	--	--
04	8CE04	Professional Elective-V	3	--		3	3	3	80	20	100	40	--	--	--	--
PRACTICALS / DRAWING / DESIGN																
05	8CE05	Construction Economics & Estimating – Costing – lab.	--	--	2	2	1	--	--	-- --	--	--	25	25	50	25
06	8CE06	Professional Elective- IV – lab.	--	--	2	2	1	--	--	-- --	--	--	25	25	50	25
07	8CE07	Project & Seminar	--	--	12	12	6	--	--	--	--	--	75	75	150	75
		Total	12	0	16	28	20	--	--	--	400	--	--	--	250	--
														Grand Total	650	

8CE03 : Prof. Elect IV: (i) Advanced Design of Steel Structures (ii) Advanced Pre-stressed Concrete Structures (iii) Advanced Water Treatment (iv) Industrial Waste Water Treatment (v) Structural Analysis by Matrix Methods

8CE04 : Prof Elect V : (i) Advanced Geotechnical Engineering (ii) Advanced Structural Analysis (iii) Advanced Design of RCC Structures (iv)Advanced Waste Water Engineering (v) Construction Equipment & Machinery (vi) Finite Element Methods

TWO YEAR POST GRADUATE DEGREE COURSE IN MASTER OF ENGINEERING (FULLTIME)
CIVIL ENGINEERING (TRANSPORTATION ENGINEERING AND MANAGEMENT)
CREDIT GRADE SYSTEM

Appendix - A

First Semester

Sr. No.	Subject Code	Subject	Lecture	Tutorial	Practical	Total HOURS	CREDITS	DURATION OF PAPER (Hr.)	MAX. MARKS THEORY PAPER	MAX. MARKS COLLEGE ASSESMENT	TOTAL	THEORY PAPER	SUBJECT	EXTERNAL	INTERNAL	TOTAL	MIN. PASSING MARKS
01	1SFTR1	Trafic Engineering and Field Studies	4	0	0	4	4	3	80	20	100	40	50	–	–	–	–
02	1SFTR2	Transport Planning and Management	4	0	0	4	4	3	80	20	100	40	50	–	–	–	–
03	1SFTR3	Design and Construction of Pavement	4	0	0	4	4	3	80	20	100	40	50	–	–	–	–
04	1SFTR4	Docks Harbour and Airport Engineering	4	0	0	4	4	3	80	20	100	40	50	–	–	–	–
05	1SFTR5	Elective – I	4	0	0	4	4	3	80	20	100	40	50	–	–	–	–
06	1SFTR6	Trafuc Engineering and Field Studies (Lab)	0	0	2	2	1	–	–	–	–	–	–	25	25	50	25
07	1SFTR7	Design & Construction of Pavement (Lab)	0	0	2	2	1	–	–	–	–	–	–	25	25	50	25
		TOTAL	20	0	4	24	22				500					100	
															TOTAL		600

Elective – I 1) Applied soil mechanies 2) DESIGN OF BRIDGES

Second Semester

Sr. No.	Subject Code	Subject	Lecture	Tutorial	Practical	Total HOURS	CREDITS	DURATION OF PAPER (Hr.)	MAX. MARKS THEORY PAPER	MAX. MARKS COLLEGE ASSESMENT	TOTAL	THEORY PAPER	SUBJECT	EXTERNAL	INTERNAL	TOTAL	MIN. PASSING MARKS
01	2SFTR1	Advanced Rail Road Engineering	4	0	0	4	4	3	80	20	100	40	50	–	–	–	–
02	2SFTR2	Road Safety and Management System	4	0	0	4	4	3	80	20	100	40	50	–	–	–	–
03	2SFTR3	Environmental Impact Assessment	4	0	0	4	4	3	80	20	100	40	50	–	–	–	–
04	2SFTR4	Elective – II	4	0	0	4	4	3	80	20	100	40	50	–	–	–	–
05	2SFTR5	Elective – III	4	0	0	4	4	3	80	20	100	40	50	–	–	–	–
06	2SFTR6	Road Safety and Management System (Lab)	0	0	2	2	1	–	–	–	–	–	–	25	25	50	25
07	2SFTR7	Environmental Impact Assessment (Lab)	0	0	2	2	1	–	–	–	–	–	–	25	25	50	25
		TOTAL	20	1	2	23	22				500					100	
															TOTAL		600

Elective –II – 1) Geometric Design of Transportation Facilities   2)Theory and Application of GIS
Elective –III – 1) Transprtation Economics & Evaluation   2) Transportaion Systems.

Third Semester

Sr. No.	Subject Code	Subject	Lecture	Tutorial	Practical	Total	CREDITS		INTERNAL MARKS	TOTAL	MIM. PASSING MARKS	
01	3 SFTR 1	SEMINAR AND DISSERTATION	–	–	6	6	15		100	100	50	
		TOTAL	–	–	6	6	15			100		

TOTAL	100	

Fourth Semester

Sr. No.	Subject Code	Subject	Lecture	Tutorial	Practical	Total	CREDITS		EXTERNAL MARKS	INTERNAL MARKS	TOTAL	MIM. PASSING MARKS
01	4 SFTR 1	SEMINAR AND DISSERTATION	–	–	12	12	30		200	100	300	150
		TOTAL	–	–	12	12	30				300	

TOTAL	300
GRAND TOTAL	1600

Semester III

Seminar : Seminar to be delivered on work completed during third semester, 50 internal marks out of 100 will be assessed by a Committee consisting of Head of Department, dissertation guide and subject expert appointed by Principal of the College / Head of University Department. Remaining 50 internal marks will be given by guide based on performance.

Dissertation : Title of the dissertation work to be submitted to the University on or before 15th Sept. (for regular examination) and 15th of February (for supplementary exam.).

Semester IV

Seminar : to be delivered on the complete work of dissertation. 50 internal marks out of 100 will be assessed by a Committee consisting of Head of Department, dissertation guide and subject expert appointed by Principal of the College / Head of University Department. Remaining 50 internal marks will be given by guide based on performance.

Note : Thesis of dissertation work must be submitted to the University on or before 30th April (for regular exam.) and 30th November (for supplementary exam.). Thesis of Dissertation work be submitted with late fee to the University upto 31 May (for regular exam.) and 31st December (for supplementary exam.). The late fee shall be charged as in case of Examination form.

Notes : 1. Student should fill the examination form in the begining of III semester jointly for III & IV semester.

2. Single marksheet for III & IV semester together will be given to the student.

Third Semester

Sr. No.	Subject Code	Subject	Lecture	Tutorial	Practical	Total	CREDITS	INTERNAL MARKS	TOTAL	MIM. PASSING MARKS
01	3 MTES	SEMINAR AND DISSERTATION	–	–	6	6	15	100	100	50
		TOTAL	–	–	6	6	15		100	

									TOTAL	100

Fourth Semester

Sr. No.	Subject Code	Subject	Lecture	Tutorial	Practical	Total	CREDITS	EXTERNAL MARKS	INTERNAL MARKS	TOTAL	MIM. PASSING MARKS
01	4 MTEP	SEMINAR AND DISSERTATION	–	–	12	12	30	200	100	300	150
		TOTAL	–	–	12	12	30			300	

									TOTAL	300
									GRAND TOTAL	1600

Semester III

Seminar : Seminar to be delivered on work completed during third semester. 50 internal marks out of 100 will be assessed by a Committee consisting of Head of Department, dissertation guide and subject expert appointed by Principal of the College / Head of University Department. Remaining 50 internal marks will be given by guide based on performance.

Dissertation : Title of the dissertation work to be submitted to the University on or before 15th Sept. (for regular examination) and 15th of February (for supplementary exam.).

Semester IV

Seminar : to be delivered on the complete work of dissertation. 50 internal marks out of 100 will be assessed by a Committee consisting of Head of Department, dissertation guide and subject expert appointed by Principal of the College / Head of University Department. Remaining 50 internal marks will be given by guide based on performance.

Note : Thesis of dissertation work must be submitted to the University on or before 30th April (for regular exam.) and 30th November (for supplementary exam.). Thesis of Dissertation work be submitted with late fee to the University upto 31 May (for regular exam.) and 31st December (for supplementary exam.). The late fee shall be charged as in case of Examination form.

Notes : 1. Student should fill the examination form in the begining of III semester jointly for III & IV semester.

2. Single marksheet for III & IV semester together will be given to the student.

TWO YEAR POST GRADUATE DEGREE COURSE IN MASTER OF ENGINEERING (FULL TIME)
MECHANICAL ENGINEERING (Advanced Manufacturing & Mechanical System Design)
CREDIT GRADE SYSTEM

Appendix - C

First Semester

			TEACHING SCHEME							EXAMINATION SCHEME								
			HOURS / WEEK							THEORY						PRACTICAL		
														MIN. PASSING MARKS		MAX. MARKS		
Sr. No.	Subject Code	Subject	Lecture	Tutorial	Practical	Total HOURS	CREDITS	DURATION OF PAPER (Hr.)	MAX. MARKS THEORY PAPER	MAX. MARKS COLLEGE ASSESMENT	TOTAL	THEORY PAPER	SUBJECT	EXTERNAL	INTERNAL	TOTAL	MIN. PASSING MARKS
01	1MMD1	Advanced Manufacturing Processes	4	0	0	4	4	3	80	20	100	40	50	–	–	–	–
02	1MMD2	Advanced Machine Design	4	0	0	4	4	3	80	20	100	40	50	–	–	–	–
03	1MMD3	Computer Aided Design and Engineering	4	0	0	4	4	3	80	20	100	40	50	–	–	–	–
04	1MMD4	Design of Material Handling Equipments	4	0	0	4	4	3	80	20	100	40	50	–	–	–	–
05	1MMD5	Elective – I	4	0	0	4	4	3	80	20	100	40	50	–	–	–	–
06	1MMD6	Advanced Manufacturing Processes- Lab	0	0	2	2	1	–	–	–	–	–	–	25	25	50	25
07	1MMD7	Computer Aided Design and Engineering Lab	0	0	2	2	1	–	–	–	–	–	–	25	25	50	25
		TOTAL	20	0	4	24	22				500					100	
															TOTAL		600

Elective – I   1) Reliability, Maintenance Management & Safety, 2) New Product design   3) Lean Manufacturing
4) Design for Manufacturing and Assembly   5) Ergonomics of Manufacturing

Second Semester

01	2MMD1	Advanced Material Technology	4	0	0	4	4	3	80	20	100	40	50	–	–	–	–
02	2MMD2	Required Prototyping and Tooling	4	0	0	4	4	3	80	20	100	40	50	–	–	–	–
03	2MMD3	Mechatronics in System Design	4	0	0	4	4	3	80	20	100	40	50	–	–	–	–
04	2MMD4	Experimental Stress Analysis	4	0	0	4	4	3	80	20	100	40	50	–	–	–	–
05	2MMD5	Elective – II	4	0	0	4	4	3	80	20	100	40	50	–	–	–	–
06	2MMD6	Mechatronics in System Design Lab	0	0	2	2	1	–	–	–	–	–	–	25	25	50	25
07	2MMD7	Experimental Stress Analysis Lab	0	0	2	2	1	–	–	–	–	–	–	25	25	50	25
		TOTAL	20	1	2	23	22				500					100	
															TOTAL		600

Elective –II – 1) Optimization Methods in Engineering Design, 2) Advanced Machine Tool Design 3) Total Quality Management
4) Computer Assisted Production Management,   5) Concurrent Engineering & Product Lifecycle Management

Third Semester

Sr. No.	Subject Code	Subject	Lecture	Tutorial	Practical	Total	CREDITS	INTERNAL MARKS	TOTAL	MIM. PASSING MARKS
01	3 MMDS	SEMINAR AND DISSERTATION	–	–	6	6	15	100	100	50
		TOTAL	–	–	6	6	15		100	

	TOTAL	100

Fourth Semester

Sr. No.	Subject Code	Subject	Lecture	Tutorial	Practical	Total	CREDITS	EXTERNAL MARKS	INTERNAL MARKS	TOTAL	MIM. PASSING MARKS
01	4 MMDP	SEMINAR AND DISSERTATION	–	–	12	12	30	200	100	300	150
		TOTAL	–	–	12	12	30			300	

	TOTAL	300
	GRAND TOTAL	1600

Semester III

Seminar : Seminar to be delivered on work completed during third semester. 50 internal marks out of 100 will be assessed by a Committee consisting of Head of Department, dissertation guide and subject expert appointed by Principal of the College / Head of University Department. Remaining 50 internal marks will be given by guide based on performance.

Dissertation : Title of the dissertation work to be submitted to the University on or before 15th Sept. (for regular examination) and 15th of February (for supplementary exam.).

Semester IV

Seminar : to be delivered on the complete work of dissertation. 50 internal marks out of 100 will be assessed by a Committee consisting of Head of Department, dissertation guide and subject expert appointed by Principal of the College / Head of University Department. Remaining 50 internal marks will be given by guide based on performance.

Note : Thesis of dissertation work must be submitted to the University on or before 30th April (for regular exam.) and 30th November (for supplementary exam.). Thesis of Dissertation work be submitted with late fee to the University upto 31 May (for regular exam.) and 31st December (for supplementary exam.). The late fee shall be charged as in case of Examination form.

Notes : 1. Student should fill the examination form in the begining of III semester jointly for III & IV semester.

2. Single marksheet for III & IV semester together will be given to the student.

SANT GADGE BABA AMRAVATI UNIVERSITY, AMRAVATI
FOUR YEAR DEGREE COURSE IN BACHELOR OF ENGINEERING
BRANCH: COMPUTER SCIENCE & ENGINEERING - SEMESTER PATTERN (CREDIT GRADE SYSTEM)
SEMESTER: FIRST/SECOND "GROUP A"

			Teaching Scheme					Examination Scheme								
			Hours per Week					Theory					Practical			
													Max Marks			
Sr No	Subject Code	Subject Name	Lecture	Tutorial	P/D	Total Hours/Week	Credit	Duration of paper (Hr)	Max Marks Theory Paper	Max Marks College Assessment	Total	Min Passing Marks	External	Internal	Total	Min Passing Marks
Theory																
1	1A1	Engineering Mathematics - I	3	1		4	4	3	80	20	100	40				
2	1A2	Engineering Physics	4			4	4	3	80	20	100	40				
3	1A3	Engineering Mechanics	3	1		4	4	3	80	20	100	40				
4	1A4	Computer Programming	3			3	3	4	80	20	100	40				
Practicals																
5	1A5	Workshop Practice			4	4	2						25	25	50	25
6	1A6	Engineering Physics Laboratory			2	2	1						25	25	50	25
7	1A7	Engineering Mechanics Laboratory			2	2	1						25	25	50	25
8	1A8	Computer Programming Laboratory			2	2	1						25	25	50	25
		Total	13	2	10	25	20				400				200	
														Total	**600**

Three Week Induction Program to be undertaken as suggested by AICTE

SANT GADGE BABA AMRAVATI UNIVERSITY, AMRAVATI
FOUR YEAR DEGREE COURSE IN BACHELOR OF ENGINEERING
BRANCH: COMPUTER SCIENCE & ENGINEERING - SEMESTER PATTERN (CREDIT GRADE SYSTEM)
SEMESTER: FIRST/SECOND "GROUP B"

Sr No	Subject Code	Subject Name	Lecture	Tutorial	P/D	Total Hours/Week	Credit	Duration of paper (Hr)	Max Marks Theory Paper	Max Marks College Assessment	Total	Min Passing Marks	External	Internal	Total	Min Passing Marks
Theory																
1	1B1	Engineering Mathematics - II	3	1		4	4	3	80	20	100	40				
2	1B2	Engineering Chemistry	4			4	4	3	80	20	100	40				
3	1B3	Basic Electrical Engineering	3	1		4	4	3	80	20	100	40				
4	1B4	Engineering Graphics	3			3	3	3	80	20	100	40				
Practicals																
5	1B5	English Communication Skill Lab			4	4	2						25	25	50	25
6	1B6	Engineering Chemistry Laboratory			2	2	1						25	25	50	25
7	1B7	Basic Electrical Engineering Lab			2	2	1						25	25	50	25
8	1B8	Engineering Graphics Laboratory			2	2	1						25	25	50	25
		Total	**13**	**2**	**10**	**25**	**20**				**400**				**200**	
														Total	**600**	

Three Week Induction Program to be undertaken as suggested by AICTE

SANT GADGE BABA AMRAVATI UNIVERSITY, AMRAVATI

FOUR YEAR DEGREE COURSE IN BACHELOR OF ENGINEERING

BRANCH: COMPUTER SCIENCE & ENGINEERING - SEMESTER PATTERN (CREDIT GRADE SYSTEM)

SEMESTER: THIRD

Sr No	Subject Code	Subject Name	Lecture	Tutorial	P/D	Total Hours/Week	Credit	Duration of paper (Hr)	Max Marks Theory Paper	Max Marks College Assessment	Total	Min Passing Marks	External	Internal	Total	Min Passing Marks
Theory																
1	3KS01	Mathematics-III	3	1		4	4	3	80	20	100	40				
2	3KS02	Discrete Structure & Graph Theory	3			3	3	3	80	20	100	40				
3	3KS03	Object Oriented Programming	3			3	3	3	80	20	100	40				
4	3KS04	Data Structures	3			3	3	3	80	20	100	40				
5	3KS05	Analog & Digital Electronics	3			3	3	3	80	20	100	40				
6	4ES06	Environmental Studies *	2			2	0									
Practicals																
7	3KS06	Object Oriented Programming (Java) Lab			2	2	1						25	25	50	25
8	3KS07	Data Structures Lab			2	2	1						25	25	50	25
9	3KS08	Analog & Digital Electronics Lab			2	2	1						25	25	50	25
10	3KS09	C Skill-Lab I (#)			2	2	1						25	25	50	25
		Total	**17**	**1**	**8**	**26**	**20**				**500**				**200**	
														Total	**700**	

* As per the Ordinance No. 42 of 2005

C Skill Lab I - based on technology like -**Python/Django** etc. to be decided by Individual Dept. of respective College

SANT GADGE BABA AMRAVATI UNIVERSITY, AMRAVATI
FOUR YEAR DEGREE COURSE IN BACHELOR OF ENGINEERING
BRANCH: COMPUTER SCIENCE & ENGINEERING - SEMESTER PATTERN (CREDIT GRADE SYSTEM)
SEMESTER: FOURTH

Sr No	Subject Code	Subject Name	Teaching Scheme					Examination Scheme									
			Hours per Week			Total Hours/Week	Credit	Theory					Practical				
													Max Marks				
			Lecture	Tutorial	P/D			Duration of paper (Hr)	Max Marks Theory Paper	Max Marks College Assessment	Total	Min Passing Marks	External	Internal	Total	Min Passing Marks
Theory																
1	4KS01	Artificial Intelligence	3			3	3	3	80	20	100	40				
2	4KS02	Data Communication & Networking	3			3	3	3	80	20	100	40				
3	4KS03	Operating System	3			3	3	3	80	20	100	40				
4	4KS04	Microprocessor & Assembly Lang. Prog.	3			3	3	3	80	20	100	40				
5	4KS05	Theory of Computation	3	1		4	4	3	80	20	100	40				
6	4ES06	Environmental Studies *	2			2	2	3	80	20	100	40				
Practicals																
7	4KS06	Data Communication & Networking Lab			2	2	1						25	25	50	25
8	4KS07	Operating System Lab			2	2	1						25	25	50	25
9	4KS08	Microprocessor & Assembly Lang. Prog. Lab			2	2	1						25	25	50	25
10	4KS09	C Skill-Lab II (#)			2	2	1						25	25	50	25
		Total	**17**	**1**	**8**	**26**	**22**				**600**				**200**	
														Total	**800**	

* As per the Ordinance No. 42 of 2005

C Skill Lab II - based on technology like -**PHP, Web Technology, Raspberry Pi/Ardino**, etc. to be decided by Individual Dept. of respective College

SANT GADGE BABA AMRAVATI UNIVERSITY, AMRAVATI
FOUR YEAR DEGREE COURSE IN BACHELOR OF ENGINEERING
BRANCH: COMPUTER SCIENCE & ENGINEERING - SEMESTER PATTERN (CREDIT GRADE SYSTEM)
SEMESTER: FIFTH

Sr No	Subject Code	Subject Name	Lecture	Tutorial	P/D	Total Hours/Week	Credit	Duration of paper (Hr)	Max Marks Theory Paper	Max Marks College Assessment	Total	Min Passing Marks	External	Internal	Total	Min Passing Marks
				Teaching Scheme Hours/Week				**Examination Scheme** Theory					Practical Max Marks			
Theory																
1	5KS01	Database Management Systems	4			4	4	3	80	20	100	40				
2	5KS02	Compiler Design	3			3	3	3	80	20	100	40				
3	5KS03	Computer Architecture & Organization	3			3	3	3	80	20	100	40				
4	5KS04	Professional Elective-I (#)	3			3	3	3	80	20	100	40				
5	5KS05	Open Elective - I ($)	3			3	3	3	80	20	100	40				
Practicals																
6	5KS06	Database Management Systems Lab (@)			2	2	1						25	25	50	25
7	5KS07	Compiler Design Lab			2	2	1						25	25	50	25
8	5KS08	Emerging Technology Lab# I			2	2	1						25	25	50	25
9	5KS09	C Skill Lab III (*)			2	2	1						25	25	50	25
		Total	**16**	**0**	**8**	**24**	**20**				**500**				**200**	
														Total	**700**	

Track	# Professional Elective-I
AI	Cognitive Technologies
DS	Data Science and Statistics
IoT	Internet of Things
Cy. Security	Introduction to Cyber Security

$ Open Elective - I
Fundamentals of Finance & Accounting
Principles of Marketing for Engineering
Entrepreneurship

@ Practicals using MongoDB,MySQL

FOSS Tools & Technology for Practicals

Track	Emerging Technology Lab# I
AI	IBM Watson, Microsoft Cognitive Toolkit , TensorFlow, Apache SystemML, Caffe, OpenNN, Torch, Neuroph
DS	R, Python, Cassandra, Apache Hadoop
IoT	Arduino, DeviceHive, Kaa, Home Assistant
CS	Kali Linux, OpenVPN, NMAP, Metasploit Framework

* C Skill Lab III - based on technology like - **Angular & React, Express, Node.js** etc. to be decided by Individual Dept. of respective College

An Orientation Program of 15 hours duration /MOOC on <u>Indian Constitution</u> *to be offered to the students during the Vth Semester*

Open Elective I to be opted from the courses offered by other engineering technology boards of the university /Massive Open learning Courses (MOOC) such as SWAYAM pertaining to the profession

SANT GADGE BABA AMRAVATI UNIVERSITY, AMRAVATI
FOUR YEAR DEGREE COURSE IN BACHELOR OF ENGINEERING
BRANCH: COMPUTER SCIENCE & ENGINEERING - SEMESTER PATTERN (CREDIT GRADE SYSTEM)
SEMESTER: SIXTH

| | | | Teaching Scheme | | | | | Examination Scheme | | | | | | | Practical | | | |
| | | | Hours per Week | | | | | Theory | | | | | | | Max Marks | | | |
Sr No	Subject Code	Subject Name	Lecture	Tutorial	P/D	Total Hours/Week	Credit	Duration of paper (Hr)	Max Marks Theory Paper	Max Marks College Assessment	Total	Min Passing Marks	External	Internal	Total	Min Passing Marks
Theory																
1	6KS01	Security Policy & Governance	3			3	3	3	80	20	100	40				
2	6KS02	Design & Analysis of Algorithm	4			4	4	3	80	20	100	40				
3	6KS03	Software Engineering	3			3	3	3	80	20	100	40				
4	6KS04	Professional Elective-II (#)	3			3	3	3	80	20	100	40				
5	6KS05	Open Elective - II ($)	3			3	3	3	80	20	100	40				
Practicals																
6	6KS06	Design & Analysis of Algorithm Lab			2	2	1						25	25	50	25
7	6KS07	Software Engineering Lab		v	2	2	1						25	25	50	25
8	6KS08	Emerging Technology Lab# II			2	2	1						25	25	50	25
9	6KS09	C Skill Lab IV (*)			2	2	1						25	25	50	25
		Total	**16**		**8**	**24**	**20**				**500**				**200**	
													Total	**700**	

Track	# Professional Elective-II
AI	Natural Language Processing
DS	Big Data Analytics
IoT	Sensors & Actuators
Cy.Security	Cryptography

$ Open Elective - II
Computational Biology
Cyber Law & Ethics
Intellectual Property Right

FOSS Tools & Technology for Practicals

Track	Emerging Technology Lab# II
AI	Natural Language Toolkit (NLTK),SpaCy, PyTorch-NLP, Natural, Retext, TextBlob
DS	KNIME, Spark, Neo4J, MongoDB, Hive, Storm,
IoT	Devicehub, Zetta, Node-RED, Flutter, M2MLabs Mainspring
CS	VeraCrypt, ModSecurity, AdBlocker, CheckShortURL, SPAMfighter, SpamBully

* C Skill Lab IV - based on technology like - **DevOp to be decided by Individual Dept. of respective College**

An Orientation Program of 15 hours duration /MOOC on Indian Constitution *to be offered to the students during the Vth Semester*

Open Elective II to be opted from the courses offered by other engineering technology boards of the university /Massive Open learning Courses (MOOC) such as SWAYAM pertaining to the profession

SANT GADGE BABA AMRAVATI UNIVERSITY, AMRAVATI
FOUR YEAR DEGREE COURSE IN BACHELOR OF ENGINEERING
BRANCH: COMPUTER SCIENCE & ENGINEERING - SEMESTER PATTERN (CREDIT GRADE SYSTEM)
SEMESTER: SEVENTH

			Teaching Scheme					Examination Scheme									
			Hours per Week			Total Hours/Week	Credit	Theory					Practical			
Sr No	Subject Code	Subject Name	Lecture	Tutorial	P/D			Duration of paper (Hr)	Max Marks Theory Paper	Max Marks College Assessment	Total	Min Passing Marks	Max Marks			
													External	Internal	Total	Min Passing Marks
Theory																
1	7KS01	Social Science & Engineering Economics	3			3	3	3	80	20	100	40				
2	7KS02	Computer Graphics	3			3	3	3	80	20	100	40				
3	7KS03	Cloud Computing	4			4	4	3	80	20	100	40				
4	7KS04	Professional Elective-III (#)	3			3	3	3	80	20	100	40				
5	7KS05	Professional Elective-IV ($)	3			3	3	3	80	20	100	40				
Practicals																
6	7KS06	Computer Graphics Lab			2	2	1						25	25	50	25
7	7KS07	Emerging Technology Lab# III			2	2	1						25	25	50	25
8	7KS08	Emerging Technology Lab# IV			2	2	1						25	25	50	25
9	7KS09	Project & Seminar			8	8	4							50	50	25
		Total	**16**		**14**	**30**	**23**				**500**				**200**	
		Total													**700**	

Track	# Professional Elective-III
AI	Robotics
DS	Data Warehousing & Mining
IoT	Embedded Systems
Cy.Security	Digital Forensics

Emerging Technology Lab# III
ROS, YARP, MRPT, Gazebo, OROCOS.
RapidMiner, Weka, Scrapy, Pandas
ThingsBoard, Kinoma, SiteWhere
Security Onion, LastPass,KeePAss

Emerging Technology Lab# V
Ethereum,BigchainDB, Corda
OpenCV, SimpleCV, Keras, Caffe
OpenEaagles, Repast, OpenSimulator

← FOSS Tools & Technology for Practicals ↑

$ Professional Elective-IV	Blockchain Fundamentals	Image Processing	Optimization Techniques

SANT GADGE BABA AMRAVATI UNIVERSITY, AMRAVATI
FOUR YEAR DEGREE COURSE IN BACHELOR OF ENGINEERING
BRANCH: COMPUTER SCIENCE & ENGINEERING - SEMESTER PATTERN (CREDIT GRADE SYSTEM)
SEMESTER: EIGHTH

Sr No	Subject Code	Subject Name	Lecture	Tutorial	P/D	Total Hours/Week	Credit	Duration of paper (Hr)	Max Marks Theory Paper	Max Marks College Assessment	Total	Min Passing Marks	External	Internal	Total	Min Passing Marks
Theory																
1	8KS01	Object Oriented Analysis & Design	3			3	3	3	80	20	100	40				
2	8KS02	Professional Ethics & Management	3			3	3	3	80	20	100	40				
3	8KS03	Professional Elective-V (#)	3			3	3	3	80	20	100	40				
4	8KS04	Professional Elective-VI ($)	3			3	3	3	80	20	100	40				
Practicals																
5	8KS05	Emerging Technology Lab# V			2	2	1						25	25	50	25
6	8KS06	Emerging Technology Lab# VI			2	2	1						25	25	50	25
7	8KS07	Project & Seminar			12	12	6						75	75	150	75
		Total	**12**		**16**	**28**	**20**				**400**				**250**	
														Total	**650**	

Track	# Professional Elective-V
AI	Virtual & Augmented Reality
DS	Machine Learning and AI
IoT	Wireless Sensor Networks
Cy.Security	System & Software Security

Emerging Technology Lab# IV
Google's ARCore, AR.js, ARToolKit, DroidAR, Brio, Adobe Aero
R Studio, Orange, D3.js, Ggplot2, Jupyter Notebooks
DSA,Thinger,RIOT, OpenRemote,Anjay
Wireshark, Burp Suit, Nessus

Emerging Technology Lab# VI
Hyperledger, HydraChain, MultiChain, Elements
Google Colab, GPUImage, Cuda, Aforge/Accord.NET
OR-Tools, Locust.io, httperf, Apache JMeter, Siege

← **FOSS Tools & Technology for Practicals** ↑

$ Professional Elective-VI	Distributed Ledger Technology	Multimedia Computing	Modeling & Simulation

SANT GADGE BABA AMRAVATI UNIVERSITY, AMRAVATI
FOUR YEAR DEGREE COURSE IN BACHELOR OF ENGINEERING
BRANCH: COMPUTER SCIENCE & ENGINEERING

Baskets for Open Electives & Professional Electives

Open Elective - I	Open Elective - II
Fundamentals of Finance & Accounting	Computational Biology
Principles of Marketing for Engineering	Cyber Law & Ethics
Entrepreneurship	Intellectual Property Right

Track	Professional Elective-IV		Professional Elective-VI
	Blockchain Fundamentals		Distributed Ledger Technology
	Image Processing		Multimedia Computing
	Statistics using R		Modeling & Simulation

Track	Professional Elective-I		Professional Elective-II
AI	Cognitive Technologies		Natural Language Processing
DS	Data Science		Big Data Analytics
IoT	Internet of Things		Sensors & Actuators
Cyber Security	Introduction to Cyber Security		Cyptography

Track	Professional Elective-III		Professional Elective-V
AI	Robotics		Virtual & Augmented Reality
DS	Data Warehousing & Mining		Machine Learning and AI
IoT	Embedded Systems		Wireless Sensor Networks
Cyber Security	Digital Forensics		System & Software Security

Specialization option can be supported by Professional Electives I, II, III, IV, V & VI can also be opted through SWAYAM which needs to be mentored by Faculty.

C Skill Lab I - IV covers the technology essentials for *Full Stack Developer* Skill set

Wherever possible students should be encouraged to opt for Virtual Labs apart from the normal Physical Labs for all the subjects specifically from Professional electives baskets. (Various Virtual Labs were floated by Ministry of HRD http://www.vlab.co.in/)

Four Year Degree Course in Bachelor of Engineering
Branch : Electronics & Telecommunication Engineering
Semester Pattern (Credit Grade System)

Semester : Fifth

			TEACHING SCHEME					EXAMINATION SCHEME								
			HOURS / WEEK			Total HOURS/WEEK	CREDITS	THEORY					PRACTICAL			
Sr. No.	Subject Code	Subject	Lecture	Tutorial	P/D			DURATION OF PAPER (Hr.)	MAX. MARKS THEORY PAPER	MAX. MARKS COLLEGE	TOTAL	MIN. PASSING MARKS	MAX. MARKS EXTERNAL	MAX. MARKS INTERNAL	TOTAL	MIN. PASSING MARKS
THEORY																
01	5XT1	Electronic Devices & Circuits-II	4	1		5	5	3	80	20	100	40	–	–	–	–
02	5XT2	Power Electronics	4			4	4	3	80	20	100	40	–	–	–	–
03	5XT3	Control System Engineering	4	1		5	5	3	80	20	100	40	–	–	–	–
04	5XT4	Communication Engineering-II	4			4	4	3	80	20	100	40	–	–	–	–
05	5FEXT5	Free Electrive-1	4			4	4	3	80	20	100	40	–	–	–	–
06	5XT6	Communication Skills	2			2	2	2	40	10	50	20				

Free Elective - I : 1. Consumer Electronics 2. Fibre Optics

PRACTICALS / DRAWING / DESIGN

Sr. No.	Subject Code	Subject	Lecture	Tutorial	P/D	Total	CREDITS	DURATION	THEORY PAPER	COLLEGE	TOTAL	MIN	EXTERNAL	INTERNAL	TOTAL	MIN
07	5XT7	Electronic Devices & Circuits-II Lab			2	2	1	–	–	–	–	–	25	25	50	25
08	5XT8	Power Electronics Lab			2	2	1	–	–	–	–	–	25	25	50	25
09	5XT9	Communication Engineering-II Lab			2	2	1	–	–	–	–	–	25	25	50	25
10	5XT10	Communication Skills Lab			2	2	1						15	10	25	12
		TOTAL	22	2	8	32	28				550				175	
														TOTAL	725	

Semester : Sixth

Sr. No.	Subject Code	Subject	Lecture	Tutorial	P/D	Total	CREDITS	DURATION OF PAPER (Hr.)	MAX. MARKS THEORY PAPER	MAX. MARKS COLLEGE	TOTAL	MIN. PASSING MARKS	EXTERNAL	INTERNAL	TOTAL	MIN. PASSING MARKS
THEORY																
01	6XT1	Digital Integrated Circuits	4			4	4	3	80	20	100	40	–	–	–	–
02	6XT2	Linear Integrated Circuits	4	1		5	5	3	80	20	100	40	–	–	–	–
03	6XT3	Introduction to Microprocessors	4	1		5	5	3	80	20	100	40	–	–	–	–
04	6XT4	Digital Communication	4			4	4	3	80	20	100	40	–	–	–	–
05	6FEXT5	Free Electrive -II	4			4	4	3	80	20	100	40	–	–	–	–

Free Elective - II : 1. Introduction to Wireless Technology 2. Electronic Test Instruments - Analog and Digital.

PRACTICALS / DRAWING / DESIGN

Sr. No.	Subject Code	Subject	Lecture	Tutorial	P/D	Total	CREDITS						EXTERNAL	INTERNAL	TOTAL	MIN
06	6XT6	Integrated Circuits Lab			2	2	1	–	–	–	–	–	25	25	50	25
07	6XT7	Introduction to Microprocessors Lab			2	2	1	–	–	–	–	–	25	25	50	25
08	6XT8	Digital Communication Lab			2	2	1	–	–	–	–	–	25	25	50	25
		TOTAL	20	2	6	28	25				500				150	
														TOTAL	650	

Note : Students will have to opt the free electives offered from other courses of their college / Institution / University Department.

Four Year Degree Course in Bachelor of Engineering
Branch : Computer Science & Engineering- Semester Pattern (Credit Grade System)

SEMESTER : FIFTH

Semester :FIFTH

Sr. No.	Subject Code	Subject	Lecture	Tutorial	P/D	Total HOURS/WEEK	CREDITS	DURATION OF PAPER (Hr.)	MAX. MARKS THEORY PAPER	MAX. MARKS COLLEGE ASSESMENT	TOTAL	MIN. PASSING MARKS	EXTERNAL	INTERNAL	TOTAL	MIN. PASSING MARKS
			TEACHING SCHEME HOURS / WEEK					EXAMINATION SCHEME THEORY					PRACTICAL MAX. MARKS			
THEORY																
01	5KS01	Data Communication	4	—	–	4	4	3	80	20	100	40	–	–	–	–
02	5KS02	File Structures & Data Processing	4	1	–	5	5	3	80	20	100	40	–	–	–	–
03	5KS03	System Software	4	–	–	4	4	3	80	20	100	40	–	–	–	–
04	5KS04	Switching Theory & Logic Design	4	1	–	5	5	3	80	20	100	40	–	–	–	–
05	5FEKS05	Free Elective I*	3	–	–	3	3	3	80	20	100	40	–	–	–	–
06	5KS06	Communication Skills	2	–	–	2	2	2	40	10	50	20	–	–	–	–
PRACTICALS / DRAWING / DESIGN																
07	5KS07	System Software Lab	–	–	2	2	1	–	–	–	–	–	25	25	50	25
08	5KS08	Switching Theory & Logic Design Lab	–	–	2	2	1	–	–	–	–	–	25	25	50	25
09	5KS09	Communication Skills Lab	–	–	2	2	1	–	–	–	–	–	25	25	50	25
		TOTAL	21	2	6	29	26				550				150	

TOTAL 700

Free Elective I* (i) Data Structures & Algorithms (ii) Data Communication & Networking

Semester :SIXTH

Sr. No.	Subject Code	Subject	Lecture	Tutorial	P/D	Total HOURS/WEEK	CREDITS	DURATION OF PAPER (Hr.)	MAX. MARKS THEORY PAPER	MAX. MARKS COLLEGE ASSESMENT	TOTAL	MIN. PASSING MARKS	EXTERNAL	INTERNAL	TOTAL	MIN. PASSING MARKS
THEORY																
01	6KS01	Operating Systems	4	1	–	5	5	3	80	20	100	40	–	–	–	–
02	6KS02	Database Systems	4	–	–	4	4	3	80	20	100	40	–	–	–	–
03	6KS03	Computing Resources Management	4	–	–	4	4	3	80	20	100	40	–	–	–	–
04	6KS04	Computer Architecture	3	1	–	4	4	3	80	20	100	40	–	–	–	–
05	6FEKS05	Free Elective II*	3	–	–	3	3	3	80	20	100	40	–	–	–	–
06	6KS06	Professional Ethics	2	–	–	2	2	2	40	10	50	20	–	–	–	–
PRACTICALS / DRAWING / DESIGN																
07	6KS07	Operating Systems Lab	–	–	2	2	1	–	–	–	–	–	25	25	50	25
08	6KS08	Database Systems Lab	–	–	2	2	1	–	–	–	–	–	25	25	50	25
09	6KS09	Computer Lab-II (Hardware Lab)	1	–	2	3	2	–	–	–	–	–	25	25	50	25
		TOTAL	21	2	6	29	26				550				150	

TOTAL 700

Free ElectiveII* (i) Database Management System (ii) Software Project Management
Note : Students will have to opt the free electives offered from other courses of their college / Institution / University Department.

FOUR YEAR DEGREE COURSE IN BACHELOR OF ENGINEERING
BRANCH - ELECTRONICS & TELICOMMUNICATION ENGINEERING -SEMESTER PATTERN(CREDIT GRADE SYSTEM)

SEMESTER - SEVENTH

Appendix - B

Sr. No.	Subject Code		TEACHING SCHEME					EXAMINATION SCHEME								
			HOURS / WEEK			Total HOURS/WEEK	CREDITS	THEORY					PRACTICAL			
			Lecture	Tutorial	P/D			DURATION OF PAPER (Hr.)	MAX. MARKS THEORY PAPER	MAX. MARKS COLLEGE ASSESMENT	TOTAL	MIN. PASSING MARKS	MAX. MARKS		TOTAL	MIN. PASSING MARKS
													EXTERNAL	INTERNAL		
THEORY																
01	7XT1	Data Communication Network	4	–	–	4	4	3	80	20	100	40	–	–	–	–
02	7XT2	Microcontroller and Applications	4	1	–	5	5	3	80	20	100	40	–	–	–	–
03	7XT3	Digital Signal Processing	4	1	–	5	5	3	80	20	100	40	–	–	–	–
04	7XT4	Professional Elective-I	4	–	–	4	4	3	80	20	100	40	–	–	–	–
PRACTICALS / DRAWING / DESIGN																
05	7XT5	Microcontroller and Applications Lab	–	–	2	2	1						25	25	50	25
06	7XT6	Digital Signal Processing Lab	–	–	2	2	1	–	–	–	–	–	25	25	50	25
07	7XT7	Simulation Lab			2	2	1	–	–	–	–	–	25	25	50	25
08	7XT8	Project and Seminar	–	–		2	4					–	–	50	50	25
		TOTAL	16	2	6	26	25				400				200	

Professional Elective-I: 1. VLSI Design 2. Computer Organization 3. Artificial Intelligence 4. Satellite & Optical Fibre communication 5. Audio & Video Engineering   TOTAL   600

Semester : Eighth

Sr. No.	Subject Code		Lecture	Tutorial	P/D	Total HOURS/WEEK	CREDITS	DURATION OF PAPER (Hr.)	MAX. MARKS THEORY PAPER	MAX. MARKS COLLEGE ASSESMENT	TOTAL	MIN. PASSING MARKS	EXTERNAL	INTERNAL	TOTAL	MIN. PASSING MARKS
THEORY																
01	8XT1	UHF and Microwaves	4	1	–	5	5	3	80	20	100	40	–	–	–	–
02	8XT2	Electronics Circuit Design	4	1	–	5	5	3	80	20	100	40	–	–	–	–
03	8XT3	Wireless Communication	4	–	–	4	4	3	80	20	100	40	–	–	–	–
04	8XT4	Professional Elective-II	4	–	–	4	4	3	80	20	100	40	–	–	–	–
PRACTICALS / DRAWING / DESIGN																
05	8XT5	UHF & Microwaves Lab	–	–	2	2	1	–	–	–	–	–	25	25	50	25
06	8XT6	Electronics Circuit Design Lab	–	–	2	2	1	–	–	–	–	–	25	25	50	25
07	8XT7	Project and Seminar	–	–	–	6	12	–	–	–	–	–	75	75	150	75
		TOTAL	16	2	4	28	32	–	–	–	400	–	–	–	250	

Professional Elective-II: 1. Biomedical Engineering 2. Digital Image Processing 3.. ARM system development and design 4. Embedded and Real time system 5.Smart sensors   TOTAL   650

FOUR YEAR DEGREE COURSE IN BACHELOR OF ENGINEERING
BRANCH - COMPUTER SCIENCE & ENGINEERING - SEMESTER PATTERN (CREDIT GRADE SYSTEM)
SEMESTER - SEVENTH

Appendix - E

Sr. No.	Subject Code	Subject	Lecture	Tutorial	P/D	Total HOURS/WEEK	CREDITS	DURATION OF PAPER (Hr.)	MAX. MARKS THEORY PAPER	MAX. MARKS COLLEGE ASSESMENT	TOTAL	MIN. PASSING MARKS	EXTERNAL	INTERNAL	TOTAL	MIN. PASSING MARKS
THEORY																
01	7KS01	Digital Signal Processing	4	_	_	4	4	3	80	20	100	40	_	_	_	_
02	7KS02	Computer Networks	4	_	_	4	4	3	80	20	100	40	_	_	_	_
03	7KS03	Design & Analysis of Algorithms	4			4	4	3	80	20	100	40				
04	7KS04	Object Oriented Analysis & Design	4			4	4	3	80	20	100	40				
05	7KS05	Professional Elective I*	4	_	_	4	4	3	80	20	100	40	_	_	_	_
PRACTICALS / DRAWING / DESIGN																
06	7KS06	Digital Signal Processing Lab	_	_	2	2	1	_	_	_	_	_	25	25	50	25
07	7KS07	Design & Analysis of Algorithms Lab	_	_	2	2	1	_	_	_	_	_	25	25	50	25
08	7KS08	Object Oriented Analysis & Design Lab	_	_	2	2	1	_	_	_	_	_	25	25	50	25
09	7KS09	Project & Seminar	_		2	2	4	_	_	_	_	_	_	50	50	25
		TOTAL	20	_	8	28	27				500				200	

TOTAL 700

Professional Elective I* (i) Computer Graphics (ii) Multimedia Technologies (iii) Web Engineering (iv) Human Computer Interface

Semester : EIGHTH

Sr. No.	Subject Code	Subject	Lecture	Tutorial	P/D	Total HOURS/WEEK	CREDITS	DURATION OF PAPER (Hr.)	MAX. MARKS THEORY PAPER	MAX. MARKS COLLEGE ASSESMENT	TOTAL	MIN. PASSING MARKS	EXTERNAL	INTERNAL	TOTAL	MIN. PASSING MARKS
THEORY																
01	8KS01	Artificial Intelligence	3	_	_	3	3	3	80	20	100	40	_	_	_	_
02	8KS02	Embedded Systems	4	_	_	4	4	3	80	20	100	40	_	_	_	_
03	8KS03	Software Engineering	3		_	3	3	3	80	20	100	40				
04	8KS04	Professional Elective II*	3	_	_	3	3	3	80	20	100	40	_	_	_	_
PRACTICALS / DRAWING / DESIGN																
05	8KS05	Artificial Intelligence -Lab	_	_	2	2	1	_	_	_	_	_	25	25	50	25
06	8KS06	Embedded Systems -Lab	_	_	2	2	1	_	_	_	_	_	25	25	50	25
07	8KS07	Project & Seminar			6	6	12						75	75	150	75
		TOTAL	13	_	10	23	27				400				250	

TOTAL 650

Professional Elective II* (i)Distributed Computing (ii) Mobile Computing (iii) Soft Computing (iv) Network Security

ENVIRONMENTAL STUDIES

Total Marks : 100

PART-A

SHORT ANSWER PATTERN   25 Marks

1. **The Multidisciplinary nature of environmental studies**
   - Definition, scope and importance.
   - Need for public awareness.
                                                                (2 lecture hours)

2. **Social Issues and the Environment**
   - From Unsustainable to Sustainable development
   - Urban problems related to energy
   - Water conservation, rain water harvesting, watershed management
   - Resettlement and rehabilitation of people; its problems and concerns. Case studies.
   - Envionmental ethics : Issues and possible solutions.
   - Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies.
   - Wasteland reclamation.
   - Consumerism and waste products.
   - Environment Protection Act.
   - Air (Prevention and Control of Pollution) Act.
   - Water (Prevention and Control of Pollution) Act.
   - Wildlife Protection Act.
   - Forest Conservation Act.
   - Issues involved in enforcement of environmental lesislation.
   - Public awareness.   (7 lecture hours)

3. **Human Population and the Environment**
   - Population growth, variation among nations.
   - Population explosion - Family Welfare Programme.
   - Environment and human health.
   - Human Rights.
   - Value Education.
   - HIV / AIDS.
   - Women and Child Welfare.
   - Role of Information Technology in Environment and human health.
   - Case Studies.   (6 lecture hours)

PART-B
ESSAY TYPE WITH INBUILT CHOICE   50 Marks

4. **Natural resources :**
   - **Renewable and non-renewable resources :**
     - Natural resources and associated problems.
       - Forest resources : Use and over exploitation, deforestation, case studies.   Timber extraction, mining, dams and their effects on forests and tribal people.
       - Water resources : Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.
       - Mineral resources : Use and exploitation, environmental effects of extracting and using mineral resources, case studies.
       - Food resources : World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer - pesticide problems, water logging, salinity, case studies.
       - Energy resources : Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources, Case studies.
       - Land resources : Land as a resource, land degradation, man induced landslides, soil erosion and desertification.
   - Role of an individual in conservation of natural resources.
   - Equitable use of resources for sustainable lifestyles.
                                                                (8 lecture hours)

5. **Ecosystems**
   - Concept of an ecosystem.
   - Structure and function of an ecosystem.
   - Producers, consumers and decomposers.
   - Energy flow in the ecosystem.
   - Ecological succession.
   - Food chains, food webs and ecological pyramids.
   - Introduction, types, characteristic features, structure and function of the following ecosystem :-
     - Forest ecosystem
     - Grassland ecosystem
     - Desert ecosystem
     - Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)
                                                                (6 lecture hours)

6. **Biodiversity and its conservation**
   - Introduction - Definition : genetic, species and ecosystem diversity.
   - Biogeographical classification of India.
   - Value of biodiversity : consumptive use, productive use, social, ethical, aesthetic and option values.
   - Biodiversity at global, National and local levels.
   - India as a mega-diversity nation.
   - Hot-spots of biodiversity.

. Threats to biodiversity : habitat loss, poaching of wildlife, man-wildlife conflicts.
. Endangered and endemic species of India.
    . Conservation of biodiversity : In-situ and Ex-situ conservation of biodiversity. (8 lecture hours)

7. Environmental Pollution
. Definition
    . Causes, effects and control measures of :-
        - Air pollution
        - Water pollution
        - Soil pollution
        - Marine pollution
        - Noise pollution
        - Thermal pollution
        - Nuclear hazards
. Solid Waste Management : Causes, effects and control measures of
    . Role of an individual in prevention of pollution.
    . Pollution case studies.
    . Diaster management : floods, earthquake, cyclone and landslides.
    (8 lecture hours)

PART-C
ESSAY ON FIELD WORK   25 Marks

8. Field work
. Visit to a local area to document environmental assets - river / forest / grass land / hill / mountain
. Visit to a local polluted site - Urban / Rural / Industrial / Agricultural
. Study of common plants, insects, birds.
. Study of simple ecosystems - pond, river, hill slopes, etc.
    (5 lecture hours)

(**Notes**   :   i)   Contents of the syllabys mentioned under paras 1 to 8 shall be for teaching for the examination based on Annual Pattern.
              ii) Contents of the syllabys mentioned under paras 1 to 4 shall be for teaching to the Semester commencing first, and
              iii) Contents of the syllabys mentioned under paras 5 to 8 shall be for teaching to the Semester commencing later.

LIST OF REFERENCES :-
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2) Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad - 380 013, India, Email : mapin@icenet.net **(R)**
3) Brunner R.C., 1989, Hazardous Waste Incineration, McGraw Hill Inc. 480p.
4) Clark R.S., Marine Pollution, Clanderson Press Oxford **(TB)**

5) Cunningham, W.P.Cooper, T.H.Gorhani, E & Hepworth, M.T., 2001, Environmental Encyclopedia, Jaico Publ. House, Mumbai, 1196p.
6) De A.K., Environmental Chemistry, Wiley Eastern Ltd.
7) Down to Earth, Certre for Science and Environment **(R)**
8) Gleick, H.P. 1993, Water in Crisis, Pacific Institute for Studies in Dev., Environment & Security. Stockholm Env. Institute, Oxford Univ. Press. 473p.
9) Hawkins R.E., Encyclopedia of Indian Natural History, Bombay Natural Histroy Society, Mumbai **(R)**
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12) Mckinney, M.L. & Schoch, R.M. 1996, Environmental Science Systems & Solutions, Web Enhanced Edition. 639 p.
13) Mhaskar A.K., Matter Hazardous, Techno-Science Publications **(TB)**
14) Miller T.G.. Jr., Environmental Science, Wadsworth Publishing Co. **(TB)**
15) Odum, E.P., 1971, Fundamentals of Ecology, W.B.Saunders Co., U.S.A., 574p.
16) Rao M.N. & Datta A.K.,1987, Waste Water Treatment, Oxford & IBH Publ. Co. Pvt. Ltd. 345 p.
17) Sharma B.K., 2001, Environmental Chemistry, Goel Publ. House, Meerut.
18) Survey of the Environment, The Hindu **(M)**
19) Townsend C., Harper J., and Michael Begon, Essentials of Ecology, Blackwell Science **(TB)**
20) Trivedi R.K., Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards, Vol. I and II, Enviro Media **(R)**
21) Trivedi R.K. and P.K. Goel, Introduction to Air Pollution, Techno-Science Publications **(TB)**
22) Wagner K.D., 1998, Environmental Management, W.B.Saunders Co., Philadelphia, USA 499p.
23) डॉ. विठ्ठल घारपूरे : पर्यावरणशास्त्र- पिंपळापूरे ॲन्ड कंपनी पब्लीशर्स, नागपूर.**(R)**
24) Dr. Deshpande, A.P.Dr. Chudiwale, A.D., Dr. Joshi, P.P., Dr. Lad, A.B.: Environmental Studies, Pimpalapure & Co., Publishers, Nagpur. **(R)**
25) R.Rajagopalan : Environmental Studies, Oxford University Press, New Delhi, 2005 **(R)**

(M) Magazine
(R) Reference
(TB) Textbook

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SANT GADGE BABA AMRAVATI UNIVERSITY GAZETTE

Official Publication of Sant Gadge Baba Amravati University

PART- TWO

(Extra-Ordinary)

Tuesday, the 22th September, 2020

NOTIFICATION

No. - 61/2020   Date : 22.9.2020

Subject :- Implementation of new syllabi of Semester III to VI of Master in Computer Application (Three Year Degree Course.... Semester Pattern) as per Choice Based Credit System in the Faculty of Science & Technology from the session 2020-2021 and onwards in phase wise manner ...

It is notified for general information of all concerned that the authorities of the University have accepted to implement the new syllabi as per AICTE Guidelines of Master in Computer Application (Three Year Degree Course... Semester Pattern ..Choice Based Credit System) Course of Semester III & IV from the academic session 2020-2021 and Semester V & VI from the academic session 2021-2022 & onwards in phase wise manner as per '**Appendix – A**' .

Sd/-
(Dr.T.R.Deshmukh)
Registrar
Sant Gadge Baba Amravati University

Appendix – A

SYLLABUS OF MCA SEM III TO VI [C.B.C.S.]

SEMESTER III

Course Code	**MCA19201**
Course Name	**JAVA PROGRAMMING**
Credits	**4**

Course Outcomes

1. Remember and know the use an integrated development environment to write, compile, run, and test simple Java programs and get knowledge of the structure and model of the Java programming language.
2. Understand Java as an Object oriented language and write programs that solve real-world problems.
3. Understand exception handling and multithreading in Java and apply the concepts to real problems
4. Understand Streams in Java and apply them to File handling, understand Generics
5. Understand Collection Frameworks and apply it for problem solving, design simple GUI based applications using Swing
6. Understand Event handling and analyze and apply the knowledge to develop small GUI based applications.

Units	Contents	Total Hrs
I	**Java Basics**: Program Components, Compilation cycle. Data types and Variables, Operators: Arithmetic, relational, Assignment, Shift operators. Control structures: if, nested if, switch, while,do-while, for loop, Enhanced for loops.	9
II	**Concepts of OOP**: Introduction to classes, class fundamentals, declaring objects, methods, constructor, **this** keyword, access control, Inheritance, Polymorphism, Abstract classes and Interfaces, Packages String and String Buffer classes, Math class. Arrays: Basics, One - & Multi-dimensional, Array of Objects, Passing array to methods.	10
III	**Exception handling:** Exception types, Built-in Exceptions, checked and unchecked Exceptions, using try and catch, throw, throws, finally clauses, multiple catch clauses, **Multithreaded programming:** Java thread model, creating a thread, creating multiple threads, thread priorities & synchronization.	9