SELF ASSESSMENT REPORT (SAR)

For Accreditation of UG Engineering Program

BE – Electronics & Communication Engineering (Tier-1)

Submitted to

National Board of Accreditation

New Delhi

By

SAMRAT ASHOK TECHNOLOGICAL INSTITUTE

(A Grant in-aid Autonomous Engineering College Estd. in 1960)

(Approved from AICTE and Affiliated to RGPV & Barkatullah University, Bhopal)

NAAC Accreditated, UGC Autonomous

(An Autonomous Institute declared by RGPV, BU and Full fledged Autonomy by UGC)

Vidisha (M.P.)

: PHONES :

STD Code : (07592)

Registrar	**:** 251083, 250744, 250741	**E-mail**	**:** registrar@satiengg.org
E-mail	**:** sati@satiengg.org	**Website**	**:** www.satiengg.in
Steno to Director :	250121	**Fax**	**:** 250124

SAMRAT ASHOK TECHNOLOGICAL INSTITUTE

(Engineering College)
Vidisha (M.P.)

SAR Contents

PART A: Institutional Information

1.	**Name and Address of the Institution**	:	Samrat Ashok Technological Institute (Engineering College), Civil Line, Vidisha (M.P.) 464 001
2.	**Name and Address of the Affiliating University**	:	Rajiv Gandhi Prodyogiki Vishwavidhyalya Airport Bypass Road, Gandhi Nagar, Bhopal, Madhya Pradesh 462036
3.	**Year of establishment of the Institution**	:	1960
4.	**Type of the Institution**	:	

	Institute of National Importance	:	
	University	:	
	Deemed University	:	
	Autonomous	:	√ Year of Autonomy - 2010
	Any other (Please specify)	:	

Note:

1. In case of Autonomous and Deemed University, mention the year of grant of status by the authority.
2. In case of University Constituent Institution, please indicate the academic autonomy status of the Institution as defined in 12th Plan guidelines of UGC. Institute should apply for Tier 1 only when fully academically autonomous.

5.	**Ownership Status**	:	

	Central Government	:	
	State Government	:	
	Government Aided	:	
	Self financing		
	Trust		
	Society	:	√
	Section 25 Company		

Any other (Please specify) :

Provide Details:

The Institute "Samrat Ashok Technological Institute" is established by Maharaja Jiwaji Rao Education Society (MJES) on November 1, 1960 under the open door policy of Government of India. The society constituted a Board of Governors (BOG) which governs the Institute as per the rules, regulation of Government of India, State Government and AICTE. A managing committee has been constituted by the BOG to take decisions on behalf of the BOG.

Following are the members of the society:

S.N.	Name	Designation
1.	Shrimant Shri Jyotiraditya M. Scindia	President
2.	Sh. Motilal Vora	Vice President
3.	Dr. Laxmikant Markhedkar	Secretary
4.	Er. Ramesh Agrawal	Treasurer
5.	Justice (former) N.K.Modi	Member
6.	Dr. K.K. Agrawal, Founder Vice-Chancellor of Indraprastha University	Member
7.	Sh. Bharat C Chhaparwal, Ex-Vice-chancellor, DAVV, Indore	Member
8.	Sh. Prashant Mehta (IAS retd.)	Member
9.	Sh. Bimal Julka IAS	Member
10.	Sh. Mahendra Sethia (Industrialist), Indore	Member
11.	Dr. Anoop Raj (Educationalist) New Delhi	
12.	Finance Secretary, Govt. of MP	Member
13.	Principal Secretary, Technical Education & Skill Development, Govt. of MP	Member
14.	Dr. N.C. Shivaprakash (AICTE Nominee)	Member
15.	Dr. C.M. Chitle (UGC Nominee)	Member
16.	Vice-Chancellor, RGPV, Bhopal	Member
17.	Director	Member Secretary
18.	Institute Professor	Member
19.	Institute Professor	Member

The function for which the society is established are:

1. To administer and manage the funds which may be received from time to time from any sources what so ever for establishing institutions at Vidisha (Bhilsa) or elsewhere for

imparting of technical, vocational or other type of education.

2. To establish and run an institution or institutions for imparting technical education in Civil, Mechanical, Electrical, Electronics, Computer Science, Information Technology, Telecommunication Engineering and other science & Technological subjects, to establish and run vocational and other educational institution.
3. To acquire either by purchase, exchange, lease, gift or otherwise and to hold, shell receive the purchase money of convey assign, lease exchange and administer and utilize all such property wholly and completely in furtherance of the aims and ends of the society and for the achievement of any other object what so ever.
4. To layout and prepare for building purposes of the society and lands, acquired by or leased to the society.
5. To erector procure the erection of buildings, of any and all kinds upon any such lands as aforesaid and to alter, pull down improve, decorate maintain, furnish and do any other works on or for or in respect of all or any building in which the society may be interested.
6. To aid in the establishment and support of association for the benefit of persons employed by the society of in any way connected with the society.
7. To invest or land money whether belonging or entrusted to the society upon such manner as may from time to time be determined by the society.
8. To raise money or mortgage or change or in such other manner as the society shall think fit and in particular by the issue of debentures charged upon all or in any of the property of the society both present and future.
9. To apply the income and property when so ever derived towards the promotion of the objects set out above.
10. To do all or any of the above things either along or in conjunction with others and to do all other such things as the society may consider necessary, incident or conductive to the attainment of the above objects.
11. To raise or borrow money as may be required from time to time for the purpose of the society.

6. Other Academic Institutions of the Trust/Society/Company etc., if any:

Name of the Institution(s)	Year of Establishment	Programs of Study	Location
Samrat Ashok Technological Institute (Polytechnic)	1957	Diploma in Engineering	Vidisha (M.P.)

Table A.6

7. Details of all the programs being offered by the institution under consideration:

S.No	Programme	Name of the Department	Year of Start	Intake	Increase/ Decrease in intake, if any	Year of Increase /Decrease	AICTE Approval	Accreditation Status*
UG-Engineering								
1.	BE- Civil Engineering	Civil	1960	60			Yes	Accredited 2012-15
2.	BE - Mechanical Engineering	Mechanical	1960	30	120	2019	Yes	Accredited 2018-19 to

								2020-21 1.23-25 Sept. 2011, 2.8-10 April 2015
3.	BE- Electrical Engineering	Electrical	1960	30	60	2001	Yes	Accredited 2012-15
4.	BE- Electronics & Instrumentation	EI	1985	30	120	2019	Yes	Accredited 2018-19 to 2020-21 & 2012-15
5.	BE- Computer Science Engineering	CSE	1988	30	120	2017	Yes	Not Accredited 1.23-25 Sept. 2011, 2.8-10 April 2015
6.	B.E. Electronics and communication	EC	2000	60			Yes	Not Accredited 8-10 April 2015
PG-Engineering								
7.	M.E. Construction Technology & Management	Civil	1997	18			Yes	Not Eligible
8.	M.E. Environmental Engineering	Civil	1999	18			Yes	Not Eligible
9.	M.E. Trasportation Engineering	Civil	2003	18			Yes	Not Eligible
10.	M.E. Advanced Production System	Mechanical	1993	18			Yes	Not Eligible
11.	M.E. Power Electronics	Electrical	1997	18			Yes	Not Eligible
12.	M.Tech CSE	CSE	2001	25			Yes	Not Eligible
Others Courses								
13.	M.Sc. Applied Chemistry	Chemistry	1972	25			Yes	--
14	Master in Business Administration	MBA	2001	30	60	2012	Yes	--

Table A.7

* ***Write applicable one:***

Applying first time

- Granted provisional accreditation for two/three years for the period(specify period)
- Granted accreditation for 5/6 years for the period (specify period)
- Not accredited (specify visit dates, year)
- Withdrawn (specify visit dates, year)
- Not eligible for accreditation
- Eligible but not applied

Note: Add rows as needed.

8. Programs to be considered for Accreditation vide this application

S.No.	Programme Name
1.	B.E. Electronics & Communication

Table A8

9. Total number of employees:

A. Regular Employees (Faculty and Staff):

Items		CAY (2019-20)		CAYm1 (2018-19)		CAYm2 (2017-18)		CAYm3 (2016-17)	
		Min	Max	Min	Max	Min	Max	Min	Max
Faculty in Engineering	M	43	44	42	45	42	42	42	43
	F	06	06	06	07	06	06	06	06
Faculty in Maths, Science & Humanities teaching in Engineering Programs	M	09	09	09	09	09	09	09	09
	F	04	04	04	04	04	04	04	04
Non-Teaching Staff	M	130	131	131	138	57	57	62	62
	F	15	16	16	16	10	10	16	16

Table A9a

Note: Minimum 75% should be Regular/Full Time faculty and the remaining shall be Contractual Faculty/Adjunct Faculty/Resource Source from industry as per AICTE norms and standards.
The contractual Faculty will be considered for assessment only if a faculty is drawing a salary as prescribed by the concerned State Government for the contractual faculty in the respective cadre and who have taught over consecutive 4 semesters.

CAY – Current Academic Year
CAYm1- Current Academic Year minus1= Current Assessment Year
CAYm2 - Current Academic Year minus2=Current Assessment Year minus 1

B. Contractual Staff Employees (Faculty and Staff): (Not covered in Table A):

Items		CAY (2019-20)		CAYm1 (2018-19)		CAYm2 (2017-18)		CAYm3 (2016-17)	
		Min*	Max	Min	Max	Min	Max	Min	Max
Faculty in Engineering	M	41	41	41	53	31	45	32	35
	F	17	18	17	21	17	20	18	18
Faculty in Maths, Science & Humanities teaching in Engineering Programs	M	05	06	06	06	02	04	02	02
	F	01	01	01	01	01	01	01	01

Table A9b

* NPIU faculty is to added

10. Total number of Engineering Students:

(i) Undergraduate-Engineering

Item	**CAY (2019-20)**	**CAYm1 (2018-19)**	**CAYm2 (2017-18)**
Total no. of Boys	1520	1508	1583
Total no. of Girls	466	536	545
Total no. of Students	1986	2044	2128

Table A.10

(ii) Postgraduate-Engineering

Item	**CAY (2019-20)**	**CAYm1 (2018-19)**	**CAYm2 (2017-18)**
Total no. of Boys	79	104	104
Total no. of Girls	16	35	50
Total no. of Students	95	139	154

Table A.10

(iii) Others (M.Sc., MBA and MCA)

Item	**CAY (2019-20)**	**CAYm1 (2018-19)**	**CAYm2 (2017-18)**
Total no. of Boys	46	62	96
Total no. of Girls	85	97	111

Total no. of Students	131	159	207

Table A.10

(Instruction: The data may be categorized in tabular form separately for undergraduate, postgraduate engineering, other program, if applicable)

Note: In case the institution is running programs other than engineering programs, a separate table giving similar details is to be included.

11. Vision of the Institution:

To contribute towards service and development of the mankind through quality education and research, in the area of science and technology and Management.

12. Mission of the Institution:

To create quality manpower equipped with technical skills ,social values, leadership, creativity and renovation for the benefit and betterment of mankind and sustainable development of the nation.

13. Contact Information of the Head of the Institution and NBA coordinator, if designated:

i. Name : Dr. J.S. Chauhan

Designation : Director

Mobile No. : 9826244840

Email ID : director@satiengg.org

ii NBA Coordinator, if designated

Name : Dr. Sanjay Katarey

Designation : Professor

Mobile No. : 9826050049

Email ID : nba@satiengg.org

14. General Information of the Institute

Samrat Ashok Technological Institute, a premier institute of the region, was established on November 1, 1960 under the “Open Door” policy of the Government of India, by Maharaja Jiwajirao Education Society, Vidisha with a donation from the Gangajali Trust Fund of the Scindias, erstwhile rulers of the Gwalior state, and commitment of non-recurring grants from the Government of India and the Government of Madhya Pradesh in agreed proportions.

The Institute has completed its 57 glorious years. During the last 57 years, the institute grew up in a big way. The institute which was started with 3 UG programmes in Engg., now offers nine undergraduate courses in Engineering (B.E.), eleven Post graduate courses in Engineering (ME/M.Tech.), Master of Computer application (MCA), Master of Business Administration (MBA), four P.G. courses in Applied Sciences, and Full Time/Part-time Ph.D. programmes with approx 3000 students. Institute has academic autonomy status, recently Institute has got NAAC accreditation also. Institute has well qualified, experienced & dynamic faculty to impart the high quality education in Engg./Technology, Science and Management. There are well equipped modern laboratories, well stocked Digital E-Library, sports facilities and other facilities to meet academic, Co-curricular extra-curricular activities, and other requirements. MHRD, Govt of India, New Delhi, has selected this institute under the World Bank Scheme TEQIP-III with financial assistance of Rs. 15.00 crores. The objective of the scheme is to establish Academic Excellence in the institute through various activities and enhance the employability of UG/PG students.

Since its inception, Institute has played a significant role in developing human resources to meet the requirement of industries with high social values at home and abroad.

Campus

The college campus a few minute walk from the Railway station, is situated in Civil lines area of Vidisha a district headquarter. It spreads over 85 acres of lush green land with well maintained internal road and approaches, play ground, garden, administrative building, academic departments, workshop, hostels, residential quarters etc. Some of the highlights of the campus are:

- Well spread over 85 acres of lush green land with internal roads and approaches.
- Total built-up area of the institute in 34463 Sq. m.
- Embedded with all amenities required for a technical institute.
- Houses sixteen academic departments, other supporting sections, workshop etc.
- Residential zone for faculty and staff.
- Three boys and two girls hostel + one girls hostel under construction.
- Post office, Two Banks, ATM, Cooperative store, Canteen, Dispensary, Central Reprographic Centre.
- Enclosed by RCC boundary wall
- One guest house, one alumni Transit House
- Indoor Auditorium of 600 capacity and open auditorium
- Own 33 KVA/400 Volt power sub station
- Overhead tanks, internal water supply pipeline, tube well etc.
- Sports complex with all indoor and outdoor sports facilities
- Round the clock security
- Power backup with two 62.5 KVA and one 200 KVA Generator sets.

PART B: Program Level Criteria

CRITERION 1	Vision, Mission and Program Educational Objectives	50

1.1. State the Vision and Mission of the Department and Institute (5)

Samrat Ashok Technological Institute, a premier institute of the region was established by Late Maharaja Jiwaji Rao Scindia on November 1, 1960 with a donation from Gangajali Trust fund. The Institute started with B.E. in Civil Engineering, Mechanical Engineering & Electrical Engineering. The Institute currently offers 6 full times Under Graduate and 8 full time Post Graduate and Ph.D Programme and (6 ME/M.Tech., MBA and one Applied Sciences) leading to degree in Bachelor of Engineering and fifteen Postgraduate courses in the areas of Engineering, Science and Management. It is an autonomous institute, which is fully funded by Government of Madhya Pradesh and managed by the Maharaja Jiwaji Rao Education Society chaired by Hon'ble Shrimant Jyotiraditya M. Scindia. The college campus is spread over an area of 85 acres of lush green land with natural surroundings.

Vision of the institute

To contribute towards services and development of the mankind, through quality education and research, in the area of science & technology.

Mission of the institute

To create quality manpower equipped with technical skills, social values, leadership, creativity, and innovation for the benefits and betterment of mankind and sustainable development of the nation.

Department of Electronics and Communication Engineering was established in the year 2000 with a graduate programme in Electronics and Communication Engineering. Right from its inception, focus has been on quality education, training and research in different areas of Electronics and Communication. In 2011, department also started offering M.Tech. program in Electronics and Communication Engineering. Department is having qualified staff with specializations in diversified areas including Signal Processing, Communication, VLSI, Embedded systems, Antenna, Computer Science etc. Being an autonomous institute, curriculum is regularly reviewed and revised with inputs from industries. To complement the theoretical studies well equipped laboratories have been established for the core subjects. Department has an excellent placement record and the graduates are well placed in leading software and core industries. Apart from the UG and PG programs, the department is also a recognized research centre of the Technical University. Department provides the guidance facilities to the research scholars for their Ph.D. program.

Vision of the Department

To contribute in service of humanity and nation's development by fulfilling the needs of industry and society through technically enriched and competent professionals with social values, entrepreneurship skill, leadership quality and capability of research in the area of Electronics and Communication.

Mission of the Department

M1- By offering well balanced curriculum to impart quality technical knowledge.

M2- By providing them facilities for hands on practice and research.

M3- Inculcating Social values, leadership, ethics, self confidence, entrepreneurship skills and providing platform to explore their creativity and hidden talents.

1.2 State the Program Educational Objectives (PEOs) (5)

Program Educational Objectives

1. To prepare Graduateswith strong foundation in engineering science and technology for successful career choices in both public and private sectors in the field of Electronics and Communication engineering.
2. To prepare students to crack various state/ national level competitive examinations like GATE/ IES etc and to prepare for higher studies or to become researchesr or successful entrepreneurs in life.
3. To inculcate a sense of ethics, professionalism and effective communication skills amongst graduates.

1.3. Indicate where the Vision, Mission and PEOs are published and disseminated among stakeholders (15)

Vision, Mission and PEOs of the department are published in the following places:

S.No.	Location	Remark
1	College Website	www.satiengg.in
2	Department	Display Board
3	H.O.D Chamber	Poster
4	Class rooms	Poster
5	Laboratories	Poster
6	Faculty rooms	Charts
7	Departmental Library	Poster
8	Departmental Seminar Hall	Poster

Vision, Mission and PEOs are disseminated during following activities:

S.No	Event/ Activity	Remark
1	Alumni meet	PPT
2	BOS Meeting	Paper Documentation
3	Admission process	PPT & Poster
4	First year induction program	PPT
5	During organized STTP/Workshop/ FDP	PPT
6	Parents meet	Poster

1.4. State the process for defining the Vision and Mission of the Department, and PEOs of the program (15)

In establishing the **Vision and Mission and PEOs** of the department, the following steps were followed:

- Vision and Mission of the Institution are taken as basis
- Views are taken from internal and external stakeholders of the program.
- Team of faculty members' drafts expected (rough) Vision, Mission and PEOs.
- The internal stake holders (faculties & staff) are then indulged via meeting for inputs and reviews to modify Vision, Mission and PEOs.
- The revised Vision , Mission and PEOs are discussed and debated in the departmental Board of Studies as shown below (BOS committee: consists of head of the department, senior faculty members, two external representative from university and other institution of repute, Two industry representative)-
- After getting approval from BOS, Statements of Vision, Mission and PEOs get finalized. However, if BOS does not approve the same it puts forward in front of the team of faculty members for necessary modifications and corrections.
- The draft finalized by BOS is submitted in Academic Council meeting.
- If Academic Council approves finalized Vision, Mission and PEOs are published and disseminated.
- If not approved by Academic Council, re-discussed with BOS members and modifications are incorporated in the draft. The improved version of the draft is submitted to academic council
- Finally the Vision, Mission and PEOs are approved by the Academic Council and Head of the institution and BOG of the institution.

1.5. Establish consistency of PEOs with Mission of the Department (10)

(Generate a "Mission of the Department – PEOs matrix" with justification and rationale of the mapping)

PEO Statements	**M1-** By offering well balanced curriculum to impart quality technical knowledge.	**M2-** By providing them facilities for hands on practice and research.	**M3-**Inculcating Social values, leadership, ethics, self confidence, entrepreneurship and providing platform to explore their creativity and hidden talents.
PEO 1	**H (3)** Program offers a balanced curriculum with 60:40 percentage ratio of core engineering to other subjects. Core engineering subjects contribute to develop technical skills and concepts. Components of other subjects are basic sciences, management and humanities which develops basic engineering science and technology concepts. To solve complex engineering and real time problems, problems need to be identified, analyzed, and investigated first than only solution can be provided. So balanced curriculum make the students able to apply the knowledge, identify and analyze the problems, make the investigations and make final conclusions and decision to solve the problems through their acquired knowledge, developed technical skills, and managerial skills. This way they may serve the public and private sectors. Therefore M1 is highly	**M(2)** By hands on practice only students become able to use engineering tools (Hardware or Software) for the purpose of providing solution to problem or research. In the process of proving solutions to any problems data related to that problem need to be acquired, processed and investigated which can be done using these tools only. Result of investigation gives the direction of solution to be provided, where again these tools play very important role. To use these tools effectively program provides them facilities for hands on practice in Lab sessions**.** And for above all strong foundation of engineering science and technology is required. Therefore M2 is moderately correlated with this PEO.	-No correlation

	correlated with PEO1.		
PEO 2	**H(3)** In balanced curriculum subjects related to GATE and engineering services and research oriented subjects are already incorporated. Therefore students become competent enough to crack these examinations. After clearing the GATE examination students become eligible to apply for advanced degrees, and research capability make them lifelong learner and drives them towards completion of advanced degrees. Therefore M1 is highly correlated with PEO 2.	**M(2)** Program has some specific research based laboratory Like MALAB Lab, LabVIEW Lab with associated hardware's and some open source software which may be used in research. Therefore M2 is moderately correlated with PEO 2.	**M(2)** Entrepreneurs develop the products and commercialize it and process of product development starts with research. And we provide them facilities for research and therefore facilitating them to become therefore M2 is moderately correlated with PEO 2.
PEO 3	**M(2)** In balanced curriculum. There are components of humanity, communication skills and ethics. Therefore M3 is moderately correlated with PEO3.	-No correlation.	**H(3)** Inculcating social values via NCC/NSS activities, in projects they work as a team member or leader which develops their leadership skills, via club activities we inculcate ethical values, self confidence and good skill to communicate and via entrepreneur cell we inculcate this skill and provide them facilities to become entrepreneur. Therefore M3 is highly correlated with PEO3.
Average	**2.66**	1.33	**1.66**

CRITERION 2	**Program Curriculum and Teaching –Learning Processes**	**100**

2.1. Program Curriculum (30)

2.1.1. State the process for designing the program curriculum (10)

1. The process for designing the program curriculum starts with conduct of need analysis in pace with PSOs and POs of the program and relevance to the branch. Process also incorporates the views of external and internal stackholders.
2. A team of faculty members (Curriculum Development Team) go through the process of critical questioning, what to be taught, when/whom to be taught and how to be taught while identifying the materials or topics and preparing structure and action plan for the curriculum design.
3. The Curriculum Development Team makes systematic decision keeping learners characteristics and intended outcomes in mind about the contents of the courses, Components of curriculum are selected to attain PSOs and POs on the basis of the relevance to the branch and accordingly distributed among the various semesters of the program.
4. Generally Curriculum maintains the balance in the composition of basic science, humanities, professional courses and their distribution in core and elective as per predefined norms.
5. Team decides on what delivery methods should be used accordingly adopts teaching learning methodology.
6. Above curriculum is delivered effectively through lectures, laboratory sessions and tutorials.

   For Scheme 2017-2018
   Lecture (L): 1 hour = 1 credit
   Tutorial (T): 1 hour = 1 credit
   Practical (P): 1 hour = 1 credit
   For Scheme 2018-2019
   Lecture (L): 1 hour = 1 credit
   Tutorial (T): 1 hour = 1 credit
   Practical (P): 2 hour = 1 credit

7. Then team prepares the management plan and evaluation strategy. Above curriculum is evaluated effectively through:

   Final exam (Theory) = 70 marks

   Final exam (Practical) = 30 marks

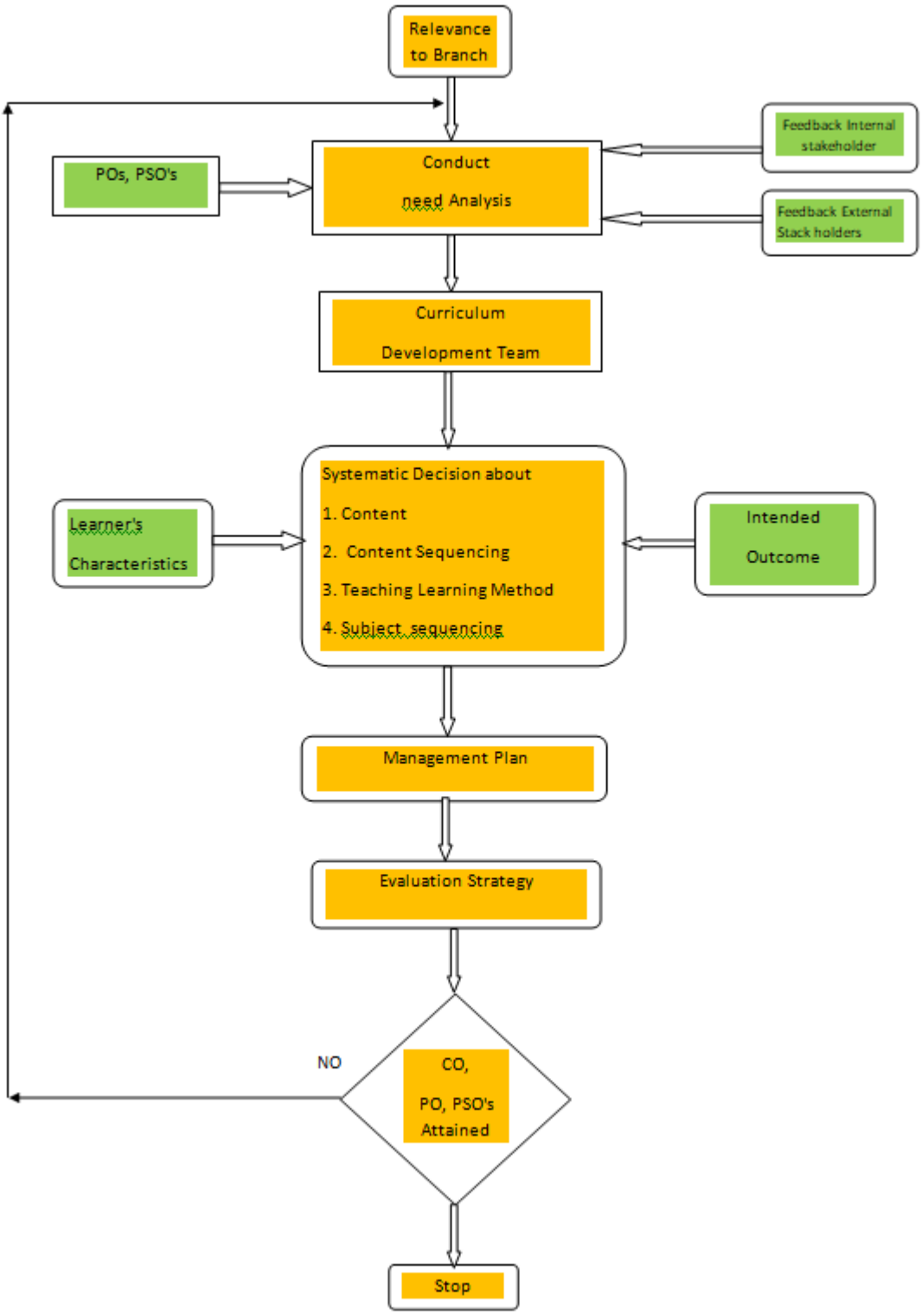
   Assignments = 20 marks

   Mid sem exam = 20 marks

   Quiz = 10 marks

8. If some components, to attain CO's/ PO's, are not included in the curriculum then the department

makes changes by adding those contents in the syllabus.



Process of Curriculum Desion

2.1.2. Structure of the Curriculum (5)

For the program each course is planned to have a lecture slot, tutorial slot and practical slot mentioning the total contact hours per week and total credits per semester. In the Choice based Grading System (2017-2018 onwards) given below one contact hour is equal to one credit but in Choice based Grading system (2018-2019onwards) two practical contact hours is equal to one credit.

Choice based Grading System From 2017-2018 to 2020-2021 (I-VIII Semester)

I- Semester						
Course Code	Course Title	Per week				Credits
		Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
BE-1721	Engineering Physics	3	1	2	6	6
BE-1722	Basic Civil Engg. &Engg. Mechanics	3	1	2	6	6
BE-1723	Basic Mechanical Engg	3	1	2	6	6
BE-1724	Energy, Environment Ecology & Society	3	1	-	4	4
BE-1725	Engineering Mathematics**	3	1	-	4	4
BE-1726	Computer Programming	-	-	4	4	4
BE-1727	Rural Outreach & Entrepreneurship	-	-	2	2	2
Total		15	05	12	32	32

II- Semester						
Course Code	Course Title	Per week				Credits
		Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
BE-1711	Engineering Chemistry	3	1	2	6	6

BE-1712	Basic Electrical & Electronics Engg.	3	1	2	6	6
BE-1713	Engineering Graphics	3	1	2	6	6
BE-1714	Engineering Mathematics**	3	1		4	4
BE-1715	Communication Skills	3	1	-	4	4
BE-1716	Workshop Practice	-	-	4	4	4
BE-1717	Introduction to branch &Entrepreneurship	-	-	2	2	2
Total		15	05	12	32	32

III- Semester						
Course Code	Course Title	Per week				Credits
		Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
EC-1731	Electronic Devices & Circuits	3	1	2	6	6
EC -1732	Network Analysis	3	1	2	6	6
EC -1733	Digital Circuit Design	3	1	2	6	6
EC -1734	Electronic Instrumentation & Measurement	3	1		4	4
EC -1735	Signals & Systems	3	1	0	4	4
EC -1736	Electronic Instrumentation and Signals & Systems Lab	-	-	4	4	4
EC -1737	Seminar & Entrepreneurship	-	-	2	2	2
Total		15	05	12	32	32

IV- Semester			
Course Code	Course Title	Per week	Credits

		Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
EC-1741	VLSI Design	3	1	2	6	6
EC-1742	Electronic Circuit Design	3	1	2	6	6
EC-1743	Control System Engineering	3	1	2	6	6
EC-1744	Electromagnetic Field	3	1	-	4	4
EC-1745	Engineering Mathematics-III*	3	1	-	4	4
EC-1746	Computer Programming Skills-I	-	-	4	4	4
EC-1747	Aptitude & Logical Reasoning	-	-	2	2	2
Total		15	05	12	32	32

V- Semester						
Course Code	Course Title	Per week				Credits
		Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
EC-1751	Antenna & Wave Propagation	3	1	2	6	6
EC-1752	Communication Network and Transmission Lines	3	1	2	6	6
EC-1753	Microprocessor & Microcontroller	3	1	2	6	6
EC-1754	Analog Communication	3	1	2	6	6
EC-1755	Probability and Stochastic Process	3	1	-	4	4
EC-1756	Computer Programming Skills-II (C and C++)	-	-	2	2	2
EC-1757	Minor Industrial Training	-	-	2	2	2

Total	15	05	12	32	32

VI- Semester						
Course Code	Course Title	Per week				Credits
		Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
EC-1761	Digital Signal Processing	3	1	2	6	6
EC-1762	Data Communication & Computer Networks	3	1	2	6	6
EC-1763	Microwave Engineering	3	1	2	6	6
EC-1764	Digital Communication	3	1	2	6	6
EC-1765	Cellular Mobile Communication	3	1	-	4	4
EC-1766	Minor Project	-	-	2	2	2
EC-1767	Technical & Professional Skills	-	-	2	2	2
Total		15	05	12	32	32

VII- Semester						
Course Code	Course Title	Per week				Credits
		Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
EC-1771	Advanced Communication	3	1	2	6	6
EC-1772	Data Structure and Algorithm	3	1	2	6	6
EC-1773	CMOS Amplifier Design	3	1	2	6	6
EC-1774	Elective-I	3	1	-	4	4
EC-1775	Elective-II	3	1	-	4	4
EC-1776	Major Project-I	-	-	4	4	4
EC-1777	Industrial Training & Startup	-	-	2	2	2

Total	15	05	12	32	32

VIII- Semester						
Course Code	Course Title	Per week				Credits
		Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
EC-1781	Elective-III	3	1	-	4	4
EC-1782	Elective-IV	3	1	-	4	4
EC-1783	Major Project-II	-	-	22	22	22
EC-1784	General Proficiency	-	-	2	2	2
Total		06	02	24	32	32

Semester	Session 2017-2018 to 2020-2021 (Choice based grading system)				Credits
	Lecture/ week (L)	Tutorial/week (T)	Practical/week (P)	Contact Hours/ week	
Ist	15	05	12	32	32
IInd	15	05	12	32	32
IIIrd	15	05	12	32	32
IVth	15	05	12	32	32
Vth	15	05	12	32	32
VIth	15	05	12	32	32
VIIth	15	05	12	32	32
VIIIth	06	02	24	32	32
	111hrs	37hrs	108hrs	256hrs	256

Scheme Choice Based Grading System (CBGS)

From 2018-2019 Onwards

(I-VIII Semester)

I- Semester						
Course Code	Course Title	Per week				Credits
		Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
BT1811	Engineering Physics	3	-	2	5	4
BT1812	Basic Civil Engineering. & Mechanics	3	-	2	5	4
BT1813	Basic Mechanical Engineering	3	-	2	5	4
BT1814	Energy, Environment Ecology & Society	3	-	-	3	3
BT1815	Engineering Mathematics-I	3	1	-	4	4
BT1816	Computer Programming	-	-	2	2	1
Total		15	1	8	24	20

II- Semester						
Course Code	Course Title	Per week				Credits
		Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
BT1821	Engineering Chemistry	3	-	2	5	4
BT1822	Basic Electrical &Electronics Engineering	3	-	2	5	4
BT1823	Engineering Graphics	3	-	2	5	4
BT1824	Communication Skills	3	-	-	3	3
BT1825	Engineering Mathematics-II	3	1	-	4	4

BT1826	Manufacturing Practices	-	-	2	2	1
Total		15	1	8	24	20

III- Semester						
Course Code	Course Title	Per week				Credits
		Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
EC1831	Managerial Economics	3	1	-	4	4
EC1832	Electronic Devices	3	-	2	5	4
EC1833	Digital Logic Design	3	-	2	5	4
EC1834	Network Analysis	3	-	2	5	4
EC1835	Signal and Systems	3	-	-	3	3
EC1836	Language Lab	-	-	2	2	1
EC1837	Evaluation of Internship – I completed at I year level & Seminar (personality development)	-	-	4	4	2
Total		15	1	12	28	22

IV- Semester						
Course Code	Course Title	Per week				Credits
		Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
EC1841	Electromagnetic Theory	3	1	-	4	6
EC 1842	Analog and Digital Communication	3	-	2	5	6
EC 1843	Analog Circuits	3	-	2	5	6
EC 1844	VLSICircuit Design	3	-	2	5	4
EC 1845	Engineering Mathematics-III	3	-	-	3	4

EC 1846	Simulation Lab I	-	-	2	2	4
EC 1847	90 hrs Internship based on using various software's - Internship – II	-	-	-	-	2
Total		15	1	8	24	20

V- Semester						
Course Code	Course Title	Per week				Credits
		Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
EC 1851	Wireless Communication	3	-	2	5	4
EC 1852	Antenna and Wave Propagation	3	-	2	5	4
EC 1853	Microprocessor and Microcontroller	3	-	2	5	4
EC 1854	Digital Signal Processing	3	1	-	4	4
EC 1855	Control Systems	3	-	-	3	3
EC 1856	Simulation Lab II	-	-	2	2	1
EC 1857	Internship – II (Evaluation) (personality development)	-	-	4	4	2
Total		15	01	12	28	22

VI- Semester						
Course Code	Course Title	Per week				Credits
		Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
EC1861	Data Communication and Computer Networks	3	-	2	5	4
EC1862	Elective-I	3	-	2	5	4
EC1863	Elective-II	3	-	2	5	4

EC1864	Elective-III	3	-	-	3	3
EC1865	Embedded Systems Design	3	-	-	3	3
EC1866	Minor Project-I	-	-	4	4	2
EC1867	90 hrs Internship in Industry or elsewhere Internship-III	-	-	-	-	-
Total		15	-	10	25	20

VII- Semester						
Course Code	Course Title	Per week				Credits
		Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
EC 1871	Elective-IV	3	1	-	4	4
EC 1872	Elective-V	3	1	-	4	4
EC 1873	Elective-VI	3	-	-	3	3
EC 1874	CMOS Circuit Design	3	-	-	3	3
EC 1875	Digital Image Processing	3	-	-	3	3
EC 1876	Simulation Lab III	-	-	2	2	1
EC 1877	Internship-III (Evaluation) (personality development)	-	-	4	4	2
EC 1878	Major Project-Planning and Survey	-	-	4	4	2
Total		15	2	10	27	22

VIII- Semester						
Course Code	Course Title	Per week				Credits
		Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
EC 1881	Elective-VII	3	-	-	3	3
EC 1882	Neural Network and Fuzzy	3	-	-	3	3

	Logic					
EC 1883	Major Project final	-	-	16	16	8
Total		06	02	24	22	14

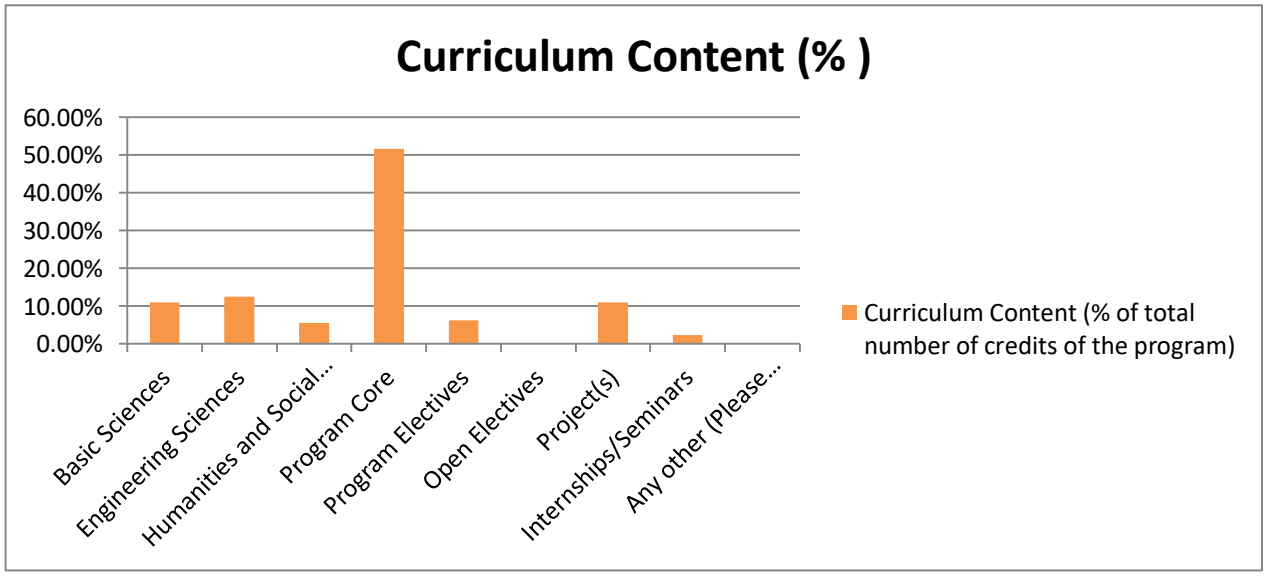
Semester	Session 2018-2019 onwards (Choice Based Grading System)				Credits
	Lecture/ week(L)	Tutorial/week (T)	Practical/week (P)	Contact Hours/ week	
Ist	15	1	8	24	20
IInd	15	1	8	24	20
IIIrd	15	1	12	28	22
IVth	15	1	8	24	20
Vth	15	01	12	28	22
VIth	15	-	10	25	20
VIIth	15	2	10	27	22
VIIIth	06	02	24	22	14
	111hrs	09hrs	92hrs	202hrs	160

2.1.3. State the components of the curriculum (5)

Scheme CBGS 2017-2018

Course Component	Curriculum Content (% of total number of credits of the program)	Total Number of Contact Hours	Total Number of Credits
Basic Sciences	10.9 %	28	28
Engineering Sciences	12.5%	32	32
Humanities and Social	5.46%	14	14

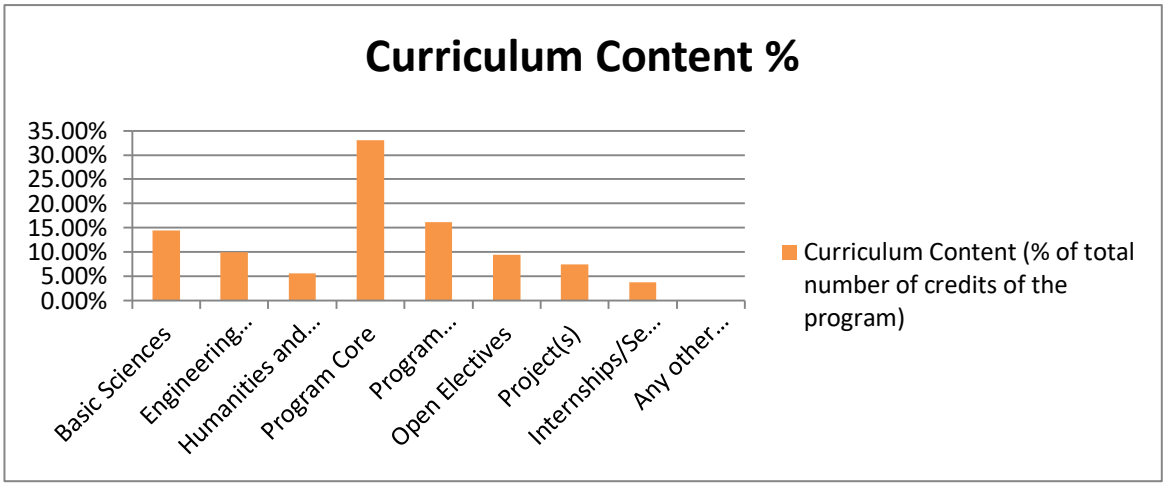
Sciences			
Program Core	51.56%	132	132
Program Electives	6.25%	16	16
Open Electives	0.00%	00	00
Project(s)	10.9%	28	28
Internships/Seminars	2.3%	06	06
Any other (Please specify)	0.00%	00	00
Total	100%	256	256



Scheme CBGS 2018-2019

Course Component	Curriculum Content (% of total number of credits of the program)	Total Number of Contact Hours	Total Number of Credits
Basic Sciences	14.4%	26	23
Engineering Sciences	10%	20	16

Humanities and Social Sciences	5.62%	11	09
Program Core	33.1%	65	53
Program Electives	16.2%	29	26
Open Electives	9.4%	15	15
Project(s)	7.5%	24	12
Internships/Seminars	3.75%	12	06
Any other (Please specify)		00	00
Total	100%	202	160



2.1.4 State the process used to identify extent of compliance of the curriculum for attaining the Program Outcomes and Program Specific Outcomes as mentioned in Annexure I (10)

1. Faculties define the COs of each course as per Bloom's Taxonomy and decide the level of COs by studying the elements of POs given in annexure I.
2. The 'COs of each and every course are mapped with POs and PSOs of the program
   With three level as 1, 2 or 3.

   In CO-PO mapping, the courses were mapped as level I when it shows Low correlation with PO, medium correlation mapped as level 2 and high correlation is mapped as level 3. So, all the basic courses, competency courses, and advanced courses are mapped in three levels.

3. Basic courses are prerequisites to competency courses and Competency courses to advanced courses. In each and every course there is different levels of cognitive learning and therefore mapped in different levels. Example: -

SUBJECT NAME : Digital Signal Processing

SUBJECT CODE - EC – 1761

After completion of the course develop students should be able to

CO 1: understand and demonstrate fundamentals of filtering and their concepts, filter specifications

CO 2: Able to represent the DT systems in time domain in terms of block diagram and signal flow graph and obtain LCCDE

CO 3: Analyze different FIR and IIR systems in time and frequency domain

CO 4: Design different FIR and IIR systems as per given specifications

CO-PO-PSO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2												2		
CO2	1		2										1		
CO3	1	2		2	2								1	2	2
CO4	1		2		2								1	2	2
Avg.	1.25	0.5	1	0.5	1								1.25	1	1

4. After performing the 'COs and POs mapping', the weak areas were identified i.e. POs were meeting level I. Faculties Discussed on whether POs mapping to level 1 was adequate or there is need to improve the level by modifying the respective subject CO's or adding more contents .

5. This way CO-PO-PSO mapping of all the courses have been done and averaged. Accordingly decisions make to add new topics or laboratory experiments, mini projects related to particular topic, or there is need to change in courses, program electives, open electives.

For developing the same

- Feedback from the students and their performance in examinations, discussed thoroughly and analysed at the department level
- Change / Revise the existing CO's.
- Meeting with subject experts has been conducted to review the syllabus and sequence the contents.

2.2 Teaching-Learning Processes (70)

Describe Processes followed to improve quality of Teaching & Learning (15)

The academic calendar for the session 2018-2019 and 2019-2020 are shown below. It is prepared every year at institute level and contains the events of the institute and information about important dates including dates for commencement of term session, Student admission and registration, mid semester break, End semester exam etc.

SAMRAT ASHOK TECHNOLOGICAL INSTITUTE (ENGINEERING COLLEGE)
(An Autonomous Institute Affiliated to RGPV, Bhopal)
Vidisha (M.P.) 464001

NO.- SATI/ACAD/2019-20/ 568

Date : ~~30-05-2019~~ 10.06.19

Academic Calendar 2019-2020 (DIAMOND JUBILEE YEAR)*

For BE/B.Tech./ME/M.Tech./MCA/MBA Program (II, III & Final year)

Odd Semester	Event	Description	Even Semester
17.06.2019 – 24.06.2019	Registration	Without late fee	28.11.2019 – 02.12.2019
25.06.2019 – 28.06.2019		Late fee Rs. 2000/-	03.12.2019 – 05.12.2019
28.06.2019 – 29.06.2019		Late fee Rs. 5000/-	06.12.2019 – 08.12.2019
01.07.2019 – 14.07.2019	Internship for Ist year passout		
15.07.2019	Classes	Commencement	10.12.2019
24.10.2019		End	04.04.2020
20.08.2019 – 22.08.2019	Mid Sem. Test at Dept. level	I Mid Sem Test	05.02.2020 – 07.02.2020
22.10.2019 – 24.10.2019		II Mid Sem Test	17.03.2020 – 20.03.2020
14.10.2019 – 16.10.2019	Submission of Exam Forms	Without late fee	20.03.2020 – 23.03.2020
17.10.2019 – 22.10.2019		Late fee Rs. 2000/-	24.03.2020 – 28.03.2020
23.10.2019 – 24.11.2019		Late fee Rs. 5000/-	31.03.2020 – 12.04.2020
25.10.2019 – 12.11.2019	Preparation Leave		05.04.2020 – 12.04.2020
13.11.2019 – 27.11.2019	Semester Exams	Theory	13.04.2020 – 27.04.2020
28.11.2019 – 03.12.2019		Practical	28.04.2020 – 02.05.2020
	Declaration of final year result		08.05.2020
04.12.2019 – 11.12.2019	End Sem. Vacation		---
25.10.2019 – 30.10.2019	Deepavali Vacation		---
---	Internship		03.05.2020 – 30.06.2020
	Holi Vacation (only for Students)		08.03.2020 – 15.03.2020

Activities

1	Celebration of world population Day – coordinator MBA Deptt.	11/07/2019
2	Celebration of Independence Day – coordinator NCC, NSS	15/08/2019
3	Celebration of world Photography Day – coordinator Photography Club	19/08/2019
4	Celebration of national sports Day – coordinator Sports Section	29/08/2019
5	Celebration of teachers Day – coordinator Dean Academic	05/09/2019
6	Celebration of Engineers Day – coordinator Elect. Engg. Deptt.	15/09/2019 (Sunday)
7	Celebration of Vishwakarma Jayanti – coordinator Mech. Engg. Deptt.	17/09/2019
8	Shrimant Madhavrao Scindia Scholarship distribution ceremony – coordinator Dean Acad.	30/09/2019
9	Shrimant Rajmata Vijayaraje Scindia Scholarship distribution ceremony – coordinator Dean Academic	12/10/2019
10	Institute Foundation day celebration and Golden Jubilee of 1967 batch – coordinator Dean Academic	01/11/2019
11	Celebration of International Mathematics Day – coordinator App. Maths	22/12/2019 (Sunday)
12	Celebration of Silver Jubilee of 1993 batch – coordinator Elect. Engg. Deptt.	30/12/2019
13	Rose Show – coordinator Registrar, Building Section	01 & 02 /01/2020
14	Technovision – coordinator Dr. Jyotsna Ogale	During 01-12 Jan 2020
15	Samrat Utsav – coordinator Dr. Kanak Saxena	
16	Cricket Tournament – coordinator Sports Section	
17	Gaurav Alankaran Divas – coordinator Civil Deptt.	11/01/2020
18	Celebration of Rashtriya Yuva Divas (Swami Vivekananda Jayanti) – coordinator App. Science Deptt.	12/01/2020 (Sunday)
19	National Voter Day – coordinator MBA. Deptt.	25/01/2020
20	Republic Day – coordinator NCC, NSS	26/01/2020
21	National Science Day – coordinator App. Science Deptt.	28/02/2020
22	International Women's Day – coordinator MBA. Deptt.	08/03/2020 (Sunday)
23	World Water Day – coordinator Civil Deptt.	22/03/2020 (Sunday)
24	Earth Day – coordinator App. Science	22/04/2020
25	World Book and Copyright Day – coordinator Central Library	23/04/2020
26	Press Freedom Day – coordinator Media Cell	03/05/2020 (Sunday)
27	National Technology Day & Graduation Day (for final year students) – coordinator Innovation & Startup Cell and Dean Academic & Academic Section	11/05/2020
28	Anti Tobacco Day – coordinator MBA. Deptt.	31/05/2020 (Sunday)
29	Sports, Cultural and Social activities – coordinator Concern Deptt.	All Saturday & Sunday

* Detailed Diamond Jubilee calendar is enclosed

Dean Academic **Director**

Copy to :
1. All HoDs, Course coordinators and Section I/c
2. Dean Academic
3. Controller (Examination)
4. Registrar
5. Accounts Section
6. VVNCC to upload on institute website

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NO.- SATI/ACAD/2019-20/ 569

Date :-~~30-05-2019~~- 10.06.19

Academic Calendar 2019-2020 (DIAMOND JUBILEE YEAR)*

For BE/B.Tech./ME/M.Tech./MCA/MBA Program (First year)

First Semester	Event	Description	Second Semester
--	Registration	Without late fee	27.12.2019 – 31.12.2019
---		Late fee Rs. 2000/-	01.01.2020 – 03.01.2020
--		Late fee Rs. 5000/-	04.01.2020 – 08.01.2020
05.08.2019	Classes	Commencement	13.01.2020
05.08.2019 – 24.08.2019		Induction Program	--
07.12.2019		End	08.05.2020
03.10.2019 – 05.10.2019	Mid sem- Test at Deptt. level	I Mid Sem Test	27.02.2020 – 29.02.2020
28.11.2019 – 30.11.2019		II Mid Sem Test	27.04.2020 – 29.04.2020
02.12.2019 – 04.12.2019	Submission of Examination forms	With late fee	01.05.2020 – 05.05.2020
05.12.2019 – 06.12.2019		Late fee Rs. 2000/-	06.05.2020 – 08.05.2020
07.12.2019 – 09.12.2019		Late fee Rs. 5000/-	09.05.2020 – 12.05.2020
08.12.2019 – 15.12.2019	Preparation leave		09.05.2020 - 16.05.2020
16.12.2019 – 26.12.2019	Semester Exams	Theory	18.05.2020 – 30.05.2020
27.12.2019 – 31.12.2019		Practical	31.05.2020 – 04.06.2020
01.01.2020 – 12.01.2020	End sem vacation		05.06.2020 – 30.06.2020
25.10.2019 – 30.10.2019	Deepavali vacation		--
--	Internship		05.06.2020 – 30.06.2020
--	Holi vacation (only for students)		08.03.2020 – 15.03.2020

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24	Earth Day – coordinator App. Science	22/04/2020
25	World Book and Copyright Day – coordinator Central Library	23/04/2020
26	Press Freedom Day – coordinator Media Cell	03/05/2020 (Sunday)
27	National Technology Day & Graduation Day (for final year students) – coordinator Innovation & Startup Cell and Dean Academic & Academic Section	11/05/2020
28	Anti Tobacco Day – coordinator MBA. Deptt.	31/05/2020 (Sunday)
29	Sports, Cultural and Social activities – coordinator Concern Deptt.	All Saturday & Sunday

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2. Dean Academic
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4. Registrar
5. Accounts Section
6. VVNCC to upload on institute website

To improve the quality of teaching learning continuous monitoring and improvement of course is carried out by:-

1. Adding new subjects, program electives and open electives.

S.No	Course	Improvement	Year
1.	Elective – I (Choice Based Grading Scheme)	New subjects added: DSP Algorithm, Process Control, Nano Electronics, MIMO System, Managerial Economics, Advanced Telecom Technology	2017-2018
2.	Elective – II (Choice Based Grading Scheme)	New subjects added: Neural Network, Field Programmable Gateway Array, Spread Spectrum Communication, Telecom Management, RTOS, Management Information System	2017-2018
3	Elective – I (Choice Based Grading Scheme)	New subjects added: Swachh Bharat Summer Internship Unnanat Bharat Abhiyaan (100Hrs)/ Rural out reach, Speech and Audio Processing, FPGA Architecture & Applications, Wavelets, Cognitive Radio	2018-2019, 2019-2020
4.	Elective – II (Choice Based Grading Scheme)	New subjects added: Internet of Things, Artificial Intelligence, Telecom System Design	2018-2019, 2019-2020

2. Adding new contents to existing curriculum.
3. Facilitating them for hands on experience.
4. Developing research based laboratory.
5. Training them to work on different software and hardwares.
    - MATLAB
    - LabVIEW
    - Keil Software
    - Ed Win XP Software
    - Proteus VSM Software
    - RAFA Solution Softwar
    - Q-1 RCP TOOLKIT (5 USER) software

- IoT Gateway solution based on Quark™ processor
- IoT Lab Hardware with machine learning Software
- Network Simulator

6. Improving communication skills through online courses and procured software dedicated for this skill improvement.
7. Sending to industry for internship to get the real time and industrial exposure.

Use of Various instructional methods and pedagogical initiatives:

1. **Project-based learning:**
   During the period of study in the 6th to 8th semester, students are divided into small groups and assigned term project which has to be submitted within specified time period. Projects are guided by the faculty members. Every week students shows the progress report in the form of presentation.

2. **E-tutorials**
   Topics were explained to students in class rooms with e-content like contents collected from the YouTube, NPTEL, and Google Search etc.

3. **Web learning:**
   The College has required number of computers. These are effectively used for teaching using computer based tools and technologies. Use of moodle , mooc's, Wikipedia, Swayam prabha.

4. **Class room**
   Students learn with the help of laptop and projector. It include conventional teaching, PowerPoint presentations, videos, animation and working pictures etc. It help students to understand more clearly about the concepts and mechanisms of particular topic

5. **Active Learning:**
   Sometimes students are asked to do the problems on the board. This process of teaching involves individual thinking and learning and improves confidence level to a great extent. Surprise quizzes and tests are also conducted to make studentslearn on daily basis.

6 **Expert Lectures / Training**
   Gave exposure to cutting edge technologies via organizing expert lectures or induction program. People from Academia and industries are invited in institute to interact with students as well as faculties to share their knowledge and real life experiences. Also students and faculties are allowed to go to other institutes and industries to attend the various programs like Expert Lecture, Software learning, Workshops, Induction Programs, Short Term Courses etc

Major Industrial Training Details

Session: 2017-18 (Current Batch)

Industrial Training/Internship Details

S.NO.	Name of Student	year	Place	Duration
1	Pallavi Sharma	III	i) BSNL,BHOPAL ii) Indian Railways	2 Weeks 2 Weeks
2	Anushri Thakur	III	HRDC,BURNPUR	2 Weeks
3	Suryansh Panthi	III	BSNL,VIDISHA	2 Weeks
4	Rhythm Panthi	III	BSNL,VIDISHA	2 Weeks
5	Shalini Sain	III	NTPC , SINGRAULI	4 Weeks
6	PRIYA JAIN	III	i) BHEL,BHOPAL	2 Weeks
			ii) AICTE(ATAL),bHOPAL	5 DAYS
8	SAPNA ARYA	III	BSNL,BHOPAL	2 Weeks
9	Shivi Srivastav	III	ICT,KANPUR	4 Weeks
10	Shivani Sharma	III	BSNL, BHOPAL	2 Weeks
11	Ritik Jain	III	BSNL, BHOPAL	2 Weeks
12	Kiran Bharti	III	BSNL, VIDISHA	2 Weeks
13	Damini Dongre	III	BSNL, VIDISHA	2 Weeks
14	Aditya Singh	III	National Fertilizers, HARIYANA	4 Weeks
15	Vivek Saxena	III	CRISP,BHOPAL	3 Weeks
16	Ajay Kumar	III	BHEL,BHOPAL	3 Weeks
17	Farid Ali	III	AICTE(ATAL)	1 Week
18	Deepika Patware	III	BHEL,BHOPAL	2 Weeks
19	Khushboo Raghuwanshi	III	BSNL,BHOPAL	2 Weeks
20	Subhanu Mishra	III	i) BSNL, SEONI ii) Intershala	2 Weeks 4 Weeks
21	Mohini Jain	III	BSNL,BHOPAL	2 Weeks

22	Sakshi Gujre	III	BHEL,BHOPAL	2 Weeks
23	Arpit Katolkar	III	BHEL,BHOPAL	2 Weeks
24	Ritika Jain	III	BSNL,BHOPAL	2 Weeks
25	Yash Gupta	III	CRISP,BHOPAL	3 Weeks
26	Somil Jain	III	BHEL,BHOPAL	2 Weeks
27	Deependra Raikwar	III	BSNL,BHOPAL	2 Weeks
28	Shimla Singh	III	NTPC , SINGRAULI	2 Weeks
29	Bharti Waridkar	III	BSNL,VIDISHA	2 Weeks
30	Shubhi Parsai	III	BHEL,BHOPAL	2 Weeks
31	Niharika Arya	III	BHEL,BHOPAL	2 Weeks
32	Isha Jain	III	BSNL,VIDISHA	2 Weeks
33	Radha Tomar	III	BSNL,BHOPAL	2 Weeks
34	Prashant Donderiya	III	BSNL,BHOPAL	2 Weeks
35	Kiran Chopde	III	BSNL,BHOPAL	2 Weeks
36	Khushaboo Gour	III	Police Telecommunication Organisation,Bhopal	2 Weeks
37	Adesh Singh	III	Convenor,Technex' 19 ,BHOPAL	4 Weeks
38	Mayank Shrivastava	III	Convenor,Technex' 19 ,BHOPAL	4 Weeks
39	Rohit Dohare	III	BSNL, BHOPAL	3 Weeks
40	Vikash Kumar Mishra	III	BSNL,BHOPAL	2 Weeks
41	Sourabh Kushwah	III	BSNL,BHOPAL	2 Weeks
42	Nirmal Choudhary	III	BSNL,BHOPAL	2 Weeks
43	Lokshya Trivedi	III	BSNL,BHOPAL	2 Weeks
44	Dhruv Bhatnagar	III	BSNL,BHOPAL	2 Weeks
45	Saurabh Joshi	III	CRISP,BHOPAL	2 Weeks
46	Aman Bhavsar	III	CRISP,BHOPAL	2 Weeks
47	Abhishek Sharde	III	CRISP,BHOPAL	2 Weeks
48	Alpesh Bist	III	CRISP,BHOPAL	2 Weeks

49	Payal Patil	III	CRISP,BHOPAL	3 Weeks
50	Dhananjay Sharma	III	AICTE(ATAL),BHOPAL	1 Weeks
51	Kajal Mahawar	III	BSNL,BHOPAL	2 Weeks
52	Adarsh Sahu	III	Techsim+,BHOPAL	4 Weeks
53	Anuj Chaturvedi	III	BSNL,BHOPAL	2 Weeks
54	Keshu Jain	III	Police Telecommunication Organisation,Bhopal	2 Weeks
55	Arpan Soni	III	BSNL,GUNA	2 Weeks
56	Parul Ahirwar	III	BSNL, VIDISHA	2 Weeks
57	Aditi Jain	III	BSNL, SAGAR	2 Weeks

7 Laboratory Work

A demonstration of experiment is given by the concerned teacher before every experiment. Laboratory records are evaluated after experiments. Continuous evaluation is done based upon technical knowledge, practical performance and written records submitted by the students. For the experiments instruction manuals are provided. Students have to study, understand it and apply the knowledge acquired to perform the experiments. The observations are checked and verified by faculty after completion of experiments. Accordingly teacher decides the learning capability of students and changes or improve the teaching methodology.

8 Library

Institute has Central Library as well as departmental library where students and faculties are facilitates with books, e-journals, magazines related to curriculum as well as other books and Magazine. Students can assess the library facilities beyond college timings. We add new subscription in library as per students demand.

9 Methodologies to support weak students and encourage bright students:

MENTORING SYSTEM Identification Criteria	**Actions taken**
1. Students scoring less than 60% of marks in Internal Assessment or attendance less than 60%. Continuously monitored through their performance in mid semester tests and assignments. 2. Diploma students who entered with less basics of mathematics and who fail in semester exams	1. Student TGs follows their progress regularly advising students about attending classes, making up classes missed, and getting additional help. 2. Intimating parents to counsel their wards. 3. Also the students are being questioned on the particular topic during the class so that teacher can understand level of learning and understanding of the students and measures can be taken for the same if necessary. 4.Surprise quizzes are also conducted to make students learn on daily basis. Through this faculties may know about

	student's strengths and weaknesses and facilitates the students for improving upon their weaknesses. 1. Conduction of remedial classes 2. Students were Encouraged to participate in seminars/conferences in different institutes. 3. Students were Encouraged to do quality project work for publishing papers in various journals. 4. To support weak students their group was formed with bright students for problem solving. 5. Students are also allowed to meet faculty in personal to overcome difficulties and future guidance.

10 Feedback from the students

To improve the learning process feedback from students are taken at the time of Mid semester exam. Considering feedbacks from the student's improvement in quality of teaching and in the course work has been made to ensure and sustain qualitative and effective teaching learning environment.

Lecture classes are monitored by senior Professors and the HOD of the Department. They give constructive comments to improve the quality of teaching and the teaching- learning process.

Counseling by the respective HOD for those faculty members who have secured low scores and negative comments, if any, in the feedback. This motivates them to improve their skills and abilities.

If required training / orientation programs are conducted by professional experts to master the skills of the faculty members for teaching & improving the efficiency of teaching-learning process.

Sample of student feedback form at the end of the VIII semester has been shown here:

Samrat Ashok Technological Institute

Student Feedback Form

Session: 2019-20 Course: BE Branch:EC Semester: V Poor(P)=0 Satisfactory(S)=2 Good(G)=3 Excellent(E)=4 Note:Mark NA for Not Available

S. No.	Item	Faculty:MLJ				Faculty: NB				Faculty: BM				Faculty: MK				Faculty: NM			
	No. of Classes Attended:	Subject: EC 1751				Subject: EC 1752				Subject: EC 1753				Subject: EC 1754				Subject: EC 1755			
	Total Classes Held:	P	S	G	E	P	S	G	E	P	S	G	E	P	S	G	E	P	S	G	E
	For Faculty																				
1	Mention the percentage of entire syllabus covered as prescribed by university																				
2	The teacher arrives & leaves class in time																				
3	The teacher comes prepared for the class/ knowledge																				
4	The teacher takes the classes regularly																				
5	The teacher communicates the subject well																				
6	Teacher encourages and listens patiently to student																				
7	The assignment/ quizzes covered the materials presented in the class																				
8	Syllabus and teaching are relevant to gate																				
9	Ability of the teacher to make lecture interesting																				
10	Discipline was maintained in the class																				
11	Assistance in performing lab/practical																				
	For Course																				
1	Is the syllabus useful? - yes/no																				
2	Any suggestion for Subject Content Improvement																				
	For Laboratory																				
2	Experiments are useful and cover entire syllabus																				
3	Lab Files are checked on regular basis																				
4	Experiments are performed beyond syllabus																				
5	Quality of Labs																				
6	Any suggestion for Laboratory																				
	For Facilties																				
1	Any suggestion for Library																				
2	Any suggestion for Co-curricular Activity/Extra Co-curricular Activity																				
3	Any other suggestion																				

Blooms Taxonomy is followed while setting the internal exam question papers where the following strategy is applied.

11 Process to ensure questions from outcomes/learning level perspectives

Each question is mapped with CO's PO's & Blooms taxonomy (BT) levels. Student who answered to particular question is taken into consideration and average of all students marks is taken for CO -PO attainment

12 . Quality of assignment and its relevance to CO's

After the completion of semester assignment questions are given to students, and student has to write it & submit within a week and each question is mapped with CO's .So the students will be able to understand course outcome of particular subject.

13. Quality of Student Projects

- The student's projects are selected in line with department mission, vision and Program outcomes.
- Students are provided with brief idea of various fields for selecting the project ideas.
- The list of previous year projects is displayed at notice board which ensures no repetition of project work and also encourages students to enhance the previous works.
- The faculties encourage the students to carry out in house projects and support is provided with all necessary software and hardware.
- The faculties encourage students to participate in project exhibitions. The project exhibition was aimed to provide common platform to exhibit their innovations and their work towards excellence in latest technology.
- The faculties encourage students to publish their project work in reputed journals/conferences.
- The faculties encourage students to avail the external funding schemes for their project work.
- In this way learning improves. New innovative ideas are born for project work
- Skills or abilities of students get improved
- Knowledge on various aspects of project management developed.
- Confidence level of the students is boosted
- Improves teamwork spirit
- Try to Implement and deploy the project for social benefits.
- Able to document and present his work and showcase their work in exhibition.

14. Process for approval and Evaluation scheme for final year Project

Every final year student undertakes project over a period of two semesters. Project work is divided into two parts as

1. Minor Project
2. Major Project.

Group of 3-4 students have been made and a guide is assigned to each group. There after students consult with their guide to select a topic. The theme of project is the choice of students without regard of guide's mastery over the subject.

Project work may include data collection, experiments, field visit, analysis and design, estimates, economic analysis, software skills, social and environmental aspect. This activity helps students to acquire various skills in communication, presentation, working in teams, leadership, ethics etc. According to nature of the problem students have to find new information and/or techniques to complete the project.

After the completion of the project a detailed report is required to be submitted at the end of year. It is evaluated by group of internal and external examiner by conducting presentation and viva-voce exam. Total marks allotted to project are 550. Internal marks have weightage of 45% (250 marks) and External marks having weightage of 55% (300 marks).

Rubrics:

Rubrics were set for internal assessment of the projects

Major Project:

Review #	Agenda	Assessment	Review Assessment Marks	Semester	Over all Marks
Review 1	Project Synopsis / Proposal Evaluation	Rubric R1	40	7th	100
Review 2	Mid-Term Project Evaluation	Rubric R2	60	7th	
Review 3	End Semester Internal Project Evaluation	Rubric R3	250	8th	550
Review 4	Final External Evalua	Rubric R4	300	8th	

Rubric #R1: Project Synopsis/Proposal Evaluation

Maximum Marks*: 40

Level of Achievement						
	Parameters	**Excellent (10)**	**Good (8)**	**Acceptable (6)**	**Unaccep tabl e (2)**	**Score**
a)	**Identification of Problem and Detailed Analysis**	Detailed and extensive explanation of the purpose and need of the project.	Good explanation of the purpose and need of the project.	Average explanation of the purpose and need of the project.	Minimal explanation of the purpose and need of the project.	
b)	**Literature Survey and Feasibility of Project Proposal**	Detailed and extensive explanation of the specifications and the limitations of the existing systems.	Collects a great deal of Information and good study of the existing systems.	Explanation of the specifications and the limitations of the existing systems not very satisfactory; limited information.	Minimal explanation of the specifications and the limitations of the existing	

					systems; incomplete information.	
c)	**Objectives, Methodology of the Proposed Work**	All objectives of the proposed work are well defined; Steps to be followed to solve the defined problem are clearly specified.	Good justification to the objectives; Methodology to be followed is specified but detailing is not done.	Only Some objectives of the proposed work are well defined; Steps to be followed to solve the defined problem are not specified properly.	Objectives of the proposed work are either not identified or not well defined; Incomplete and improper specification.	
d)	**Cost Estimation**	Totally erroneous cost estimates presented.	Reasonable cost estimates presented, but no profitability analysis included.	Reasonable profitability analysis presented, but no interpretation of the results.	Effective use of profitability analysis leading to improvement recommendations.	

Rubric #R2: Mid-term Project Evaluation

Maximum Marks: 60

Level of Achievement						
	Parameters	**Excellent (20)**	**Good (16)**	**Average (12)**	**Unacceptable (6)**	**Score**
a)	**Design Methodology**	• Division of problem into modules and good selection of computing framework. • Appropriate design methodology and properly justification.	• Division of problem into modules and good selection of computing framework • Design methodology not properly justified.	• Division of problem into modules but inappropriate selection of computing framework • Design methodology not defined properly	• Partial division of problem into modules and inappropriate selection of computing framework • Design methodology not defined properly	
b)	**Planning of Project Work**	• Time frame properly specified and being followed.	• Time frame properly specified but being followed partly	• Time frame properly specified, but not being followed	• Time frame not properly specified	

c)	**Demonstration and Presentation**	• Objectives achieved as per time frame • Contents of presentations are appropriate and well arranged • Proper eye contact with audience and clear voice with good spoken language.	• Objectives achieved as per time frame • Contents of presentations are appropriate but not well arranged • Satisfactory demonstration, clear voice with good spoken language but eye contact not proper	• Objectives achieved as per time frame • Content of presentations are appropriate but not well arranged • Eye contact with few people and unclear voice	• Objectives not achieved as per time frame • Content of presentations are not appropriate • Demonstration not satisfactory	

Rubric #R3: End Semester Internal Project Evaluation

Maximum Marks*: 250

Level of Achievement						
	Parameters	**Excellent (30)**	**Good (24)**	**Average (18)**	**Unacceptable (8)**	**Score**
a)	**Incorporation of Suggestions**	• Changes are made as per modifications suggested during midterm evaluation and new innovations added.	• Changes are made as per modifications suggested during midterm evaluation and good justification.	• All major changes are made as per modifications suggested during midterm evaluation.	• Suggestions during midterm evaluation are not incorporated	
b)	**Project Demonstration**	• All defined objectives are achieved • Each module working well and properly demonstrated • All modules of project are well integrated and system working is accurate	• All defined objectives are achieved • Each module working well and properly demonstrated • Integration of all modules not done and system working is not very satisfactory	• All defined objectives are achieved • Modules are working well in isolation and properly demonstrated • Modules of project are not properly integrated	• Only some of the defined objectives are achieved • Modules are not in proper working form that further leads to failure of integrated system	
c)	**Presentation**	• Contents of presentations are appropriate and well delivered • Proper eye contact with audience and clear voice with good spoken language	• Contents of presentations are appropriate and well delivered • Clear voice with good spoken language but less eye contact with audience	• Contents of presentations are appropriate but not well delivered • Eye contact with only few people and unclear voice	• Contents of presentations are not appropriate and not well delivered • Poor eye contact with audience and unclear voice	

d)	**Project Report**	Project report is according to the specified format • References and citations are appropriate and well mentioned	• Project report is according to the specified format • References and citations are appropriate but not mentioned well	• Project report is according to the specified format but some mistakes • In-sufficient references and citations	• Project report not prepared according to the specified format • References and citations are not appropriate	
e)	**Description of Concepts and Technical Details**	• Complete explanation of the key concepts and strong description of the technical requirements of the project	• Complete explanation of the key concepts but in-sufficient description of the technical requirements of the project	• Incomplete explanation of the key concepts and in-sufficient description of the technical requirements of the project	• Inappropriate explanation of the key concepts and poor description of the technical requirements of the project	
f)	**Conclusion and Discussion**	• Results are presented in very appropriate manner • Project work is well summarized and concluded • Future extensions in the project are well specified	• Results are presented in good manner • Project work summary and conclusion not very appropriate • Future extensions in the project are specified	• Results presented are not much satisfactory • Project work summary and conclusion not very appropriate • Future extensions in the project are not specified	• Results are not presented properly • Project work is not summarized and concluded • Future extensions in the project are not specified	
	Parameter	**Excellent (70)**	**Good (56)**	**Average (42)**	**Poor (20)**	**Score**
g)	**Regularity and Attendance**	Reports to the guide regularly and consistent in work	Reports to the guide very often but not very consistent	Reports to the guide but lacks consistency	Irregular and inconsistent in work	

Rubric #R4: External Project Evaluation

Maximum Marks*: 300

Level of Achievement						
		Excellent (60)	**Good (48)**	**Average (36)**	**Unacceptable (20)**	**Score**
a)	**Project Demonstration And Implementation Strategy**	• All defined objectives are achieved • Each module working well and properly demonstrated • All modules of project are well integrated and system working is accurate	• All defined objectives are achieved • Each module working well and properly demonstrated • Integration of all modules not done and system working is not very satisfactory	• All defined objectives are achieved • Modules are working well in isolation and properly demonstrated • Modules of project are not properly integrated	• Only some of the defined objectives are achieved • Modules are not in proper working form that further leads to failure of integrated system	

b)	**Presentation**	• Contents of presentations are appropriate and well delivered • Proper eye contact with audience and clear voice with good spoken language	• Contents of presentations are appropriate and well delivered • Clear voice with good spoken language but less eye contact with audience	• Contents of presentations are appropriate but not well delivered • Eye contact with only few people and unclear voice	• Contents of presentations are not appropriate and not well delivered • Poor eye contact with audience and unclear voice	
c)	**Project Report**	• Project report is according to the specified format • References and citations are appropriate and well mentioned	• Project report is according to the specified format • References and citations are appropriate but not mentioned well	• Project report is according to the specified format but some mistakes • In-sufficient references and citations	• Project report not prepared according to the specified format • References and citations are not appropriate	
d)	**Technical Knowledge and Awareness related to the Project**	Extensive knowledge and awareness related to the project	Fair knowledge and awareness related to the project	Lacks sufficient knowledge and awareness	Poor knowledge and no awareness related to project	
e)	**Results and Future Scope**	• Results are presented in very appropriate manner • Project work is well summarized and concluded • Future extensions in the project are well specified	• Results are presented in good manner • Project work summary and conclusion not very appropriate • Future extensions in the project are specified	• Results presented are not much satisfactory • Project work summary and conclusion not very appropriate • Future extensions in the project are not specified	• Results are not presented properly • Project work is not summarized and concluded • Future extensions in the project are not specified	

Minor Project Work Internal Assessment (B.Tech)

S.no.	Name of the Student	Title of the Project	Semester Examination								
			Title & Feasibility (2)	Literature Survey (4)	Abstract & Depth of Knowledge (2)	Presentation (2)	Cost Estimation, Usage of Modern Tool/ Technology (4)	Innovative-ness and Future Scope (2)	Applications and contribution of project towards society and environme	Group activity (2)	Total (20)

									nt (2)		

Minor Project Work External Assessment (B.Tech)

S. No	Scholar No.	Name of the Student	Title of the Project									
				Title and Abstract (3)	Implement-ation Strategy (3)	Presentation (3)	Results and Analysis (5)	Viva Voce (3)	Innovative-ness (5)	Final Report (5)	Attendance (3)	Total (30)

Best Major Project Evaluation Scheme (B.Tech)

Maximum Marks 100

S. No.	Scholar No	Name of the Student	Title of the Project										
				Organization- of the report (20)	Working model (15)	Viva Voce (10)	Contemp-orary issues (10)	Cost effectiveness (10)	Application (10)	Future scope (5)	Possibility of commerc e-alization (5)	Publication or patents if any (10)	Got some funding from different agencies (5)	Total (100)

Best project evaluation scheme

On the basis of following points bes t project is selected:-

- Organization of the report.
- Viva-Voce
- Working model.
- Contemporary issues
- Cost effectiveness.
- Application

- Future scope
- Possibility of commercialization.
- Publications if any.
- Patents filed.
- Got some funding from different agencies.

15. Initiatives related to industry interaction- To enhance learning via industry interaction to improve the quality of learning.

The students are encouraged to take internship program during their semester break. Faculty members give their guidelines, suggestions and contact details for internship. They also help the students by interacting with the industrial experts, provide the students recommendation letters and other necessary supports. The alumni coordinator constantly interacts with alumni those who are working in the industries and request them to provide necessary guidelines and supports for their junior's internship and Industry training/tours for students . This helps students to gain confidence, valuable work experience and apply acquired knowledge. Thus to enhance interaction

MOU's were done with industries to emphasize on:-
(a) Internship
(b) Project Workshop for Students
(c) Industrial Visits
(d) Students specific Training
(e) Faculty Development Program

MOUs

S.No.	Name of Organisation	Date of MoU
1	Lee Vedla Industrial Corporation, Bhopal	16.05.2013
2.	Shark Shopfits Pvt. Ltd. New Delhi	16.05.2013
3.	M.I.T.S. Gwalior	21.05.2013
4.	SGSITS Indore	24.05.2013
5.	U.I.T. RGPV Bhopal	24.05.2013
6.	S.G.S.I.T.S. Indore	27.05.2013
7.	Satya Sai Agroils Pvt. Ltd. Vidisha	19.07.2013
8.	CSIR Ampri Bhopal	23.08.2013
9.	DAuto Engineering Pvt. Ltd. Bhopal	13.04.2016
10.	Crisp Bhopal	01.07.2017
11.	VNIT Nagpur	21.07.2017
12.	Magadh Precision Dewas	11.08.2017

13.	CoE Pune	28.07.2017
14.	Jila Anta. Vyawasayi Sahkari Vikas Samiti Vidisha	16.08.2017
15.	ECI New Delhi for Incubation Centre	12.09.2017
16.	CIDC New Delhi	16.09.2017
17.	Indian Society for Trenchless Technology, New Delhi	18.09.2017
18.	ECI New Delhi for training	21.09.2017
19.	Insta Printz Indore	20.04.2018
20.	MoU Robonomics AI India Private Limited (RAI)	22.06.2018

CRITERION 3	Course Outcomes and Program Outcomes	175

3.1. Establish the correlation between the courses and the Program Outcomes (POs) and Program Specific Outcomes (PSOs)

PSOs are framed to make the students skillful technically so that they can serve the industry, pursue higher education , develop research capability or initiate some start ups

Program Specific Objectives

The graduates of the department will attain:
PSO1: The ability to absorb and apply fundamental knowledge of core Electronics and Communication Engineering in the analysis, design, and development of various types of systems.
PSO2: Competence in using electronic modern IT tools (both software and hardware) for the design and analysis purpose as well as able to interpret and synthesize the experimental data leading to valid conclusions.
PSO3: With the help of established COE's (IOT, Virtual Instrumentation) students are working with cutting edge technology and can pursue their career in the specific areas

Program outcomes

Upon graduation our students will be able to -

PO1. (KB) **Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. (PA) **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. (Des.) **Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4. (Inv.) **Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. (Tools) **Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6. (Engg &Society) **The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7. **Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8. **Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9-Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10-Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11-Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12-Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Correlation between POs and PSO's

PO's	PSO1	PSO2	PSO3
PO-1	3	-	2
PO-2	3	3	3
PO-3	3	3	3
PO-4	3	3	3
PO-5	2	3	3
PO-6	2	-	-
PO-7	2	-	-
PO-8	2	-	-
PO-9	2	2	-
PO-10	2	2	-
PO-11	2	2	-
PO-12	2	2	2
Avg.	2.33	1.66	1.33

3.1.1 Course Outcomes

Course Outcomes (COs) for all courses are prepared after finalizing the courses and course contents. These statements are usually generic and shows diffetent levels of cognitive learning.

Session 2019-20		Session 2018-19		Session 2017-18	
Subject Code & Name	Course Outcomes	Subject Code & Name	Course Outcomes	Subject Code & Name	Course Outcomes
			IIIrd Semester		
EC1831 Managerial Economics	CO1: Able to analyze and Discuss customer behavior and Markets. CO2: Analyze business practice with respect to pricing and competition. CO3: Application of concept in decision analysis. CO4: Application of estimation cost analysis. CO4: Forecasting	EC-1731 Electronic Devices & Circuits	CO1: Identify, understand the fundamental principle, principles of electronic components and devices CO2: Acquire the knowledge and demonstrate the working principles of electronic components and devices. CO3: Apply fundamental knowledge to analyze various electronic circuits and systems. CO4: Apply fundamental knowledge to design different Basic electronic circuits and systems	EC-1731 Electronic Devices & Circuits	CO1: Identify, understand the fundamental principle, principles of electronic components and devices CO2: Acquire the knowledge and demonstrate the working principles of electronic components and devices. CO3: Apply fundamental knowledge to analyze various electronic circuits and systems. CO4: Apply fundamental knowledge to design different Basic electronic circuits and systems
EC183 Electronic Devices	CO1: Identify, understand the fundamental principle, principles of electronic components and devices CO2: Acquire the knowledge and demonstrate the working principles of electronic	EC - 1732 Network Analysis	CO1: Apply the fundamental concepts in solving and analyzing different Electrical networks. CO2: Apply mathematics in analyzing and synthesizing the networks in time and frequency domain. CO3:Evaluate the performance of a	EC - 1732 Network Analysis	CO1: Apply the fundamental concepts in solving and analyzing different Electrical networks. CO2: Apply mathematics in analyzing and synthesizing the networks in time and frequency domain. CO3:Evaluate the performance of a

	components and devices. CO3: Apply fundamental knowledge to analyze various electronic circuits and systems. CO4: Apply fundamental knowledge to design different Basic electronic circuits and systems		particular network from its analysis.		particular network from its analysis.
EC1833 Digital Logic Design	CO1: Acquire and Demonstrate the knowledge of code conversion, flip flops , timing circuits , shift register, logic families sequential and combinational logic circuit and systems, memory and programmable logic device. CO2: Apply acquired knowledge in analyzing code converters, flip flops , timing circuits , shift register, logic families sequential and combinational logic circuit and systems , memory and programmable logic device. CO3: Apply acquired knowledge indesigning code converters, sequential and combinational	EC - 1733 Digital Circuit Design	CO1: Acquire and Demonstrate the knowledge of code conversion, flip flops , timing circuits , shift register, logic families sequential and combinational logic circuit and systems, memory and programmable logic device. CO2: Apply acquired knowledge in analyzing code converters, flip flops , timing circuits , shift register, logic families sequential and combinational logic circuit and systems , memory and programmable logic device. CO3: Apply acquired knowledge indesigning code converters, sequential and combinational logic circuit and system.	EC - 1733 Digital Circuit Design	CO1: Acquire and Demonstrate the knowledge of code conversion, flip flops , timing circuits , shift register, logic families sequential and combinational logic circuit and systems, memory and programmable logic device. CO2: Apply acquired knowledge in analyzing code converters, flip flops , timing circuits , shift register, logic families sequential and combinational logic circuit and systems , memory and programmable logic device. CO3: Apply acquired knowledge indesigning code converters, sequential and combinational logic circuit and system.

	logic circuit and system.				
EC1834 Network Analysis	CO1: Apply the fundamental concepts in solving and analyzing different Electrical networks. CO2: Apply mathematics in analyzing and synthesizing the networks in time and frequency domain. CO3:Evaluate the performance of a particular network from its analysis.	EC - 1734 Electronic Instrumentation & Measurement	CO1: Acquire knowledge, understand basic concepts and demonstrate use of measurement devices, signal generators, counters, encoders, different sources, detectors, sensors, and analyzers. CO2: Apply acquired knowledge to analyze frequency system, measurement devices, signal generators, counters, encoders, different sources, detectors, sensors, and analyzers. CO3: Apply acquired knowledge to design and develop solutions to practical problems using measurement devices, signal generators, counters, encoders, different sources, detectors, sensors, and analyzers.	EC - 1734 Electronic Instrumentation & Measurement	CO1: Acquire knowledge, understand basic concepts and demonstrate use of measurement devices, signal generators, counters, encoders, different sources, detectors, sensors, and analyzers. CO2: Apply acquired knowledge to analyze frequency system, measurement devices, signal generators, counters, encoders, different sources, detectors, sensors, and analyzers. CO3: Apply acquired knowledge to design and develop solutions to practical problems using measurement devices, signal generators, counters, encoders, different sources, detectors, sensors, and analyzers.
EC1835 Signal and Systems	CO1: CO2: Analysis signal & system in time and frequency domain and extract the necessary information (Analysis and application). CO3: Apply the basic concepts of signal and system in system Modelling and transform domain analysis (knowledge, understanding and	EC - 1735 Signals & Systems	CO1: CO2: Analysis signal & system in time and frequency domain and extract the necessary information (Analysis and application). CO3: Apply the basic concepts of signal and system in system Modelling and transform domain analysis (knowledge, understanding and application). CO4: Model, analyze and synthesize the systems and performance of systems	EC - 1735 Signals & Systems	CO1: CO2: Analysis signal & system in time and frequency domain and extract the necessary information (Analysis and application). CO3: Apply the basic concepts of signal and system in system Modelling and transform domain analysis (knowledge, understanding and application). CO4: Model, analyze and synthesize the systems and performance of

	application). CO4: Model, analyze and synthesize the systems and performance of systems (analysis, synthesis and evaluation).		(analysis, synthesis and evaluation).		systems (analysis, synthesis and evaluation).
EC1836 Language Lab		EC - 1736 Electronic Instrumentation and Signals & Systems Lab	CO1. Able to identify and analyze different signals and systems and their properties. CO2. Determine and analyze responses of Linear Time Invariant Systems. CO3. Able to apply transformation tools to transform from time to frequency domain. CO4. Acquire knowledge of and able to demonstrate different measurement instruments like CRO, DSO, BRIDGES, TRANSDUCERS, COUNTERS, LCR meters. CO5. Able to determine and measure different parameters of interest with the help of these measuring instruments.	EC - 1736 Electronic Instrumentation and Signals & Systems Lab	CO1. Able to identify and analyze different signals and systems and their properties. CO2. Determine and analyze responses of Linear Time Invariant Systems. CO3. Able to apply transformation tools to transform from time to frequency domain. CO4. Acquire knowledge of and able to demonstrate different measurement instruments like CRO, DSO, BRIDGES, TRANSDUCERS, COUNTERS, LCR meters. CO5. Able to determine and measure different parameters of interest with the help of these measuring instruments.
EC1837 Evaluation of Internship – I	-	EC - 1737 Seminar & Entrepreneurship	CO1. Able to demonstrate the things and communicate effectively. CO2. Able to manage projects and work as an individual or team leader. CO3. Able to do complex investigation, resource and finance	EC - 1737 Seminar & Entrepreneurship	CO1. Able to demonstrate the things and communicate effectively. CO2. Able to manage projects and work as an individual or team leader. CO3. Able to do complex investigation, resource and finance

			management. CO4. Able to design products and gain from it.		management. CO4. Able to design products and gain from it.
	IVth Semester				
EC1841 Electromagnetic Theory	CO 1: Acquire knowledge of orthogonal co-ordinate systems, gradient, divergence and curl, different theorems Static and time varying fields, circular and elliptical polarization, refraction and reflection of waves (Knowledge) CO 2: Understand and demonstrate acquired knowledge of orthogonal co-ordinate systems, gradient, divergence and curl, different theorems Static and time varying fields, circular and elliptical polarization, refraction and reflection of waves (Knowledge & Understanding). CO 3: Provide solutions of Laplace equations in systems of dielectric and conducting boundaries	EC-1741 VLSI Design	CO1: Understand and demonstrate different IC technologies, fabrication process, design approaches, MOS transistor, inverters, dynamic logic circuits & HDL based design. CO 2: Analyze MOSFET characteristics, logic circuits and Dynamic circuit techniques. CO 3: Design VLSI based circuits and simulate logic circuits on FPGA boards using HDL	EC-1741 VLSI Design	CO1: Understand and demonstrate different IC technologies, fabrication process, design approaches, MOS transistor, inverters, dynamic logic circuits & HDL based design. CO 2: Analyze MOSFET characteristics, logic circuits and Dynamic circuit techniques. CO 3: Design VLSI based circuits and simulate logic circuits on FPGA boards using HDL

EC 1842 Analog and Digital Communication	CO 1: Acquire knowledge, understand and demonstrate about different modulation, demodulation, generation and detection techniques ofanalog and digital signals, radio transmitter and receiver circuits.. CO 2: conduct analysis of baseband signals in time domain and frequency domain performance of modulation and demodulation techniques in various transmission environments. CO 3:Analyze error performance of a communication system in presence of noise and other interference. CO4: evaluate fundamental communication system parameters such as bandwidth, power and signal to noise ration. CO5: design communication systems to mee desired needs	EC-1742 Electronic Circuit Design	CO1: Understand and demonstrate the basics of Operational Amplifier active filters, feedback amplifier and oscillator (knowledge and understanding apply) and different operational amplifier applications. CO2: CO3: Design active filters and different applications. CO4:	EC-1742 Electronic Circuit Design	CO1: Understand and demonstrate the basics of Operational Amplifier active filters, feedback amplifier and oscillator (knowledge and understanding apply) and different operational amplifier applications. CO2: CO3: Design active filters and different applications. CO4:
EC 1843 Analog Circuits	CO 1: Understand and demonstrate the basics of Operational Amplifier active	EC-1743 Control System Enginee	CO1: Acquire knowledge and understand of different types of systems and their representation,	EC-1743 Control System Enginee	CO1: Acquire knowledge and understand of different types of systems and their representation, stability,

	filters, feedback amplifier and oscillator (knowledge and understanding apply) and different operational amplifier applications. CO 2: Analyze op-amp circuits and active filters CO 3: Design active filters and different applications. CO 4: Evaluate the performance of desired applications.	ring	stability, time domain and frequency domain behavior controllers and compensators to obtain mathematics (Knowledge) CO2: Apply knowledge to obtain mathematical modelling of different systems, find out transfer function and obtain knowledge, signal flow graph and state space representation. CO3:Analyze the time domain and frequency domain behavior of different types of signal & system stability CO4:Design feedback controllers and compensation circuits	ring	time domain and frequency domain behavior controllers and compensators to obtain mathematics (Knowledge) CO2: Apply knowledge to obtain mathematical modelling of different systems, find out transfer function and obtain knowledge, signal flow graph and state space representation. CO3:Analyze the time domain and frequency domain behavior of different types of signal & system stability CO4:Design feedback controllers and compensation circuits
EC 1844 VLSI Circuit Design	CO1: Understand and demonstrate different IC technologies, fabrication process, design approaches, MOS transistor, inverters, dynamic logic circuits & HDL based design. CO 2: Analyze MOSFET characteristics, logic circuits and Dynamic circuit techniques. CO 3: Design VLSI based circuits and simulate logic circuits on FPGA boards using HDL	EC-1744 Electro magnetic Field	CO1:Acquire knowledge of orthogonal co-ordinate systems, gradient, divergence and curl, different theorems Static and time varying fields, circular and elliptical polarization, refraction and reflection of waves (Knowledge) CO2: Understand and demonstrate acquired knowledge of orthogonal co-ordinate systems, gradient, divergence and curl, different theorems Static and time varying fields, circular and elliptical polarization, refraction and reflection of waves (Knowledge & Understanding). CO3 Provide solutions of Laplace equations in systems of dielectric and conducting boundaries.	EC-1744 Electro magnetic Field	CO1:Acquire knowledge of orthogonal co-ordinate systems, gradient, divergence and curl, different theorems Static and time varying fields, circular and elliptical polarization, refraction and reflection of waves (Knowledge) CO2: Understand and demonstrate acquired knowledge of orthogonal co-ordinate systems, gradient, divergence and curl, different theorems Static and time varying fields, circular and elliptical polarization, refraction and reflection of waves (Knowledge & Understanding). CO3 Provide solutions of Laplace equations in systems of dielectric and conducting boundaries.

EC 1845 Engineering Mathematics-III	CO1: Helps to understand the advanced topics in engineering mathematics which very useful to further study CO2: Students become able to identity and formulation engineering problem. CO3 Students will be skilled in using interpolation , numerical different ion ,Integration and population problems. CO4 Expansion of function play key role in the field of engineering and science . CO5 Through numerical method students will gain experience for solving many engineering problem.	EC-1745 Engineering Mathematics-III*	CO1: Helps to understand the advanced topics in engineering mathematics which very useful to further study CO2: Students become able to identity and formulation engineering problem. CO3 Students will be skilled in using interpolation , numerical different ion ,Integration and population problems. CO4 Expansion of function play key role in the field of engineering and science . CO5 Through numerical method students will gain experience for solving many engineering problem**.**	EC-1745 Engineering Mathematics-III*	CO1: Helps to understand the advanced topics in engineering mathematics which very useful to further study CO2: Students become able to identity and formulation engineering problem. CO3 Students will be skilled in using interpolation , numerical different ion ,Integration and population problems. CO4 Expansion of function play key role in the field of engineering and science . CO5 Through numerical method students will gain experience for solving many engineering problem**.**
EC 1846 Simulation Lab I	CO1: Ability to know about the syntax of the language used to solve engineering problems. CO2: Ability to understand the programming concept and simulation. CO3: Ability to write programs and simulate different engineering applications	EC-1746 Computer Programming Skills-I	CO1: Ability to know about the syntax of the language used to solve engineering problems. CO2: Ability to understand the programming concept and simulation. CO3: Ability to write programs and simulate different engineering applications related with CO4: Ability to use programming skill required for the	EC-1746 Computer Programming Skills-I	CO1: Ability to know about the syntax of the language used to solve engineering problems. CO2: Ability to understand the programming concept and simulation. CO3: Ability to write programs and simulate different engineering applications related with CO4: Ability to use programming skill

	related with CO4: Ability to use programming skill required for the development of projects at higher semester.		development of projects at higher semester.		required for the development of projects at higher semester.
EC 1847 90 hrs Internship based on using various software's - Internship – II	CO1: Ability to apply acquired knowledge in problem solving. CO2: Ability to identify sources of hazards, and assess/identify appropriate health & safety measures. CO3: Ability to work in a team and effectively communicate solution to problems (oral, visual, written). CO4: To have hands-on experience in the Industry' related field so that they can relate and reinforce what has been taught at the university/college.	EC-1747 Aptitude & Logical Reasoning	CO1. Formulate the problem quantitatively and use appropriate arithmetical, and/or statistical methods to solve the problem. CO2. Describe various principles involved in solving mathematical problems and thereby reducing the time taken for performing job functions. CO3. Interpret quantitative information (i.e., formulas, graphs, tables, models, and schematics) and draw implications from them. CO4. Critically evaluate various real life situations by resorting to analysis of key issues and factors.	EC-1747 Aptitude & Logical Reasoning	CO1. Formulate the problem quantitatively and use appropriate arithmetical, and/or statistical methods to solve the problem. CO2. Describe various principles involved in solving mathematical problems and thereby reducing the time taken for performing job functions. CO3. Interpret quantitative information (i.e., formulas, graphs, tables, models, and schematics) and draw implications from them. CO4. Critically evaluate various real life situations by resorting to analysis of key issues and factors.
	Vth Semester				
EC-1751 Antenna & Wave Propogation	CO1: Acquire and demonstrate fundamental knowledge of radiation pattern, antenna parameters and types of arrays and propagation of waves. CO2: Analyze antenna on the basis of different parameters CO3: Design	EC-1751 Antenna & Wave Propogation	CO1: Acquire and demonstrate fundamental knowledge of radiation pattern, antenna parameters and types of arrays and propagation of waves. CO2: Analyze antenna on the basis of different parameters CO3: Design antenna arrays	EC-1751 Antenna & Wave Propogation	CO1: Acquire and demonstrate fundamental knowledge of radiation pattern, antenna parameters and types of arrays and propagation of waves. CO2: Analyze antenna on the basis of different parameters CO3: Design antenna arrays

	antenna arrays				
EC-1752 Communication Network and Transmission Lines	CO1: Acquire and demonstrate fundamental knowledge of propagation of signals through lines and nature of transmission line at high frequency. CO2: Analyze calculation of various line parameters by conventional and graphical methods. CO3: Analyze and demonstrate the need for impedance matching and different impedance matching techniques. CO4: Acquire and demonstrate of different types of filters, equalizer and attenuators.	EC-1752 Communication Network and Transmission Lines	CO1: Acquire and demonstrate fundamental knowledge of propagation of signals through lines and nature of transmission line at high frequency. CO2: Analyze calculation of various line parameters by conventional and graphical methods. CO3: Analyze and demonstrate the need for impedance matching and different impedance matching techniques. CO4: Acquire and demonstrate of different types of filters, equalizer and attenuators.	EC-1752 Communication Network and Transmission Lines	CO1: Acquire and demonstrate fundamental knowledge of propagation of signals through lines and nature of transmission line at high frequency. CO2: Analyze calculation of various line parameters by conventional and graphical methods. CO3: Analyze and demonstrate the need for impedance matching and different impedance matching techniques. CO4: Acquire and demonstrate of different types of filters, equalizer and attenuators.
EC-1753 Microprocessor & Microcontroller	CO1: Acquire and demonstrate fundamental knowledge of microprocessors and Microcontroller and its interfacing and programming CO2: Analyse the performance of microprocessor and Microcontroller with the help of instruction set. CO3: Do complex investigation of of 8085 and 8086	EC-1753 Microprocessor & Microcontroller	CO1: Acquire and demonstrate fundamental knowledge of microprocessors and Microcontroller and its interfacing and programming CO2: Analyse the performance of microprocessor and Microcontroller with the help of instruction set. CO3: Do complex investigation of of 8085 and 8086 architectural features and various interfacing chips and compare them CO4: Design and	EC-1753 Microprocessor & Microcontroller	CO1: Acquire and demonstrate fundamental knowledge of microprocessors and Microcontroller and its interfacing and programming CO2: Analyse the performance of microprocessor and Microcontroller with the help of instruction set. CO3: Do complex investigation of of 8085 and 8086 architectural features and various interfacing chips and compare them CO4: Design and

	architectural features and various interfacing chips and compare them CO4: Design and development of applications using processors and controllers.		development of applications using processors and controllers.		development of applications using processors and controllers.
EC-1754 Analog Communication	CO1: Acquire knowledge of basics of signals and communication systems and identify basic process involved in communication system (knowledge, understanding, and application). CO2: Acquire knowledge, understand and demonstrate about different modulation, demodulation, generation and detection techniques of analog signals. CO3: Design the radio transmitter and receiver circuits for analog signals. CO4: Ability to perform the noise calculation for the communication system.	EC-1754 Analog Communication	CO1: Acquire knowledge of basics of signals and communication systems and identify basic process involved in communication system (knowledge, understanding, and application). CO2: Acquire knowledge, understand and demonstrate about different modulation, demodulation, generation and detection techniques of analog signals. CO3: Design the radio transmitter and receiver circuits for analog signals. CO4: Ability to perform the noise calculation for the communication system.	EC-1754 Analog Communication	CO1: Acquire knowledge of basics of signals and communication systems and identify basic process involved in communication system (knowledge, understanding, and application). CO2: Acquire knowledge, understand and demonstrate about different modulation, demodulation, generation and detection techniques of analog signals. CO3: Design the radio transmitter and receiver circuits for analog signals. CO4: Ability to perform the noise calculation for the communication system.
EC-1755 Probability and Stochas	CO1: illustrate and simulate formulate fundamental probability distribution and density functions,	EC-1755 Probability and Stochas	CO1: illustrate and simulate formulate fundamental probability distribution and density functions, as well as functions of random	EC-1755 Probability and Stochastic	CO1: illustrate and simulate formulate fundamental probability distribution and density functions, as well as functions of random

tic Process	as well as functions of random variables (knowledge, understanding, apply) CO2: explain the concepts of expectation, conditional expectation, stationary, wide-sense stationary processes and describe the properties (knowledge, understanding) CO3: Analyze continuous and discrete time random processes and applied the theory of stochastic processes to analyze linear systems (knowledge understanding analysis) CO4: apply the above knowledge to solve basic problems in filtering, prediction and smoothing. (knowledge understanding, apply, problem solving)	tic Process	variables (knowledge, understanding, apply) CO2: explain the concepts of expectation, conditional expectation, stationary, wide-sense stationary processes and describe the properties (knowledge, understanding) CO3: Analyze continuous and discrete time random processes and applied the theory of stochastic processes to analyze linear systems (knowledge understanding analysis) CO4: apply the above knowledge to solve basic problems in filtering, prediction and smoothing. (knowledge understanding, apply, problem solving)	Process	variables (knowledge, understanding, apply) CO2: explain the concepts of expectation, conditional expectation, stationary, wide-sense stationary processes and describe the properties (knowledge, understanding) CO3: Analyze continuous and discrete time random processes and applied the theory of stochastic processes to analyze linear systems (knowledge understanding analysis) CO4: apply the above knowledge to solve basic problems in filtering, prediction and smoothing. (knowledge understanding, apply, problem solving)
EC-1756 Computer Programming Skills-II (C and	CO1: Ability to know about the syntax of the language used to solve engineering problems. CO2: Ability to understand the programming	EC-1756 Computer Programming Skills-II (C and	CO1: Ability to know about the syntax of the language used to solve engineering problems. CO2: Ability to understand the programming concept and simulation. CO3: Ability to write	EC-1756 Computer Programming Skills-II (C and	CO1: Ability to know about the syntax of the language used to solve engineering problems. CO2: Ability to understand the programming concept and simulation. CO3: Ability to write

C++)	concept and simulation. CO3: Ability to write programs and simulate different engineering applications related with CO4: Ability to use programming skill required for the development of projects at higher semester.	C++)	programs and simulate different engineering applications related with CO4: Ability to use programming skill required for the development of projects at higher semester.	C++)	programs and simulate different engineering applications related with CO4: Ability to use programming skill required for the development of projects at higher semester.
EC-1757 Minor Industrial Training	CO1: Ability to analyse a given engineering problem, identify an appropriate problem solving methodology, implement the methodology and propose a meaningful solution. CO2: Ability to apply prior acquired knowledge in problem solving. CO3: Ability to identify sources of hazards, and assess/identify appropriate health & safety measures. CO4: Ability to work in a team and effectively communicate solution to problems (oral, visual, written). CO5: To have hands-on experience in the students' related field so that they	EC-1757 Minor Industrial Training	CO1: Ability to analyse a given engineering problem, identify an appropriate problem solving methodology, implement the methodology and propose a meaningful solution. CO2: Ability to apply prior acquired knowledge in problem solving. CO3: Ability to identify sources of hazards, and assess/identify appropriate health & safety measures. CO4: Ability to work in a team and effectively communicate solution to problems (oral, visual, written). CO5: To have hands-on experience in the students' related field so that they can relate and reinforce what has been taught at the university/college.	EC-1757 Minor Industrial Training	CO1: Ability to analyse a given engineering problem, identify an appropriate problem solving methodology, implement the methodology and propose a meaningful solution. CO2: Ability to apply prior acquired knowledge in problem solving. CO3: Ability to identify sources of hazards, and assess/identify appropriate health & safety measures. CO4: Ability to work in a team and effectively communicate solution to problems (oral, visual, written). CO5: To have hands-on experience in the students' related field so that they can relate and reinforce what has been taught at the university/college.

	can relate and reinforce what has been taught at the university/college.				
	VIth Semester				
EC-1761 Digital Signal Processing	CO 1:understand and demonstrate fundamentals of filtering and their concepts, filter specifications CO 2:Able to represent the DT systems in time domain in terms of block diagram and signal flow graph and obtain LCCDE CO 3: Analyze different FIR and IIR systems in time and frequency domain CO 4: Design different FIR and IIR systems as per given specifications	EC-1761 Digital Signal Processing	CO 1: understand and demonstrate fundamentals of filtering and their concepts, filter specifications CO 2:Able to represent the DT systems in time domain in terms of block diagram and signal flow graph and obtain LCCDE CO 3:Analyze different FIR and IIR systems in time and frequency domain CO 4: Design different FIR and IIR systems as per given specifications	EC-1761 Digital Signal Processing	CO 1:understand and demonstrate fundamentals of filtering and their concepts, filter specifications CO 2:Able to represent the DT systems in time domain in terms of block diagram and signal flow graph and obtain LCCDE CO 3:Analyze different FIR and IIR systems in time and frequency domain CO 4: Design different FIR and IIR systems as per given specifications
EC-1762 Data Communication & Computer Networks	CO 1:understand and explain computer network technology, data com systems and its components, Ethernet, wireless network IEEE 802.11 and Bluetooth standard. CO 2:identify and analyze the different types of network, network topologies and	EC-1762 Data Communication & Computer Networks	CO 1:understand and explain computer network technology, data com systems and its components, Ethernet, wireless network IEEE 802.11 and Bluetooth standard. CO 2:identify and analyze the different types of network, network topologies and protocols. CO 3:Enumerate the layers of OSI Mode,	EC-1762 Data Communication & Computer Networks	CO 1:understand and explain computer network technology, data com systems and its components, Ethernet, wireless network IEEE 802.11 and Bluetooth standard. CO 2:identify and analyze the different types of network, network topologies and protocols. CO 3:Enumerate the layers of OSI Mode,

	protocols. CO 3:Enumerate the layers of OSI Mode, TCO/IP model and explain function of each layers. CO 4:Provide solutions for network security.		TCO/IP model and explain function of each layers. CO 4:Provide solutions for network security.		TCO/IP model and explain function of each layers. CO 4:Provide solutions for network security.
EC-1763 Microwave Engineering	CO 1:Understand the basic concept and principle of microwave transmission system, and spectrum, different parameters, microwave network and components, solid-state vacuum tubes devices and measurement devices. CO 2:Analyze different microwave network CO 3:Able to measure different physical quantities using micro devices.	EC-1763 Microwave Engineering	CO 1:Understand the basic concept and principle of microwave transmission system, and spectrum, different parameters, microwave network and components, solid-state vacuum tubes devices and measurement devices. CO 2:Analyze different microwave network CO 3:Able to measure different physical quantities using micro devices.	EC-1763 Microwave Engineering	CO 1:Understand the basic concept and principle of microwave transmission system, and spectrum, different parameters, microwave network and components, solid-state vacuum tubes devices and measurement devices. CO 2:Analyze different microwave network CO 3:Able to measure different physical quantities using micro devices.
EC-1764 Digital Communication	CO 1:Acquire knowledge of basics of random variables and processes and identify basic process involved in communication system (knowledge,	EC-1764 Digital Communication	CO 1:Acquire knowledge of basics of random variables and processes and identify basic process involved in communication system (knowledge, understanding, and application). CO 2:Acquire	EC-1764 Digital Communication	CO 1:Acquire knowledge of basics of random variables and processes and identify basic process involved in communication system (knowledge, understanding, and application). CO 2:Acquire knowledge,

	understanding, and application). CO 2:Acquire knowledge, understand and demonstrate about different modulation, demodulation, generation and detection techniques of digital signals. CO 3:Analyze error performance of a communication system in presence of noise and other interferences CO 4: Understand the concept of information theory.		knowledge, understand and demonstrate about different modulation, demodulation, generation and detection techniques of digital signals. CO 3:Analyze error performance of a communication system in presence of noise and other interferences CO 4: Understand the concept of information theory.		understand and demonstrate about different modulation, demodulation, generation and detection techniques of digital signals. CO 3:Analyze error performance of a communication system in presence of noise and other interferences CO 4: Understand the concept of information theory.
EC-1765 Cellular Mobile Communication	CO 1:Understand and describe concept and basic fundamental of cellular mobile system, network, performance, parameters, frequency, management channel assignment, different architecture and protocols. CO 2:Analyse mobile system for attenuation and interference and do complex	EC-1765 Cellular Mobile Communication	CO 1:Understand and describe concept and basic fundamental of cellular mobile system, network, performance, parameters, frequency, management channel assignment, different architecture and protocols. CO 2:Analyse mobile system for attenuation and interference and do complex inventor for channel assignment and frequency management. CO 3:Analyse cell coverage for signal and traffic.	EC-1765 Cellular Mobile Communication	CO 1:Understand and describe concept and basic fundamental of cellular mobile system, network, performance, parameters, frequency, management channel assignment, different architecture and protocols. CO 2:Analyse mobile system for attenuation and interference and do complex inventor for channel assignment and frequency management. CO 3:Analyse cell coverage for signal and traffic.

	inventor for channel assignment and frequency management. CO 3:Analyse cell coverage for signal and traffic. CO 4:Design cell split mobile outage and handoff procedure.		CO 4:Design cell split mobile outage and handoff procedure.		CO 4:Design cell split mobile outage and handoff procedure.
EC-1766 Minor Project	CO1.Formulate a real world problem and develop its requirements. and design a solution for a set of requirements. CO2. Test and validate the conformance of the developed prototype against the original requirements of the problem. CO3. Work as a responsible member and possibly a leader of a team in developing software solutions CO4. Prepare and conduct oral, written presentations. CO5. Self learn new tools, algorithms, and/or	EC-1766 Minor Project	CO1.Formulate a real world problem and develop its requirements. and design a solution for a set of requirements. CO2. Test and validate the conformance of the developed prototype against the original requirements of the problem. CO3. Work as a responsible member and possibly a leader of a team in developing software solutions CO4. Prepare and conduct oral, written presentations. CO5. Self learn new tools, algorithms, and/or techniques that contribute to the software solution of the project. CO6. Generate alternative solutions, compare them and	EC-1766 Minor Project	CO1.Formulate a real world problem and develop its requirements. and design a solution for a set of requirements. CO2. Test and validate the conformance of the developed prototype against the original requirements of the problem. CO3. Work as a responsible member and possibly a leader of a team in developing software solutions CO4. Prepare and conduct oral, written presentations. CO5. Self learn new tools, algorithms, and/or techniques that contribute to the software solution of the project. CO6. Generate alternative solutions, compare them and

	techniques that contribute to the software solution of the project. CO6. Generate alternative solutions, compare them and select the optimum one.		select the optimum one.		select the optimum one.
EC-1767 Technical& Professional Skills	CO1. Develop technical and behavioral competencies of students needed to be successful at their personal and professional life. CO2. Develop leadership quality and enhances communication and presentation skills by developing their personality. CO3. Make them think critically, inculcate ethical values to take responsibilities as an engineer to work for society, environment and for sustainable development. CO4. Develop attitude of life long learning.	EC-1767 Technical& Professional Skills	CO1. Develop technical and behavioral competencies of students needed to be successful at their personal and professional life. CO2. Develop leadership quality and enhances communication and presentation skills by developing their personality. CO3. Make them think critically, inculcate ethical values to take responsibilities as an engineer to work for society, environment and for sustainable development. CO4. Develop attitude of life long learning.	EC-1767 Technical& Professional Skills	CO1. Develop technical and behavioral competencies of students needed to be successful at their personal and professional life. CO2. Develop leadership quality and enhances communication and presentation skills by developing their personality. CO3. Make them think critically, inculcate ethical values to take responsibilities as an engineer to work for society, environment and for sustainable development. CO4. Develop attitude of life long learning.
	VIIth Semester				
EC-1771 Advanc	CO 1: Understand the concept of	EC-1771 Advanc	CO 1: Understand the concept of	EC-1171 Optical communi	CO1.Acquire knowlwdge of optical fibers, different peformance parameters, signal

ed Communication	spread spectrum communication, hopping based system, implementation method of performance criteria, types of OFDM Communication satellite system and different parameters, cost, optical communication and cognitive radios. CO 2: Able to analyze design parameter of Spread Spectrum Communication system, optical communication system, wireless sensor Network and cognitive radios	ed Communication	spread spectrum communication, hopping based system, implementation method of performance criteria, types of OFDM Communication satellite system and different parameters, cost, optical communication and cognitive radios. CO 2: Able to analyze design parameter of Spread Spectrum Communication system, optical communication system, wireless sensor Network and cognitive radios CO 3: Use concepts of	cation	degradation, optical sourses and coupling, optical receivers and different transmission system. CO2. Analyze and do complex investigation of causes of Signal degradation , and optical fibre links CO3. Design and Develop optical fiber links.

	CO 3: Use concepts of probability theory and stochastic process to solve the problems in different communication system CO 4: Able to design sensor Network and Communication system.		probability theory and stochastic process to solve the problems in different communication system CO 4: Able to design sensor Network and Communication system.		
EC-1772 Data Structure and Algorithm	CO 1: acquire and demonstrate the concepts of data structure CO 2: understand and design the structure of queues and trees CO 3: develop the various types of sorting and searching algorithms	EC-1772 Data Structure and Algorithm	CO 1: acquire and demonstrate the concepts of data structure CO 2: understand and design the structure of queues and trees CO 3: develop the various types of sorting and searching algorithms	EC-1172 Antenna and Wave Propogation	CO 1:Acquire and demonstrate fundamental knowledge of radiation pattern, antenna parameters and types of arrays and propagation of waves. CO 2: Analyze antenna on the basis of different parameters CO 3: Design antenna arrays
EC-1773 CMOS Amplifier Design	CO 1: Acquire knowledge, understand and demonstrate the physicsbehind MOS Structure	EC-1773 CMOS Amplifier Design	CO 1: Acquire knowledge, understand and demonstrate the physicsbehind MOS Structure and operation	EC-1173 Embedded System	CO 1: understand what is microprocessor, microcontroller, communication

	and operation CO 2: Analyze circuits based on CMOS devices in term of its operation, frequency response and performance analysis. CO 3: Design operational amplifier based on understanding of frequency response and performance parameter of CMOS amplifier		CO 2: Analyze circuits based on CMOS devices in term of its operation, frequency response and performance analysis. CO 3: Design operational amplifier based on understanding of frequency response and performance parameter of CMOS amplifier		protocols, ARM and embedded system and its importance in real life engineering and industrial applications CO 2: consolidate theoretical concepts of embedded system and microcontroller architecture CO 3: Learn practice and implement program using concepts of microcontroller CO 4: learn peripherals interfacing and programming to solve prototype problems
EC-1774 Elective-I Digital Image Processing	CO 1:Acquire Knowledge and understand and able to demonstrate about basics of image processing including	EC-1774 Elective-I Digital Image Processing	CO 1:Acquire knowledge, understand and able to demonstrate about basics of image processing including enhancement, restoration and compression.	EC-1174 Digital Image Processing	CO 1: Acquire knowledge, understand and able to demonstrate about basics of image processing including enhancement, restoration and

	enhancement, restoration and compression. CO 2: Analyze the performance of different transformations for image enhancement and compresion CO 3: Evaluation of deifferent compression and enhancement techniques		CO 2: Analyze the performance of different transformations for image enhancement and compresion CO 3: Evaluation of deifferent compression and enhancement techniques		compression. CO 2: Analyze the performance of different transformations for image enhancement and compresion CO 3: Evaluation of deifferent compression and enhancement techniques
EC-1775 Elective-II Embedded Systems	CO 1: understand what is microprocessor, microcontroller, communication protocols, ARM and embedded system and its importance in real life engineering and industrial applications CO 2: consolidate theoretical concepts of embedded system and	EC-1775 Elective-II Embedded Systems	CO 1: understand what is microprocessor, microcontroller, communication protocols, ARM and embedded system and its importance in real life engineering and industrial applications CO 2: consolidate theoretical concepts of embedded system and microcontroller architecture	EC-1175 Satellite Communication	CO 1: Acquire knowledge,and Understandthe concepts of satellite communication, optical mechanics and launchers, satellite subsystems, transmitters, receivers,multiple access techniques CO 2: Analyze and do complex investigation of different alttitude and orbit control systems, tracking systemsand diferent links. CO 3:Design and Develop satellite links. CO 3: Evaluation of designed satellite links.

	microcontroller architecture CO 3: Learn practice and implement program using concepts of microcontroller CO 4: learn Peripherals interfacing and programming to solve prototype problems		CO 3: Learn practice and implement program using concepts of microcontroller CO 4: learn Peripherals interfacing and programming to solve prototype problems		
EC-1776 Major Project-I	CO1. Develop plans with relevant people to achieve the project goals. CO2. Break work down into task and determine handover procedures. CO3. Identify links and dependencies and schedule to achieve	EC-1776 Major Project-I	CO1. Develop plans with relevant people to achieve the project goals. CO2. Break work down into task and determine handover procedures. CO3. Identify links and dependencies and schedule to achieve deliverables. CO4. Estimate and cost the human and physical recourses required and	EC-1176 Industrial Training	CO1-Able to identify, apply important principles of science and engineering. CO2- Able to do complex investigations of the issues and the problems faced on site and able to solve them .CO3-Communicate effectively and take socia, cultural,global and environmental respnsibilitie. CO4-Capability and Zest for self improvement through constant professional development and life lnge learning.

	deliverables. CO4. Estimate and cost the human and physical recourses required and make plans to obtain the necessary recourses. CO5. Allocate roles with clear lines of roles and responsibilities		make plans to obtain the necessary recourses. CO5. Allocate roles with clear lines of roles and responsibilities.		
EC-1777 Industrial Training &Startup	CO1-Able to identify, apply important principles of science and engineering. CO2- Able to do Complex investigations of the issues and the problems faced on site and able to solve them .	EC-1777 Industrial Training &Startup	CO1-Able to identify, apply important principles of science and engineering. CO2- Able to do complex investigations of the issues and the problems faced on site and able to solve them . C03- Communicate effectively and take socia, cultural,global and environmental respnsibilitie. CO4-Capability and Zest for self	EC-1177 Major Project	CO1. Develop plans with relevant people to achieve the project goals. CO2. Break work down into task and determine handover procedures. CO3. Identify links and dependencies and schedule to achieve deliverables. CO4. Estimate and cost the human and physical recourses required and make plans to obtain the necessary recourses.

	C03- Communicate effectively and take socialL,cultural,global and environmental respnsibilitie. CO4-Capability and Zest for self improvement through constant professional development and life lnge learning.		improvement through constant professional development and life lnge learning.		CO5. Allocate roles with clear lines of roles and responsibilities.
EC-1781 Nano Electronics	CO1: understand the potential of Nano Technology and the design approaches and conduction mechanism at nano level, CO2: analyze the Nano level circuits and physics behind Quantum wells, its structure and working CO3: Simulate the standard designs and implement their own designs using EDA Tools for various applications.		CO1: understand the potential of Nano Technology and the design approaches and conduction mechanism at nano level, CO2: analyze the Nano level circuits and physics behind Quantum wells, its structure and working CO3: Simulate the standard designs and implement their own designs using EDA Tools for various applications.	EC-1181 Microwave Engineering	CO 1:Understand the basic concept and principle of microwave transmission system, and spectrum, different parameters, microwave network and components, solid-state vacuum tubes devices and measurement devices. CO 2: Analyze different microwave network CO 3: Able to measure different physical quantities using micro

					devices.
EC-1782 Radar Engineering	CO 1: Understand and discuss concepts, basics operation of pulse, CW, Tracking radar, phased array and radar detector. CO 2: by analyzing given problem able to choose suitable tracking radar and select appropriate criterion for detecting a target CO 3: analyze the Statistical parameters of noise, radar cross section of targets and estimate the noise figure and noise temperature	EC-1782 Radar Engineering	CO 1: Understand and discuss concepts, basics operation of pulse, CW, Tracking radar, phased array and radar detector. CO 2: by analyzing given problem able to choose suitable tracking radar and select appropriate criterion for detecting a target CO 3: analyze the statistical parameters of noise, radar cross section of targets and estimate the noise figure and noise temperature CO 4: evaluate the radar performance based on pulse width peak power and beam width	EC-1182 CMOS Circuit Design	CO 1: Acquire knowledge, understand and demonstrate the physicsbehind MOS Structure and operation CO 2: Analyze circuits based on CMOS devices in term of its operation, frequency response and performance analysis. CO 3:

	CO 4: evaluate the radar performance based on pulse width peak power and beam width				
EC-1783 Major Project-II	CO1.Formulate a real world problem and develop its requirements. and design a solution for a set of requirements. CO2. Test and validate the conformance of the developed prototype against the original requirements of the problem. CO3. Work as a Responsible member and possibly a leader of	EC-1783 Major Project-II	CO1.Formulate a real world problem and develop its requirements. and design a solution for a set of requirements. CO2. Test and validate the conformance of the developed prototype against the original requirements of the problem. CO3. Work as a responsible member and possibly a leader of a team in developing software solutions . CO4.Prepare and conduct oral, written presentations. CO5. Self learn new tools, algorithms, and/or techniques that contribute to the	EC-1183 MIS	Upon completion of this course student will be able to: CO1. Recognize the concept & technologies related with MIS. CO2. Classify the types of MIS. CO3. Develop and implement the MIS. Understand the role of information system in strategic management. CO4. Aware the ethical, social & security issues of information system. CO5. Develop the composite information system for an organization.

	a team in developing software solutions . CO4. Prepare and conduct oral, written presentations. CO5. Self learn new tools, algorithms, and/or techniques that contribute to the software solution of the project. CO6. Generate alternative solutions, compare them and select the optimum one.		software solution of the project. CO6. Generate alternative solutions, compare them and select the optimum one.		
EC-1784 General Proficiency	CO1. Achievement in academics and co-curricular activities (selection in competitive exams for higher studies and campus interviews). CO2. Participation in extra-curricular activities.	EC-1784 General Proficiency	CO1. Achievement in academics and co curricular activities (selection in competitive exams for higher studies and campus interviews). CO2. Participation in extra-curricular activities. CO3. Contribution towards society and	EC-1184 Advanced Communication	CO 1: Understand the concept of spread spectrum communication, hopping based system, implementation method of performance criteria, types of OFDM communication satellite system and different parameters, cost, optical communication

	CO3. Contribution towards society and environment. CO4. General and ethical behavior as an individual and as in team.		environment. CO4. General and ethical behavior as an individual and as in team.		and cognitive radios. CO 2: Able to analyze design parameter of Spread Spectrum communication system, optical communication system, wireless sensor Network and cognitive radios CO 3: Use concepts of probability theory and stochastic process to solve the problems in different communication system CO 4: Able to design sensor Network and communication system.
	-		-	EC-1185 Major Project	CO1.Formulate a real world problem and develop its requirements. and design a solution for a set of requirements. CO2. Test and validate the conformance of the developed prototype against the original

					requirements of the problem. CO3. Work as a responsible member and possibly a leader of a team in developing software solutions . CO4. Prepare and conduct oral, written presentations. CO5. Self learn new tools, algorithms, and/or techniques that contribute to the software solution of the project. CO6. Generate alternative solutions, compare them and select the optimum one.
	-		-	EC-1186 General Proficiency	CO1. Achievement in academics and co curricular activities (selection in competitive exams for higher studies and campus interviews). CO2. Participation in extra-curricular activities. CO3. Contribution towards society and

					environment. CO4. General and ethical behavior as an individual and as in team.

3.1.2 CO-PO-PSO MATRICES OF COURSES

CO-PO-PSO mapping of the courses of academic year **(2018-2019)**are shown below:-

CO-PO-PSO Mapping

SEMESTER-III

SUBJECT CODE: EC -1731

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1												1		
CO2	1												1		
CO3	1	1		1	1								1	1	
CO4	1	1	2	1	1				1		1		1	1	
Avg.	1	0.5	0.5	0.5	0.5	0	0	0	0.25	0	0.25	0	1	0.5	0

SUBJECT CODE: EC -1732

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	1	1	1	1								1	1	
CO2	1	1	1	1								1		1	
CO3	1	1	1	1	1							1		1	
Avg.	1	1	1	1	0.6	0	0	0	0	0	0	0.6	0.3	1	0

SUBJECT CODE: EC -1733 Digital Circuit Design

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3

CO1	2									1			1		
CO2	1	2		1	1								1	1	
CO3	1	1	2	1	1	1			2		1	1	1	1	1
Avg.	1.3	1	0.6	0.6	0.6	0.3	0	0	0.6	0.3	0.3	0.3	1	0.6	0.3

SUBJECT CODE: EC -1734 Electronic Instrumentation & Measurement

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2												2		
CO2	1	2		1	1								1	1	2
CO3	1	1	2	1	1	1			1		1	1	1	1	2
Avg.	1.3	1	0.6	0.6	0.6	0.3	0	0	0.3	0	0.3	0.3	1.3	0.6	1.3

SUBJECT CODE: EC -1735 Signals & Systems

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1												1		
CO2	1	2		1	1								1	1	1
CO3	1				1								1		1
CO4	1	1		1	1								1	1	1
Avg.	1	0.75	0	0.5	0.75	0	0	0	0	0	0	0	1	0.5	0.75

SUBJECT CODE: EC -1736 Electronics Instrumentation and Signals and System LAB

POs / COs	PO 1	PO 2	PO 3	PO4	PO 5	PO 6	PO 7	PO8	PO9	PO10	PO11	PO1 2	PSO1	PSO2	PSO3
CO 1	2	2		2	2								2	2	2

CO 2	1	2		2	2								2	2	2
CO 3	1		2		1								1	1	1
CO 4	2												2		2
CO 5		2		2	2								2	2	2
Avg.	1.2	1.2	.4	1.2	1.4	0	0	0	0	0	0	0	1.8	1.4	1.8

SUBJECT CODE: EC -1737 Seminar and Entrepreneurship

CO / PO	PO1	PO2	PO3	PO4	PO5	PO 6	PO 7	P O 8	PO 9	PO10	PO11	PO12	PSO1	PSO2	PSO 3
CO1	2									2			2	2	
CO2			2		2				2		2			2	
CO3	1	1		2							2		2	2	2
CO4	1	1	2	1									2	2	2
Avg .	**1**	**.5**	**1**	**.75**	**.5**	**0**	**0**	**0**	**.5**	**.5**	**1**	**0**	**1.5**	**2**	**1**

CO-PO-PSO Mapping

SEMESTER-IV

SUBJECT CODE: EC -1741 VLSI Design

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3				2								3		
CO2	2	3	3	3	3								2	3	3
CO3	2	2	3	2	3	1			2		2	1			
Avg.	2.3	1.67	2	1.67	2.67	0	0	0	0.6	0	0.6	0.3	1.67	1	1

SUBJECT CODE: EC -1742 Electronic Circuit Design

CO/	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3

PO															
CO1	2												2		
CO2	2	2		2	2								2	2	2
CO3	2	2	2	2	2				2		2	2	2	2	2
CO4	3	3		3	3								3	3	3
Avg.	2.25	1.75	0.5	1.75	1.75	0	0	0	0.5	0	0.5	0.5	2.25	1.75	1.75

SUBJECT CODE: EC -1743 Control System Engineering

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2											2		2	
CO2	2	2	2		2								2	2	2
CO3	2	2		2	2								2	2	2
CO4		2	2		2								2	2	
Avg.	1.5	1.5	1	0.5	1.5	0	0	0	0	0	0	0.5	1.5	2	1

SUBJECT CODE: EC -1744 Electromagnetic Field

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2											2	2	2	
CO2	2	2	2			2						2	2	2	
CO3			2	2	2							2			2
Avg.	1.33	066	1.33	0.66	0.66	0.66	0	0	0	0	0	2	1.33	1.33	0.66

SUBJECT CODE: EC-1745 Engineering Mathematics-III

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3
CO 1	3	3	2	2	-	-	2	3	1	2	1	3	3	3	
CO 2	3	3	2	3	-	-	1	1	1	2	2	3	2	3	

CO 3	3	2	2	2	-	-	1	2	1	2	1	2	2	3	2
CO 4	3	3	2	2	-	-	2	1	1	2	1	2	1	3	
CO 5	3	3	2	3	-	-	2	3	1	3	2	3	2	3	2
Avg	3	2.8	2	2.4	0	0	1.6	2	1	2.2	1.4	2.6	2	3	.8

SUBJECT CODE: EC-1746 Computer programming skill-I

CO / PO	PO 1	PO 2	PO3	PO 4	PO5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
CO 1	2	2	2	2	2								2	2	
CO 2	2				2										
CO 3	2			2	2								2	2	
CO 4	2		3		1								1	2	
Avg .	2	.5	1.2 5	1	1.7 5	0	0	0	0	0	0	0	1.25	1.5	0

SUBJECT CODE: EC-1747 Aptitude and Logical Reasoning

PO / CO	**PO0 1**	**PO0 2**	**PO0 3**	**PO0 4**	**PO0 5**	**PO0 6**	**PO07**	**PO0 8**	**PO0 9**	**PO10**	**PO11**	**PO1 2**	**PS0O 1**	**PSO0 2**	**PSO0 3**
CO01	3	2		3	3								2	2	2
CO02	2	2		3					2				2		
CO03	3	3		3	3								3	3	
CO04	3	3		3	3								3	3	
Avg.	2.75	2.5	0	3	2.25	0	0	0	.5	0	0	0	2.5	2	.5

CO-PO-PSO Mapping

SEMESTER-V

SUBJECT CODE: EC-1751 Antenna & Wave Propogation

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2												2		
CO2	2	2		2	2								1	2	2
CO3	1	1	2	1	2								2	2	2
Avg.	1.66	1	0.66	1	1.33	0	0	0	0	0	0	0	1.66	1.33	1.33

SUBJECT CODE: EC -1752 Communication Network and Transmission Lines

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	2	2									2	1	1
CO2	1	2	2			1							2		
CO3	1	2	2										2		
CO4			3	1		1							2	2	2
Avg.	1.25	1.25	2.25	0.75	0	0.5	0	0	0	0	0	0	2	0.75	0.75

SUBJECT CODE: EC -1753 Microprocessor & Microcontroller

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3												3	3	2
CO2	3	3		3	3								3	2	2
CO3	3	3		3	3								3	3	2
CO4	3	2	3	3	3								3	3	3
Avg.	3	2	.75	2.25	2.25	0	0	0	0	0	0	0	3	2.75	2.25

SUBJECT CODE: EC -1754 Analog Communication

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2											2	2		
CO2	2	2		2	2							1	2	2	2
CO3	2	2		2	2								2	2	2
CO4	2	2	1	2	2								2	2	2
Avg.	2	1.5	.25	1.5	1.5	0	0	0	0	0	0	.75	2	1.5	1.5

SUBJECT CODE: EC -1755 Probability and Stochastic Process

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1												1		
CO2	1												1		
CO3	1	2		2	1								1	1	1
CO4	1		2		1				1		1	1	1	1	1
Avg.	1	.5	.5	.5	.5	0	0	0	.25	0	.25	.25	1	.5	.5

SUBJECT CODE: EC -1756 Computer Programming Skills-II (C and C++)

CO / PO	PO 1	PO 2	PO3	PO 4	PO5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
CO 1	2	2	2	2	2								2	2	
CO 2	2				2										
CO 3	2			2	2								2	2	

CO 4	2		3		1								1	2	
Avg.	2	.5	1.25	1	1.75	0	0	0	0	0	0	0	1.25	1.5	0

SUBJECT CODE: EC -1757 Minor Industrial Training

POs / COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	3	3								3	3	3
CO2	3	2		3	3								2	2	3
CO3	3	3		3	3	3				5					
CO4									3	3	3				
CO5	3	2	2	2	3							3	2	2	3
Avg.	2.4	2	1	2.2	2.4	.6	0	0	0.6	1.6	.6	.6	1.4	1.4	1.8

CO-PO-PSO Mapping

SEMESTER-VI

SUBJECT NAME: Digital Signal Processing CODE: EC -1761

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2												2		
CO2	1		2										1		
CO3	1	2		2	2								1	2	2
CO4	1		2		2								1	2	2
Avg.	1.25	.5	1	.5	1	0	0	0	0	0	0	0	1.25	1	1

SUBJECT CODE: EC -1762 Data Communication & Computer Networks

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3

CO1	1	1		1	2								1	2	3
CO2		3	3	1	2									2	3
CO3			2	1	2								1	2	3
CO4		1	3	1	2	2								2	3
Avg.	.25	1.25	2	1	2	.5	0	0	0	0	0	0	.5	2	3

SUBJECT CODE: EC -1763 Microwave Engineering

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2												2		
CO2	1	2		1	1								1	1	1
CO3	1	1		2	1								1	1	1
Avg.	1.3	1	0	1	.67	0	0	0	0	0	0	0	1.3	.67	.67

SUBJECT CODE: EC -1764 Digital Communication

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2											2	2		
CO2	2	2		2	2								2	2	2
CO3	2	2		2									2	2	2
CO4	2	2		1	2							1	2	2	2
Avg.	2	1.5	0	1.25	1	0	0	0	0	0	0	.75	2	1.5	1.5

SUBJECT CODE: EC -1765 Cellular Mobile Communication

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2												2		

CO2	1	2			2								1	2	2
CO3	1	2			2								1	2	2
CO4	1		2		2				1		1	1	1	2	2
Avg.	1.25	1	.5	0	1.5	0	0	0	.25	0	.25	.25	1.25	1.5	1.5

SUBJECT CODE: EC -1766 Minor Project

Os / COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	3	3								3	3	2
CO2	2	2		3	3								2	2	3
CO3						3		2	3						
CO4										3					
CO5	3	2		2	3							3			3
CO6	2	2	2	2	2				2	1	2		1	2	2
Avg.	1.67	1.5	.67	1.67	1.83	.5	0	.33	.83	.67	.33	.5	1	1.16	1.67

SUBJECT CODE: EC -1767 Technical& Professional Skills

CO-PO-PSO Mapping:

POs / COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	3	3	3		2		2			1		
CO2									3	3					
CO3		3		3		3	3	3							
CO4												3			
Avg.	1	2	1	2	1	2	1	1.67	1	1.67	0	1	0.33	0	0

<u>CO-PO-PSO Mapping</u>

SEMESTER-VII

SUBJECT CODE: EC -1771 Advanced Communication

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3

CO1	2												2		
CO2	2	3		2	2								2	2	2
CO3	2	2	3		2				2		2	2	2	2	2
Avg.	2	1.67	1	0.67	1.33	0	0	0	0.67	0	.67	.67	2	1.33	1.33

SUBJECT CODE: EC -1772 Data Structure and Algorithm

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3												3	2	
CO2	3	2	3	2	3								1	2	3
CO3	3	2	3	3	3								1	3	
Avg.	3	1.33	2	1.66	2								1.66	2.33	1

SUBJECT CODE: EC -1773 CMOS Amplifier Design

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3												3		
CO2	2	3	2	2	2									2	2
CO3	2	1	3	2	3				2		2	2	2	2	2
Avg.	2.33	1.33	1.67	1.33	1.67				0.66		0.66	0.66	1.67	1.33	1.33

SUBJECT CODE: EC -1774 – Digital Image Processing

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3												3		
CO2	2	3		2	2								2	2	2

CO3	2	2		2	2				1		1	1	2		
Avg.	2.33	1.67		1.33	1.33				0.33		0.33	0.33	2.33	0.67	0.67

SUBJECT CODE: EC -1775-Embedded System

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2											3	3	3
CO2	3	1		1									3		
CO3	3	3	3	2	3								3	3	1
Avg.	3	2	1	1	1								3	2	1.33

SUBJECT CODE: EC -1776 Major Project-I

POs / COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3		2		3					2		2	2	
CO2		2	3	2							2			1	
CO3		3		3											
CO4		3		3				2		2	3				
CO5									3	3	3				
Avg.	0.6	2.2	0.6	2		0.6		0.4	0.6	1	2		0.4	0.6	

SUBJECT CODE: EC -1777: Industrial Training & Startup

POs / COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3		3									3	2	2
CO2	3	3	3	3	3								2	2	3
CO3						3	3	2	2	3					
CO4								2				3			
Avg.	1.5	1.5	0.75	1.5	0.75	0.75	0.75	1	0.5	0.75		0.75	1.25	1	1.25

CO-PO-PSO Mapping

SEMESTER-VIII

SUBJECT CODE: EC -1781 Nano Electronics

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1		1		2									3	1	
CO2		2		2									1	1	
CO3	3		3		3								3	2	3
Avg.	1	1	1	1.33	1								2.33	1.33	1

SUBJECT CODE: EC -1782 Radar Engineering

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2												2		
CO2	1	2			2								1	2	2

CO3	1	2			2							1	2	2
CO4	1	1	2	2							1	1		
Avg.	1.20	1.67	2	2	2						1	1.20	2	2

SUBJECT CODE: EC -1783 Major Project-II

POs / COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	3									3	2	2
CO2			3		3								1	2	3
CO3			3			3			3						
CO4									3	3					
CO5					3			3				3			3
CO6	3	3	3	3	3								3	3	3
Avg.	1	1	1.83	1	1.5	0.5		0.5	1	0.5		0.5	1.16	1.16	1.83

SUBJECT CODE: EC -1784 General Proficiency

PO / CO	**PO01**	**PO02**	**PO03**	**PO04**	**PO05**	**PO06**	**PO07**	**PO08**	**PO09**	**PO10**	**PO11**	**PO12**	**PS0O1**	**PSO02**	**PSO03**
CO1	3	2	2	3	3								2	2	
CO2							2	2	2						
CO3						3	3		3						
CO4								3	3						
Avg.	0.75	0.5	0.5	0.75	0.75	0.75	1.25	1.25	2				0.5	0.5	

3.1.3 Program Level Course-PO Matric of all Courses Including Final Year Courses (10).

First year to Final Year

Target Attainment

Subject code	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO1 1	PO 12	PSO0 1	PSO 02	PSO 03
C101	1	1	1	1	1	1	1	0	1	0	0	1	0	0	0
C102	1	1	1	1	1	1	1	1	1	0	1	1	1	0	0
C103	1	1	1	1	1	0	0	0	0	0	1	1	1	1	0
C104	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0
C105	1	1	1	1	1	1	0	0	1	1	1	1	1	0	0
C201	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
C202	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0
C203	1	1	1	1	0	1	1	1	0	0	0	1	1	0	0
C204	0	1	0	2	1	2	2	2	1	0	1	1	0	0	0
C205	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
C301	1	0.5	0.5	0.5	0.5	0	0	0	0.25	0	0.25	0	1	0.5	0
C302	1	1	1	1	0.6	0	0	0	0	0	0	0.6	0.3	1	0
C303	1.3	1	0.6	0.6	0.6	0.3	0	0	0.6	0.3	0.3	0.3	1	0.6	0.3
C304	1.3	1	0.6	0.6	0.6	0.3	0	0	0.3	0	0.3	0.3	1.3	0.6	1.3
C305	1	0.75	0	0.5	0.75	0	0	0	0	0	0	0	1	0.5	0.75
C306	1.2	1.2	.4	1.2	1.4	0	0	0	0	0	0	0	1.8	1.4	1.8
C307	**1**	**.5**	**1**	**.75**	**.5**	**0**	**0**	**0**	**.5**	**.5**	**1**	**0**	**1.5**	**2**	**1**
C401	2.3	1.67	2	1.67	2.67	0	0	0	0.6	0	0.6	0.3	1.67	1	1
C402	2.25	1.75	0.5	1.75	1.75	0	0	0	0.5	0	0.5	0.5	2.25	1.75	1.75
C403	1.5	1.5	1	0.5	1.5	0	0	0	0	0	0	0.5	1.5	2	1
C404	1.33	066	1.33	0.66	0.66	0.66	0	0	0	0	0	2	1.33	1.33	0.66

C405	3	2.8	2	2.4	0	0	1.6	2	1	2.2	1.4	2.6	2	3	.8
C406	2	.5	1.25	1	1.75	0	0	0	0	0	0	0	1.25	1.5	0
C407	2.75	2.5	0	3	2.25	0	0	0	.5	0	0	0	2.5	2	.5
C501	1.66	1	0.66	1	1.33	0	0	0	0	0	0	0	1.66	1.33	1.33
C502	1.25	1.25	2.25	0.75	0	0.5	0	0	0	0	0	0	2	0.75	0.75
C503	3	2	.75	2.25	2.25	0	0	0	0	0	0	0	3	2.75	2.25
C504	2	1.5	.25	1.5	1.5	0	0	0	0	0	0	.75	2	1.5	1.5
C505	1	.5	.5	.5	.5	0	0	0	.25	0	.25	.25	1	.5	.5
C506	2	.5	1.25	1	1.75	0	0	0	0	0	0	0	1.25	1.5	0
C507	2.4	2	1	2.2	2.4	.6	0	0	0.6	1.6	.6	.6	1.4	1.4	1.8
C601	1.25	.5	1	.5	1	0	0	0	0	0	0	0	1.25	1	1
C602	.25	1.25	2	1	2	.5	0	0	0	0	0	0	.5	2	3
C603	1.3	1	0	1	.67	0	0	0	0	0	0	0	1.3	.67	.67
C604	2	1.5	0	1.25	1	0	0	0	0	0	0	.75	2	1.5	1.5
C605	1.25	1	.5	0	1.5	0	0	0	.25	0	.25	.25	1.25	1.5	1.5
C606	1.67	1.5	.67	1.67	1.83	.5	0	.33	.83	.67	.33	.5	1	1.16	1.67
C607	1	2	1	2	1	2	1	1.67	1	1.67	0	1	0.33	0	0
C701	2	1.67	1	0.67	1.33	0	0	0	0.67	0	.67	.67	2	1.33	1.33
C702	3	1.33	2	1.66	2	0	0	0	0	0	0	0	1.66	2.33	1
C703	2.33	1.33	1.67	1.33	1.67	0	0	0	0.66	0	0.66	0.66	1.67	1.33	1.33
C704	2.33	1.67	0	1.33	1.33	0	0	0	0.33	0	0.33	0.33	2.33	0.67	0.67
C705	3	2	1	1	1	0	0	0	0	0	0	0	3	2	1.33
C706	0.6	2.2	0.6	2	0	0.6	0	0.4	0.6	1	2	0	0.4	0.6	
C707	1.5	1.5	0.75	1.5	0.75	0.75	0.75	1	0.5	0.75	0	0.75	1.25	1	1.25
C801	1	1	1	1.33	1	0	0	0	0	0	0	0	2.33	1.33	1

C802	1.20	1.67	2	2	2	0	0	0	0	0	0	1	1.20	2	2
C803	1	1	1.83	1	1.5	0.5	0	0.5	1	0.5	0	0.5	1.16	1.16	1.83
C804	0.75	0.5	0.5	0.75	0.75	0.75	1.25	1.25	2	0	0	0	0.5	0.5	0
Overall Average	**1.46**	**2.55**	**0.90**	**1.16**	**1.15**	**0.36**	**0.27**	**0.30**	**0.42**	**0.28**	**0.35**	**0.51**	**1.30**	**1.06**	**0.83**

3.2 Attainment of Course outcomes (75)

3.2.1 Describe the assessment tools and processes used to gather the data upon which the evaluation of course outcomes is based (10).

Assessment Tools are:

1. Direct Assessment Tool: Includs final theory exam , practical exam, mid sem exam, quiz and assignment. With the help of these assessment tools evaluation of attainment of COs are done and by CO-PO-PSO mapping evaluation of POs-PSOs are done.
2. Indirect Assessment Tool: Program Exit Survey is used to evaluate the attainment of POs and PSOs.

CO Assessment Tools

Direct Assessment Tools	
Assignments	The assignment is a qualitative and Quiz is a quantitative performance assessment tool designed to assess students' knowledge of engineering practices, framework, and problem solving.
Quiz	
Midsem exams	Midterm and semester End examination are metric for assessing whether all the POs are attained or not. Examination is more focused on attainment of course outcomes and program outcomes using a descriptive exam.
End semester exam (theory)	
Practical exam	This is mainly to assess student's practical knowledge with their designing capabilities.

CO Assessment Methodology

CO Assessment Tools	Assessment Frequency	Process of data collection
Mid sem Test- Two mid sem tests are conducted after completion of 2 and half unit. Each test is of 10/20 marks.	Twice in a sem.	List of students appeared and their scores is available with all concern faculty members and available in the course files.
Quiz- Conducted at the end of final exams. Carry total 10 objective type questions each of one mark.	At the End of session	List of students appeared and their scores is available with all concern faculty members and available in the course files.
Assignment- Generally one or two assignments are given during or at the end of the session.	During or At the End of session	Students submit the assignment at the end of the session. Assignment question are so asked to satisfy the courses CO's.
Final Exams (Theory+Practical)- At the end of the session.	At the End of session	TR is available at the exam centre. Results of final exams are sent to the concern department along with Exam Answer Books. copies

3.2.2 Record the attainment of course outcomes of all courses with respect to set attainment levels (65)

The Course Outcomes attainment is measured through direct and indirect assessment assessment in three different levels: Set attainment level for all the courses are set to 50%. CO attainment which is < 50% is considered as below target attainment and its contribution in PO-PSO attainment is not considered.

Attainment Level 0 (No Attainment) :- scoring < 50% marks

Attainment Level 1 :- scoring 50%-60% marks

Attainment Level 2 :- students scoring 60%-70% marks

Attainment Level 3 :- students scoring more than 70% marks

Course Articulation Matrix

Ist –IInd Semester

Batch- (2018-2019)

Attainment of CO in %

Session 2018-2019

Name of the Department	Course Code	Course Title	Attainment				
			CO1	**CO2**	**CO3**	**CO4**	**CO5**
Applied Maths	BT-1815	Engineering Maths I	58	70	23	53	35
	BT-1825	Engineering Maths II	50	40	43	44	23
Applied Physics	BT-1821	Engineering Physics	43	38	39	36	58
Applied Chemistry	BT-1811	Engineering Chemistry	43	49	33	36	25
Civil Engineering	BT-1822	Basic Civil Engineering & Engineering Mechanics	49	35	50	31	34
Electrical Engineering	BT-1812	Basic Electrical & Electronics Engineering	47	47	31	43	-
Mechanical Engineering	BT-1823	Basic Mechanical Engineering	49	47	40	48	50
Mechanical Engineering	BT-1813	Engineering Graphics	62	42	42	45	48
Petrochemical Engineering	BT-1824	Energy Environment Ecology & Society	60	61	52	50	50
Humanities	BT-1814	Communication Skill	55	49	53	50	50
Avg. CO Attainment			**51.6**	**47.8**	**40.6**	**43.6**	**37.3**

Course Articulation Matrix

IIIrd sem to VIIIth sem

Batch- (2018-2019)

Attainment of CO in %

Subject code	CO1%	Attainment	CO2%	Attainment	CO3%	Attainment	CO4 %	Attainment	CO5 %	Attainment	CO6 %	Attainment
Semester-III												
EC - 1731	61.12	Y	68.68	Y	69.00	Y	68.39	Y				
EC - 1732	60.00	N	58,80	N	59,30	N						
EC - 1733	70.64	Y	71.28	Y	72.94	Y						
EC - 1734	67.23	Y	67.44	Y	67.80	Y						
EC- 1735	47.13	N	45.88	N	45.58	N	46.39	N				
EC- 1736	75.15	Y	71.58	Y	74.64	Y	74.33	Y	71.58	Y		
Avg.	**63.54**	**Y Level 2**	**64.97**	**Y Level 2**	**65.99**	**Y Level 2**	**63.03**	**Y Level 2**	**71.58**	**Y Level 3**		
Semester-IV												
EC - 1741	65.25	N	61.27	N	71.85	Y						
EC - 1742	67.0	Y	70.0	Y	67.0	Y	63.0	Y				
EC - 1743	60.78	Y	70.75	Y	64.52	Y	62.30	Y				
EC - 1744	53.05	Y	53.82	Y	51.95	Y						
EC - 1745	64.61	Y	61.95	Y	60.50	Y	62.17	Y	63.99	Y		
EC- 1746	76.29	Y	76.37	Y	76.45	Y	76.39	Y				
EC- 1747	90.0	Y	90.0	Y	90.0	Y	90.0	Y				
Avg.	**68.14**	**Y Level 2**	**69.16**	**Y Level 2**	**68.89**	**Y Level 2**	**70.77**	**Y Level 3**	**63.99**	**Y Level 2**		
Semester-V												
EC - 1751	70.14	Y	75.38	Y	67.15	Y						
EC - 1752	62.01	Y	61.85	Y	62.33	Y	63.75	Y				
EC -	62.63	Y	63.50	Y	58.55	Y	66.19	Y				

1753												
EC-1754	68.67	Y	71.53	Y	73.40	Y	69.39	Y				
EC - 1755	58.36	N	57.33	Y	56.27	N	56.36	Y				
EC-1756	88.88	Y	88.88	Y	88.88	Y	88.88	Y				
EC-1757	78.47	Y	78.47	Y	78.47	Y	78.47	Y	78.47	Y		
Avg.	**69.88**	**Y Level 2**	**70.99**	**Y Level 3**	**69.29**	**Y Level 2**	**70.50**	**Y Level 3**	**78.47**	**Y Level 3**		
Semester-VI												
EC - 1761	73.78	Y	71.75	Y	73.81	Y	74.98	Y				
EC - 1762	70.64	Y	74.64	Y	69.73	Y	76.07	Y				
EC - 1763	74.82	Y	75.75	Y	73.69	Y						
EC - 1764	75.00	Y	76.00	Y	75.00	Y	74.00	Y				
EC - 1765	53.87	Y	53.28	Y	61.28	Y	54.09	Y				
EC-1766	85.63	Y	85.58	Y	85.63	Y	84.79	Y	85.83	Y	84.98	Y
EC-1767	86.20	Y	86.20	Y	86.20	Y	86.20	Y				
Avg.	**74.27**	**Y Level 3**	**74.74**	**Y Level 3**	**75.04**	**Y Level 3**	**75.02**	**Level 3**	**85.83**	**Y Level 3**	**84.98**	**Y Level 3**
Semester-VII												
EC - 1771	78.37	Y	79.52	Y	69.80	Y						
EC - 1772	68.17	Y	77.08	y	77.68	Y						
EC - 1773	77.05	Y	72.15	Y	76.86	Y						
EC - 1774	70.9	Y	72.8	Y	72.2	Y						
EC-1775	66.0	Y	65.0	Y	66.00	Y						
EC 1776	84.58	Y	84.60	Y	84.36	Y	84.60	Y	81.72	Y		
EC 1777	88.76	Y	88.76	Y	88.76	Y	88.76	Y				
Avg.	**76.27**	**Y Level 3**	**77.13**	**Y Level 3**	**76.52**	**Y Level 3**	**86.68**	**Y Level 3**	**81.72**	**Y Level 3**		
Semester-VIII												

EC - 1781	66.21	Y	66.15	Y	66.53	Y						
EC - 1782	69.68	Y	70.84	Y	71.09	Y	71.25	Y				
EC - 1783	90.73	Y	90.75	Y	90.71	Y	90.71	Y	90.66	Y	90.69	Y
EC - 1784	86.83	Y	86.83	Y	86.83	Y	86.83	Y				
Avg.	**78.36**	**Y Level 3**	**78.64**	**Y Level 3**	**78.79**	**Y Level 3**	**82.93**	**Y Level 3**	**90.66**	**Y Level 3**	**90.69**	**Y Level 3**
Overall Avg Attainment of CO %	**72.57**	**Y Level 3**	**72.60**	**Y Level 3**	**72.43**	**Y Level 3**	**74.83**	**Y Level 3**	**78.45**	**Y Level 3**	**87.83**	**Y Level 3**

3.3 Attainment of Program outcomes and Program specific outcomes of all courses with respect to set attainment levels (75)

3.3.1 Describe he assessment tools and processes used for measuring the attainment of each of the Program Outcomes and Program Specific Outcomes. (10)

Assessment Tools are:

1. Direct Assessment Tool: Includs final theory exam , practical exam, mid sem exam, quiz and assignment. With the help of these assessment tools evaluation of attainment of COs are done and by CO-PO-PSO mapping evaluation of POs-PSOs are done.
2. Indirect Assessment Tool: Program Exit Survey is used to evaluate the attainment of POs and PSOs.

Program Articulation Matrix

IIIrd Semeter- VIIIth Semester

Session 2018-2019

Target

Subject code	PO01	PO02	PO03	PO04	PO05	PO06	PO07	PO08	PO09	PO10	PO11	PO12	PSO01	PSO02	PSO03
EC-1731	1	0.5	0.5	0.5	0.5	0	0	0	0.25	0	0.25	0	1	0.5	0
EC - 1732	1	1	1	1	0.6	0	0	0	0	0	0	0.6	0.3	1	0

EC - 1733	1.3	1	0.6	0.6	0.6	0.3	0	0	0.6	0.3	0.3	0.3	1	0.6	0.3
EC- 1734	1.3	1	0.6	0.6	0.6	0.3	0	0	0.3	0	0.3	0.3	1.3	0.6	1.3
EC - 1735	1	0.75	0	0.5	0.75	0	0	0	0	0	0	0	1	0.5	0.75
EC - 1736	1.2	1.2	.4	1.2	1.4	0	0	0	0	0	0	0	1.8	1.4	1.8
EC - 1737	1	.5	1	.75	.5	0	0	0	.5	.5	1	0	1.5	2	1
EC - 1741	2.3	1.67	2	1.67	2.67	0	0	0	0.6	0	0.6	0.3	1.67	1	1
EC - 1742	2.25	1.75	0.5	1.75	1.75	0	0	0	0.5	0	0.5	0.5	2.25	1.75	1.75
EC- 1743	1.5	1.5	1	0.5	1.5	0	0	0	0	0	0	0.5	1.5	2	1
EC - 1744	1.33	066	1.33	0.66	0.66	0.66	0	0	0	0	0	2	1.33	1.33	0.66
EC - 1745	3	2.8	2	2.4	0	0	1.6	2	1	2.2	1.4	2.6	2	3	.8
EC - 1746	2	.5	1.25	1	1.75	0	0	0	0	0	0	0	1.25	1.5	0
EC - 1747	2.75	2.5	0	3	2.25	0	0	0	.5	0	0	0	2.5	2	.5
EC - 1751	1.66	1	0.66	1	1.33	0	0	0	0	0	0	0	1.66	1.33	1.33
EC - 1752	1.25	1.25	2.25	0.75	0	0.5	0	0	0	0	0	0	2	0.75	0.75
EC - 1753	3	2	.75	2.25	2.25	0	0	0	0	0	0	0	3	2.75	2.25
EC- 1754	2	1.5	.25	1.5	1.5	0	0	0	0	0	0	.75	2	1.5	1.5
EC - 1755	1	.5	.5	.5	.5	0	0	0	.25	0	.25	.25	1	.5	.5
EC -	2	.5	1.25	1	1.75	0	0	0	0	0	0	0	1.25	1.5	0

1756														
EC - 1757	2.4	2	1	2.2	2.4	.6	0	0	0.6	1.6	.6	.6	1.4	1.4	1.8
EC - 1761	1.25	.5	1	.5	1	0	0	0	0	0	0	0	1.25	1	1
EC - 1762	.25	1.25	2	1	2	.5	0	0	0	0	0	0	.5	2	3
EC - 1763	1.3	1	0	1	.67	0	0	0	0	0	0	0	1.3	.67	.67
EC- 1764	2	1.5	0	1.25	1	0	0	0	0	0	0	.75	2	1.5	1.5
EC - 1765	1.25	1	.5	0	1.5	0	0	0	.25	0	.25	.25	1.25	1.5	1.5
EC - 1766	1.67	1.5	.67	1.67	1.83	.5	0	.33	.83	.67	.33	.5	1	1.16	1.67
EC - 1767	1	2	1	2	1	2	1	1.67	1	1.67	0	1	0.33	0	0
EC - 1771	2	1.67	1	0.67	1.33	0	0	0	0.67	0	.67	.67	2	1.33	1.33
EC- 1772	3	1.33	2	1.66	2	0	0	0	0	0	0	0	1.66	2.33	1
EC - 1773	2.33	1.33	1.67	1.33	1.67	0	0	0	0.66	0	0.66	0.66	1.67	1.33	1.33
EC - 1774	2.33	1.67	0	1.33	1.33	0	0	0	0.33	0	0.33	0.33	2.33	0.67	0.67
EC - 1775	3	2	1	1	1	0	0	0	0	0	0	0	3	2	1.33
EC- 1776	0.6	2.2	0.6	2	0	0.6	0	0.4	0.6	1	2	0	0.4	0.6	
EC- 1777	1.5	1.5	0.75	1.5	0.75	0.75	0.75	1	0.5	0.75	0	0.75	1.25	1	1.25
EC - 1781	1	1	1	1.33	1	0	0	0	0	0	0	0	2.33	1.33	1
EC - 1782	1.20	1.67	2	2	2	0	0	0	0	0	0	1	1.20	2	2

EC - 1783	1	1	1.83	1	1.5	0.5	0	0.5	1	0.5	0	0.5	1.16	1.16	1.83
EC - 1784	0.75	0.5	0.5	0.75	0.75	0.75	1.25	1.25	2	0	0	0	0.5	0.5	
Overall Average	**1.63**	**2.97**	**0.93**	**1.21**	**1.22**	**0.20**	**0.11**	**0.18**	**0.33**	**0.23**	**0.24**	**0.38**	**1.48**	**1.30**	**1.08**

3.3.2. Provide results of evaluation of each PO & PSO (65)

(The attainment levels by direct (student performance) and indirect (surveys) are to be presented through Program level Course-PO&PSO matrices as indicated).

- Direct atainment levels of a PO & PSO is determined by taking average across all courses addressing that PO or PSO.
- Indirect attainment level of PO & PSO is determined by students exit survey taken at the end of VIII th semester.
- It is assume that each course will contribute to certain POs.

Overall attainment gives 80% weightage to direct assessment and 20% weightage to indirect assessment.

Actual PO/PSO Attainment: first year courses (2018-2019)

Course	Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
BT-1811	Engineering Chemistry	1	1	N	N	N	1	1	0	N	0	0	N	0	0	0
BT-1812	Basic Electrical & Electronics Engineering	1	1	1	1	N	N	N	N	1	0	N	N	1	0	0
BT-1813	Engineering Graphics	1	1	1	1	1	0	0	0	0	0	N	N	1	1	0
BT-1814	Communication Skills	0	0	0	0	1	N	N	N	1	N	N	N	0	0	0

BT - 1815	Engineering Maths I	1	1	1	1	N	N	0	0	N	N	N	N	1	0	0
BT-1825	Engineering Maths II	1	1	1	N	N	N	0	0	N	N	N	N	1	0	0
BT - 1821	Engineering Physics	1	1	1	N	N	N	N	N	N	N	N	1	1	0	0
BT - 1822	Basic Civil Engineering & Engineering Mechanics	1	1	N	N	N	N	N	N	N	N	N	N	0	0	0
BT - 1823	Basic Mechanical Engineering	1	1	N	N	0	N	N	N	0	0	0	N	0	0	0
BT - 1824	Energy Environment Ecology & Society	0	1	0	2	N	2	2	2	1	0	1	1	0	0	0
Avg.		**0.8**	**0.9**	**0.71**	**1.0**	**0.66**	**0.75**	**0.6**	**0.4**	**0.6**	**0.0**	**0.33**	**1.0**	**0.5**	**0.10**	**0.0**

PO Attainment

Program level course-PO-PSO matrix

Session 2018-2019

Actual Attainment

Subject code	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
EC - 1731	0.67	0.33	0.33	0.33	0.33	0	0	0	0.17	0	O.17	0	0.67	0.33	0
EC - 1732	0.4	0.4	0.4	0.4	0.3	0	0	0	0	0	0	0.2	0.2	0.4	0

EC - 1733	1.33	1.00	0.67	0.67	0.67	0.33	0	0	0.67	0.33	0.33	0.33	1.0	0.67	0.33
EC - 1734	0.51	0.70	0.40	0.40	0.40	0.20	0	0	0.20	0	0.20	0.20	0.50	0.40	0.90
EC- 1735	N	N	N	N	N	N	0	0	N	N	N	N	N	N	N
EC- 1736	1.2	1.2	0.4	1.20	1.40	0	0	0	0	0	0	0	1.80	1.40	1.80
EC - 1741	1.78	1.33	1.67	1.33	2.11	0.33	0	0	0.67	0	0.67	0.33	1.11	0.67	0.67
EC - 1742	1.66	1.33	0.33	1.33	1.33	0	0	0	0.33	0	0.33	0.33	1.66	1.5	1.33
EC - 1743	1.17	1.17	0.83	0.33	1.17	0	0	0	0	0	0	0.33	1.17	1.50	0.83
EC - 1744	0.44	0.22	0.44	0.22	0	0	0	0	0	0	0	0.67	0.44	0.44	0.22
EC - 1745	3.0	2.80	2.00	2.40	0	0	1.60	2.00	1.00	2.20	1.40	2.60	2.00	3.00	0.80
EC- 1746	2.0	0.5	1.25	1.0	1.75	0	0	0	0	0	0	0	1.25	1.50	0
EC- 1747	2.75	2.5	0	3.0	2.35	0	0	0	0.50	0	0	0	2.5	2	0.5
EC - 1751	1.56	0.89	0.44	0.89	1.11	0	0	0	0	0	0	0	1.44	1.11	1.11
EC - 1752	0.83	0.83	1.50	0.50	0	0.33	0	0	0	0	0	0	1.33	0.50	0.50
EC - 1753	0.75	0.42	0.33	0.50	0.83	0	0	0	0	0	0	0	0.75	0.83	0
EC- 1754	1.67	1.33	0.17	1.33	1.33	0	0	0	0	0	0	0.58	1.67	1.33	0
EC - 1755	0.33	0.17	0.17	0.17	0.17	0	0	0	0.08	0	0.08	0.08	0.33	0.17	0.17
EC- 1756	2.75	2.50	0	3.0	2.25	0	0	0	0.5	0.00	0	0	2.5	2.0	0.5
EC- 1757	2.40	2.0	1.0	2.20	2.40	0.60	0	0	0.60	1.60	0.60	0.60	1.40	1.40	1.80
EC - 1761	1.25	0.50	1.0	0.50	1.00	0	0	0	0	0	0	0	0	0	1.25
EC - 1762	0.25	1.25	2.00	1.00	2.00	0.50	0	0	0	0	0	0	0.5	2.0	3.0
EC - 1763	1.30	1.0	0	1.0	0.70	0	0	0	0	0	0	0	1.33	0.67	0.67
EC - 1764	2.0	1.5	0	1.25	1.00	0	0	0	0	0	0	0.75	2.0	1./5	1.5
EC - 1765	0.50	0.50	0.17	0	0.67	0	0	0	0.08	0	0.08	0.08	0.50	0.67	0.67
EC- 1766	1.67	1.50	0.67	1.67	1.83	0.50	0	0.33	0.83	0.67	0.33	0.50	1.0	1.17	1.67
EC- 1767	0.75	1.50	0.75	1.5	0.75	1.5	0.75	1.25	0.75	1.25	0	0.75	0.25	0	0

EC - 1771	1.78	1.44	0.67	0.67	1.11	-	-	-	0.44	-	0.44	0.44	1.78	1.11	1.11
EC - 1772	2.67	1.33	2.00	1.67	2.00	0	0	0	0	0	0	0	1.33	2.11	1.00
EC - 1773	2.33	1.00	1.67	0.67	1.67	0	0	0	0.67	0	0.67	0.67	1.67	1.33	1.33
EC - 1774	2.33	1.67	0	1.33	1.33	0	0	0	0.33	0	0.33	0.33	2.33	0.67	0.67
EC- 1775	2.0	1.33	0.66	0.66	0.66	0	0	0	0	0	0	0	2.0	1.33	0.88
EC 1776	0	2.20	0.60	2./0	0	0.6	0	0.4	0.6	1.0	2.5	0	0.40	0.60	0
EC 1777	1.5	1.5	0.75	1.5	0.75	0.75	0.75	1.0	0.5	0.75	0	0.75	1.25	1	1.25
EC - 1781	0.67	0.67	0.67	0.89	0.67	0	0	0	0	0	0	0	1.56	0.89	0.67
EC - 1782	1.08	1.25	0.5	0.5	1.0	0	0	0	0	0	0	0.25	1.08	1.0	1.0
EC - 1783	1./0	1.0	1.8	1.0	1.5	0.5	0	0.5	1.0	0.5	0	0.5	1.16	1.16	1.8
EC - 1784	0.75	0.5	0.5	0.75	0.75	0.75	1.30	1.30	2.0	0	0	0	0.5	0.5	0
Avg.	**1.35**	**1.13**	**0.70**	**1.02**	**1.03**	**0.18**	**0.11**	**0.18**	**0.31**	**0.22**	**0.21**	**0.29**	**1.16**	**1.00**	**0.78**

Table B.3.3.2a

Indirect Assessment

Students Exit Survey for attainment of PO-PSO.

Survey	PO 01	PO02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
1	2	2	3	3	1	2	2	2	2	3	3	2	1	2	0
2	2	2	1	2	2	3	2	2	2	1	2	2	2	3	0
3	1	2	3	2	2	2	3	1	2	1	1	2	1	2	0
4	3	3	2	2	1	1	1	3	2	1	1	1	2	3	0
5	2	3	2	3	2	1	1	1	3	2	3	3	2	3	0
6	2	2	2	3	1	3	1	1	2	2	1	3	3	2	0
7	2	2	3	3	3	3	3	1	2	1	3	1	2	3	0
8	2	3	3	2	2	1	3	1	2	2	1	3	3	3	0

9	1	3	3	3	3	3	2	3	3	2	-	2	2	3	0
10	3	2	2	2	2	1	3	1	2	2	1	-	3	2	0
11	2	2	3	3	1	2	2	2	2	3	3	2	1	2	0
12	2	2	1	2	2	1	2	2	2	1	2	2	3	3	0
13	1	2	3	2	2	2	3	1	2	1	1	2	1	2	0
14	3	3	2	2	1	1	1	3	2	1	1	1	2	3	0
15	2	3	2	3	2	1	1	1	3	2	3	3	2	3	0
16	2	2	2	3	1	2	1	1	2	2	1	3	3	3	0
17	2	2	3	3	3	3	2	1	2	1	3	1	2	3	0
18	2	3	3	2	2	1	3	1	2	2	1	3	3	3	0
19	1	2	3	3	3	2	2	3	3	2	-	2	2	3	0
20	3	2	2	2	2	1	3	1	2	2	1	-	3	2	0
21	2	2	3	3	1	2	2	2	2	3	3	2	1	2	0
22	2	2	1	2	3	3	2	2	2	1	2	2	2	3	0
23	1	2	3	2	2	2	3	1	2	1	1	2	1	2	0
24	3	3	2	2	1	1	1	3	2	1	1	1	2	3	0
25	2	3	2	3	2	1	1	1	3	2	3	3	2	3	0
26	2	2	2	2	1	3	1	1	2	2	1	3	3	2	0
27	2	2	3	3	3	1	3	1	2	1	3	1	2	3	0
28	2	3	2	2	2	1	3	1	2	2	1	3	3	3	0
29	1	3	3	3	2	3	2	3	3	2	-	2	2	3	0
30	3	2	2	2	2	1	3	1	2	2	1	-	3	2	0
31	2	2	3	3	1	2	2	2	2	3	3	2	1	2	0
32	2	2	1	2	2	3	2	2	2	1	2	2	2	3	0
33	1	2	3	2	2	2	3	1	2	1	1	2	1	2	0
Avg.	1.94	2.32	2.38	2.5	1.97	1.97	2.23	1.79	2.38	1.94	2.09	2.41	2.06	2.60	0

Table B.3.3.2b

PO-PSO Attainment

Third-Final Year

	PO01	PO02	PO03	PO04	PO05	PO06	PO07	PO08	PO09	PO10	PO11	PO12	PSO01	PSO02	PSO03
Target DA	1.63	2.97	0.93	1.21	1.22	0.20	0.11	0.18	0.33	0.23	0.24	0.38	1.48	1.30	1.08
80% of Target DA (A)	1.30	2.38	0.74	0.97	0.98	0.16	0.09	0.14	0.26	0.18	0.19	0.30	1.18	1.04	0.86
Target IDA	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
20% of Target IDA (B)	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Target (A+B)	1.9	2.98	1.34	1.57	1.58	0.76	0.69	0.74	0.86	0.78	0.79	0.9	1.78	1.64	1.46
Actual DA	1.35	1.13	0.70	1.02	1.03	0.18	0.11	0.18	0.31	0.22	0.21	0.29	1.16	1.00	0.78
80% of Actual DA (A')	1.08	0.90	0.56	0.82	0.82	0.14	0.09	0.14	0.25	0.18	0.17	0.23	0.93	0.80	0.62
Actual IDA	1.94	2.32	2.38	2.5	1.97	1.97	2.23	1.79	2.38	1.94	2.09	2.41	2.06	2.60	0
20% of Actual IDA	0.39	0.46	0.48	0.50	0.39	0.39	0.45	0.36	0.48	0.39	0.42	0.48	0.41	0.52	0.00

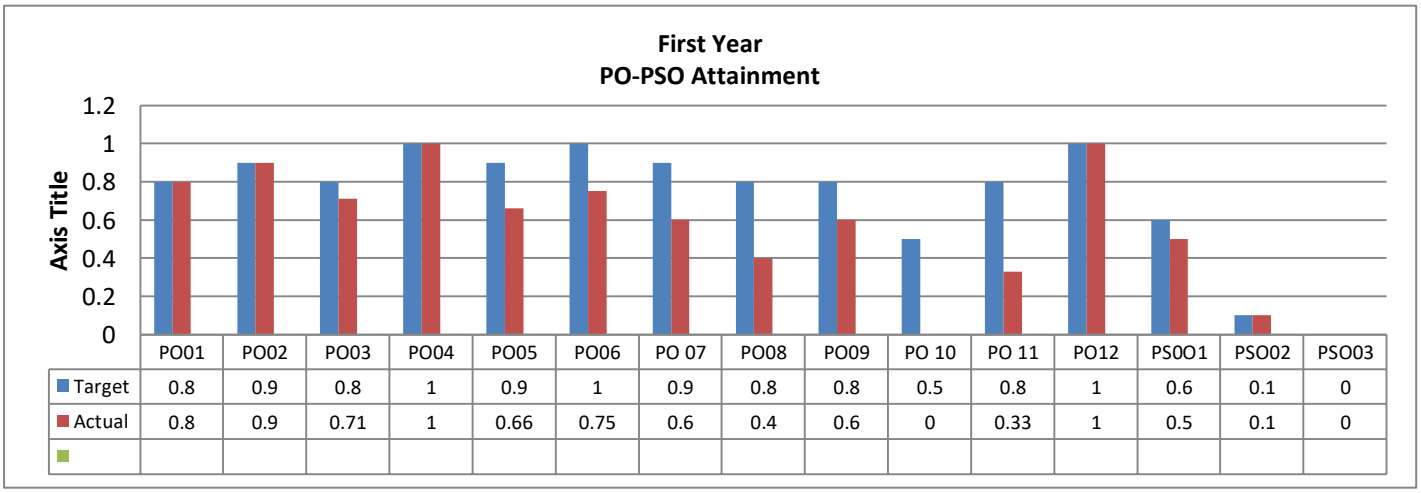
(B')															
A'+B'	1.47	1.36	1.04	1.32	1.21	0.53	0.54	0.5	0.73	0.57	0.59	0.71	1.34	1.32	0.62
Lag %	22.63%	54.36%	22.39%	15.92%	23.42%	30.26%	21.74%	32.43%	15.12%	26.92%	25.32%	21.11%	24.72%	19.51%	57.53%

DA* Direct Attainment, IDA* Indirect Attainment

PO-PSO Attainment

First Year

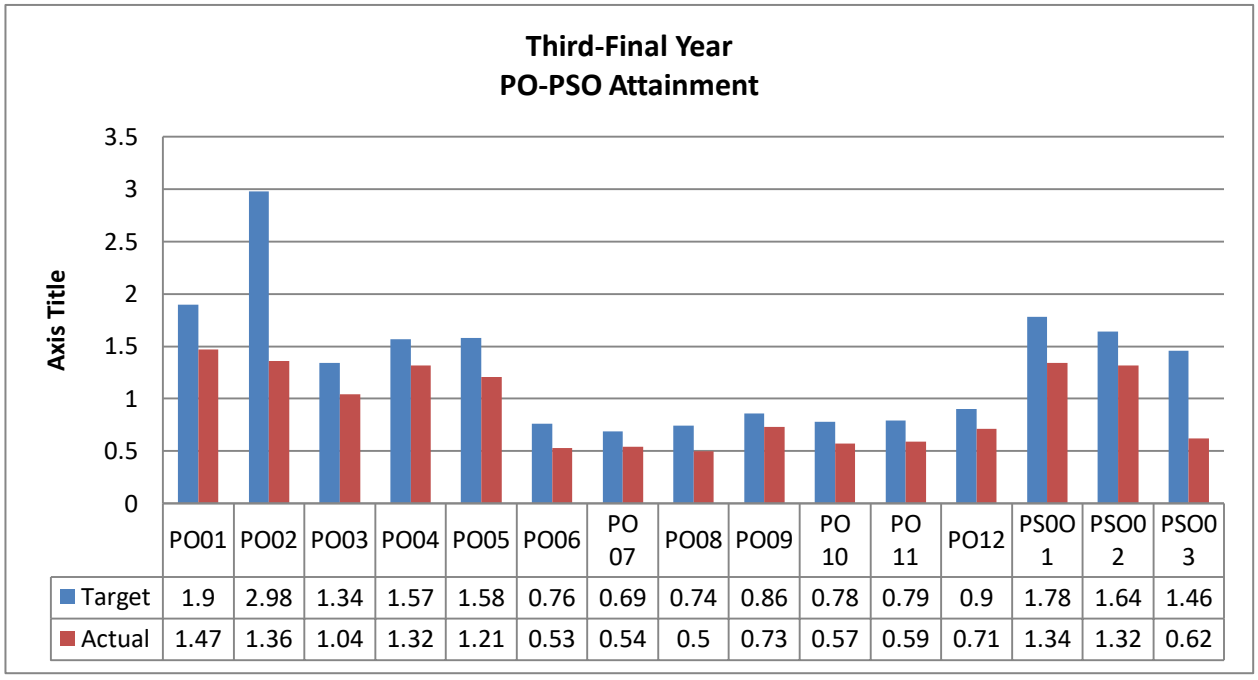
POs-PSOs	PO01	PO02	PO03	PO04	PO05	PO06	PO 07	PO08	PO09	PO 10	PO 11	PO12	PSOO1	PSOO2	PSOO3
Target	0.8	0.9	0.8	1.0	0.9	1.0	0.9	0.8	0.8	0.5	0.8	1.0	0.6	0.1	0.0
Actual	0.8	0.9	0.71	1.0	0.66	0.75	0.6	0.4	0.6	0.0	0.33	1.0	0.5	0.10	0.0



PO-PSO Attainment

Third-Final Year

POs-PSOs	PO01	PO02	PO03	PO04	PO05	PO06	PO 07	PO08	PO09	PO 10	PO 11	PO12	PSO01	PSO02	PSO03
Target	1.9	2.98	1.34	1.57	1.58	0.76	0.69	0.74	0.86	0.78	0.79	0.9	1.78	1.64	1.46
Actual	1.47	1.36	1.04	1.32	1.21	0.53	0.54	0.5	0.73	0.57	0.59	0.71	1.34	1.32	0.62
Lag %	22.63 %	54.36 %	22.39 %	15.92 %	23.42 %	30.26 %	21.74 %	32.43 %	15.12 %	26.92 %	25.32 %	21.11 %	24.72 %	19.51 %	57.53 %



Item (Information to be provided cumulatively for all the shifts with explicit headings, wherever applicable)	CAY (2019-20)	CAYm1 (2018-19)	CAYm2 (2017-18)
Sanctioned intake of the program (*N*)	60+3+6+12	60+3+12	60+3+12
Total number of students admitted in first year *minus* number of students migrated to other programs/institutions, plus no. of students migrated to this program (*N*1)	60	60	55
Number of students admitted in 2nd year in the same batch via lateral entry (*N*2)	00	04	10
Separate division students, if applicable (N3)	03+06	03	00
Total number of students admitted in the Program (*N*1 + *N*2 + N3)	69	67	65

Table B.4a

CAY – Current Academic Year

CAYm1- Current Academic Year minus1= Current Assessment Year

CAYm2 - Current Academic Year minus2=Current Assessment Year
minus 1 LYG – Last Year Graduate

LYGm1 – Last Year
Graduate minus 1
LYGm2 – Last Year
Graduate minus 2

Year of entry	*N*1 + *N*2 + N3 (As defined above)	Number of students who have successfully graduated without backlogs in any semester/year of study (Without Backlog means no compartment or failures in any semester/year of study)			
		I Year	II Year	III Year	IV Year
CAY	(2019-20 admitted)				
CAYm1	(2018-19 admitted)	62			
CAYm2	(2017-18 admitted)	54	69		
CAYm3	(2016-17 admitted)	57	62	61	0
CAYm4 (LYG)	(2015-16 admitted)	55	65	65	64

CAYm5 (LYGm1)	(2014-15 admitted)	51	61	60	60
CAYm6 (LYGm2)	(2013-14 admitted)	52	61	58	60

Table B.4b

Year of entry	***N*1 + *N*2 + N3 (As defined above)**	**Number of students who have successfully graduated (Students with backlog in stipulated period of study)**			
		I Year	II Year	III Year	IV Year
CAY	(2019-20 admitted)				
CAYm1	(2018-19 admitted)	0			
CAYm2	(2017-18 admitted)	1	1		
CAYm3	(2016-17 admitted)	0	1	0	
CAYm4 (LYG)	(2015-16 admitted)	2	2	3	1
CAYm5 (LYGm1)	(2014-15 admitted)	2	1	3	3
CAYm6 (LYGm2)	(2013-14 admitted)	2	4	3	5

Table B.4c

4.1. Enrolment Ratio (20)

Enrolment Ratio= N1/N

Item (Students enrolled at the First Year Level on average basis during the last three years starting from current academic year)				**Marks**
CAY	(2019-20)	(69/69)	100%	20 Marks
CAYm1	(2018-19)	(60/60)	100%	
CAYm2	(2017-18)	(55/60)	92%	

Table B.4.1

4.2. Success Rate in the stipulated period of the program (20)

4.2.1. Success rate without backlogs in any semester/year of study (15)

SI= (Number of students who have graduated from the program without backlog)/(Number of students admitted in the first year of that batch and admitted in 2nd year via lateral entry and separate division, if applicable)

Average SI = Mean of Success Index (SI) for past three batches

Success rate without backlogs in any semester/year of study = 15 × Average SI

Item	Last Year Graduate, LYG (CAYm4) (2015-16)	Last Year Graduate minus 1, LYGm1 (CAYm5) (2014-15)	Last Year Graduate minus 2, LYGm2 (CAYm6) (2013-14)
Number of students admitted in the corresponding First Year + admitted in 2nd year via lateral entry and separate division, if applicable	71	67	66
Number of students who have graduated without backlogs in the stipulated period	64	60	60
Success Index (SI)	0.90	0.90	0.91
Average Success Index (SI)	0.90		

Table B.4.2.1

4.2.2. Success rate with backlog in stipulated period of study (5)

SI= (Number of students who graduated from the program in the stipulated period of course duration)/ (Number of students admitted in the first year of that batch and admitted in 2nd year via lateral entry and separate division, if applicable)

Average SI = mean of Success Index (SI) for past three batches Success rate = 5 x Average SI

Item	Last Year Graduate, LYG (CAYm4)	Last Year Graduate minus 1, LYGm1 (CAYm5)	Last Year Graduate minus 2, LYGm2 (CAYm6)
Number of students admitted in the corresponding First Year + admitted in 2nd year via lateral entry and separate division, if applicable	71	67	66
Number of students who have graduated with backlogs in the stipulated period	01	03	05

Success Index (SI)	0.01	0.05	0.08
Average Success Index (SI)	0.05		

Table B.4.2.2

Success rate = (15 x 0.90)+(5 x 0.05) = 13.75

Note: If 100% students clear without any backlog then also total marks scored will be 20 as both 4.2.1 & 4.2.2 will be applicable simultaneously.

4.3. Academic Performance in Second Year (10)

Academic Performance = Average API (Academic Performance Index),where

***API** = ((Mean of 2nd Year Grade Point Average of all successful Students on a 10 point scale) or (Mean of the percentage of marks of all successful students in Second Year/10)) x (number of successful students/number of students appeared in the examination)*

Successful students are those who are permitted to proceed to the Third year.

Academic Performance	**CAYm 1**	**CAY*m2***	**CAY*m3***
Mean of CGPA or Mean Percentage of all successful students (X)	6.42	7.00	7.25
Total no. of successful students (Y)	69	65	61
Total no. of students appeared in the examination (Z)	70	69	61
API = X* (Y/Z)	6.33	6.60	7.25
Average API = (AP1 + AP2 + AP3)/3	6.73		

Table B.4.3

4.4. Placement, Higher Studies and Entrepreneurship (30)

Assessment Points = 30 × average placement

Item	**CAYm 1**	**CAY*m2***	**CAY*m3***

Total No. of Final Year Students (N)	65	61	60
No. of students placed in companies or Government Sector (x)	31	29	17
No. of students admitted to higher studies with valid qualifying scores (GATE or equivalent State or National Level Tests, GRE, GMAT etc.) (y)	-	-	-
No. of students turned entrepreneur in engineering/technology (z)	-	-	-
x + y + z =	31	29	17
Placement Index : (x + y + z)/N	0.48	0.48	0.28
Average placement= (P1 + P2 + P3)/3	0.41		
Assessment Points = 30 × average placement	12.40		

Table B.4.4

4.5. Professional Activities (20)

4.5.1. Professional societies/chapters and organizing engineering events (5)

(The Department shall provide relevant details)

1. IET Student chapter
   Under IET head we have organized one expert talk as details given below

Name of Activity	Duration	Date	Expert	Target Audience	Budget Amount Rs
IET Membership	**yearly**	---	---	20 Faculty + 50 Students	3,25,620.00
Expert Lecture on Robot Interface on Enhance Perception and Social well being	1 Day	18.03.2019	Dr. Devid Jenkins	Student and Faculty	8126.00

4.5.2 Publication of technical magazines, newsletters, etc. (5)

At the department level we have

1. Program brochure
2. News letter
3. Project reports (Technical Magazines)

4.5.3 Participation in inter-institute events by students of the program of study (10)

(The Department shall provide a table indicating those publications, which received awards in the events/conferences organized by other institutes)-

(i) Publication/Awards **NIL**

(ii) Participation

S. No.	Name of Event	Date	Students
1.	TECHFEST OF IIT Bombay	28/8/2019	Ajay Patidar, Anushri, Pankaj Abeejeet
2.	TECHFEST OF IIT Guwahati	28/8/2019 to 5/9/2019	Damini dongre, Parul Ahirwar
3.	IOT workshop at IIT Indore	4/9/2019	Akash Saxena, Aniket Saxena, Sachin Bandal, Abhishek Malhotra
4.	Ethical Hacking workshop MANIT Bhopal	13/10/2019	Abhishek Malhotra

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CRITERION 5	Faculty Information and Contributions	200

CAY-(2019-2020)

S. No.	Name of faculty	Qualification			Association with the institution	Designation	Date of Joining	Department	Specialization	Academic Research			Sponsored Research	Consultancy & Product Development
		Degree	University	year of Graduation						Research Paper Publication	Ph.D Guidance	Faculty Receiving Ph.D during assessment year		
1	Dr.(Mrs). J.V.Ogale	Ph.D	RGPV Bhopal	1995	SATI (Deg.) Vidisha	Professor & Head	15.06.1999	ECE	Signal Processing	15	0	yes	0	0
2	Dr. Ashutosh Datar	Ph.D	RGPV Bhopal	1989	SATI (Deg.) Vidisha	Professor	08.10.1990	ECE	Signal Processing	07	6	No		
3	Dr. D.K. Shakya	Ph.D	RGPV Bhopal	1999	SATI (Deg.) Vidisha	Asst. Professor	11.03.2002	ECE	Signal Processing	13	3	No	0	0
4	Dr. Neelesh Mehra	Ph.D	MANIT Bhopal	2001	SATI (Deg.) Vidisha	Asst. Professor	24.02.2002	ECE	Digital Communication	08	0	No	1*	0
5	Mr. M. L. Jatav	M.tech, Ph.D(P)	MANIT Bhopal	1999	SATI (Deg.) Vidisha	Asst. Professor	23.08.2005	ECE	Wireless Communication	11	0	No	1#	0
6	Mr. Abhishek Jain	M.tech, Ph.D(P)	BU Bhopal	2007	SATI (Deg.) Vidisha	Asst. Professor	11.09.2007	ECE	Signal Processing	09	0	No	0	0
7	Mrs. Bharti Mehra	M.tech, Ph.D(P)	DAVV Indore	2008	SATI (Deg.) Vidisha	Asst. Professor	18.07.2011	ECE	Embedded System	00	0	No	0	0
8	Mrs. Smriti Dubey	M.tech, Ph.D(P)	RGPV Bhopal	2009	SATI (Deg.) Vidisha	Asst. Professor	12.08.2013	ECE	Wireless Communication	02	0	No	0	0

9	Saksham Vasudev	M.tech, Ph.D(P)	MANIT Bhopal	2005	SATI (Deg.) Vidisha	Asst. Professor	12.08.2013	ECE	Digital VLSI Design	00	0	No	0	0
10	Sheena Kumar	M.Tech	RGPV Bhopal	2013	SATI (Deg.) Vidisha	Asst. Professor	27.01.2015	ECE	Image Processing	03	0	No	0	0
11	Mr. Aman Sharma	M.tech, Ph.D(P)	RGPV Bhopal	2011	SATI (Deg.) Vidisha	Asst. Professor	27.01.2015	ECE	Signal Processing	05	0	No	0	0
12	Dr. Ashok Kumar	Ph.D	IIT Dhanbad	2009	SATI (Deg.) Vidisha	Asst. Professor	04.09.2018	ECE	Analog VLSI Design	11	0	Yes	1#	0
13	Dr. Mukesh Kumar Mishra	Ph.D	ABV IIITM Gwalior	2008	SATI (Deg.) Vidisha	Asst. Professor	01.09.2018	ECE	Wireless Communication	11	0	No	1*	0
14	Ms. Anusha P	M.Tech	NIT Surathakal	2014	SATI (Deg.) Vidisha	Asst. Professor	01,10.2018	ECE	Nano Technology	02	0	No	0	0
15	Mr. Nihit Bhatnagar	M.Tech	ABV IIITM Gwalior	2011	SATI (Deg.) Vidisha	Asst. Professor	15.10.2018	ECE	Digital Comm	01	0	No	0	0

CAY-(2018-2019)

S. No.	**Name**	**PAN No.**	**Qualification**	**Area of Specialization**	**Designation**	**Date of Joining**	**Date on which Designated as Professor / Associate Professor**	**Currently Associated (Y/N)**	**Nature of Association (Regular/Contract/ Adjunct)**	**Date of Leaving** (In case Currently Associated is "No")
1	Prof. S Phulambrikar	AIFPP1089H	M.Tech,	Computer Technology	Asso. Prof.	27-12-1988	01-01-2006	Y	Regular	NA
2	Dr.. Neelesh	AKLPM6533H	Ph.D.	Digital Comm. And Image	Asst. Prof.	29-07-2002	NA	Y	Regular	NA

	Mehra			Processing						
3	Prof. M. L. Jatav	AGRPJ5364R	M.Tech,	Communication Engg.	Asst. Prof.	19-08-2003	NA	Y	Regular	NA
4	Prof. Abhishek Jain	ATOPA0915F	M.Tech,	Digital Image Processing	Asst. Prof.	13-09-2007	NA	Y	Contract	NA
5	Prof. Bharti Mehra	BQLPM9179A	M.Tech,	Embedded Systems	Asst. Prof.	18-07-2011	NA	Y	Contract	NA
6	Prof. Saksham Vasudev	AIEPV1507B	M.Tech,	VLSI & Embedded system	Asst. Prof.	12-08-2013	NA	Y	Contract	NA
7	Prof. Smriti Dubey	BLWPD9623C	M.Tech,	Communication	Asst. Prof.	12-08-2013	NA	Y	Contract	NA
8	Prof. Sheena Kumar	AVXPK7206L	M.Tech	Digital Image Processing	Asst. Prof.	27-01-2015	NA	Y	Contract	NA
9	Prof. Aman Sharma	CUUPS5635M	M.Tech,	Signal Processing	Asst. Prof.	25-01-2016	NA	Y	Contract	NA
10	Dr. Aditya Jain	AUCPJ5315R	Ph.D.		Asst. Prof.	31-08-2018	NA	N	Contract(NPIU)	28-02-2019
11	Prof. Ashok Kumar	BFOPK9089K	M.Tech	Analog Circuits	Asst. Prof.	04-09-2018	NA	Y	Contract(NPIU)	NA
12	Dr. Mukesh Ku. Mishra	BQKPM7168Q	Ph.D.	Wireless Communication	Asst. Prof.	01-09-2018	NA	Y	Contract(NPIU)	NA
13	Prof. Anusha P	EDUPP0267H	M.Tech	Nano Technology	Asst. Prof.	01-10-2018	NA	Y	Contract(NPIU)	NA
14	Prof. Nihit Bhatnagar	BCZPB2919P	M.Tech	Digital Communication	Asst. Prof.	15-10-2018	NA	Y	Contract(NPIU)	NA

CAY-(2017-2018)

S. No.	Name	PAN No.	Qualification	Area of Specialization	Designation	Date of Joining	Date on which Designated as Professor / Associate Professor	Currently Associated (Y/N)	Nature of Association (Regular/Contract/ Adjunct)	Date of Leaving (In case Currently Associated is "No")
1.	Prof. S Phulambrik	AIFPP1089H	M.Tech	Computer Technology	Asso. Prof	27-12-1988	01-01-2006	Y	Regular	NA
2	Dr.. Neelesh Mehra	AKLPM6533H	Ph.D.	Digital Comm. And	Asst. Prof	29-07-2002	NA	Y	Regular	NA
3	Prof. M. L. Jatav	AGRPJ5364R	M.Tech,	Communication Engg	Asst. Prof	19-08-2002	NA	Y	Regular	NA
4	Prof. Abhishek	ATOPA0915E	M.Tech,	Digital Image Processing	Asst. Prof	13-09-2007	NA	Y	Contract	NA
5	Prof. Bharti Mehra	BQLPM9179A	M.Tech,	Embedded Systems	Asst. Prof	18-07-2011	NA	Y	Contract	NA
6	Prof. Saksham Vasudev	AIEPV1507B	M.Tech,	VLSI & Embedded system	Asst. Prof.	12-08-2013	NA	Y	Contract	NA
7	Prof. Smriti Dubey	BLWPD9623C	M.Tech,	Communication	Asst. Prof	12-08-2013	NA	Y	Contract	NA
8	Prof. Sheena	AVXPK7206L	M.Tech	Digital Image Processing	Asst. Prof	27-01-2015	NA	Y	Contract	NA
9	Prof. Aman Sharma	CUUPS5635M	M.Tech,	Signal Processing	Asst. Prof	25-01-2016	NA	Y	Contract	NA
10	Prof. Saurabh	-	M.Tech,	-	Asst. Prof	03-01-2018	NA	N	Contract(NPIU)	01-09-2018

5.1 Student-Faculty Ratio (SFR) (20)

(To be calculated at Department Level)

No. of UG Programs in the Department (n): ____01_____

No. of PG Programs in the Department (m): ____nil_____

No. of Students in UG 2nd Year= **u1**

No. of Students in UG 3rd Year= **u2**

No. of Students in UG 4th Year= **u3**

No. of Students = Sanctioned Intake + Actual admitted lateral entry students

(The above data to be provided considering all the UG and PG programs of the department)

S=Number of Students in the Department = UG1+UG2+UG3

F = Total Number of Faculty Members in the Department (excluding first year faculty)

Student Faculty Ratio (SFR) = S / F

Year	CAY	CAYm1	CAYm2
u1.1	64	70	63
u1.2	70	63	72
u1.3	63	72	70
UG1	**197**	**205**	**205**
Total No. of Students in the Department **(S)**	**197**	**205**	**205**
No. of Faculty in the Department **(F)**	**9**	**9**	**9**
Student Faculty Ration (SFR)	**21.89**	**22.78**	**22.78**
Average SFR	**22.48**		

Marks to be given proportionally from a maximum of 20 to a minimum of 10 for average SFR between 15:1 to 25:1, and zero for average SFR higher than 25:1. Marks distribution is given as below:

<=15 - 20 marks

<= 17 - 18 marks

<=19 - 16 marks

<=21 - 14 marks

<=23 - 12 marks

<=25 - 10 marks

>25 - 0 Marks

Note:

Minimum 75% should be Regular/ full time faculty and the remaining shall be Contractual Faculty/Adjunct Faculty/Resource persons from industry as per AICTE norms and standards.

The contractual Faculty (doing away with the terminology of visiting/adjunct faculty, whatsover) who have taught for 2 consecutive semesters in the corresponding academic year on full time basis shall be considered for the purpose of calculation in the student faculty ratio.

5.1.1 Provide the information about the regular and contractual faculty as per the format mention below:

	Total number of regular faculty in the department	Total number of contractual faculty in the department
CAY	06	10

(2019-20)		

Year	Professors		Associate Professors		Assistant Professors	
	Required F1	Availabl e	Required F2	Availabl e	Required F3	Available
CAY	1	2	2	0	6	14
CAY*m*1	1	2	2	0	6	10
CAYm 2	1	2	2	0	6	10
Average Numbers	RF1=1	AF1=2	RF2=2	AF2=0	RF3=6	AF3=11.3

CAYm1 (2018-19	06	06
CAYm2 (2017-18)	06	06

5.2 Faculty Cadre Proportion (20)

The reference Faculty cadre proportion is 1(F1):2(F2):6(F3)

F1: Number of Professors required = 1/9 x Number of Faculty required to comply with 15:1 Student-Faculty ratio based on no. of students (N) as per 5.1

F2: Number of Associate Professors required = 2/9 x Number of Faculty required to comply with 15:1 Student-Faculty ratio based on no. of students (N) as per 5.1

F3: Number of Assistant Professors required = 6/9 x Number of Faculty required to comply with 25:1 Student-Faculty ratio based on no. of students (N) as per 5.1

Table B.5.2

Cadre Ratio Marks = (AF1/RF1+(AF2/RF2)*0.6+(AF3/RF3)*0.4)*10

Cadre Ratio Marks = (2/01+(0*0.6)/2+(11.3*0.4)/6)*10

= 27.53 Limited to 20

Marks Obtained =20/20

5.3 Faculty Qualification (20)

FQ =2.0 x [(10X +4Y)/F)] where x is no. of regular faculty with Ph.D., Y is no. of regular faculty with M. Tech., F is no. of regular faculty required to comply 1:15 Faculty Student ratio (no. of faculty and no. of students required are to be calculated as per 5.1)

	X	Y	F	FQ=2.0 x [(10X +4Y)/F)]
CAY	4	2	8	12
CAYm1	4	2	8	12
CAYm2	4	2	8	12
Average Assessment				12

Table B.5.3

5.4. Faculty Retention (10)

No. of regular faculty members in CAYm2=03 CAYm1=03 CAY=05

Marks = 10

S.No	Year	Total No. of Faculty	No of Faculty Retained	% of Faculty Retained
1	CAY (2019-2020)	15	15	100%
2	CAYm1 (2018-2019)	10	09	90%
3	CAYm2 (2017-2018)	10	09	90%

Table B.5.4

Average % of Faculty Retained = 93.33

Marks Obtained =10/10

5.5 Faculty competencies in correlation to Program Specific Criteria (10)

Graduates of this program should have strengths in the building, testing, operation, and maintenance of electronic systems. Graduates of the program should demonstrate the application of circuit analysis and design, computer programming, associated software, analog and digital electronics, and microcomputer. To meet out these criterias faculty of the department is having specialization in following domains-

(i) Electronics & Instrumentation

(ii) Electronics & Communication

(iii) Wireless Communication

(iv) Signal Processing

(v) Biomedical Engineering

(vi) Computer Science & Technology

(vii) Digital Communication

(viii) Analog Circuits

(ix) Nano Electronics

Specializations and publications fairly establish faculty competencies in correlation to Program Specific:

S. No.	Name of Faculty Member	Qualification		
1.	Dr. Jyotsna V.Ogale	UG	BE	Electronics & Communication
		PG	ME	Communication Systems
		Ph.D		Signal processing
2.	Dr. Ashutosh Datar	UG	BE	EI Engineering
		PG	M. Tech	M.Tech Biomedical Engineering
		Ph.D		Signal processing
3.	Dr. D.K Shakya	UG	BE	EI Engineering
		PG	M. Tech	EI Engineering
		Ph.D		Bio medical signal processing
4.	Dr. Neelesh Mehra	UG	BE	EC Engineering

		PG	M. Tech	Digital Communication
		Ph.D		Image Processing
5.	Mr. M.L Jatav	UG	BE	EC Engineering
		PG	M. Tech	Digital Communication
		Ph.D		Pursuing
6.	Mr. Abhishek Jain	UG	BE	EC Engineering
		PG	M. Tech	Digital Communication
		Ph.D		Pursuing
7.	Mrs. Bharti Mehra	UG	BE	EC Engineering
		PG	M. Tech	Embedded Systems
		Ph.D		Pursuing
8.	Mr. Saksham Vasudev	UG	BE	EI Engineering
		PG	M. Tech	VLSI and Embedded System
		Ph.D		Pursuing
9.	Mrs. Smriti Dubey	UG	BE	EC Engineering
		PG	M. Tech	Computer Science Engineering
		Ph.D		Pursuing
10.	Miss Sheena Kumar	UG	BE	EC Engineering
		PG	M. Tech	Computer Science Engineering
		Ph.D		-
11.	Mr. Aman Sharma	UG	BE	EC Engineering
		PG	M. Tech	Signal Processing
		Ph.D		Pursuing

12.	Dr. Mukesh Kumar Mishra	UG	BE	EC Engineering
		PG	M. Tech	EC Engineering
		Ph.D		Hetrogenous Cellular Networks
13.	Dr. Ashok Kumar	UG	BE	EC Engineering
		PG	M. Tech	EC Engineering
		Ph.D		Analog Filters
14.	Mr. Nihit Bhatnagar	UG	BE	EC Engineering
		PG	M. Tech	Digital Communication
15.	Miss Anusha P	UG	BE	EC Engineering
		PG	M. Tech	Nano Technology

5.6 Innovations by the Faculty in Teaching and Learning (10)

To improve student learning faculty adopts following instructional methods :-

- Use of modern teaching aids like LCD projectors, computers and lap tops with internet and Wi-Fi connectivity either available at the classroom or usually employed.
- Expert video lectures delivered by various eminent resourse persons are available at NPTEL, Swayam prabha , corsera and others.
- E- learning materials are available for the students.
- We organise expert lectures, training programmes, workshops, seminars, webinars to improve the learning of the students.
- Conduct MOOC Courses.

Events organised by faculty members to improve learning of the students.

Name of Activity	Duration	Date	Expert	Target Audience
Graphical System Design Using LABVIEW	6 Days	12.05.2018	Mr. Suresh Venktesh From Benglore	Student and Faculty
Data Acquisition Graphical Programming Training	5 Days	29.05.2018 to 03.06.2018	Mr. Suresh Venktesh From	Student and Faculty

Program			Benglore	
Expert Talk for NBA Accreditation of E&I Deptt.	1 Day	05.06.2018	Mr. Vitthal Bandal	Faculty
Microstrip Antenna :Recent Trends-M.L Jatav	1Day	16-08-2018	Dr. Manoj Kumar Meshram	Students
Robotic Process Automation, Artificial Intelligence	1 Day	30.08.2018	Mr.Ashutosh Sinha, Banglore	Faculty
Event Robox-18 by Club Flux	1Day	15,09.2018	---	By Students
Signal and Systems Expert Talk	1 Day	17-09-2018	Dr. Sudakar Singh Chauhan	Students
Expert Talk on Artificial Intelligence	1 Day		Mr.Ashutosh Sinha, from: Banglore	Faculty
Expert Talk on Artificial Intelligence	1Day		Mr. Samir Sinha from: Mumbai	Faculty
Expert Lecture on Robot Interface on Enhance Perception and Social well being	1 Day	18.03.2019	Dr. Devid Jenkins	Student and Faculty
Workshop on LABVIEW Training Program	5 Days	01-05 July 2019	Mr.Shiva Kumar, STARCOM Banglore	Student and Faculty
Expert Lecture on Process Automation and Artificial Intelligence	1 Day	17.06.2019	Mr. Ashutosh Sinha from Bangalore	Faculty
10% Course coverage	3 hours	29-07-19	Mr. Prassanna Rao, Faculty, VNIT	Students
Talk on " Office Management"	1 hour	29-06-19	Mr. Prassanna Rao, Faculty, VNIT	Non Teaching Staff
Sttp on advanced image and signal processing using LabVIEW- Aman Sharma	5 Days	26-30/08/2019	Essaki Raja- VI Solutions	Students+Faculty

Faculty visit at IIT Dhanbad	06 Days	02-09-19-07-09-19	To visit Nano Electronics Lab	To visit Nano Electronics Lab
IOT Workshop at IIT Indore		07-08/09/19	04 Students went to attend IOT workshop at IIT Indore	04 Students went to attend IOT workshop at IIT Indore
Two days workshop on IOT -Bharti mehra	2 Days	05-06/08/19	Miss Megha Patil , IOT Development Engineering, PROCOM Enterprises, Ichalkaranji	Students
Expert talk on Microstrip patch based MIMO Antenna Design-M.L Jatav	1 Day	23-09-2019	Dr. Leeladhar Malviya	Students
FDP on Advanced Communication System and Technology using NETSIM	05 Days	04-08/09/19	Vishal Bhatt, Tetcos Banglore	Students+Faculties
Exibition of poster and models- krishi manthan	01 Day	10-12-19	Organizer-Aman sharma	Inhouse event

Instructional Methods

a. Instruction Delivery	b. Instructional Methods	c. Assessment	d. Evaluation	e. Use of Information & Comm. Tech. (ICT)
Dr. Jyotsna V.Ogale				
Class room Teaching	Class room Teaching	Mid sem	Mid sem	NPTEL
PPT	PPT	Quiz	Quiz	Moocs
NPTEL Lectures	NPTEL Lectures	Tutorial Assignment	Tutorial Assignment	Swayam Prabha
Mooc Courses	Mooc Courses	Final Exam	Final Exam	Online videos
Through hands on	Through hands on	Practical Exam	Ptractical Exam	
Concept Building approach	Concept Building approach	GD seminar	GD seminar	
Moodle	Moodle	Minor/Major Projects	Minor/Major Project	
Dr. Ashutosh Datar				
Class room Teaching	Class room Teaching	Mid sem	Mid sem	NPTEL
PPT	PPT	Quiz	Quiz	Moocs
NPTEL Lectures	NPTEL Lectures	Tutorial Assignment	Tutorial Assignment	Swayam Prabha
Mooc Courses	Mooc Courses	Final Exam	Final Exam	Online videos
Through hands on	Through hands on	Practical Exam	Ptractical Exam	
Concept Building approach	Concept Building approach	GD seminar	GD seminar	
Moodle	Moodle	Minor/Major Projects	Minor/Major Project	
Dr. D. K. Shakya				
Class room Teaching	Class room Teaching	Mid sem	Mid sem	NPTEL

PPT	PPT	Quiz	Quiz	Moocs
NPTEL Lectures	NPTEL Lectures	Tutorial Assignment	Tutorial Assignment	Swayam Prabha
Mooc Courses	Mooc Courses	Final Exam	Final Exam	Online videos
Through hands on	Through hands on	Practical Exam	Ptractical Exam	
Concept Building approach	Concept Building approach	GD seminar	GD seminar	
Moodle	Moodle	Minor/Major Projects	Minor/Major Project	
Dr. Neelesh Mehra				
Class room Teaching	Class room Teaching	Mid sem	Mid sem	NPTEL
PPT	PPT	Quiz	Quiz	Moocs
NPTEL Lectures	NPTEL Lectures	Tutorial Assignment	Tutorial Assignment	Swayam Prabha
Mooc Courses	Mooc Courses	Final Exam	Final Exam	Online videos
Through hands on	Through hands on	Practical Exam	Ptractical Exam	
Concept Building approach	Concept Building approach	GD seminar	GD seminar	
Moodle	Moodle	Minor/Major Projects	Minor/Major Project	
Mr. M. L. Jatav				
Class room Teaching	Class room Teaching	Mid sem	Mid sem	NPTEL
PPT	PPT	Quiz	Quiz	Moocs
NPTEL Lectures	NPTEL Lectures	Tutorial Assignment	Tutorial Assignment	Swayam Prabha
Mooc Courses	Mooc Courses	Final Exam	Final Exam	Online videos
Through hands on	Through hands on	Practical Exam	Ptractical Exam	
Concept Building	Concept Building	GD seminar	GD seminar	

approach	approach			
Moodle	Moodle	Minor/Major Projects	Minor/Major Project	
Mr. Abhshek Jain				
Class room Teaching	Class room Teaching	Mid sem	Mid sem	NPTEL
PPT	PPT	Quiz	Quiz	Moocs
NPTEL Lectures	NPTEL Lectures	Tutorial Assignment	Tutorial Assignment	Swayam Prabha
Mooc Courses	Mooc Courses	Final Exam	Final Exam	Online videos
Through hands on	Through hands on	Practical Exam	Ptractical Exam	
Concept Building approach	Concept Building approach	GD seminar	GD seminar	
Moodle	Moodle	Minor/Major Projects	Minor/Major Project	
Mrs. Bharti Mehra				
Class room Teaching	Class room Teaching	Mid sem	Mid sem	NPTEL
PPT	PPT	Quiz	Quiz	Moocs
NPTEL Lectures	NPTEL Lectures	Tutorial Assignment	Tutorial Assignment	Swayam Prabha
Mooc Courses	Mooc Courses	Final Exam	Final Exam	Online videos
Through hands on	Through hands on	Practical Exam	Ptractical Exam	
Concept Building approach	Concept Building approach	GD seminar	GD seminar	
Moodle	Moodle	Minor/Major Projects	Minor/Major Project	
Mr. Saksham Vasudav				
Class room Teaching	Class room Teaching	Mid sem	Mid sem	NPTEL
PPT	PPT	Quiz	Quiz	Moocs

NPTEL Lectures	NPTEL Lectures	Tutorial Assignment	Tutorial Assignment	Swayam Prabha
Mooc Courses	Mooc Courses	Final Exam	Final Exam	Online videos
Through hands on	Through hands on	Practical Exam	Ptractical Exam	
Concept Building approach	Concept Building approach	GD seminar	GD seminar	
Moodle	Moodle	Minor/Major Projects	Minor/Major Project	
Mrs. Smriti Dubey				
Class room Teaching	Class room Teaching	Mid sem	Mid sem	NPTEL
PPT	PPT	Quiz	Quiz	Moocs
NPTEL Lectures	NPTEL Lectures	Tutorial Assignment	Tutorial Assignment	Swayam Prabha
Mooc Courses	Mooc Courses	Final Exam	Final Exam	Online videos
Through hands on	Through hands on	Practical Exam	Ptractical Exam	
Concept Building approach	Concept Building approach	GD seminar	GD seminar	
Moodle	Moodle	Minor/Major Projects	Minor/Major Project	
Miss. Sheena Kumar				
Class room Teaching	Class room Teaching	Mid sem	Mid sem	NPTEL
PPT	PPT	Quiz	Quiz	Moocs
NPTEL Lectures	NPTEL Lectures	Tutorial Assignment	Tutorial Assignment	Swayam Prabha
Mooc Courses	Mooc Courses	Final Exam	Final Exam	Online videos
Through hands on	Through hands on	Practical Exam	Ptractical Exam	
Concept Building approach	Concept Building approach	GD seminar	GD seminar	

Moodle	Moodle	Minor/Major Projects	Minor/Major Project	
Mr. Aman Sharma				
Class room Teaching	Class room Teaching	Mid sem	Mid sem	NPTEL
PPT	PPT	Quiz	Quiz	Moocs
NPTEL Lectures	NPTEL Lectures	Tutorial Assignment	Tutorial Assignment	Swayam Prabha
Mooc Courses	Mooc Courses	Final Exam	Final Exam	Online videos
Through hands on	Through hands on	Practical Exam	Ptractical Exam	
Concept Building approach	Concept Building approach	GD seminar	GD seminar	
Moodle	Moodle	Minor/Major Projects	Minor/Major Project	
Dr. Mukesh Kumar Mishra				
Class room Teaching	Class room Teaching	Mid sem	Mid sem	NPTEL
PPT	PPT	Quiz	Quiz	Moocs
NPTEL Lectures	NPTEL Lectures	Tutorial Assignment	Tutorial Assignment	Swayam Prabha
Mooc Courses	Mooc Courses	Final Exam	Final Exam	Online videos
Through hands on	Through hands on	Practical Exam	Ptractical Exam	
Concept Building approach	Concept Building approach	GD seminar	GD seminar	
Moodle	Moodle	Minor/Major Projects	Minor/Major Project	
Dr. Ashok Kumar				
Class room Teaching	Class room Teaching	Mid sem	Mid sem	NPTEL
PPT	PPT	Quiz	Quiz	Moocs
NPTEL Lectures	NPTEL Lectures	Tutorial	Tutorial	Swayam Prabha

		Assignment	Assignment	
Mooc Courses	Mooc Courses	Final Exam	Final Exam	Online videos
Through hands on	Through hands on	Practical Exam	Ptractical Exam	
Concept Building approach	Concept Building approach	GD seminar	GD seminar	
Moodle	Moodle	Minor/Major Projects	Minor/Major Project	
Miss. Anusha P				
Class room Teaching	Class room Teaching	Mid sem	Mid sem	NPTEL
PPT	PPT	Quiz	Quiz	Moocs
NPTEL Lectures	NPTEL Lectures	Tutorial Assignment	Tutorial Assignment	Swayam Prabha
Mooc Courses	Mooc Courses	Final Exam	Final Exam	Online videos
Through hands on	Through hands on	Practical Exam	Ptractical Exam	
Concept Building approach	Concept Building approach	GD seminar	GD seminar	
Moodle	Moodle	Minor/Major Projects	Minor/Major Project	
Mr. Nihit Bhatnagar				
Class room Teaching	Class room Teaching	Mid sem	Mid sem	NPTEL
PPT	PPT	Quiz	Quiz	Moocs
NPTEL Lectures	NPTEL Lectures	Tutorial Assignment	Tutorial Assignment	Swayam Prabha
Mooc Courses	Mooc Courses	Final Exam	Final Exam	Online videos
Through hands on	Through hands on	Practical Exam	Ptractical Exam	
Concept Building approach	Concept Building approach	GD seminar	GD seminar	
Moodle	Moodle	Minor/Major	Minor/Major	

		Projects	Project	

Faculty as participants in Faculty development/training activities/STTPs (15)

- A Faculty scores maximum five points for participation.
- Participation in 2 to 3 days faculty development program : 3 points
- Participation > 5 days faculty development program : 5 points

Name of the Faculty	Max. 5 per Faculty		
	CAY (2019-20)	CAYm1 (2018-19)	CAYm2 (2017-18)
Dr. Jyotsna V.Ogale	3	NA	NA
Dr. Ashutosh Datar	NA	NA	NA
Dr. D.K Shakya	3	NA	NA
Dr. Neelesh Mehra	2	-	5
Mr. M.L Jatav	3	5	5
Mr. Abhishek Jain	5	5	5
Mrs. Bharti Mehra	5	5	5
Mr. Saksham Vasudev	5	-	5
Mrs. Smriti Dubey	5	5	5
Miss Sheena Kumar	5	-	5
Mr. Aman Sharma	5	5	5
Dr. Mukesh Kumar Mishra	5	5	NA
Dr. Ashok Kumar	5	5	NA
Mr. Nihit Bhatnagar	5	5	NA
Miss Anusha P	5	5	NA
RF=No of faculty Required to comply with 25;1 student faculty ratio as per 5.1	8	8	8
Assisment =3*(sum/0.5RF) (Marks limited to 15)	3*(61/0.5*8)=45.75	3*(45/0.5*8)=33.75	3*(40/0.5*8)=30.00

Average assessment over 3 years	36.50

5.8 Research and Development (30)

5.8.1. Academic Research (20)

Acedamic research includes reseach papers publications, Ph. D guidence, and faculty received Ph. D during assessment year.

Number of quality publication in referred /SCI Journals, citations, Books/ Book chapters etc.

Faculty Name	**Research Publication refereed/SCI Journals during assessment year**	**Ph.D Guided /awarded during assessment year**	**Recieiving Ph.D during assessment year**	**Citations during assessment year**	**Book/Book Chapter during assessment year**
Dr. Jyotsna V.Ogale	NA	NA	NA	NA	NA
Dr. Ashutosh Datar	NA	5	NA	NA	NA
Dr. D.K Shakya	0	1	NA	NA	NA
Dr. Neelesh Mehra	0	2	NA	NA	NA
Mr. M.L Jatav	1	NA	NA	NA	NA
Mr. Abhishek Jain	0	NA	NA	NA	NA
Mrs. Bharti Mehra	0	NA	NA	NA	NA
Mr. Saksham Vasudev	0	NA	NA	NA	NA
Mrs. Smriti Dubey	0	NA	NA	NA	NA
Miss Sheena Kumar	0	NA	NA	NA	NA

Mr. Aman Sharma	0	NA	NA	NA	NA
Dr. Mukesh Kumar Mishra	3	NA	NA	NA	NA
Dr. Ashok Kumar	3	NA	yes	NA	NA
Mr. Nihit Bhatnagar	0	NA	NA	NA	NA
Miss Anusha P	0	NA	NA	NA	NA

Research publications in other journals/Conferences.

Faculty Research Publication

Name- Dr.(Mrs). J.V.Ogale

S.no	Theme	Authors	Year of Publication	Volume/Page/Issue	ISSN/DOI Number	Impact factor
1.	Contribution of Barker and Nested Barker code in CDMA Technology	Sakshi Jain Jyotsna v. ogale	November-2018	International Journal of Management Technology and Engineering. Volume No. - 8, Issue No.–10. Page-593-600	ISSN NO-2249-7455 UGC Approved	
2.	Improved fast block LMS adaptive algorithm using LABVIEW.	Akansha parihar. Jyotsna v. ogale	October-2018	International Journal of Management Technology and Engineering. Volume No. - 8, Issue No.–10. Page-593-600	ISSN NO-2249-7455 UGC Approved	
3.	Codes and its Impact on the Performance of the CDMA System	Akash Prajapai, Jyotsna Ogale	Aug-2018	International Journal of Modern Electronics and Communication Engineering (IJMECE) Volume No. - 6, Issue No.–4, July, 2018	ISSN: 2321-2152 UGC Approved	0.353
4.	Biomedical Image Fusion for Brain	Gaurav Lodhwal,	Jan-2018	International Journal of Advanced Research in	ISSN: 2278	0.426

	Cancer Detection	Jyotsna Ogale		Electronics and Communication Engineering/vol.07/Issue.01	– 909X	
5.	A Modified Method for Sound Compression Using Intrinsic Mode Functions	Divya Jain, Jyotsna Ogale	Jan-2017	International Journal of Modern Electronics and Communication Engineering (IJMECE) ISSN: 2321-2152 Volume No. - 5, Issue No. – 1, Page(s): 97-102	ISSN: 2321-2152	0.353
6.	Image Denoising Technique by Using Various Filters	Vikash Panthi, Jyotsna Ogale	Nov-2016	International Journal of Advanced Research in Computer and Communication Engineering/vol.05/Issue.11	ISSN (Online) 2278-1021 ISSN (Print) 2319 5940	0.426
7.	Empirical Mode Decomposition for Speech Synthesis	Ram Kumar Panthi, Jyotsna Ogale	Dec-2016	International Journal of Advanced Research in Computer and Communication Engineering/vol.05/Issue.12 Page(s): 288-294	ISSN (Online) 2278-1021 ISSN (Print) 2319 5940 DOI: 10.17148/IJARCCE.2016.51266	0.426

Name- Dr. D.K. Shakya

S.no	Theme	Authors	Year of Publication	Volume/Page/Issue	ISSN/DOI Number	Impact factor
1.	Identification of Eukaryotic Genes with Improved Noise Suppression, International Journal of Signal Processing, Image Processing & Pattern Recognition.	D. K. Shakya, Rajiv Saxena, S.N. Sharma	June, 2011	Vol.4 no.2	ISSN 2005-4254	

2.	A Simple Algorithm for Gene Prediction with Improved Noise Suppression, ICSIP2010 Proceedings.	D. K. Shakya, Rajiv Saxena, S.N. Sharma	2010	10.1109/ICOSP.2010.5656361	978-1-4244-5900-1	
3.	Evaluation of DNA Mapping Schemes for Exon Detection, International Conference on Computer, Communication and Electrical Technology (ICCCET)	S. D. Sharma D. K. Shakya, S.N. Sharma	2011	10.1109/ICCCET.2011.5762441	978-1-4244-9394-4	
4.	Classification of Exons and Introns by Time-Frequency Analysis using Neural Network, Proceedings of National Conference on Advances in Mathematics & its Applications.	Sourabh Yadav S.N. Sharma D. K. Shakya			978-93-83083-22-0	
5.	A DSP-Based Approach for Gene Prediction in Eukaryotic Genes, International Journal on Electrical Engineering & Informatics.	D. K. Shakya, Rajiv Saxena, S.N. Sharma	2011		10.15676/ijeei.2011.3.4.7	
6.	Improved Exon Prediction With Transforms by De-noising Period-3 measure.	D. K. Shakya, Rajiv Saxena, S.N. Sharma	2013	Volume 23, Issue 2, March 2013, Pages 499-505	https://doi.org/10.1016/j.dsp.2012.09.019	
7.	An Adaptive Window Length Strategy for Eukaryotic CDS Prediction, IEEE/ACM Transaction on Computational Biology & Bioinformatics.	D. K. Shakya, Rajiv Saxena, S.N. Sharma	1 July 2013	Vol. No. 10, No. 5.	10.1109/TCBB.201.76	

Name- Dr. Neelesh Mehra

S.no	Theme	Authors	Year of Publication	Volume/Page /Issue	ISSN/DOI Number	Impact factor
1	Adaptive lossless medical image watermarking algorithm based on DCT and DWT	Amit mehto and N. Mehra	2016	78/88-94	10.1016/j.procs.2016.02.015	SNIP 0.883
2	Imprecise reversible visible watermarking	N. Mehra & M. Shandilya	2013	1/355-365/4	DOI 10.1007/s40012-013-0031-3	
3	Imprecise Reversible Dual Watermarking Scheme	N. Mehra & M. Shandilya	2013	4/166-171/4	Doi:10.4304/Jait.4.4.166-171	
4	Pseudonymous Privacy Preserving Buyer-Seller Watermarking Protocol	N. Mehra & M. Shandilya	2011	8/215-219/6	ISSN : 1694-0814	0.242
5	Techniques of Digital Image Watermarking: A Review	Amit mehto and N. Mehra	2015	128/21-23/9	ISSN : 0975 - 8887	
6	Attacks Resistant Hybrid Watermarking Scheme	S. Pachori and N. Mehra	2013	IEEE31661		
7	Dual Watermarking scheme for secure Buyer –Seller Watermarking protocol	N. Mehra & M. Shandilya	2012	SPIE 8334	doi 10.1117/12.956459	

Name- Prof. M. L. Jatav

S.no	Theme	Authors	Year of Publication	Volume/Page/ Issue	ISSN/DOI Number	Impact factor
	Optimized Filter based Compression with Run-length Encoding.	Bharti Palya, M.L. Jatav	2017	Vol. 05/ PP-267-270/ Issue 05, 2017.	ISSN: 2321-0613	4.396
	A Review of Wireless Sensor Network Based on Energy Minimization Algorithms.	Ramesh Maurya, M.L. Jatav	May 2018	Vol. 05/ pp-118-121/ Issue-5	ISSN No.(online): 2394-6172	
	Integration of Dual Probability in LEACH Protocol for Energy Minimization in Wireless Sensor Networks.	Ramesh Maurya, M.L. Jatav	May 2018	Vol. 05/ pp-122-127/ Issue-5	ISSN No.(online): 2394-6172	
	2.4 GHz Transceiver Design for Wireless Sensor Application	Ankush Sahu, M.L. Jatav	June 2018	Volume 8/ Page No.18517-15521/ Issue No.6	ISSN No. 2250-1371	5.611

Name- Abhishek Jain

S.no	Theme	Authors	Year of Publication	Volume/Page/Issue	ISSN/DOI Number	Impact factor
1.	Spatial Video Compression using EZW, 3D-SPIHT, WDR & ASWDR Techniques, International *Journal of Advanced Research in Computer Science and Software Engg.*	Abhishek Jain & Dr. Ashutosh Datar	July 2013	Vol. 3, Issue 7, pp. 1-9.	(ISSN: 2277 128X)	

2.	Wavelet based Video Compression using STW, 3D-SPIHT & ASWDR Techniques, *International Journal of Advances in Engineering & Technology*	Abhishek Jain & Dr. Anjali Potnis	May 2012	Vol. 3, Issue 2, pp. 224-234.	(ISSN: 2231-1963)	
3.	A video compression technique utilizing spatio-temporal lower coefficients, *International Journal of Electronics and Communication Engg.*	Ashwini Atulkar & Abhishek Jain	Jan-Feb 2016,	*3 (7)*, Vol. 7, Issue 1, pp. 10-19.	(ISSN Print: 0976-6464 and ISSN Online: 0976-6472)	
4.	Image compression using wavelet and ridgelet transform, *International Journal of Scientific and Engineering Research (IJSER)*,	Sukh Singh Ahirwar, Prof. Abhishek Jain and Prof. Sheena Kumar	July 2016	Vol. 6, Issue7, Edition, pp. 185-189	(ISSN 2229-5518).	
5.	Video Steganography Using Lazy Wavelet Transform, *International Journal of Research*,	Shailesh Yadav, Prof. Abhishek Jain and Prof. Aman Sharma,	June 2017	Vol. 04, Issue 07,	(p-ISSN: 2348-6848 e-ISSN: 2348-795X)	
6.	Multiple Face Detection on Distorted Images using NSS-HOG Features and Neuro-SVM Classifier, *International Journal of Advanced Research in Electronics and Communication Engineering*,	Gagan Pataskar and Abhishek Jain	April-2018,	Volume 7, Issue 4, pp. 302-306.		

7.	Improved Distributed Energy Efficient Hierarchical Clustering Scheme For Wireless Sensor Networks, *International Journal Of Innovation In Engineering Research & Management*	Suchita Jain, Abhishek Jain and Sheena Kumar,	June 2018	Volume 05, Issue 03, Paper id-IJIERM-V-III-1210 ,	(ISSN: 2348-4918)	
8.	Machine Learning Approach for Wrinkle Feature based Age Estimation from Facial Images, *International Journal of Research and Analytical Reviews (IJRAR),*	Neha Thakur and Abhishek Jain,	October 2018	Volume.5, Issue 4, Page No pp.428-436,.	E-ISSN 2348-1269, P- ISSN 2349-5138,	
9.	A Performance Evaluation of 3D-SPIHT & WDR Techniques for Video Compression, in proc. of RTMIS-2013	Abhishek Jain & Dr. Ashutosh Datar	April 2013,	pp. 187-192.		

Name- Sheena Kumar

S.No.	Authors	Title of the paper	Year	Name of the Journal	Vol. No.	Page No.	ISSN	Impact Factor
1	Sheena Kumar Dr. Y.K.Jain	Performance Evaluation and Analysis of Image Restoration Technique using DWT	2013	International Journal of Computer Applications	Volume 72, No. 18	11-20	0975-8887	3.1524

2	Sukh Singh Ahirwar, Prof. Abhishek Jain, Prof. Sheena Kumar	Image Compression using Wavelet and Ridgelet Transform	2016	International Journal of Scientific & Engineering Research	Volume 7, Issue 7	185-189	2229-5518	4.2
3	Suchita Jain Prof. Abhishek Jain, Prof. Sheena Kumar	Improved distributed energy efficient hierarchical clustering Scheme for wireless sensor networks	2018	International Journal Of Innovation In Engineering Research & Management	Volume 05, Issue 03	1-8	2348-4918	4.035

Name- Smriti Dubey

S.no	Theme	Authors	Year of Publication	Volume/Page/Issue	ISSN/DOI Number	Impact factor
1.	Optimal Channel Allocation with Hot-Spot Techniques in wireless network	Smriti Dubey	2013	61/11-17	10.5120/9963-4612	3.12

Name- Aman Sharma

S.No.	Name of Author	Title	Year	Name of Journal/Conference	Vo. No., Page No.	Impact Fator
1.	Aman Sharma, Dr. S N Sharma	Adaptive Filtering Of LFM Signals Using FrFT	2014	ICSP 2014 , IET Conference		
2.	Shailesh Yadav, Abhishek Jain Aman Sharma	Video Steganography Using Lazy Wavelet Transform	June 2017	International Journal of Research	Vol. 04, Issue 07	3.541
3.	Ashish Ku. Malviya	Comparative Study of Palm Print using Edge Detection Techniques", International	March 2018	International Journal of Electronics,	Volume7,	

	Aman Sharma	Journal of Electronics, Electrical and Computational System, IJEECS, ISSN 2348-117X, Volume7,Issue 3,March 2018		Electrical and Computational System	Issue 3	
4.	Akanksha Parihar Jyotsna Ogale Aman Sharma	Improved Fast Block LMS Adaptive Algorithm using Labview	Oct 2018	International Journal of Management, Technology And Engineering,	Volume 8, Issue X	

Name- Dr. Ashok Kumar

S.no	Theme	Authors	Year of Publication	Volume/Page/ Issue	ISSN/DOI Number	Impact factor
1.	Current mode first order universal filter and multiphase sinusoidal oscillator, AEU-International Journal of Electronics and Communications (Elsevier).	Ashok Kumar & Sajal K. Paul	2017	vol. 81, pp. 37-49,	-	2.853
2.	DX-MOCCII Based Fully Cascadable Second Order Current-Mode Universal Filter, Journal of Circuits, Systems and Computers (World Scientific).	Ashok Kumar and Sajal K. Paul	2018	vol. 27, no. 7,	-	0.595
3.	Nth order Current mode Universal filter using MOCCCIIs," Analog Integrated circuit and Signal Processing (Springer).	Ashok Kumar and Sajal K. Paul	2018	vol. 95, pp. 181-193,	-	0.823
4.	OTA based high frequency tunable resistorless grounded and floating memristor emulators," AEU-International Journal of Electronics and Communications (Elsevier),	Gaurav Kanyal, Pratik Kumar, Sajal K. Paul, and Ashok Kumar	2018	vol. 92, pp. 124-145,	-	2.853
5.	DXCCII-Based First Order Voltage-Mode All-Pass Filter, Advances in Power Systems	Ashok Kumar, Ajay K. Kushwaha, and	2018	vol. 436, pp. 709-717,	DOI: 10.1007/978-981-10-	Scopus Indexed.

	and Energy Management, Lecture Notes in Electrical Engineering, Springer Singapore.	Sajal K. Paul			4394-9_70,	
6.	CMOS Based Sinusoidal Oscillator Using Single CCDDCCTA, In Advances in Systems, Control and Automation, Lecture Notes in Electrical Engineering, Springer Singapore.	Ajay K. Kushwaha, Ashok Kumar, and Sajal K. Paul	2018	vol. 442, pp. 309-317,	DOI: 10.1007/978-981-10-4762-6_29.	Scopus Indexed.
7.	Sinusoidal Oscillator Realization Using Band-Pass Filter. Journal of The Institution of Engineers (India).	Ajay K. Kushwaha, Ashok Kumar	2019	Series B, pp. 1-10,	-	Scopus Indexed.
8.	Current Mode and Voltage Mode Third Order Sinusoidal Oscillator Using CCDDCCTA, Nanoscience & Nanotechnology-Asia.	Ajay K. Kushwaha, Ashok Kumar, and Prakash Pareek	Accepted	_	DOI: 10.2174/2210681209666190820102339.	Scopus Indexed.
9.	Electronically Tunable Mixed Mode Quadrature Oscillator, Revue roumaine des sciences techniques (Romanian Academy).	Ashok Kumar, Ajay K. Kushwaha, and Sajal K. Paul	Communicated	-	-	SCI Indexed.
10.	Cascadable voltage-mode all-pass filter with single DXCCII and grounded capacitor, Proc. in 2016 International Conference on Microelectronics Computing and Communications (MicroCom 2016), NIT Durgapur, India.	Ashok Kumar and Sajal K. Paul	January 2016	pp. 1-4, 22-25 (IEEE Xplore)	DOI: 10.1109/MicroCom.2016.7522415.	Scopus Indexed
11.	Third Order Sinusoidal Oscillator Employing Single CCDDCCTA, In 2018 IEEE Electron Devices Kolkata Conference (EDKCON).	Ajay K. Kushwaha, Ashok Kumar, & Prakash Pareek,	2018	pp. 379-382. IEEE.	-	-

Name- Dr. Mukesh Kumar Mishra

S.no	Theme	Authors	Year of Publication	Volume/Page/Issue	ISSN/DOI Number	Impact factor
1	Spectral Efficiency and Deployment Cost efficiency Analysis of Mixed Millimeter Wave/Ultra High Frequency Band based Cellular Network **Name of Journal:** IEEE Transactions on Vehicular Technology	Mukesh Kumar Mishra, Aditya Trivedi	2019	Volume 68 , Issue 7 **Page No.: 6565-6577**	**1939-9359**	5.539
2	Outage and Energy Efficiency Analysis for Cognitive Based Heterogeneous Cellular Networks **Name of Journal:** Wireless Networks	Mukesh Kumar Mishra, Aditya Trivedi, and K. K. Pattanaik	2018	**Vol. No.: 24** **Page No.: 847-865** https://doi.org/10.1007/s11276-016-1371-3	**1022-0038**	**2.405**
3	Analytical Model for LoS Probability and Area Transport Efficiency of Millimeter Wave Cellular Network **Name of Journal:** Wireless Personal Communications	Mukesh Kumar Mishra, Aditya Trivedi, and K. K. Pattanaik	2017	**Vol. No.: 97** **Page No.:** 2383–2398	**0929-6212**	**0.929**
4	Analysis of Downlink Power Control and Cooperation Scheme for Two Tier Heterogeneous Cellular Network	Pragya Swami, Mukesh Kumar Mishra, and Aditya Trivedi	2017	**Vol. No.: 30** **Page No.: 1-13,** https://doi.org/10.1002/dac.3282	**1099-1131**	1.278

	Name of Journal: Wiley International Journal of Communication Systems					
5	Outage and ASE Analyses for Power Controlled D2D Communication **Name of Journal: IEEE Systems Journal**	**Praveen Pawar,** Aditya Trivedi, Mukesh Kumar Mishra	2019	10.1109/JSYST.2019.2925112	1937-9234	**4.463**
6	Efficient BER Analysis of OFDM System over Nakagami-m Fading Channel **International Journal of Advanced Science and Technology (IJAST), SERSC Journals**	Mukesh Kumar Mishra, Neetu Sood, Ajay K Sharma	2011	vol. 37, pp.37-46		**NA**
7	Analytical Outage Performance of Cognitive Small Cell Network **Name of Conference and Dates:** IEEE Online International Conference on Green Communication 2014, Arizona, USA. 12-14 Nov2014	Mukesh Kumar Mishra, Aditya Trivedi	2014	10.1109/OnlineGreenCom.2014.7114427	**ISBN/ISSN No.:** 978-1-4799-7384-2	**NA**
8	Performance Analysis of Two Tier Cognitive Heterogeneous Cellular Network **Name of Conference** 21stNationalConference on Communication (NCC-2015), IIT Bombay, India..	Mukesh Kumar Mishra, Aditya Trivedi	2015	**Page No.: 1-5** 10.1109/NCC.2015.7084848	**ISBN/ISSN No.:** 978-1-4799-6619-6	**NA**

	27Feb 1 march2015					
9	Analytical outage performance of uplink distributed green antenna system **Name of Conference and Dates: 11th International Conference on Wireless and Optical Communications Networks (WOCN), Vijayawada, India,11-13 Sep 2014**	Mukesh Kumar Mishra, Parag Aggarwal, Aditya Trivedi, K.K. Pattanaik	2014	**Page No.: 1-5** 10.1109/WOCN.2014.6923068		**NA**
10	Performance Analysis of Two-Tier Cellular Network Using Power Control and Cooperation **Name of Conference and Dates:** International Conference on Advances in Computing, Communications and Informatics 2016, Jaipur, India. 21-24 Sep 2016.	Pragya swami, Mukesh Kumar Mishra, Aditya Trivedi	2016	1-6	**ISBN/ISSN No.: INSPEC Accession Number:** 16429905	**NA**
11	Outage Probability of Multi-RAT Heterogeneous Cellular Networks with NOMA," **Name of Conference and Dates: 16th International Symposium on Wireless Communication Systems, Finland. 27-30 Aug 2019**	Pragya Swami, Mukesh Kumar Mishra, Vimal Bhatia, Tharmalingam Ratnarajah	2019	1-6		**NA**

Name- Anusha P

S.no	Theme	Authors	Year of Publication	Volume/ Page/Issue	ISSN/DOI Number	Impact factor
1	Effect of O_2, N_2 and H_2 on annealing of pad printed high conductive Ag–Cu nano-alloy electrodes	G. Manjunath, **P Anusha**, Ashritha Salian, Bikesh Gupta and Saumen Mandal	2018	5/ 014014 (1-13)/1	https://doi.org/10.1088/2053-1591/aaa829	1.449
2	Investigation of sintering kinetics and morphological evolution of silver films from nano-dispersion	Pavan Pujar, **P. Anusha**, Dipti Gupta, Saumen Mandal	2018	124/831(1-11)/ 12	0947-8396/ https://doi.org/10.1007/s00339-018-2249-2	1.784

Name- Nihit Bhatnagar

S. no	Theme	Authors	Year of Publication	Volume/Page/Issue	ISSN/DOI Number	Impact factor
1.	Energy efficient communication schemes in multi-relay WSNs with power allocation	Nihit Bhatnagar, Arvind Sirvee, Murli Manohar Sharma	2015	Page(s): 1 - 6	2325-9418 /10.1109/INDICON.2015.7443119	-

5.8.2. Sponsored Research (20) ----- 02 (TEQIP Sponsored)

5.8.3. Development activities (15)-----

Product Development- Nil

Research Laboratories- Procured research based software and hardwares from National Instruments to develop a Centre of Excellence of Virtual Instrumentation. Purpose of creating this COE is to enhance the research and development activities within institute and creat a platform to start testing and consultancy in future for internal revenue generation. This COE is going to be a multidiciplanary platform for R&D work and therefore may be utilized by most of the UG & PG programs like (EC,EI,EE,ME,CE,CSE and respective PG programs). By utilizing this COE we will be able to make our students industry ready.

Details are as follows:-

S.no	Hardware's	No. of units	Unit price	Total
1	NI MyRIO hardware	**08**	54000.00	4,32,000.00
2	Starter kit, for myRIO.	**01**	12500	12500
3	Embedded sensors kit	**01**	17900	17900
4	Mechatronics sensors Kit	**01**	23100	23100
5	iWorx Bioinstrumentation Sensor Package	**01**	75000	75,000.00
6	NI PITSCO TETRIX Prime	**01**	130000	1,30,000.00
7	USRP (10MHz to 6GHz-2901)	**02**	140000	2,80,000.00
8	USRP RIO(1.2GHz to 6GHz-2943)	**01**	925025	9,25,025.00
9	Labview software updradation	01	11,00,000.00/-	11,00,000.00/-
10	RAFA Solution software	01	4,25,000.00/-	4,25,000.00/-
11	Q-1 RCP TOOLKIT (5 USER) software	01	61,500.00/-	61,500.00/-
12	QUBE-Servo for NI myRIO	01	3,75,000.00/-	3,75,000.00/-
13	Quancer AERO: For teaching advanced control research and aerospace applications	01	8,90,000.00/-	8,90,000.00/-
14	NI Virtual Bench	01	2,55,000.00/-	2,55,000.00/-

Instructional materials- Developed Lab Manuals for all the practical courses and Labs. For given list of practical's we have developed complete lab manual/folders with all the details like:

Few example:-

SAMRAT ASHOK TECHNOLOGICAL INSTITUTE, VIDISHA, (M.P.)

(Engineering College)

Department of Electronics Engineering

Control System Engineering

LIST OF EXPERIMENTS

1. To Obtain the following synchronous characteristics of
   (a) Starter voltage of synchronous transmission for various positions of its excited rate.
   (b) To study the angular relationship between synchronous transmitter and receiver.
   (c) To study the characteristics synchronous transmitter and receiver control transformer.
2. To observe the response of standard test input signals for first order electrical system.
3. To observe the response of standard test input signals for second order electrical system and measure the transient response parameters.
4. To plot the Bode diagram and evaluate transfer function of the phase lead network and measure its gain and phase margins.
5. Using LabVIEW generate the transfer function of the given equitation in the pole zeros form ad polynomial form. Verify the stability of the transfer function.
6. To obtain the step response of second order system and measure the transient response parameters using LabVIEW. Observe the step response for different values of damping ratio.
7. To calculate the static error constants using LabVIEW and find steady state error for standard test inputs.
8. To draw the Root Locus of a given transfer function using LabVIEW.
9. To draw the Bode plot of a given transfer function and find gain and phase margins using LabVIEW.
10. To draw the Nyquist plot for a given transfer function and find gain and phase margins in LabVIEW.
11. To obtain the state space matrix of a given transfer function using LabVIEW.
12. Using LabVIEW verify the given state equation of the linear system are controllable. Observable, stable. Obtain the corresponding transfer function.

SAMRAT ASHOK TECHNOLOGICAL INSTITUTE, VIDISHA, (M.P.)

Department of Electronics Engg.

EXPERIMENT NO.:

1. OBJECT: Study of stepper motor controller.

2. INSTRUMENT REQUIRED:

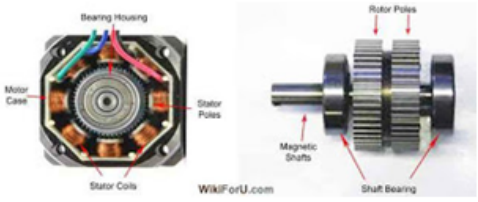
Sr. No.	Instruments	Range	Qty.
1.	Stepper Motor Controller		01
2.	Digital Multimeter		01
3.	Connecting Leads		10

3. THEORY:

A stepper Motor is basically a synchronous Motor. In stepper motor there is no brushes. This motor does not rotate continuously; instead it rotates in form of pluses or in discrete steps. That's why it is called stepper motor. There are different types of motors available on the basis of steps per rotation, for example- 12 steps per rotation, 24 steps per rotation etc. We can control or operate Stepper motor with the feedback or without any feedback. A simple image of stepper motor is shown in above picture.

Working Principle of Stepper Motor:

The principle of Working of stepper motor is Electro-Magnetism. It constructs of a rotor that is of permanent magnet and a stator that is of electromagnets, the following figure shows the construction of a practical stepper motor:



Now when we gives supply to stator's winding. There will be a magnetic field developed in the stator. Now rotor of motor that is made up of permanent magnet, will try to move with the revolving magnetic field of stator. This is the basic principle of working of stepper motor. Now we are going to discuss its types. In this note you will find the real method of working of specific type of servo motor.

Types of Servo Motor:

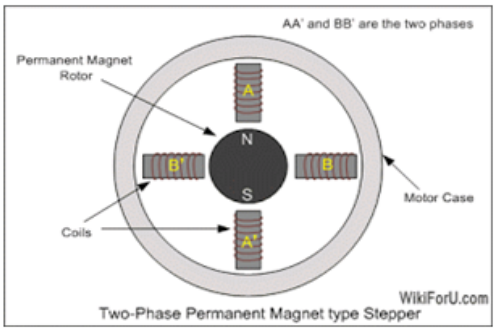
The Stepper Motor is of following types:

- Permanent Magnet
- Variable Reluctance.
- Hybrid Stepper Motor

The first type is most important, so first we should discuss it.

1. Permanent Magnet Type Stepper Motor:

The Working and Construction of the Permanent Magnet Type Stepper Motor is given below:
The permanent magnet type stepper motor has a stator, that is of electromagnets and a rotor that is of Permanent Magnet, therefore this motor is called permanent magnet type stepper motor.
Working:
When we gives supply to the stator, the winding of stator is energized and hence produces magnetic field. As described above, the rotor is made up of permanent magnet, that's why it tends to follow the revolving field. Thus a stepper motor works.
The speed or torque of a permanent magnet type motor is changed by the number of poles used in stator, If we use a large number of poles in stator then the speed of motor will increase and if we use a less number of poles then the speed will decrease.
The diagram of Permanent Magnet Type Stepper Motor is given below:



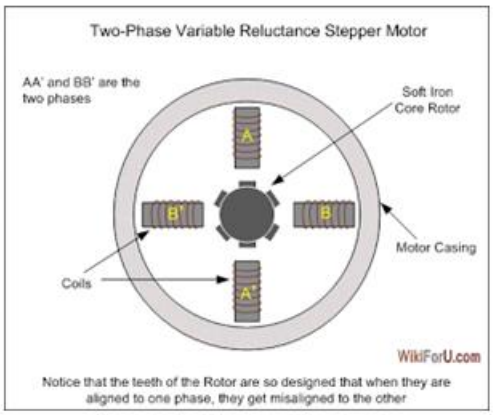
Two-Phase Permanent Magnet type Stepper

The speed control method is almost same as in the permanent magnet type motor. In this motor we can increase the speed by increasing the number of poles of stator as well as by increasing the number of teeth of rotor and vice versa.

2. Variable Reluctance Motor:

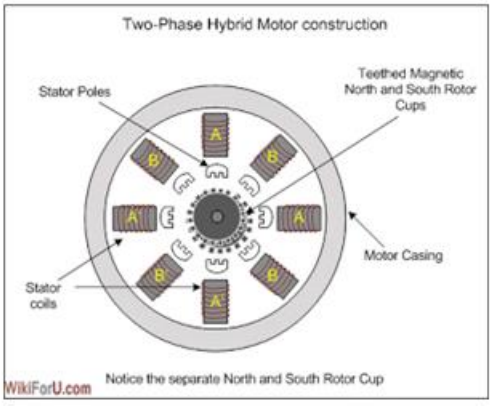
In Variable reluctance stepper motor, we uses a non magnetic iron core rotor, which has winding turned on its surface. The stator is same as used in the Permanent Type Stepper Motor.
Working:

When we apply supply to the stator, a magnetic field is induced in the stator winding which causes an e.m.f. induction in the rotor's winding, thus a magnetic field is also set up in the rotor which tends to follow the magnetic field of stator.
The diagram of Variable reluctance stepper motor is given below:

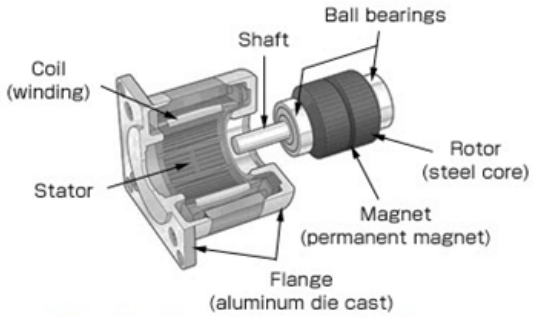


3. Hybrid Type Stepper Motor:

The Hybrid type motor, as the name suggests is a mixture of both above types. This consists a rotor which is magnetic and as well as teethed. The diagram of the construction of this motor is shown below:



The rotor of this type of motor is made up of two rotors joining like a shaft of motor. One of them is for north and other is for South Pole. These poles arrange in alternative manner as they designed in such a manner.

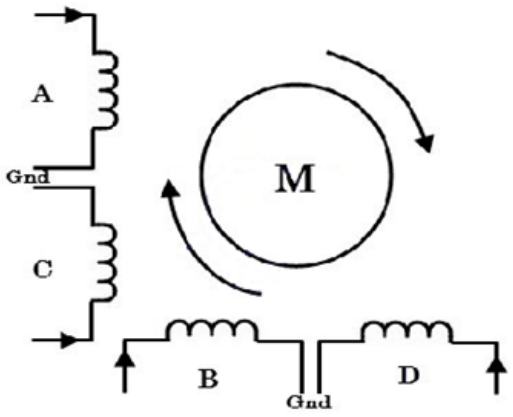


Construction of Stepper Motor

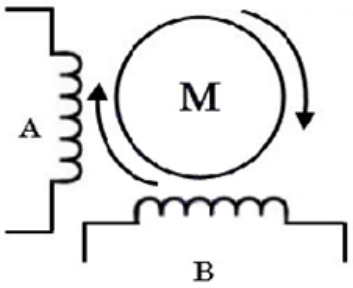
- **Unipolar and Bipolar Stepper Motors:**

The above discussed motors can be unipolar or bipolar based on the coil winding arrangements. A unipolar motor is employed with two windings per phase and hence the direction of current flow through these windings changes the rotation of the motor. In this configuration, the current flow is through one direction in one coil and opposite direction in another coil.

The figure below shows 2-phase unipolar stepper motor wherein A and C coils are for one phase and B and D are for other phase. In each phase each coil carries current in opposite direction to that of other coil. Only one coil will be carrying current at a time in each phase for achieving particular direction of rotation. So just by switching the terminals to each coil, the direction of rotation is controlled.



In case of a bipolar stepper motor, each phase consists of a single winding rather than two in case of unipolar one. In this, the direction of rotation is controlled by reversing the current through the windings. Hence, it requires a complex drive circuit for current reversal.



- **Stepping Modes of a Stepper Motor**

A typical stepping action causes the motor to step through a sequence of equilibrium positions in response to current pulses given to it. It is possible to vary the stepping action in different ways simply by changing the sequence through which stator windings are energized. The following are the most common operating or driving modes of stepper motors.

1. **Wave step**
2. **Full step**
3. **Half step**
4. **Microstepping**

1.Wave Step:

Wave step mode is the simplest of all other modes in which only one winding is energized at any given time. Each coil of the phase is connected to the supply alternatively. The table below shows the order through which coils are energized in a 4-phase stepper motor.

In this mode motor gives maximum step angle compared to all other modes. It is the simplest and most commonly used mode for stepping; however the torque produced is less as it uses some part of the total winding at a given time.

STEP	COLI-A	COLI-B	COLI-C	COLI-D
1	ON	OFF	OFF	OFF
2	OFF	ON	OFF	OFF
3	OFF	OFF	ON	OFF
4	OFF	OFF	OFF	ON

2. Full Step:

In this drive or mode, two stator phases are energized simultaneously at any given time. When two phases are energized together, the rotor will experience the torque from both phases and comes to the equilibrium position, which will be interleaved between two adjacent wave step positions or 1-phase excitations. So this step provides better holding torque than wave step. The table below shows the full step drive for 4-phase stepper motor.

STEP	COLI-A	COLI-B	COLI-C	COLI-D
1	ON	OFF	OFF	OFF
2	OFF	ON	OFF	OFF
3	OFF	OFF	ON	OFF
4	OFF	OFF	OFF	ON

3. Half step:

It is the combination of both wave and full step modes. In this, single phase and dual phase excitations are carried out alternatively, i.e., one-phase ON, two-phases ON, and so on. The step angle in this mode becomes half of the full step angle. This drive mode has highest torque and stability compared to all other modes. The table containing phase pulsing sequence for a 4-phase

Motor in half stepping is given below. motor in half stepping is given below.

STEP	COLI-A	COLI-B	COLI-C	COLI-D
1	ON	OFF	OFF	OFF
2	ON	ON	OFF	OFF
3	OFF	ON	OFF	OFF
4	OFF	ON	ON	OFF
5.	OFF	OFF	ON	OFF
6.	OFF	OFF	ON	ON

7.	OFF	OFF	OFF	ON
8.	ON	OFF	OFF	ON

.

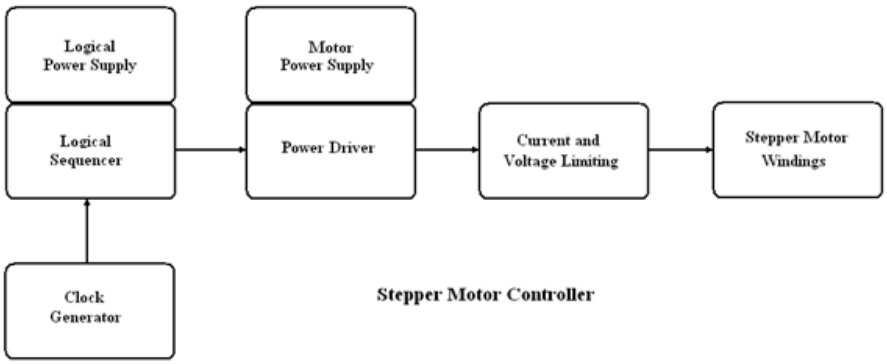
4.Microstepping:

In this mode, each motor step is subdivided into several small steps, even hundreds of fixed positions; therefore a greater positioning resolution is obtained. In this, currents through the windings are continually varied in order to get very small steps. In this, two phases are excited simultaneously, but with the unequal currents in each phase.

For example, the current through phase -1 is held constant while the current through phase-2 is incremented in steps till the maximum value of current, whether it is negative or positive. The current in the phase-1 is then decreased or increased in steps till zero. Thus, the motor will produce a small step size.

All these stepping modes can be obtained by each type of stepper motor discussed above. However, the direction of current in each winding during these steps can be varied depending on the type of motor and either it is unipolar or bipolar

4. BLOCK DIAGRAM:



Stepper Motor Controller

5. PROCEDURE:

a. Operating Voltage : 12VDC
b. Torque : 3.5 Kg-cm
c. Step Angle : 1.8^0

1. Connect the clock CLK from clock generator to the clock input (CLK) of synchronous up/down counter.

2. Connect MODE input to synchronous up/down counter. Keep FW/REV switch for FW position.
3. Connect the output from code converter and driver stage A11 to base of Q1, B11 to base of Q2, A21 to base of Q3, and B21 to base of Q4.
4. Make power on to the unit.
5. Keep speed adjust potmeter for minimum clock speed.
6. Note the output pulse pattern as observed on LED D1, D2, D3, D4.
7. Change the MODE switch to REV position, note the output pulse pattern as 1observed on LED D1, D2, D3, D4.
8. Count total number of steps for one complete rotation.
   a. No. of steps for one rotation = ……..
   b. Step Angle = 360^0 / No. of steps for one rotation
9. Note the number of rotations required for motor shaft to complete on rotation of gear box shaft.
10. Instead of continuous clock, connect clock from Manual pulser provide signale pulse clock and repeat the steps 6 to 8.

6. OBSERVATION TABLE:

STEP	COLI-A1 D1	COLI-B1 D2	COLI-A2 D3	COLI-B2 D4
1				
2				
3				
4				

7. CALCULATION: a. No. of steps for one rotation = ……..

b. Step Angle = 360^0 / No. of steps for one rotation

8. RESULT: Verify the stepper motor work in step forward and reverse mode.

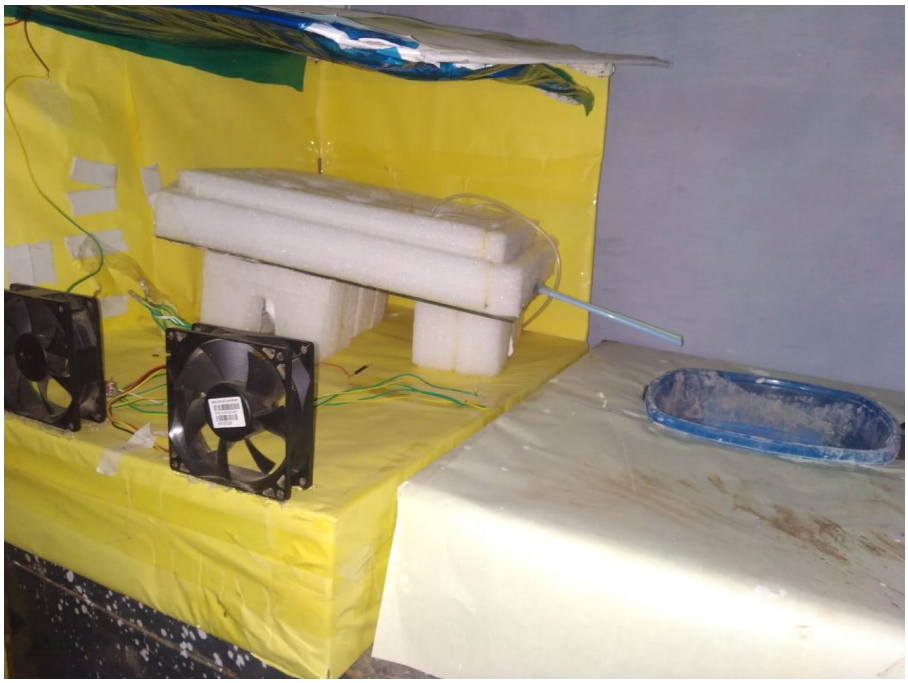
9. CONCLUSION: In overall practical stepper motor work in discrete steps with a torque.

10. PRECAUTION: 1. first check the connection of circuit.

2. Carefully measure the reading of steps for one rotation

Working models/charts/monograms etc.-Developed kits for Digital Electronics lab and there are so many working modlesi.e dron, Home automation system, Bottle filing system, hydroponics vertical farming. Inn each and every lab there is charts for vision, mission, pso and po display., charts for basic equipment, component, phenomenon display, Time table display, list of experiments display all available in the form of charts.

Few details are given below:-



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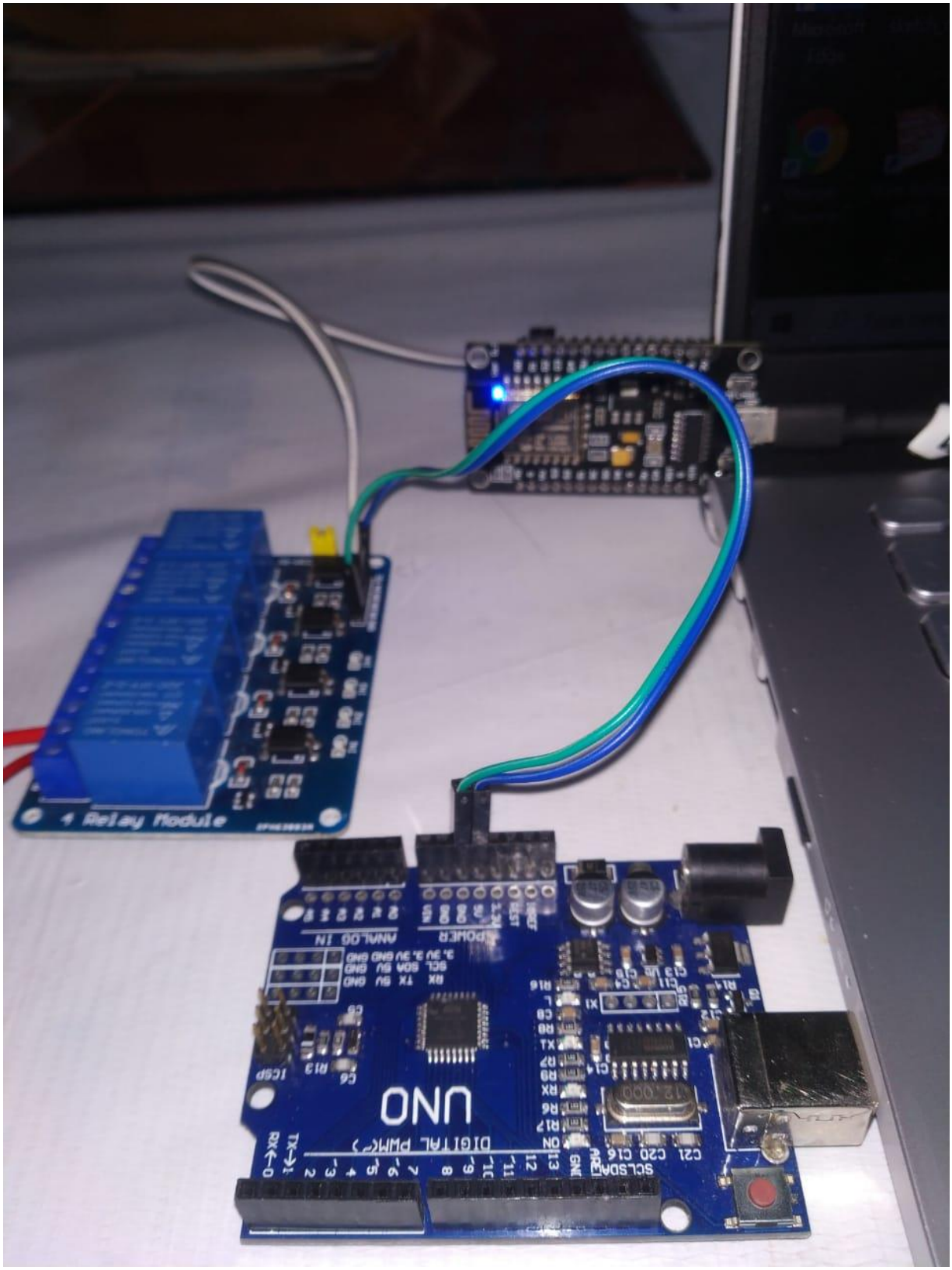


HOME AUTOMATION

5.8.4 Consultancy (from Industry) (20) ----NIL

5.9 Faculty Performance Appraisal and Development System (FPADS) (10)

Faculty members of Higher Educational Institutions today have to perform a variety of tasks pertaining to diverse roles. In addition to instruction, Faculty members need to innovate and conduct research for their self-renewal, keep abreast with changes in technology, and develop expertise for effective implementation of curricula. They are also expected to provide services to the industry and community for understanding and contributing to the solution of real life problems in industry. Another role relates to the shouldering of administrative responsibilities and co-operation with other Faculty, Heads-of-Departments and the Head of Institute. An effective performance appraisal system for Faculty is vital for optimizing the contribution of individual Faculty to institutional performance.

The assessment is based on:

A well-defined system for faculty appraisal for all the assessment years (5)

In the format we ask for following information:

- Teaching and Lab work assignment.
- Performance of the students for the subject taught.
- Teaching learning and Evaluation related activities.
- Professional Development
- Co-Curriculum and Extra Curricular activities.
- Reseach and Academic Contribution.
- Future planning for departmental upgradation.
- Details of Memos/Warnings/Note/Punishment
- Details of leave taken
- Self analysis
- Use of library journals/ Books apar from mentioned text books.
- Self development through upgrading qualification
- Fellowship awards & Invited lectures delivered in conferences/ Seminars

Its implementation and effectiveness (5)

- The College / Department encourages faculty members, who are attending in the national/ international conference.
- The College / Department encourages faculty members, who are doing R&D projects and consultancy.
- The College / Department encourages faculty members, who are filing patents/ copyrights by paying money towards expenditure of it.
- The College / Department encourages faculty members, who are members of the professional societies.
- The College / Department encourages faculty members, to organize different technical events like training programs, workshops, seminars, expert talks, conferences etc.
- Granting leave for attending and dellivering training programs, workshops, seminars, expert

talks, conferences etc.

- Encouraging faculy to apply for research grants.

5.10 Visiting/Adjunct/Emeritus Faculty etc. (10) ----

As adjunct faculty also include industry experts , w have arranged so many training programs, workshops, and expert talks by calling industry persons. Almost completing 50 hours.

Details of session 2018-2019 are given below:-

Name of Activity	Duration	Expert	Target Audience	Budget Amount Rs
Graphical System Design Using LABVIEW	6 Days	Mr. Suresh Venktesh From Benglore , VI Solutions	Student and Faculty	42,530.00
Data Acquisition Graphical Programming Training Program	5 Days	Mr. Suresh Venktesh From Benglore, VI Solutions	Student and Faculty	66,549.00
Robotic Process Automation, Artificial Intelligence	1 Day	Mr.Ashutosh Sinha, Banglore	Faculty	22,556.00
Expert Talk on Artificial Intelligence	1 Day	Mr.Ashutosh Sinha, from: Banglore, Robonomics	Faculty	16,205.00
Expert Talk on Artificial Intelligence	1Day	Mr. Samir Sinha from: Mumbai Robonomics	Faculty	9,858.00
Workshop on LABVIEW Training Program	5 Days	Mr.Shiva Kumar, STARCOM Banglore	Student and Faculty	1,32,651.00
Expert Lecture on Process Automation and Artificial Intelligence	1 Day	Mr. Ashutosh Sinha from Bangalore	Faculty	21,111.04
Sttp on advanced image and signal processing using LabVIEW- Aman Sharma	5 Days		Students+Faculty	14,576.00/-
Two days workshop on IOT -Bharti mehra	2 Days	Miss Megha Patil , IOT Development Engineering, PROCOM	Students	11,662.00/-

Enterprises, Ichalkaranji

RITERION 6	Facilities and Technical Support	80

6.1 Adequate and well equipped laboratories, and technical manpower (40)

S. No	**Name of the Physical Lab**	**Logical Lab.**	**Lab Facilities**			**Technical Manpower Support**		
			No of Students Per setup	**Name of the Important Equipments**	**Weekly utilization status**	**Name of Technical Staff**	**Designation**	**Qualification**
1.	Simulation	DSP	04	**Environments:** Windows XP/WINDOWS7 (Campus License MVL) **Development/Software Tools:** C++ (Open Source) JAVA (Open Source) Edsim (Open Source) Jgate (Open Source) Arduino Software (Open Source) XCTU for Xbee/Zigbee	06 Hours	Miss. Rashmi Porwal	Computer programmer	M.Sc
		Data Communication	04		06 Hours			
		VLSI	04		06 Hours			
		Advance Communication	04		06 Hours			

				modules (Open Source) MATLAB LT Spice (Open source) Xilinx design and synthesis (ACADEMIC VERSION) Keil Microcontroller Software (LICENSED version) Netsim (LICENSED version)				
2.	LabVIEW Lab	LabVIEW Lab	01	LabVIEW SPEEDY 33 Academic DSP(8.6) NI ELVIS II Plus(Workstation + Prototype Board + Adaptor + USB Cable + CD) Emona DATEx Telecommunication Trainer (Headphones + Prototype Board + Leads)	06 Hours	Mr. Jitendra Raghuwanshi	Computer Programmer	M.Tech
3.	Electronics Workshop	Electronics Workshop	04	Analog Multimeters, Digital Multimeters, CRO, Function Generator, Power Supply, All Electronic Components: Resistors, Capacitors, Inductors, Diodes, Transistors, PCB and PCB Fabrication Tools	06 Hours	Mr. Ajay Goliait	Technical Assistant	M.Tech (DC)

4.	Electronics Lab	Electronics Devices & Circuits	04	Circuit Boards/Trainer kits for studying characteristics of following: Semiconductor diode, Zener diode and FET, JFET, UJT. Study of IC regulator as +ve and -ve Voltage Regulator, Transformer coupled class A amplifier, Class B push pull amplifier, Clipping circuit. Clamping circuit, Two stage RC coupled class A amplifier using transistor, Direct Coupled Amplifier, Emitter follower with Boot Strap, Darlington bootstrap amplifier, Kits for Half Wave Rectifier, Kits for Full Wave Rectifier Different types of Feedback Amplifier, IC 741 as inverting amplifier/ non-inverting amplifier/ Subtractor/ Adder/ Instrumentation amplifier/ voltage comparator/ phase shift oscillator/ squre-wave oscillator/ Wein-bridge oscillator/ triangular wave generator/ Schmitt trigger/ Sample & Hold circuit/ Integrator/ Diffcrentiator/ Log amplifier/ V to I converter/ Ito V converter IC 555 as	06 Hours	Mr. Sanjay Muley	Technical Assistant	DCA
		Analog Electronics & Linear ICs	04					

				Astable Multivibrator/ Monostable Multivibrator Analog system Lab Kit Power Supply, Digital multimeter, Bread Board,Function Generator, CRO Leads,74I IC,555 Timer Capacitor, Electrolyte Capacitor Resistance, Hookup Wire,BNC 10 Crocodile Leads, BNC Crocodile				
5.	Embedded Design and Simulation Lab	Microprocessor & Microcontroller	04	8085 Trainer Kit, 8086/8088 Trainer Kit, ATmega8 development kit, DC-Motor Controller Interface Card with Motor and Power Supply, Display Interface Card Stepper Motor Controller Interface Card With stepper Motor And Power Supply Keyboard Interface Card, Elevator Simulator Interface Card, Traffic Light Controller Interface Card, Temperature Measurement Interface Card With Thermocouple, Relay & Opto-Coupler Interface Card, LED Display Matrix Interface Card, Thumb Wheel Switch Interface Card, ADC & DAC Interface Card Printer Interface	06 Hours	Mr. Rakesh Sagar	Computer Programmer	M.Tech (Electrical Drive)

				Card, Study Of USART 8251,Timer: Study Of 8253 Interrupt Study Card, DMA Controller Stud^{y} Card, IC Tester Interface Card Development Board For AVR, 8051, PIC, ARM and Arduino - All In One 89V51 RD2 Starter Kit, ARM Trainer Kit Keil **IDE** micro vision compatible ARM development board IDE CCS V 6, Wireless Sensor Hub, Wireless communication Board. Proteus Simulation Software Edsim51 Simulator				
6.	Electronics Instrumentation Lab		04	Circuit Board, CRO, Function Generator, BNC to BNC Lead, Digital LCR Meter, Universal Frequency Counter, Sharing Bridge Kit, Maxwell Bridge Kit, Wcin's Capacitance Bridge Kit, LVDT Unit	06 Hours	Mr. Ajay K. Golait	Technical Assistant	M.Tech (DC)
7.	Network Analysis Lab	Network Analysis	04	Integrating Network Boards, Differentiating Network Boards Constant Current Network Boards, Constant Voltage Network Boards Superposition Theorem Network	06 Hours	Mr. Ajay K. Golait	Technical Assistant	M.Tech (DC)

				Boards, Thevenin's Theorem Network Boards, Norton Theorem Network Boards, Maximum Power Transfer Theorem Network Boards, Open/Short Circuit Boards, Millman Circuit Board, Compensation Ckt Board, Reciprocity Board				
8.	Control System Lab		04	Linear System Simulator, Potentiometric Error Detector Compensation Design Trainer, Magnetic Amplifier Trainer Stepper Motor Study Trainer with Stepper Motor Dc Position Control Trainer, Ac Position Control Trainer Dc Servo Motor Trainer, P, Pi, Pd, Pid Controller Trainer	06 Hours	Mr. Ajay K. Golait	Technical Assistant	M.Tech (DC)
9.	Antenna/ Microwave Lab	Antenna	04	Antenna Trainer including Automatic Motorized rotating unit & Plotting Software compatible with computer through RS-232 interface delink and Antenna Learning Software Module with basic 24 Antennas as	06 Hours	Mr. Anuj Upadhay	Technical Assistant	M.Sc

				described				
		Microwave	04	Microwave Test Bench (Kryston Based) with VSWR Meter Microwave Test Bench (Gunn Based) with VSWR Meter	06 Hours			
10.	Communication Lab	Analog comm.	04	Sampling PAM, PPM, PWM and Line Coding Techniques Trainer Kit PCM,DPCM,CVSD Modulator & Demodulator Trainer Kit, Delta Modulation/ Demodulation System Trainer, Amplitude Shift Keying Modulation/Demodulation System Trainer, Frequency Shift Keying Modulation/Demodulation System Trainer, Phase Shift Keying Modulation/Demodulation System	06 Hours	Mr. Anuj Upadhay	Technical Assistant	M.Sc
		Digital comm.	04					

6.2. Laboratories maintenance and overall ambiance (10)

(Self-Explanatory)

Maintenance of Laboratory Equipments

1. Regular checkup of equipment is carried out at the end of every semester.
2. Breakdown maintenance register is maintained in the laboratories.
3. As per the requirement minor repairs are carried out by the lab technical staff
4. Major repairs are outsourced by following the procedure of the institute.

Overall Ambience

Calibration of the instruments carried out annualy.

Technical staffs are well trained for maintenance.

- Conditions of chairs/benches are in good condition in class rooms. Stools are provided for simulation lab.
- Labs are equipped with sufficient hardware and licensed software to run program specific curriculum.
- Sufficient laboratory manual are distributed to students.
- Sufficient number of windows is available for ventilation and natural light and every lab has few fans.
- Lighting system is very effective, along with the natural light in every corner of the rooms.
- Generator connections available in Lab in case of power failure.
- Each Lab is equipped with white/black board.
- Research laboratory is available 24X7 for all faculties and students to carry research work

6.3. Safety measures in laboratory

Sr. No.	Name of the Laboratory	Safety measures
1.	Electronic devices and Circuit Lab	1. High impedance prob and Insulated Transformer (Well Insulated) 2. Fire alarm and Fire extinguisher 3. Electrical connections to the heating device must be fully insulated to prevent electric shock. 4. First-aid-box
2.	Simulation Lab	
3.	LabVIEW Lab	
4.	Electronics Workshop	
5.	Electronics Lab	
6.	Embedded Design and Simulation Lab	
7.	Electronics Instrumentation Lab	
8.	Network Analysis Lab	
9.	Control System Lab	
10.	Antenna/ Microwave Lab	
11.	Communication Lab	

Table B.6.3

6.4. Project laboratory (20)

(Mention facilities & Utilization)

S. No.	Name of the Facilities	Utilization
1.	Embedded Design and Simulation Lab	6^{th} semester students, 8^{th} semester Students of EI/EE/EC/BM BranchComputer
2.	Simulation Lab	6^{th}, 7^{th}, 8th semester students Research scholars and Faculty
3.	LABVIEW Lab (COE Virtual Instrumentation)	6^{th}, 7^{th}, 8th semester students, PG students, Research scholars and Faculty members.

CRITERION 7	Continuous Improvement	75

7.1 Actions taken based on the results of evaluation of each of the COs, POs & PSOs (30)

Identify the areas of weaknesses in the program based on the analysis of evaluation of COs, POs & PSOs attainment levels. Measures identified and implemented to improve POs& PSOs attainment levels for the assessment year including curriculum intervention, pedagogical initiatives, support system improvements, etc.

Actions to be written as per table in 3.3.2

Examples of analysis and proposed action Sample 1-Course outcomes for a laboratory course did not appropriately measure up, as some of the lab equipment did not have the capability to do the needful (e.g., single trace oscilloscopes available where dual trace would have been better, or, non-availability of some important support software etc.). Action taken-Equipment up-gradation was carried out (with details of up-gradation)

Sample 2-In a course on EM theory student performance has been consistently low with respect to some COs. Analysis of answer scripts and discussions with the students revealed that this could be attributed to a weaker course on vector calculus.

Action taken-revision of the course syllabus was carried out (instructor/text book changed too has been changed, when deemed appropriate).

Sample 3-In a course that had group projects it was determined that the expectations from this course about PO3 (like: “to meet the specifications with consideration for the public health and safety, and the cultural, societal, and environmental considerations”) were not realized as there were no discussions about these aspects while planning and execution of the project. Action taken-Project planning, monitoring and evaluation included in rubrics related to these aspects.

Attainment of POs and PSOs are directly related to achievements od COs. Thus to achieve the taget of program outcomes and program spcific outcomes, emphasis should be given on atainment of course

outcomes. All couse outcomes whether related to knowledge, comprehension, application ,analysis or design should be achieved.

As pe the analysis based on attainment of COs of different subjects in III rd semester subjects mathematics and signals and systems have scored very low below target level. Therefore not contributing in achievement of PO-PSO at all. So for this following actions are proposed:-

1. Change of Text book.
2. Revise the contents of syllabus.
3. Refer NPTEL or other online video lecture of the same subjects.
4. Deliver the course through moocs.
5. Revise the course outcomes and set them as per Bloom Taxonomy.
6. For content delivery use some innovative ways.
7. Regarding the course and teaching learning process feedback should be taken from students on weekly basis to analyze the gaps or shortcoming. Actions for improvement should be taken accordingly.
8. Concept building approach should be adopted.
9. Organize some subject related training programms or expert talks.

POs-PSOs Attainment levels and proposed action for improvement

For CAY (2018-2019)

POs /PSOs	Target Level	Attainment Level	% Lag	Observation	Analysis
	PO1-Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.				
PO1	1.9	1.47	22.36	Below Target	1. Lateral entry Students are not exposed to basic of engineering mathematics. 2. Students enter with less basics of mathematics, science and engineering.
Proposed Action/Action Taken--- **1.** Scores of basic sciences and mathematics need to be assessed at the induction level. Depending on result of assessment extra classes to be conducted to improve fundamentals of engineering mathematics. **2.** To improve engineering concepts basic engineering courses to be taught at first year level with subjective approach and concept building approach.					

Taken Actions---

1. Basic science courses and basic engineering courses are added at the first year level.
2. A course on Data Structure is added.
3. Topics on Transducer is added.
4. Topic on Sensors and Actuators are also added in one of the course.

PO2-Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO2	2.98	1.36	54.36%	Above Target	1. Ability of analysis is not well developed. 2. Students may have less basic knowledge and fundamentals.

Proposed Action/Action Taken ---

1. Expert talk can be arranged to improve the analytical ability.
2. Small task or project should be given to students to let them identify the problem and analyze it.
3. Mathematical contents should be added in the existing course that can improve the system modeling ability of the students.

PO3-Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO3	1.34	1.04	22.39%	Below Target	1. To design solutions research ability is required. Students are having less research capability 2.May be having less research facilities available. 3.Lack of access of standard journals

Proposed Action/Action Taken---

1. Contents on aptitude and logical reasoning is added.
2. To improve decision taking ability proper interpretation of data is needed so for this statistical analysis based course is employed.
3. Created research facility by developing center of excellence of virtual instrumentation to

enhance students R&D capability and make them industry ready as per global demand.

4. Students may use modern tool and technologies available in above COE for the purpose of research work and design and development of product.

PO4-Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO4	1.57	1.32	15.92%	Below Target	1.Students find it difficult to conduct investigations of problems. 2.Less decision taking ability

Proposed Action/Action Taken---

1. New softwares and hardwares are procured under TEQIP III to develop ability of analysis and investigation. Which also helps in increasing research based knowledge and supports in R&D work
2. Some topics on research methodology should be added and expert talk should be arranged.
3. Access of standard journals is made available like IEEE, Science Direct, Springer etc.

PO5-Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO5	1.58	1.21	23.42%	Below Target	Students are less proficient in using modern engineering tools.

Proposed Action/Action Taken---

1. Modern Engineering tools trainings are conducted regularly.

2. Software's related to Electronics and communication should be procured.

3. Courses on programming tools are added.

Taken Actions---

5. Organized Short term training programm on software tool "LabVIEW".
6. FDP on software tool "NETSIM".
7. Organized Short term training programm on "Data acquition using My-Rio and Hardware Programming":
8. Organized Short term training programm on "IOT Software":
9. New softwares are procured like RAFA solution, Proteus VSM.

PO6-The engineer and society: Apply reasoning informed by the contextual knowledge to

assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO6	0.76	0.53	30.26%	Below Target	1. Less emphasis is given on Projects or industrial training programs. 2. Lack of knowledge, understanding and research capability 3. Issues related to society, health safety, legal and cultural should be identified by proper aptitude and reasoning.

Proposed Action/Action Taken---

1. Training on modern tools and technology should be given to students to enhance ability of analysis, investigation, research and design and development to resolve the issues and provide the solutions.
2. More project assignment are given related to societal causes/problem
3. Students are motivated and facilitated to go for industrial training/internship.
4. Some books should be procured and made available at the departmental library to improve awareness of students for prevailing issues.

Taken Actions---

1. Technical events like Technovision, krishi-manthan etc. are organized regularly to motivate the students to work in a team at the institute level.
2. Assignment of major projects to group of students to resolve these issues

PO7-Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO7	0.69	0.54	21.74%	Below Target	1. Understanding of role and responsibility with respect to society and environment are not considered.

Proposed Action/Action Taken---

1. Awareness programs through NSS (at institute level) and student completion like Krishi-manthan are initiated for understanding of roles and responsibilities of professionals towards society and environment.

2. Guest lecturers should be organized to improve professionalism.

3. Students are motivated to develop sustainable solutions for problems pertaining to environment and society.

PO8-Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO8	0.74	0.50	32.43%	Below Target	1. Lack of ethical values and accountability.

Proposed Action/Action Taken---

1. Students should be made aware about the importance of ethics in engineering.

2. Seminar on engineering ethics should be organized.

3. Students should be promoted to take responsibility of engineering project with accountability.

Taken Actions---

1. Meditation Sessions are conducted for students and faculty
2. Personal Effectiveness programs are conducted regularly
3. Community Programs are organized by institute to inculcate ethical values and make students aware towards their responsibility
4. Candidates pursuing research work are motivated to regularly to check for plagiarism regularly

PO9-Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO9	0.86	0.73	15.12%	Below Target	1. Lack of leadership quality

Proposed Action/Action Taken---

1. students are motivated to work in teams for developing projects
2. Many student clubs are facilitated by institute to inculcate team work and leadership qualities in students

Taken Actions---

1. Activities through NSS/NCC are organized to improve the same.

PO10-Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO10	0.78	0.57	26.92%	Below Target	1.Less proficient in English 2. Poor writing skills

Proposed Action/Action Taken---

1. Essay writing competition during college fest is organized.

2. Course work includes Presentation on relevant topics.

3. Training program should be conducted for E-mail writing, Resume writing, official letter writing, Thesis writing.

4. Students should be promoted to read English news papers and novels which should be made available at the library.

5. Software(s) dedicated to improve communication skills should be procured.

6. Online videos should be preferred to improve verbal communication skills.

Taken Actions---

1. Industry Readiness Program is organized by institute to develop communication skills of students.
2. Students have done some online certification courses to improve the communication skills.
3. Communication Skill development software are procured by institute under TEQIP III

PO11-Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO11	0.79	0.59	25.32%	Below Target	1. Lack of concepts of economics and project management.

Proposed Action/Action Taken---

1. Course on managerial economics and project management are introduces in Curriculum.
2. Expert lecture or talks should be organized on risk and change management.

Taken Actions---

1. A course on stategic knowledge and management should be added.
2. A course on managerial economics is added.

PO12-Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PO12	0.9	0.71	21.11%	Below Target	Students are less motivated to study/work on their own

Proposed Action/Action Taken---

1. Group discussions should be organized.

2. Projects should be given on relevant topics to each and individual student for self learning.

3. Assignments should be given individually.

4. students are motivated to make use of institute infrastructure to develop their competency by self learning.

PSO1: The ability to absorb and apply fundamental knowledge of core Electronics and Communication Engineering in the analysis, design, and development of various types of systems.

PSO1	1.78	1.34	24.72%	Below Target	1.Students have less knowledge of different technologies. 2.Less ability to apply the knowledge

Proposed Action/Action Taken---

1. To provide solution to complex problems multidisciplinary approach and knowledge is required. So multidisciplinary subjects and projects should be promoted

2. Students should practice on latest software's.

3. Faculties from multiple disciplines should be incorporated in the department.

4. Interdisciplinary subjects should be taught.

Taken Actions---

1. Course on Internet of things is added
2. Organized Short term training program on software tool "LabVIEW".
3. Organized Short term training program on "Data acquition using My-Rio and Hardware Programming
4. Course on C++,MATLAB,LABVIEW etc. are added as Computer Programming Skill I & II

PSO2: Competence in using electronic modern IT tools (both software and hardware) for the design and analysis purpose as well as able to interpret and synthesize the experimental data leading to valid conclusions.

PSO2	1.64	1.32	19.51%	Below Target	1. Lack of ability of analysis and investigation 2. Lack of knowledge for utilizing Modern IT Tools.

Proposed Action/Action Taken---

1. Some programs should be organized to improve the critical thinking.
2. Students should have solid knowledge of basic sciences and engineering so more emphasis should be given in building of these concepts.

Taken Actions---

1. Induction program was organized on “Drone Technology”. Drone technology is contributing in providing solutions to real life problems.
2. A course on power plant Instrumentation is added to identify and resolve the issues related to power plant.
3. Student Technological Clubs are there to motivate students to learn and use Modern Tools.

PSO3: With the help of established COE’s (IOT, Virtual Instrumentation) Students are working with cutting edge technology and can pursue their career in the specific area.

PSO3	1.46	0.62	57.53%	Above Target	1. Not exposed to current COE

Proposed Action/Action Taken---

1. Training programs should be organized by COEs on modern engineering tools and Technologies.
2. Few courses on latest technology should be incorporated in curriculum through COEs.
3. Future planning is to provide more training on modern tools and technologies available in COEs and conduct certification examinations. So that students can pursue their career in specific area.

Taken Actions---

1. Organized Short term training program on software tool “LabVIEW”.
2. Organized Short term training program on “Data acquition using My-Rio and Hardware Programming”:
3. A course on programming tool is added.
4. New software are procured like RAFA solution, Proteus VSM.

EC 1731

The CO attainment level for this subject is 2 which is satisfactory for this subject

The PO-PSO attainment as compared to targeted attainment is satisfactory

EC 1732

The CO attainment level for this subject is 2 for CO1 and 1 for CO(2,3). For the improvement in attainment of CO2 and CO3, student must be provided with practices sheet consisting of analytical and numerical questions.

The PO-PSO attainment as compared to targeted attainment is average, for the improvement the students must be encouraged to solve the provided practice sheets and go through online MOOCs courses to develop their understanding of subject after attending the theory classes.

EC 1734

The CO attainment level for this subject is 2 which is satisfactory for this subject

The PO-PSO attainment as compared to targeted attainment is satisfactory

EC 1735

The COs for this subject are not attained. For the attainment of COs students must be provided with extra study material focusing toward basic concepts of mathematics related to subject, and students must be motivated to pursue online available MOOCs courses.

Since the COs for this subject are not attained therefore the PO-PSOs for this subject are also not attained, for the attainment students must be encouraged to solve problems related to trigonometry, differential equation and calculus etc. It is observed that students appearing in the examination vary in their aptitude for understanding of subject, for such students who are unable to grasp the concepts in allotted time some extra/remedial classes must be organized.

EC 1736

The CO attainment level for this subject is 3 which is satisfactory for this subject

The PO-PSO attainment as compared to targeted attainment is satisfactory

EC 1741

The CO attainment level for this subject is 2 & 3 which is satisfactory for this subject

The PO-PSO attainment as compared to targeted attainment is satisfactory

EC1742: The CO attainment level for this subject is 3 for CO 2, but 2 for CO (1, 3,4)which is satisfactory for this subject.

Similarly PO and PSO attainment of this course does not differ much from targeted value.

EC- 1743

In control system engineering, CO's attainment is satisfactory.

PO, PSO attainment is satisfactory for this subject as this is a competency course.

EC 1744

The CO attainment level for this subject is 1, this is sufficient for a pre-requisite subject.

The PO-PSO attainment for this subject as compared to targeted attainment is average, this as a pre-requisite subject, student needs to build a basic understanding of topic, so some sessions on mathematical equation solving and expert lectures focusing on theory of recent works can be conducted to improve the attainment level

EC 1745

The CO attainment level is 2, which is satisfactory for this subject

The PO-PSO attainment as compared to targeted attainment is satisfactory

EC 1746

The CO attainment level for this subject is 3 which is satisfactory for this subject

The PO-PSO attainment as compared to targeted attainment is satisfactory

EC 1747

The CO attainment level for this subject is 3 which is satisfactory for this subject

The PO-PSO attainment as compared to targeted attainment is satisfactory

EC 1751

The CO attainment level for this subject is 2 & 3 which is satisfactory for this subject

The PO-PSO attainment as compared to targeted attainment is satisfactory

EC 1752

The CO attainment level for this subject is 2 which is satisfactory for this subject

The PO-PSO attainment as compared to targeted attainment is satisfactory

EC 1753

The CO attainment for this subject is at level 2 for CO(1,2,4), and at 1 for CO3, for its improvement video lecture dealing with architecture of the microprocessors can be suggested to students for extra study

The PO-PSO attainment as compared to targeted attainment is satisfactory

EC 1754

The CO attainment level for this subject is 2 & 3 which is satisfactory for this subject

The PO-PSO attainment as compared to targeted attainment is satisfactory

EC 1757

The CO attainment level for this subject is 3 which is satisfactory for this subject

The PO-PSO attainment as compared to targeted attainment is satisfactory

EC 1761

The CO attainment level for this subject is 3 which is satisfactory for this subject

The PO-PSO attainment as compared to targeted attainment is satisfactory

EC 1762

The CO attainment level for this subject is 2 & 3 which is satisfactory for this subject

The PO-PSO attainment as compared to targeted attainment is satisfactory

EC 1763

The CO attainment level for this subject is 3 which is satisfactory for this subject

The PO-PSO attainment as compared to targeted attainment is satisfactory

EC 1764

The CO attainment level for this subject is 3 which is satisfactory for this subject

The PO-PSO attainment as compared to targeted attainment is satisfactory

EC 1765

As this course is an advanced course for which expected attainment level is 3. But COs' and hence POs' and PSOs'are at low level. To improve the outcomes of this course: students are motivated to go through online courses such as NPTEL. Students are also motivated to attend some probability theory based online courses.

EC 1766

The CO attainment level for this subject is 3 which is satisfactory for this subject

The PO-PSO attainment as compared to targeted attainment is satisfactory

EC 1767

The CO attainment level for this subject is 3 which is satisfactory for this subject

The PO-PSO attainment as compared to targeted attainment is satisfactory

EC 1771

The CO attainment level for this subject is 2 & 3 which is satisfactory for this subject

The PO-PSO attainment as compared to targeted attainment is satisfactory

EC 1772

The CO attainment level for this subject is 2 & 3 which is satisfactory for this subject

The PO-PSO attainment as compared to targeted attainment is satisfactory

EC 1773

The CO attainment level for this subject is 3 which is satisfactory for this subject

The PO-PSO attainment as compared to targeted attainment is satisfactory

EC 1775

The CO attainment level for this subject is 2 which is ok for this subject, for its improvement more expert lectures and hands on/case studies of embedded systems may be provided for students

The PO-PSO attainment as compared to targeted attainment may be improved by conducting more session on programming languages and providing students with online study materials for improving their concepts related to embedded systems.

EC 1776

The CO attainment level for this subject is 3 which is satisfactory for this subject

The PO-PSO attainment as compared to targeted attainment is satisfactory

EC 1777

The CO attainment level for this subject is 3 which is satisfactory for this subject

The PO-PSO attainment as compared to targeted attainment is satisfactory

EC 1781

The CO attainment level for this subject is 2 which is satisfactory for this subject, for its improvement more expert lectures and handouts related to advancements in field of nano materials may be provided for students

The PO-PSO attainment as compared to targeted attainment may be improved by providing students with online study materials for improving their concepts. Expert lectures to improve the understanding of potential of nano technology and the design approach.

EC 1782

The CO attainment level for this subject is 3 for CO(2,3,4), but 2 for CO1 which is satisfactory for this subject, however for further improvement in attainment of CO1, students must be motivated to explore the online available courses on the basics of radar modules

The PO-PSO attainment as compared to targeted attainment may be improved by providing students with online study materials for improving their concepts and Expert lectures to improve the understanding of structure, working and applications of Radar systems.

EC 1783

The CO attainment level for this subject is 3 which is satisfactory for this subject

The PO-PSO attainment as compared to targeted attainment is satisfactory

EC 1784

The CO attainment level for this subject is 3 which is satisfactory for this subject

The PO-PSO attainment as compared to targeted attainment is satisfactory

7.2 Academic Audit and actions taken thereof during the period of Assessment (15)

(Academic Audit system/process and its implementation in relation to Continuous Improvement)

The process of Academic Auditing intends to monitor and enhance the quality of technical education through proper guidelines for both teaching faculty and students, so as to ensure qualified engineers/researchers passing out from S.A.T.I.

OBJECTIVES OF ACADEMIC AUDITING:

(i) To ensure academic accountability.

(ii) To define quality of each component of the functionalities and to ensure quality of technical education throughout the system.

(iii) To safeguard functionalities of technical education.

(iv) To define effectiveness of teaching – learning process and to devise methodology to confirm maximum output from faculty members as well as students.

DOCUMENTS TO BE PRODUCED FOR AUDIT COURSE DIARY AND COURSE FILE

Institution has to maintain the details of various academic activities in the form of documents given below. These documents shall be made available to the external auditor as and when required.

1. Class Time Table& Faculty Time Table
2. Students Roll List
3. Students Batch List (for practical courses, projects)
4. Teachers Diary for all the courses.
5. Course File
6. Equipment Log register used in Laboratories

7. Attendance statement of students

8 statement of marks of internal tests

9. Project (Mini project/Design project/Final semester project) reports.

10. Internal evaluation marks. (Mid sem test and Quiz)

12. Result Analysis

Following parameters are audited with respect to each program:

1. Lesson plan, Result analysis and evaluation.
2. Mentoring and counceling.
3. Events organized
4. Events attended.
5. Research activities.
6. Placements and higher studies.

7.3 Placement, Higher Studies and Entrepreneurship

Items	CAYm1 2018-19	CAYm2 2017-18	CAYm3 2016-17
Total No. of Final Year Students (N)	65	61	60
No. of students placed in companies or Government Sector (x)	23	27	17
% Placement	35.38%	44.26%	28.33%
GATE or equivalent State or National Level Tests, GRE, GMAT etc Selected	8	2	0
% GATE	12.31%	03.28%	0%
No. of students turned entrepreneur in engineering/technology (z)	0	0	0
Total (Placement+Gate+Entrepreneur)	31	29	17
Percentage (%)	47.69%	47.54%	28.33%

7.4 Improvement in the quality of students admitted to the program (20)

Assessment is based on improvement in terms of ranks/score in qualifying state level/national level entrances tests, percentage marks in Physics, Chemistry and Mathematics in 12th Standard and percentage marks of the lateral entry students.

Item		CAY (2019-20)	CAYm1 (2017-18)	CAYm2 (2016-17)
National Level Entrance Examination (Name of the Entrance Examination): JEE	No. of Students admitted	-	-	-
	Opening Score/Rank	-	-	-
	Closing Score/Rank	-	-	-

State/Institute/Level Entrance Examination/Others (Name of the Entrance Examination)	No. of Students admitted	548	445	468
	Opening Score/Rank	95.71/48082	113/42747	124/44300
	Closing Score/Rank	0.76/114.248	0.00/993639	0.00/1037769
Name of the Entrance Examination for Lateral Entry or lateral entry details	No. of Students admitted	34	67	65
	Opening Score/Rank	84.2/74	79.5/297	85.1/33
	Closing Score/Rank	63.2/3286	57.9/4649	56.2/4588
Average CBSE/Any other Board Result of admitted students (Physics, Chemistry & Mathematics)				

Table B.7.4.

8.1. First Year Student-Faculty Ratio (FYSFR) (5)

Data for first year courses to calculate the FYSFR:

Year	Number of students (approved intake strength)	Number of faculty members (considering fractional load)	FYSFR	*Assessment = (5 ×20)/ FYSFR (Limited to Max. 5)
CAY	540	61	8.85	11.29
CAYm1	540	83	6.51	15.36
CAYm2	540	73	7.4	13.51
Average	540	72.33	7.58	13.38

Table B.8.1.

*Note: If FYSFR is greater than 25, then assessment equal to zero.

8.2. Qualification of Faculty Teaching First Year Common Courses (5)

Assessment of qualification = (5x +3y)/RF, x= Number of Regular Faculty with Ph.D., y = Number of Regular Faculty with Post-graduate qualification RF= Number of faculty members required as per SFR of 20:1, Faculty definition as defined in 5.1

Year	X	Y	RF	Assessment of faculty qualification (5x + 3y)/RF
CAY	32	29	27	9.14
CAYm1	39	44	27	12.11
CAYm2	34	39	27	10.63
	Average Assessment			10.62

Table B.8.2

8.3. First Year Academic Performance (10)

Academic Performance = ((Mean of 1st Year Grade Point Average of all successful Students on a 10 point scale) or (Mean of the percentage of marks in First Year of all successful students/10)) x (number of successful students/number of students appeared in the examination)

Successful students are those who are permitted to proceed to the second year.

Branch	2016-2017							Mean	Mean	Academic Performance
	Dec 2016			June 2017			Promoted to second year	C	Z	= C * Z
	Appeared Students	Successful Students X	Mean A	Appeared Students	Successful Students Y	Mean B		=(A+B) /2	=(X+Y) /(P+Q)	
BME	36	30	6.89	34	20	7.35	25	7.12	0.71	5.09
CE	60	58	7.20	60	41	7.52	60	7.36	0.83	6.07
CSE	63	55	8.18	73	51	7.65	62	7.91	0.78	6.17
EE	62	56	7.351	61	50	7.405	50	7.378	0.86	6.36
ECE	61	57	7.06	60	48	5.81	60	6.435	0.87	5.58
EI	56	52	7.2	56	38	9.7	55	8.45	0.80	6.79
IT	61	58	7.38	61	43	7.4	60	7.39	0.83	6.12
ME	61	53	7.36	64	44	7.45	60	7.405	0.78	5.75
PCE	49	41	7.24	49	30	7.41	46	7.325	0.72	5.31
Total	56.56	51.11	7.32	57.56	40.56	7.52	59.75	7.42	0.80	5.91

Branch	2017-2018							Mean	Mean	Academic Performance
	Dec 2017			June 2018			Promoted to second year	C	Z	= C * Z
	Appeared Students	Successful Students X	Mean A	Appeared Students	Successful Students Y	Mean B		=(A+B) /2	=(X+Y) /(P+Q)	
BME	22	22	6.18	22	22	5.77	22	5.97	1.00	5.98
CE	62	45	7.08	61	38	6.60	61	6.84	0.67	4.62
CSE/IT	120	95	7.00	118	90	6.62	90	6.81	0.78	5.29
EE	60	47	7.22	57	40	4.76	57	5.99	0.74	4.45

ECE	56	40	5.11	55	44	7.33	52	6.22	0.76	4.71
EI	46	36	8.7	46	33	9.19	46	8.94	0.75	6.71
ME	61	49	7.35	59	43	6.81	56	7.08	0.77	5.43
PCE	28	15	7.12	27	23	6.99	27	7.05	0.69	4.87
Total	56.88	43.63	6.97	40.88	30.38	5.93	47.88	6.45	0.77	4.94

Branch	2018-2019							Mean	Mean	Academic Performance
	Dec 2018			June 2019			Promoted to second year	C	Z	= C * Z
	Appeared Students	Successful Students X	Mean A	Appeared Students	Successful Students Y	Mean B		=(A+B) /2	=(X+Y) /(P+Q)	
BME	08	07	6.4	08	03	6.41	8	6.40	0.625	4
CE	62	37	6.29	62	51	6.28	62	6.28	0.709	4.45
CSE/IT	136	97	6.55	133	80	6.33	125	6.44	0.65	4.23
EE	63	44	7.47	61	44	6.52	61	6.995	0.709	4.959
ECE	63	23	8.86	62	45	7.81	62	8.335	0.544	4.53
EI	42	29	8.55	40	24	8.6	40	8.575	0.646	5.5
ME	60	40	6.69	60	32	6.35	54	6.52	0.6	3.912
PCE	18	09	7.03	15	09	7.27	13	7.15	0.545	3.89
Total	452	286	58.47	441	288	55.57	425	56.695	5.028	35.471

8.4. Attainment of Course Outcomes of first year courses (10)

8.4.1. Describe the assessment processes used to gather the data upon which the evaluation of Course Outcomes of first year is done (5)

(Examples of data collection processes may include, but are not limited to, specific exam questions, laboratory tests, internally developed assessment exams, oral exams assignments, presentations, tutorial sheets etc.)

Name of the Department	Course Code	Course Title	Teaching Faculty	Session	Semester	Remark
Applied Maths	BT-1815	Engineering Maths I	Dr. Poonam lata Sagar	2018-2019	I	OK

	BT-1825	Engineering Maths II	Dr. Rajendra Pathak	2018-2019	II	OK
Applied Physics	BT -1821	Engineering Physics	Dr. Sachin Mahajan	2018-2019		Ok
Applied Chemistry	BT -1811	Engineering Chemistry	Dr. Manoj Datar	2018-2019	I & II	Ok
	BT -1824	Energy Environment Ecology & Society	Dr. R. N. Shukla	2018-2019	I & II	Ok
			Dr. Pradeep Sharma	2018-2019	I & II	Ok
Civil Engineering	BT -1822	Basic Civil Engineering & Engineering Mechanics	Tanu Chaturvedi	2018-2019	I	OK
			Suraj Jain	2018-2019	II	OK
Computer Science Engineering	BT -1826	Computer Programming	Sourabh Sharma	2018-2019	I	Ok
			Sachin kamley			
Electrical Engineering	BT -1812	Basic Electrical & Electronics Engineering	Bharat Singh Choudhary	2018-2019	I	Ok
			Bhavna Sharma	2018-2019	II	Ok
Mechanical Engineering	BT -1823	Basic Mechanical Engineering	Prachi Kanherkar	2018-2019	I & II	Ok
	BT-1816	Workshop Practice	R.M. Saxena	2018-2019	I & II	Ok
	BT-1813	Engineering Graphics	Kamlesh Sharma	2018-2019	I & II	Ok
Master of Computer Application	BT-1826	Computer Programming	Narendra Gupta	2018-2019	II	Ok
			Sushil Verma	2018-2019	II	Ok
			Dr. Sachin Kamley	2018-2019	II	Ok
			Sourabh Sharma	2018-2019	II	Ok
Humanities	BT-1814	Communication Skills	Dr. Manorama Saini	2018-2019	I & II	Ok

8.4.2. Record the attainment of Course Outcomes of all first year courses (5)

Program shall have set attainment levels for all first year courses.

(The attainment levels shall be set considering average performance levels in the institution level examination or any higher value set as target for the assessment years. Attainment level is to be measured in terms of student performance in internal assessments with respect the COs of a subject plus the performance in the institution level examination)

Session 2018-2019

Name of the Department	Course Code	Course Title	**Attainment**				
			CO1	**CO2**	**CO3**	**CO4**	**CO5**
Applied Maths	BT-1815	Engineering Maths I	0.58	0.7	0.23	0.53	0.35
	BT-1825	Engineering Maths II	0.50	0.40	0.43	0.44	0.23
Applied Physics	BT-1821	Engineering Physics	0.43	0.38	0.39	0.36	0.58
Applied Chemistry	BT-1811	Engineering Chemistry	0.43	0.494	0.33	0.36	0.25
Civil Engineering	BT-1822	Basic Civil Engineering & Engineering Mechanics	0.49	0.35	0.50	0.31	0.34
Electrical Engineering	BT-1812	Basic Electrical & Electronics Engineering	0.47	0.47	0.31	0.43	-
Mechanical Engineering	BT-1823	Basic Mechanical Engineering	0.49	0.47	0.4	0.48	0.5
Mechanical Engineering	BT-1813	Engineering Graphics	0.62	0.42	0.42	0.45	0.48
Petrochemical Engineering	BT-1824	Energy Environment Ecology & Society	0.6	0.61	0.52	0.5	0.5
Humanities	BT-1814	Communication Skill	0.55	0.49	0.53	0.5	0.5

8.5. Attainment of Program Outcomes from first year courses (20)

8.5.1. Indicate results of evaluation of each relevant PO and/or PSO if applicable (10)

The relevant program outcomes that are to be addressed at first year need to be identified by the institution

Program Outcome attainment levels shall be set for all relevant POs and/or PSOs through first year courses.

(Describe the assessment processes that demonstrate the degree to which the Program Outcomes and Program Specific Outcomes are attained through first year courses and document the attainment levels. Also include information on assessment processes used to gather the data upon which the evaluation of each Program Outcome is based indicating the frequency with which these processes are carried out)

PO/PSO Attainment: Mention first year courses

Course	Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
BT-1811	Engineering Chemistry	37.5	34.37	15.62	18.75	12.5	37.5	37.5	0	25	0	0	12.5
BT-1812	Basic Electrical & Electronics Engineering	42.7	42.7	42.7	42.7	28.4	14.2	28.4	14.2	42.7	0	28.4	28.4
BT-1813	Engineering Graphics	48	44.8	32	35.2	32	0	0	0	0	0	16	16
BT-1814	Communication Skills	0	0	0	0	34	17	17	17	34	22.61	17	25.5
BT - 1815	Engineering Maths I	47.8	47.8	47.8	31.8	15.6	15.6	0	0	15.6	15.6	15.6	15.6
BT-1825	Engineering Maths II	40	40	40	26.28	13.34	13.34	0	0	13.34	13.34	13.34	13.34
BT - 1821	Engineering Physics	42.9	39.38	32.22	25.06	21.48	21.48	14.32	19.04	25.06	28.64	23.77	32.22
BT - 1822	Basic Civil Engineering & Engineering Mechanics	35.47	40	22.13	22.13	13.33	13.33	13.33	13.33	13.33	13.33	13.33	22.13
BT - 1823	Basic Mechanical Engineering	47	43.08	23.5	15.66	0	15.66	15.66	15.66	0	0	0	15.66
BT -	Energy Environment	0	36	0	54.96	18.32	54.96	54.96	54.96	36	0	36	36

8.5.2. Actions taken based on the results of evaluation of relevant POs and PSOs (10)

(The attainment levels by direct (student performance) are to be presented through Program level Course-PO matrix as indicated)

PO Attainment Levels and Actions for improvement – CAY only – Mention for relevant Pos

POs	Target Level	Attainment Level	Observations

PO1: Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization for the solution of complex engineering problems.

PO1	78.86	42.67	Attainment is low in Basic civil engineering and engineering chemistry. Observations : 1. Attainment level still it is 42.67 we need to improve. 2. Students find it difficult to solve and analyze the problems.

Action 1: Additional classes to be conducted to introduce projection concepts.

Action 2: More problems will be given for practices.

PO2: . Problem analysis: Identify, formulate, research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO2	65.93	40.90	Attainment is low in engineering chemistry and energy environment ecology and soceity. Observations : 1. Attainment level still it is 40.90 we need to improve. 2. Students find it difficult to solve and analyze the problems.

Action 1: Additional classes to be conducted to introduce projection concepts.

Action 2: More problems will be given for practices.

PO3: Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for public health and safety, and cultural, societal, and environmental considerations.

PO3	58.87	31.99	Attainment is low in Basic civil engineering and Basic mechanical engineering. Observations : 1. Attainment level still it is 31.99 we need to improve. 2. Students find it difficult to solve and analyze the problems.

Action 1: Additional classes to be conducted to introduce projection concepts.

Action 2: More problems to be taught in tutorial classes.

PO4: . Conduct investigations of complex problems: The problems: • that cannot be solved by straightforward application of knowledge, theories and techniques applicable to the engineering discipline. • That may not have a unique solution. For example, a design problem can be solved in

many ways and lead to multiple possible solutions. • That requires consideration of appropriate constraints/requirements not explicitly given in the problem statement. (Like: cost, power requirement, durability, product life, etc.). • Which need to be defined (modeled) within appropriate mathematical framework. • That often require use of modern computational concepts and tools.#

PO4	53.66	30.28	Attainment is low in Basic civil engineering and engineering chemistry. Observations : Attainment level still it is 30.28 we need to improve.

Action 1: Additional classes to be conducted to introduce projection concepts.

Action 2: More problems to be taught in tutorial classes.

PO5: Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling to complex engineering activities, with an understanding of the limitations.

PO5	34.07	20.99	Attainment is low in Basic civil engineering and engineering maths-I. Observations : 1. Attainment level still it is 20.99 we need to improve. 2. Students find it difficult to solve and analyze the problems.

Action 1: Additional classes to be conducted.

Action 2: Possibilities will be find to explore the target level.

PO6: The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal, and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO6	40	22.56	Attainment is low in Basic electrical and electronics engineering and engineering maths-II. Observations : 1. Attainment level still it is 22.56 we need to improve. 2. Students find it difficult to solve and analyze the problems.

Action 1: Additional classes to be conducted.

Action 2: Possibilities will be find to explore the target level.

PO7: Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO7	45.71	25.88	Attainment is low in communication skill and engineering physics. Attainment level still it is 25.88 students are doing better in improving the overall expertise in the field of engineering but due to lack of communication skills and other ethical knowledge Observations. Some are lagging in real life knowledge.

Action 1: Additional classes to be conducted.

Action 2: Possibilities will be find to explore the target level.

PO8: . Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO8	37.06	22.36	Attainment is low in Basic electrical and electronics engineering and Basic civil engineering. Observations : 1. Attainment level still it is 22.36 we need to improve. 2. Students find it difficult to solve and analyze the problems.

Action 1: Possibilities will be find to explore the target level

PO9: . Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO9	45.83	25.62	Attainment is low in Engineering maths-I and Basic civil engineering. Observations : 1. Attainment level still it is 25.62 we need to improve. 2. Students find it difficult to solve and analyze the problems.

Action 1: Possibilities will be find to explore the target level

PO10: Communication: Communicate effectively on complex engineering activities with the engineering community and with t h e society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO10	33.76	18.7	Attainment is low in Engineering maths-II and Basic civil engineering. Observations : 1. Attainment level still it is 18.7 we need to improve. 2. Students find it difficult to solve and analyze the problems.

Action 1: Possibilities will be find to explore the target level

PO11: Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments

PO11	35.53	20.43	Attainment is low in Engineering maths-II and Basic civil engineering. Observations : 1. Attainment level still it is 20.43 we need to improve. 2. Students find it difficult to solve and analyze the problems.

Action 1: Possibilities will be find to explore the target level

PO12: Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

PO12	38.43	21.73	Attainment is low in Engineering chemistry and Engineering maths-II. Observations : 1. Attainment level still it is 21.73 we

need to improve. 2. Students find it difficult to solve and analyze the problems.

Action 1: Additional classes to be conducted.

Action 2: Possibilities will be find to explore the target level.

CRITERION-9 Student Support Systems

9. STUDENT SUPPORT SYSTEMS (50)

9.1 Mentoring system to help at individual level (5)

Type of mentoring: Professional guidance/ career advancement/course work specific/ laboratory specific/ all-round development. Number of faculty mentors: Number of students per mentor: Frequency of meeting:
(The institution may report the details of the mentoring system that has been developed for the students for various purposes and also state the efficacy of such system)

- Mentoring System : Yes
- Type of Mentoring : Tutor Guardian Scheme
- Number of faculty mentors : 138
- Number of students per mentor : 20
- Frequency of meeting : Fortnightly

Details of the mentoring system

A faculty mentor is assigned to a group of 20 students to deal with their problems the mentor maintains record of students. The mentor observes the overall growth of student and provides counseling whenever required. The mentor also makes sure to maintain a regular parent-teacher dialogue.

Efficiency of such system

The system develops an interaction amongst the students, teachers and parents. The system helps to improve the academic performance of the students. The system provides scope for healthy, positive and stress free state of mind. Teachers are also becoming more responsive to the learner needs day by day which is being reflected in the diary maintained by the teacher. The mentors meet to the students periodically and monitor their performance and their activities. Guidance regarding the lagging issues is provided. Occasionally tutor meeting with the parents is conducted based on the requirement.

Professional Guidance:

The department is well equipped with knowledgeable Human resources in the form of members of faculty who by keeping themselves of development, offer guidance to the prospective professionals in addition to the classroom teaching. The Industry-institute Partnership cell and Entrepreneurship development cell have been putting efforts in this direction.

Career advancement:

The Training and Placement cell has been active not only in arranging campus recruitment drives, but also offering awareness and training for the students Course work. Members of faculty handling different courses interact with students in clearing all their Concept-oriented and test based mechanics of the respective courses. The teachers after first of formative evaluation guide the students as far as student- specific gray areas are concerned.

Lab-specific:

Each of the lab sessions are handled by 2 Teachers in order to have special care for the students(batch size 30) while experiments are being handled. A demonstrative presentation is given by the teacher concerned before every experiment. The Laboratory records are evaluated after the experiment is held. In other words, there is active involvement of the faculty members at Pre-experiment stage, at the time of experiment and after the experiment.

Total Development:

As stated above, the college puts forward efforts to realize total development of the student. In addition to academics, literary, cultural and sports activities are conducted which offer leadership qualities, decision making abilities, team spirit, precision, analytical capabilities, socio- psychological awareness etc. which make an individual a intellectually mature being.

9.2. Feedback analysis and reward/corrective measures taken, if any (10)

Feedback collected for all courses: YES/NO; Specify the feedback collection process; Average Percentage of students who participate; Specify the feedback analysis process; Basis of reward/ corrective measures, if any; Indices used for measuring quality of teaching & learning and summary of the index values for all courses/teachers; Number of corrective actions taken.
Feedback collected for all courses (Yes/No): Yes

Specify the feedback collection process:

A standard feedback questionnaire is collected from the students every semester course wise. At the end of semester, department conduct end course survey in order to take the feedback about the facilitators as well about the effectiveness of course. Apart from this exit survey is also conducted for passing out student

Number of Feedback Items	:	20
Frequency of feedback collection	:	Once in a semester.
Feedback collection Hard-copy	:	Yes.
Average percentage of students who participates	:	**above** 80%

Feedback analysis Process:

1. The feedback analysis is done manually
2. Collected feedback is scrutinized at department level.
3. The feedback is quantified
4. All the parameters mentioned in the feedback form is analyzed.
5. Ability of teaching with respect to each item and comprehensive ability of the teachers is analyzed
6. All the comments written by the students in the feedback forms is communicated to the respective faculty members along with their feedback levels to know their strengths and weaknesses and to enhance their teaching skills.

Basis of reward/corrective measure:

1. Faculty members who get average feedback identified and provided with induction program and faculty development program.

2. Also the faculty members who get better feedback appreciated by management on Independence day & Republic day

9.3. Feedback on facilities (5)

Assessment is based on student feedback collection, analysis and corrective action taken.

1. Student's feedback on facilities such as class room ambiance, furniture, is satisfactory.
2. Student's feedback on facilities such as library, no of books to be increased. We have increase purchase of books for central library.
3. Student's feedback on facilities such as speed of internet to be improved. We have increased the band width & procured another WiFi network (Jio).

9.4. Self-Learning (5)

(The institution needs to specify the facilities, materials and scope for self-learning/ learning beyond syllabus, Webinars, Podcast, MOOCs etc. and evaluate their effectiveness)

- The curriculum offers courses like, minor project, major projects where the topics are self-selected or based on guide suggestion. The component of self-learning is evaluated in these courses.
- Seminars, conference, workshop & guest lecturers were organized.
- In every lecture 5-10 minutes discussion on new technology and its application in real life that is beyond the syllabus is discussed for improvement & innovation.
- Every student has to submit a home assignment in every course which has been evaluated for 10 marks. Some of these tasks are beyond syllabus to encourage out-standing students to develop their self-learning capabilities.
- Department library with sufficient number of volumes on core and application areas, technology awareness journals are opened during college working hours. IPR Cell, Innovation Club, Centre of Excellence has been established in Institute Swayam & Swayam Prabha courses are also available. T.V. Set at prominent locations has been installed to watch the online lecture.
- E-notes has been prepared by the department faculty and maintained by the department faculty for the development of students for all subjects in our department.
- Apart from the above, the college actively promotes self-learning through the following resources procured through NPTEL, QEEE and other Audio-Video content:

9.5. Career Guidance, Training, Placement (10)

(The institution may specify the facility, its management and its effectiveness for career guidance including counseling for higher studies, campus placement support, industry interaction for training/internship/placement, etc.)
The Career guidance cell and Training & Placement department in coordination with Student section Counselors keeps students abreast with the opportunities of higher studies & placement on regular basis. The team for Career counseling comprises of departmental Representatives.

Functions of the Departmental Representative

1. To arrange Seminars / Workshops on Career opportunities
2. To conduct mock tests for competitive examinations.
3. To arrange interactive sessions between alumni and students.
4. To procure study material and make it available in the Library/Intranet.
5. Display of Posters, Notices relating to Opportunities

Details of activities organized by placement cell year 2018-19

1. Employability Skill Training run by T&P Cell for betterment of students.
2. GATE Training run by T&P Cell for students who are interested in Higher Education and to face competitive GATE exam .
3. 2 days Workshop on Employability Skill on 19-20 Jan, 2019.
4. Employability Sill Test by Aspiring Minds for 1455 students.

Selections through campus Drive durig 2018-19

S.NO	Name Of Company	Selections
1	Zensar Technologies	8
2	Argusoft	0
3	Xoriant Technologies	1
4	Prism Johnson	6
5	Capgemini	48
6	Tata AIG	2
7	TCS Mumbai	36
8	Trading Bells	11
9	Matrix Inc.	0
10	UNO TECH.	0
11	LG Soft	0
12	Relince Jio	1
13	BORL	2
14	Infosys	9
15	Cognizant	2
16	LG Soft	0
17	Kotak Mahindra	8
18	Opentext	0
19	GR Infra	3
20	Matrix Inc.	0
21	Research Panel Indore	5
22	Infostretch Corporation (India) Pvt Ltd.	1
23	Zyacus	0
24	Rippls Advisory indore	15
25	Kalka IPS Academy	2
26	Calsoft	2
27	Infosys	1
28	Insta Printz	1
29	Mount Blue	0
30	BBB	0
31	Azim Prem Ji Foundation	0
32	AU Bank	0
33	Tech. Mahindra	2

34	50 Hertz	**1**
	TOTAL SECLCTIONS	**167**

Placement Details of 5 years

Year	No of Companies Visited in closed /pool)	No of students placed (Open campus drive)		No of students placed (Open campus drive)		No of students placed		Total Placement
		Engineering	Non Engineering	Engineering	Non Engineering	Engineering	Non Engineering	
2018-19	34	151	16	13	-	151	16	167
2017-18	31	102	23	7	0	109	23	132
2016-17	32	70	5	28	0	98	5	103
2015-16	19	182	22	0	0	182	22	204
2014-15	33	169	13	20	18	189	33	222

9.6. Entrepreneurship Cell and incubation facilities (5)

(The institution may describe the facility, its management and its effectiveness in encouraging entrepreneurship and incubation) (Success stories for each of the assessment years are to be mentioned)

In our institute entrepreneurship development cell is organizing workshop on entrepreneurship. Through entrepreneurship development cell interaction with the entrepreneur is organized. Through entrepreneurship development cell competitions are arranged for new innovative business ideas. The entrepreneurship Development Cell has been organizing workshops and seminar for the benefit of students. The EDC Cell invites speaker, Entrepreneurs to share their experiences and also invites professionals from Banks, Federation of Commerce and Industry to motivate and educate students on Entrepreneurship.

Vision and Ideology of the E-Cell Vision
To stimulate, support and sustain all initiatives and endeavors of students, which will lead to generation of entrepreneurship based on Engineering and Technology

Ideology

- To motivate and inspire students to take up the challenge of entrepreneurship
- To equip them with necessary skills and provide all possible assistance
- To promote creative thinking and an entrepreneurial mindset among the students
- To promote innovations and help convert them into market accepted Products

Activities undergoing in E- Cell:

The E-cell Organizes lectures, workshops and seminars by renowned personalities from different domains of expertise, competitions of various kinds etc. round-the-year in order to create awareness and to sharpen business acumen of students and aspiring entrepreneurs. Mentor students / new faculties who have business ideas by bringing expertise to their doorsteps.

The E-cell is network hub for students aspiring to be entrepreneurs and also play a role in team building as a part of its mentorship. Mentoring the students at an early stage by giving proper direction and necessary exposure would be crucial in converting technical ideas/projects into viable business plans It is an interface between the entrepreneurial activity in institute and the outside world, a consolidation of logistic and knowledge resources necessary to make a business plan and set up an enterprise. Form permanent associations with professional bodies and organizations, Universities, corporations, media etc. to facilitate exchange of ideas and to promote entrepreneurial ventures. Knowledge partnerships will play an important role in engaging good expertise for the benefit of entrepreneurial activity at institute. Associations with venture capital firms and seed funds would be crucial in the setup of new ventures. To achieve the above objectives the E-Cell will focus on some initiatives to foster the spirit of entrepreneurship in the following ways.

Innovation club:

In It is aimed at nurturing innovation at the grassroots level, it is an organized group of selected students getting together to discuss each other's ideas. This discussion is now being done on a wiki page. The discussion helps the students stay motivated to work on their idea as well as helps build their idea into something feasible.

In-house Events/competition:

To motivate student towards entrepreneurship, e-Cell will regularly conduct in-house competition of various events such as business idea competition, case study competition, Business quiz, brand watch, innovation approach, best out- of- waste competition, innovation approaches in IT industry, new ventures lunched and their idea and profile, story writing of successful entrepreneur, Expose the youth to the latest innovations and entrepreneurial success stories etc.

Start up cell:
To connect the students with the start-ups through which start-ups get an opportunity to interact with the students and pitch their ideas to the panel of Venture Capitalists and the students get hired for summer internship.

For Smooth functioning of E-cell and carry out strategic planning with aligning our vision and mission and promote of E-cell, we should have team of following:

a. Faculty Coordinator :

There is a faculty coordinator whose role will is to see day to day affair of E-cell and organize the different events and competition. He is responsible to promote E-Cell and work under the guidance of Director. He is responsible to work according to vision and mission of the cell.

b. Student Team:

There is a student Coordinator, and Secretary cum treasurer from the student community, who will work under the guidance of committee member. They are responsible for monitoring

E-cell activities and initiatives. They remain in touch various students of E-cell and other Entrepreneurship network establish in different institute.

9.7. Co-curricular and Extra-curricular Activities (10)

(The institution may specify the co-curricular and extra-curricular activities)(Quantify activities such as NCC, NSS etc.)

NCC ACTIVITIES FROM DEC 2018 TO DEC 2019

S. NO.	**DATE**	**ACTIVITY**
1	26.01.19	REPULIC DAY PARADE AT POLICE GROUND VIDISHA
2	21.06.19	INTERNATIONAL YOGA DAY CELEBRATION
3	23.07.19	PLANTATION AT NCC PARK IN COLLEGE CAMPUS
4	26.07.19	KARGIL VIJAY DIWAS(MOVIE SHOW)
5	15.08.19	INDEPENDACE DAY CELEBARATION AT COLLEGE
6	02.10.19	GANDHI JAYANTI CELIBRATON
7	01.11.19	DIAMOND JUBLEE CELEBRATION (FLAG HOSTING)
8	05.12.10	SWACHH BHARAT ABHIYAN(MONUMENTS CLEANING)
9	19.06.19 To 28.06.19	CATC CAMP
10	21.09.19 To 30.09.19	CATC CAMP

For the overall development of the students, the institute organize Techfest, Samrat Utsav, State level inter engineering college cricket tournament every year in this we organize different events like, cultural. Sports, painting, competitions through various committees. A student's newsletter and magazine is also published to exhibit their talent.

Co-curricular Activities

Engineers Day, Mathematics Day, Rashtriya Yuva Divas, International Yoga day ,Teachers Day, Women Day, World- Water Day, Earth Day, World Book Day, Press Freedom Day,world Science Day,
Quiz Competition
Tech Fest (SATYARTH)
Seminars, Workshop,
Conference & Guest Lecture (at least once in a session in each department) Institute is registered for NSS, & University Youth Festival for sports and cultural activities. Yearly excursion cum Industrial tours is conducted for students wherein students are taken to various places of interest.

Extra-curricular activities are:

Activity	**Detail of activities**

Annual Festival (SAMRAT UTSAV)	Extempore, Mehndi Competitions, , Poster Competition, Classical / Fusion Dances, Quiz, Poetry, Debate, Essay, Painting, Sketching, Photography, Robo competition, Dance (Group &Solo), Singing (Group &Solo), skit competition, Nukkad Natak, Rangoli etc. Sports Competition (kabbadi, Volley Ball ,Hand Ball, Badminton ,Cricket, Foot Ball, Kho-Kho, Chess, carom, Table Tennis, Lawn Tennis, & Athletics, Annual Festival (SAMRAT UTSAV)
Social activities	Blood Donation Camps, Rallies, Nukkad Natak on social issues, and Tree plantation.
Other	Independence Day, Republic Day, Ganesh Utsav, Rose Show, Bhajan Sandhya, Vishwakarma jayanti,
Inter Engineering College Competitions	State level Inter Engineering college cricket tournament.
Foundation Day	Alumni meet

Games and Sports facilities, and qualified sports instructors (5)

Outdoor –

1. Kabaddi
2. Volley Ball
3. Hand ball
4. Badminton
5. Cricket
6. Football
7. Kho-Kho

Indoor –

1. Chess
2. Carom
3. Table Tennis
4. Gymnasium

CRITERION 10 Governance, Institutional Support and Financial Resources 120

10.1. Organization, Governance and Transparency (55)

10.1.1. State the Vision and Mission of the Institute (5)

Vision : To contribute towards service and development of the mankind through quality education and research, in the area of science and technology.

Mission : To create quality manpower equipped with technical skills ,social values, leadership, creativity and innovation for the benefit and betterment of mankind and sustainable development of the nation.

10.1.2. Availability of the Institutional Strategic Plan and its Effective Implementation and Monitoring (25)

Institutional strategic plan has been made by performing deep analysis of Strength, weakness, Opportunity and Threat of the institute. Several meetings and interactions with Management, Director, Dean Academic, Dean Research, Registrar, all HoDs, Faculties, Supporting staff, Students, Parents and Alumni were held for the same. Following key points about institute were discussed to carry out the analysis-

- Infrastructure/Laboratory/Equipment/Workshop
- Research/Consultancy
- Placement Cell
- Industry interaction
- Workshop/Training Programme for Faculty/Staff/Students
- Mentorship Programme for the students
- Active & Innovative Learning Process
- Outcome based Curriculum
- Admission policies/Fee Structure
- TEQIP-III
- MoU with Reputed Institutes/Industries
- E-Learning/Library
- Skill Development Programme
- Unnat Bharat Abhiyan
- Moodle
- Sports/clubs/Activities/social Service
- Awards/Scholarships
- IT Infrastructure/ digital technology
- Security
- Woman grievance & redressal

After several brainstorming session by keeping above key points in mind, following strategy plans and its implementation & monitoring have been set up that transform S.A.T.I., Vidisha into globally recognize technical institute-

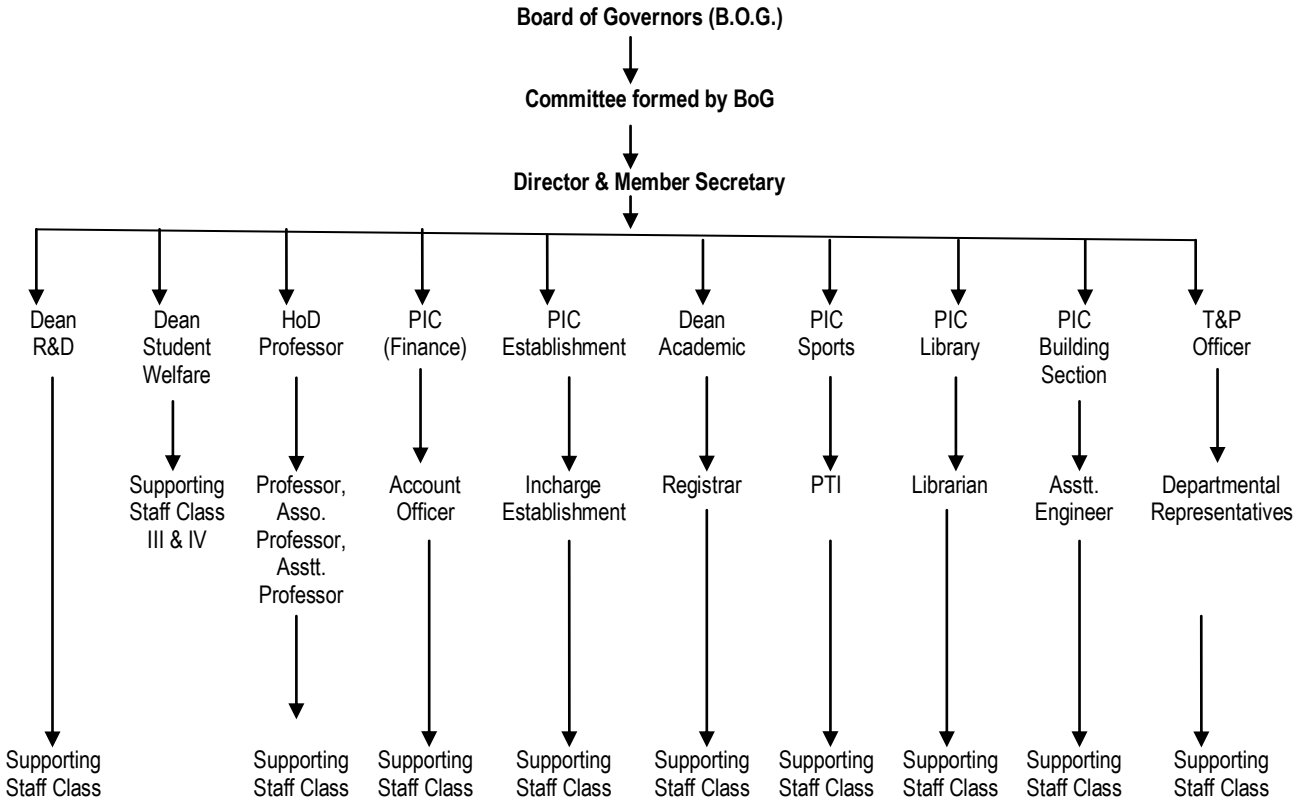
Sr. No	Strategy Plan	Implementation	Monitoring
1	To improve teaching learning environment	• Set up of new Smart Class Rooms • Adoption of Moodle • Use Moocs/NPTEL for e learning • Arrange Expert Talks • Interaction with industry person • Provide Career Guidance to students • Use service of Adjunct faculty	Director of the institute, Dean academic and HODs visit the class rooms, labs daily in order to make healthy academic environment and make sure successful implementation of outcome based education in the campus. In additions to the

		• Successful implementation of OBE	regular classes, expert talks on emerging areas also arrange weekly in the institute. Daily attendance, assignment, quizzes are uploaded on Moodle and noticed by director and HODs.
2	To improve laboratory/ library	• To setup new labs on emerging areas. • To setup modern Lab for research • Rich library resources such as reputed journals/ new books	Meeting of HODs , Dean academic , Dean research arrange once in each semester for setting up new labs or purchasing of new equipment. In-charge library regularly ask for new books/e-journal from faculties & students and arrange them in the library.
3	To enhance research culture	Funds/Workshop/Training have been arranged for the faculty/students in order to attract funded research project/consultancy	Every month Dean research arrange the meeting with director of the institute and encourage the faculty to create the research culture in the institute, arrange the workshop/training/expert talk on emerging areas
4	To enhance interaction with reputed institute	MoU with reputed institute/company has been set up to joint research & exchange of human resources	MoU with reputed institute / industry is decided in the meeting of BOG
5	To provide mentorship to students	Proper assistance is provided by TGs to the needy students in all areas such as study, fiancé, career etc	Meeting between TGs & students takes place daily and resolve various problems of students
6	To start new PG programs in emerging areas	For enhancement of research culture in the institute	Director of the institute arrange the meeting every month with Dean Academic, Dean Research and HODs and try to find the emerging areas for witch new courses can be launched
7	To obtain accreditation for various courses	Applied for NBA accreditation and prepared for that	Coordinator of NBA arrange the meeting once in a week of Head of the departments to be accredited with director and assess the status of preparation of accreditation
8	To improve quality of campus	Various steps have been taken to provide world class infrastructure in the institute such as digital technology used in every section/ high speed wi-fi/ lush green campus/ smart class rooms/ central library/ computer centre/ higenic hostels/ playgrounds/ indoor stadium/ auditorium /security/electrical maintenance	In-charge of various section such as building section, hostel warden, computer maintenance , security officer, electrical maintenance etc continuously supervise the concern section and keep the campus up-to-date for easy and better life
9	To improve	Communication has been setup with	Placement team continuously

	students placement	various MNCs such as TCS, Infosys, IBM, Cap Gemini etc. for campus drives at the institute	interact with HR of various MNCs for campus recruitment, arrange various career oriented programme at institute.
10	To increase Sports activity/social services	National level sports and cultural & technical activities have been organized. Institute participates and organize various national and international level activities such as Energy day, Science day, Yoga day, Woman day. Technical day etc.	PIC Sports & PTI interact regularly with students and arrange facilities of sports, encourage the students for participation at national level competitions. Coordinators of each clubs meet weekly and decide activities to be performed at institute level.
11	Trained students under Skill Development Program	More students have been trained under various schemes of central and state government such as PMKVY & MMKVY	Coordinator of S&D visits the class rooms regularly and assess the performance of trainee, and arrange better environment to improve themselves.
12	To improve the quality of rural areas under the "Unnat Bharat Abhiyan"	Institute is participating in full sprit under "Unnat Bharat Abhiyan" for the development and betterment of rural area	Coordinator of Unnat Bharat Abhiyan takes the meeting of concern faculty & students and make the plan weekly for the betterment of rural areas

10.1.3. Governing body, administrative setup, functions of various bodies, service rules, procedures, recruitment and promotional policies (10)

Organizational Chart showing the hierarchy of administration and academic is given below



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For the smooth functioning of administration, following committees are formed.

(1) Administrative Committee

(i) Board of Governors

S. No.	Member list	Frequency of Meeting
1.	Shrimant Shri Jyotiraditya M. Scindia	Minimum Two meetings per year. However, the meeting may be scheduled as and when necessary.
2.	Sh. Motilal Vora	
3.	Dr. Laxmikant Markhedkar	
4.	Er. Ramesh Agrawal	
5.	Justice (former) N.K.Modi	
6.	Dr. K.K. Agrawal, Founder Vice-Chancellor of Indraprastha University	
7.	Sh. Bharat C Chhaparwal, Ex-Vice-chancellor, DAVV, Indore	
8.	Sh. Prashant Mehta (IAS retd.)	
9.	Sh. Bimal Julka IAS	
10.	Sh. Mahendra Sethia (Industrialist), Indore	
11.	Dr. Anoop Raj (Educationalist) New Delhi	
12.	Finance Secretary, Govt. of MP	
13.	Principal Secretary, Technical Education & Skill Development, Govt. of MP	
14.	Dr. N.C. Shivaprakash (AICTE Nominee)	
15.	Dr. C.M. Chitle (UGC Nominee)	
16.	Vice-Chancellor, RGPV, Bhopal	
17.	Director	
18	Institute Professor	
19.	Institute Professor	

Function and Responsibility

1. To manage the affairs of the S.A.T.I. (Degree) & to regulate its expenditure.
2. To determine the cadre and grades of the Departments and to create, suspend or abolish posts and to fix the emoluments and the terms of service of the employees of the Institute.
3. To appoint all staff in accordance with the regulations drawn up for the purpose.
4. To grant leave and allowance to determine conditions of service to enter into service contracts and grant extension of service to staff.
5. To impose penalties on the staff in accordance with the procedure laid down, for the purpose.

6. To consider the annual report and audited accounts for the previous financial year and the budget estimates of the ensuing year and to take decision thereon.
7. To appoint qualified auditors every year and to fix their remuneration.
8. The decision of the Governing Body in all matters pertaining to the managements of the Institute should be final and should not be subject to any revision by the Society or by any other organization under it.

Managing Committee

Member list	Frequency of Meeting
Shrimant Jyotiraditya M. Scindia, Chairman	Periodically
Dr. Laxmikant Markhedkar, Secretary	
Er. Ramesh Agrawal, Member	
Justice (former) N.K.Modi, Member	
Sh. Prashant Mehta (IAS retd.) , Member	
Director ,S.A.T.I. Vidisha, Member	

Function and Responsibility

(a) Subject to the general control of the Board of Governors the day to day administration and management of the Institute established by the society shall be entrusted to a Managing Consisting of not more than five members which may exercise such powers as may be delegated to it by the Society.

(b) The Board of Governors may from time to time nominee one Managing Committee for each of the institution run by it and shall also nominee its office bearers from amongst the nominated members. The Board of Governors shall be free to include in the Managing Committee such persons as may not be the members of the society.

(c) The term of office of the members of a Managing Committee as nominated shall be one year from the date of nomination.

(2) **Academic Committees :** Following committees are constituted for academics matters of the institute.

(i) Academic Affair Committee

Member list	Function and Responsibility	Frequency of Meeting
Dr. J.S. Chauhan	To take decisions on all academic and routine administrative matters.	Twice in a month
Dr. Pankaj Agarwal		
Dr. Sanjay Katarey		
Dr. Kanak Saxena		
Dr. R.N. Shukla		
Dr. Pramod Sharma, Dean (Academic)		
Dr. Shailesh Jalori		
Dr. Shailendra Shrivastava		
Dr. Rajeev Jain		

Dr. Jitendra Parashar		
Dr. Jyotsna Ogale		
Dr. Manorama Saini		
Prof. Sudhir Phulambrikar		
Special Invitees		

(ii) Proctorial Board Committee

Member list	Function and Responsibility	Frequency of Meeting
Dr. Lokesh Bajpai	To deal with cases of student conduct and discipline and decide suitable action	Periodically as and when required.
Dr. Sanjay Bhandari		
Dr. Pramod Sharma (Dean Academic)		
Dr. Shailendra Shrivastava		
Prof. C.S. Sharma		
Dr. Manorama Saini		
Prof. S.S. Goliya		
Dr. Umesh Banodha		
Er. Praveen Karkare (Registrar)		
Special invitee (if any)		

(3) Being an autonomous institute, following Academic Autonomy Committees have been constituted under Statue-37 of Rajeev Gandhi Prodhyogiki Vishwavidhlaya, Bhopal

(i) Governing Body

Member list	Function and Responsibility	Frequency of Meeting
Three members to be nominated for a period of 2 years by the management of the college of whom one shall be the chairman. The person so nominated shall include at least one outstanding educationist/ scientist/ technocrat/ jurist/ management expert	To lay down service conditions, regulates and enforce discipline among staff, Financial management and other academic and administrative matters.	Thrice in a year
Two senior most teachers of the college to be nominated by rotation according to seniority, by the Director/ Principal for a period of two years		
One nominee of the University not below the rank of Professor		
One nominee of the State Government		
one nominee of the University Grant Commission; and		
The Principal of the college – Ex-officio Member-Secretary		

(ii) Academic Council

Member list	Function and Responsibility	Frequency of Meeting
The Director/Principal of the College – Chairperson	To finally approve course of study, scheme of examination and syllabus. Maintain academic standard.	Once in a year
All Heads of Departments-Member		
One Professor from each of the Department by rotation for a period of one year according to seniority-Member		
One Reader from each Department by rotation for a period of one year according to seniority-Member		
Three University representatives nominated by the Vice Chancellor-Member		
Director of Technical Education or his nominee-Member		

The Chairman and the Secretary of the Governing Body- Member		
Dean (Academic)		

(iii) Board of Studies (In each Department)

Member list	Function and Responsibility	Frequency of Meeting
Head of the Department of the subject in the University or his nominee	To take decision on examination related matters, recommend syllabus scheme etc.	Once in a year
Head of the Department of the subject concerned in the college, not below the rank of the reader,		
Not more than two Faculty Members of that subject in the college		
Not more than two experts from outside the College/ University.		

In addition to these committees, other committees are also constituted for specific purposes. Academic departments also have committees at department level.

Service Rules and Policies :

The institute, being a government aided institute, adheres to all the service rules and procedure as notified by the government of Madhya Pradesh and amended from time to time. The selection and promotion of teachers is as per AICTE (All India council for Technical Education) norms and as approved by government of Madhya Pradesh and BoG of the Institute. Selection of teachers is done by a selection committee constituted as per norms of AICTE and Government of Madhya Pradesh. Reservation for SC/ST/OBC and Other classes in recruitment and promotions is provided as per state government policy and Roster.

10.1.4. Decentralization in working and grievance redressal mechanism (5)

Administrative powers have been delegated to senior faculty members by appointing them as Dean, Co Dean, Professor In Charges of different sections and activities. All the matters pertaining to any section or activities is placed before concern Professor Incharge or Dean for disposal who dispose the matter in consultation with the director or the management.

List of faculty members with administrative responsibilities is given below:

Member list	Administrative Responsibility	Function
Dr. Sanjay Bhandari	Dean Student Welfare	All matters related to student welfare and discipline
Dr. Sanjay Katarey	Coordinator, NBA Accreditation	NBA Accreditation
Dr. Kanak Saxena	Professor-in-Charge Establishment section	All service matter of the employees
Dr. Pramod Sharma	Dean Academic	All academic matters
Dr. G.R. Chetty	Placement Officer	Carrier guidance, Placement, Industrial training and Interaction
Dr. Rajeev Jain	Professor-in-Charge Library section	Supervision of Central Library
Dr. Shailesh Jalori	Professor-in-Charge Account section	All financial planning control, Budget
Shri Sudhir Phulambrikar	Controller	Conduction of examination as

	Examination	autonomous institute of RGPV, Bhopal
Dr. S.S. Goliya	Professor-in-Charge Student Scholarship section	Scholarship Affairs
Dr. Umesh Banodha	Professor-in-Charge Security section	Supervision of campus security
Shri Sanjay Saraswat	Professor-in-Charge Vehicle, Water supply, Building section, Sports	Construction and maintenance, vehicle maintenance and campus water supply, sports activities
Dr. Sunil Joshi	Professor-in-Charge Computer Maintenance section	Supervision and maintenance of hardware and software
Shri Praveen Karkare	Public Information Officer	To provide information under RTI act.

Grievance Redressal System : All the Staff member (faculty and supporting staff) can place their grievance to the competent higher authorities. Staff members can meet with the director and management regarding their demand and grievance for which administration always resolve sympathically in the best interest of the institute and employees. Every Saturday has been reserved by the Director for such meetings. Similarly all students can meet dean student welfare or any concerned teacher or director for their grievances.

A separate women grievance cell has been constituted under the chairpersonship of a senior woman faculty member with representation of other women employee and one girl student representation each from UG and PG classes. The cell specially hear cases related to grievances of women employees and students and recommends suitable action to the authorities.

Samrat Ashok Technological Institute
(Engineering College)
Vidisha (MP)

No.SATI/Estt/2019/ 378 Dated : 25.05.2019

Office Order

As per letter No. 588 dated 23.04.2019 Collector, District Vidisha , following Women's Grievance Cell is hereby constituted.

1. Dr. Kanak Saxena, Chairperson
2. Dr. Manorama Saini
3. Dr. Vinita Singh
4. Prof. Shaila Chugh
5. Dr. Poonamlata Sagar
6. Smt. Bhawana Shrivastava
7. Smt. Ritu Raghuwanshi
8. Ku. Chitransee Kirar, III yr Civil (UG student, Special invitee)
9. Ku. Radhika Yadav, I yr MBA (PG student, Special invitee)

Director

Copy to :-
1 All Concerned as above
2. All HoDs/Section Incharges
3. Dean Academic
4. Registrar
5. VVNCC to upload on website
6. Steno to Director

The institute has zero tolerance policy towards ragging. Anti ragging committees has been constituted comprises of faculty members to keep a strict watch on any undesirable activities and prevent any incidence of ragging or harassment.

Samrat Ashok Technological Institute (Engg. College) Vidisha,(M.P.)

ANTI RAGGING DUTY CHART

No. Acad./Anti–Ragging./2019-20/ 1057 Date : 01/08/2019

The following staff members are allotted the anti ragging duties as given below. Staff members are requested to attend the duties allotted to them sincerely. The first member of each squad should keep the record of observations during the allotted time period and submit to the undersigned weekly.

Day	TIME		
	10.00 am to 12.30 pm	12.30 pm to 3.00 pm	3.00 pm to 5.30 pm
MONDAY	1. Dr. Sanjay Bhandari (CE) 2. Prof. R.R. Ahirwal (CS) 3. Prof.Sudhir Sharma (EE) 4. Prof. J.P. Shakya (ME) 5. Prof. Pradeep Semil (PCE) 6. Prof. Bharti Mehra (EC) 7. Prof. Chennaiah Kate (CS)	1. Dr. Shailendra Shrivastava (CS) 2. Dr. S.K. Dhakad (ME) 3. Prof. Ajay Goyal (CS) 4. Prof. Satish Pawar (CSE) 5. Prof Neeraj Sen (ME) 6.Prof. Suchi Mishra (EI) 7. Prof. Yogendra Singh (CE)	1.Dr. S.N. Sharma (EI) 2. Dr. Amitosh Singh (Hum) 3. Prof. Satyam Maheshwari (CS) 4. Dr. R.M. Saxena (ME) 5.Dr. C.P. Singh (ME) 6.Prof. Rakesh Mangore (ME) 7. Prof. Deepti Jain (EE)
TUESDAY	1.Dr. Preeti D. Swami (EI) 2.Prof. C.S.Sharma (EE) 3.Dr. J.S. Shakya (EE) 4.Prof. Sheena Kumar (EC) 5. Dr. Bablu Kirar (CE) 6. Dr. Shubha Khatri (CE) 7. Prof. Lokesh Sahu (CS)	1. Dr. Jitendra Parashar (Phy.) 2.Prof. Shivendra Singh Thakur (EE) 3.Dr. D.K. Shakya (BME) 4. Dr. Neelesh Mehra (EC) 5.Prof. Sooraj Jain (CE) 6.Prof. Narendra Mahawar (BME) 7. Prof. Ajay Sonare (ME)	1. Dr. Sanjay Katarey (ME) 2.Dr. Manoj Datar (Chem) 3. Prof. Vibha Jain (Maths) 4.Prof. Hemant Dangi (BME) 5. Prof. Kamlesh Sharma (ME) 6. Prof. Bharat Choudhary (EE) 7. Prof. Anusha P. (EC)
WEDNESDAY	1. Dr. P.L. Verma (ME) 2. Prof. Abhishek Mathur (CS) 3.Dr. Poonamlata Sagar (Maths) 4.Prof. D.P.S. Rajput (PCE) 5.Prof. Prachi Kanherkar (ME) 6. Prof. Ramesh Meesala (EE) 7. Dr. Mukesh Mishra (EC)	1. Dr. Alok Jain (EI) 2. Prof. K.K. Punjabi (CE) 3. Dr. S.K. Mahajan (Phy.) 4. Prof. Shaila Chugh (CS) 5. Prof. Sachin Jain (MBA) 6. Prof. Satyendra Jain (CA) 7. Prof. Vivek Sharma (CSE)	1. Dr. Ashutosh Datar (EI) 2. Prof. Sanjay Jain (ME) 3. Prof. Veena Datar (Humanities) 4. Prof. Anil Dubey (Maths) 5. Prof S.K. Verma (CA) 6.Prof. Sourabh Jain (EE) 7. Dr. Arghya Basu (Chem)
THURSDAY	1.Dr. Y.K. Jain (EI) 2.Prof. Sandeep Jain (ME) 3.Prof. S.S. Goliya (CE) 4.Prof. K.G. Kirar (EI) 5.Prof. Abhishek Jain (EC) 6. Dr. Rakesh Mehar (CE) 7. Prof. Bhawana Sharma(EE)	1. Prof. S.K. Sharma (EI) 2. Prof Sanjeev Gupta (EE) 3. Dr. Ravi Jain (Phy.) 4. Prof. Smriti Dubey (EC) 5. Prof. Anusha Lahoti (EE) 6. Prof. Tanu Chaturvedi (CE) 7. Prof. Nirmal Gaud (CSE)	1.Dr. Ashish Manoria (ME) 2.Dr. Pradeep Purohit (CE) 3. Prof. Sandeep Raghuwanshi (CS) 4. Dr. Sripana Vijaya Kumar (Chem) 5. Prof. Somu Chaitaniya (EE) 6. Prof. Nihit Bhatnagar (EC) 7. Prof. Mukesh Azad (CS)
FRIDAY	1.Dr. Shailesh Jalori (Maths) 2.Prof. Shilpa Datar (EI) 3. Prof. Saksham Vasudev (EC) 4.Prof.Ruchi Chauhan (PCE) 5. Prof. Deepak Sain (CS) 6.Prof. Bharat S. Chauhan (CE) 7. Prof. Tushar Lone (EE)	1.Dr.Rajeev Jain (CE) 2. Dr. Dharmesh Jain (MBA) 3.Prof. M.L. Jatav (EC) 4.Dr. Vinita Singh (Maths) 5. Prof.Pranita Jain (CS) 6.Prof. Naveen Malviya (EI) 7. Prof. Anil Suryawanshi (CS)	1. Dr. Pradeep Sharma (Chem) 2. Prof. Sanjay Saraswat (CE) 3.Dr. R.K. Pathak (Maths) 4. Prof. Anamika Kushwaha (PCE) 5. Dr. Sonia Rajput 6. Prof. Sandeep Sahu (CSE) 7. Dr. Narasinga Rao (Chem)
SATURDAY	1.Dr. Sunil Joshi (CS) 2.Prof. K.G. Kirar (EI) 3. Prof. A. Chandrawanshi (MBA) 4.Prof.Devendra Tiwari(EE) 5. Prof. Aman Sharma (EC) 6. Prof. Vipin Patait (BME) 7. Prof. Piyush Jain (CS)	1. Dr. Manorama Saini (Humanities) 2.Dr. Umesh Banodha (CS) 3.Prof. Gayatri Kushwaha (ME) 4.Prof. Sachin Kamble (CA) 5. Dr. Ashish Khaira (ME) 6. Prof. Sumeet Dhillon (CS) 7. Dr. Divya Rishi Sahu (CS)	1. Prof. Prashant Tiwari (MBA) 2. Prof. Shakuntala Chauhan (EI) 3. Prof. Sourabh Sharma (CA) 4. Prof. Deepak S. Chauhan (BME) 5. Prof. Abhishek Patel (CS) 6. Prof. Sanjeev Kumar (CS)

Note :- (I) Following staff members residing in Campus will take round in evening /night.

(1) Prof. Sanjay Jain (2) Dr. Umesh Banodha (3) Prof. Jyotsna Ogale (4) Prof. Ajay Kumar Goyal (5) Dr. Ravi Jain
(6) Dr. Ashish Mishra (7) Prof. Ramesh Meesala (8) Prof. Sakuntala Chauhan

(II) Following Professors will take round during the day as mentioned and co-ordinate with various teams of the day.
(1) Dr.Jyotsna Ogale –Monday (2) Prof. S.P. Phulambrikar – Tuesday (3) Dr. Kanak Saxena – Wednesday
(4) Dr.R.N. Shukla – Thursday (5) Dr. A.K. Saxena – Friday (6) Dr. Pankaj Agarwal – Saturday

DIRECTOR

Copy to : (1) All HOD (2) All Concerned as above (3) All Notice Boards
(4) Steno to Director Sir (5) Dean Acad.(6) Registrar (7) VVNCC to upload

10.1.5. Delegation of financial powers (5)

In order to have smooth functioning and speedy disposal, financial power have been delegated at different level as given below.

Head of the Departments	:	up to Rs. five thousand
Director	:	up to Rs. Fifty thousand
Managing Committee	:	above One lac

10.1.6. Transparency and availability of correct/unambiguous information in public domain (5)

All the important information about the Institute like fee, admission, hostel, important student notice, recruitment notice, tender notice employee details etc are available on the Institute web site www.satiengg.in. The information on the website is updated regularly.

Being a government aided Institute, Right to Information act has been in force since its implementation by the government of Madhya Pradesh. All the provision of the act are being followed in the Institute. Any type of information can be sought under the right to information act. All the mandatory information under the act has been uploaded on the Institute web site under link " Right to Information". As per the provision of the act, following officer are appointed as information officer and appellant authority.

Public Information Officer	: Er. Praveen Karkare, Registrar
Asst. Public Information Officer	: Shri Rakesh Sagar, Computer Programmer
First Appealant Authority	: Dr.J S Chauhan, Director

Details of above officials with their mobile numbers are displayed at the prominent places of the Institute.

10.2. Budget Allocation, Utilization, and Public Accounting at Institute level (15)
Total Income at Institute level: For CFY, CFYm1, CFYm2 & CFYm3

CFY: Current Financial Year – CFYm1 (Current Financial Year minus 1), CFYm2 (Current Financial Year minus 2), CFYm3 (Current Financial Year minus 3)

Table B.10.2a

Year	Total Income in CFY:					Actual expenditure in CFY (till…)					Total No. of students
	Fees	Govt.	Grant(s)	Other Sources (specify)	Total Actual Receipts	Recurring including Salaries	Non-recurring	Special Projects/Any other, specify TEQIP/MMKVY	Total Actual Expenditures	Expenditure per students	
CFY 2016-17	118,040,645	State Govt.	49,273,000.00	31,462,178.55	**198,775,824**	225,643,170	5,225,626	14,882,285	**245,751,081**	85,406	2642
CFY 2017-18	108,425,053	State Govt.	49,599,999.00	27,295,557.00	**185,320,609**	238,066,883	25,210,629	17,905,834	**281,183,346**	95,456	2494
CFY 2018-19	99,977,160	State Govt.	49,600,000.00	61,969,573.00	**211,546,733**	260,791,653	2,442,391	59,585,960	**322,820,004**	111,307	2343
CFY 2019-20 up to 30/11/19	64,696,597.00	State Govt.	64,629,752.00	52,951,369.55	**182,277,719**	126,091,764	639,225	92,066,506	**218,797,495**	57,004	2212

Table B.10.2a ELECRTONICS AND TELECOMMUNICATION ENGINEERING DEPARTMENT

Year	Total Income in CFY:					Actual expenditure in CFY (till…)				Total No. of students in CFY:	Total No. of students
	Fees	Govt.	Grant(s)	Other Sources (specify)	Total Actual Receipts	Recurring including Salaries	Non-recurring	Special Projects/Any other, specify TEQIP/MMKVY	Total Actual Expenditures	Expenditure per students	
CFY 2016-17	14,135,890	State Govt.	8,212,167	2,551,725	**24,899,782**	8,643,028	653,203	1,860,286	**11,156,517**	32,989	262
CFY 2017-18	13,763,300	State Govt.	8,266,667	2,799,950	**24,829,917**	5,939,695	3,151,329	2,238,229	**11,329,253**	23,570	252
CFY 2018-19	13,443,100	State Govt.	8,266,667	3,373,950	**25,083,717**	6,864,020	305,299	7,448,245	**14,617,564**	26,199	262
CFY 2019-20 Upto 30-11-19	11,189,500	State Govt.	10,771,625	3,859,000	**25,820,125**	6,284,653	79,903	11,508,313	**17,872,869**	23,627	266

Table B.10.2b :

Item	Expenses CFY 2019-20 up to 30-11-19	Expenses CFY 2018-19	Expenses in CFY 2017-18	Expenses in CFY 2016-17
Infrastructural built-up	5,200,959	9,800,380	8,598,056	4,642,456
Library	12,982,022	1,195,782	3,534,189	303,170
Laboratory equipment	36,120,682	17,104,781	19,895,523	280,000
Laboratory consumables	-	-	1,587,588	-
Teaching and non-teaching staff salary	113,810,146	240,635,492	222,267,884	212,955,954
Maintenance and Spares	940,483	442,930	12,685	-
R&D	826,022	1,849,172	1,443,319	-
Training and Travel	348,236	473,717	58,339	-
Miscellaneous expenses *	48,917,181	51,791,467	23,324,768	27,569,501
Other, specify	19,036,983	18,163,750	3,497,330	-
Total	238,182,714	341,457,471	284,219,681	245,751,081

10.2.1. Adequacy of budget allocation (5)

The allocated budget is sufficient to meet the financial need of the institute. However due to decline in Grant in recent years, financial status is a bit strain.

10.2.2. Utilization of allocated funds (5)

The fund allocated in the budget has been utilized as per the budget provisions.

10.2.3. Availability of the audited statements on the institute's website (5)

The audited statements for the last three years are available on the institute website.

10.3. Program Specific Budget Allocation, Utilization (30)

Total Budget at program level: For CFY, CFYm1, CFYm2 & CFYm3

CFY: Current Financial Year – CFYm1 (Current Financial Year minus 1) CFYm2 (Current Financial Year minus 2) CFYm3 (Current Financial Year minus 3)

Table B.10.3a Name of Deptt. : Electronics & Telecommunication Engineering

Total Budget in CFY: 2019-20		Actual expenditure in CFY (till 30-11-2019)		Total No. of students in CFY:
Non-recurring	**Recurring**	**Non-recurring**	**Recurring**	**Expenditure per students**
		4,515,085.25	20,605,258.50	19,774.72

Note : Similar tables are to be prepared for CFYm1, CFYm2 & CFMm3

Table B.10.3b : Name of Deptt. : Electronics & Telecommunication Engineering

Item	Expenses CFY 2019-20 up to 30-11-19	Expenses CFY 2018-19	Expenses in CFY 2017-18	Expenses in CFY 2016-17
Laboratory equipment &	4,515,085	2,138,098	2,486,940	35,000
Software				
Laboratory consumables	-	-	198,449	-
Maintenance and Spares	117,560	55,366	1,586	-
R&D	103,253	231,147	180,415	-
Training and Travel	43,530	59,215	7,292	-
Miscellaneous expenses *				
- Salary & Allowances	14,226,268	30,079,437	27,783,486	26,619,494
- Other Contingency Exp.	6,114,648	6,473,933	2,915,596	3,446,188
Total	25,120,344	39,037,195	33,573,763	30,100,682

10.3.1. Adequacy of budget allocation (10)

The allocated budget is sufficient to meet the financial need of the department. However due to decline in income from fee component in recent years, financial status is a bit strain

10.3.2. Utilization of allocated funds (20)

The fund allocated in the budget has been generally utilized as per the budget provisions

10.4. Library and Internet (20)

10.4.1. Quality of learning resources (hard/soft) (10)

Institute has a central library which has a rich collection of books/journals/periodicals etc. Details of the library are as under.

❖ **Library space and ambience, timings and usage, availability of a qualified librarian and other staff, library automation, online access, networking, etc.**

- Carpet area of library (in m): **495.89 Sqm. or 5330.8 Sqft.**
- Reading space (in m): **154.49 Sqm. or 1663.86 Sqft.**
- Number of seats in reading space: **65**
- Number of Books Circulation per day: **165-200**
- Number of users per day: **250-300**
- Number of users (reading space) per day: **100-125**
- Timings: During Working day: **09:00 AM to 8:00 PM**
- Number of library staff: **11**
- Number of library staff with degree in Library: **02**
- Management Computerization:
  - For search: **YES**
  - Indexing: **YES**
  - Issue/return records Bar coding used: **YES**
- Library services on Internet/Intranet:
  - **E-Books Access & Downloading Facility.**
  - **E-Journals Access & Downloading Facility.**
  - **NPTEL – Lecture Videos Access Facility**
  - **NPTEL – Courses Accessing Facility**
  - **OPAC (Online Public Access Catalogue)**
- Consortium Membership:
  - **Shodh Sindhu, INFLIBNET, Gandhinagar**
  - **N-List INFLIBNET, Gandhinagar**

- **Relevance of available learning resources including e-resources**

Year	Total No. of Books (Hard/Soft)	
	Hard Copy	Soft Copy (Subs. +Through N-List)
2019-20	75684	139683
2018-19	75684	80654
2017-18	74346	136054

Year	Total No. of Journals/Technical Magazines Subscribed (Hard/Soft)	
	Hard Copy	Soft Copy (Subs.+Through N-List)
2019-20	55	6490
2018-19	55	4665
2017-18	NIL	6472

- **Digital Library**

  - **Separate Digital Library** accessible (24x7) over the Intranet/Internet
  - **Membership**: of National Digital Library, IIT Kharagpur
  - **Consortium Membership:**
    a. Shodh Sindhu, INFLIBNET, Gandhinagar

b. N-List INFLIBNET, Gandhinagar

- Availability over Internet/Intranet:
  - E-Books: **139683 Nos.**
  - E-Journals: **6490Nos.**

• Accessibility to Students

- Open Access System for searching and selection of book(s) from library collection
- OPAC (Online Public Access Catalogue) through Library Automation Software 'Koha'
- Separate webpage of Central Library Accessible over the Intranet
- e-Books & e-Journals Access & Downloading Facility within the campus
- NPTEL – Lecture Videos Access & Downloading Facilities
- e-Resource access facility through ;
  - ✓ e-Shodh Sindhu, INFLIBNET, Gandhinagar
  - ✓ N-List, INFLIBNET, Gandhinagar
  - ✓ National Digital Library, IIT Kharagpur
- Other Open Access e-Resources Access facility available on Internet

• Supports to Students for Self Learning activities

- Separate Reference Section
- Separate Reading Section
- e-Resources access points (Computers) for self learning
- Library e-Resources access facility within the Campus.
- Orientation Programmes for better utilization of library facilities
- Training Programmes for utilization of e-Resources

• Utilization of Facilities

- Number of Books Circulation per day: **150-200**
- Number of user per day: **75-100**
- Number of users (reading space) per day: **50-75**
- Number of users (e-Resources) per day: **50-75**

• Effective Availability / Purchased Record

Print Books	:	(Annexure-01)
E-Books	:	(Annexure -02 & 03))
Print Journals	:	(Annexure -04)
e- Journals	:	(Annexure -05 & 06)
Turnitin Software	:	(Annexure - 07)

10.4.2. Internet (10)

***** Name of the internet provider	:	NKN (National Knowledge Network) ISP Railtel, JIO Net
***** Available Bandwidth	:	1 Gbps
*****Wifi Availability	:	Yes, External WiFi Access points installed in the campus including Hostels, Main Building, Workshop. Departments.
*****Internet Access in Labs classrooms, Library and offices of all departments	:	Yes, via Managed Network switches (L-2,L-3) connected to library, offices, labs thru fiber optic cable.
*Security Arrangement	:	for Internet security Cyberoam (300iNG) hardware firewall is installed in the campus

Declaration

The head of the institution needs to make a declaration as per the format given below:

I undertake that, the institution is well aware about the provisions in the NBA's accreditation manual concerned for this application, rules, regulations, notifications and NBA expert visit guidelines in force as on date and the institute shall fully abide by them.

It is submitted that information provided in this Self-Assessment Report is factually correct. I understand and agree that an appropriate disciplinary action against the Institute will be initiated by the NBA in case any false statement/information is observed during pre-visit, visit, post visit and subsequent to grant of accreditation.

Date: **Signature & Name**

Place: **Head of the Institution with seal**