MINUTES
OF
THE ACADEMIC COUNCIL (SENATE) MEETING
HELD IN
November, 2020 BY CIRCULATION

भारतीय सुचना प्रौद्योगिकी संस्थान सेनापति, मणिपुर
Indian Institute of Information Technology Senapati, Manipur

The Minutes of the 4th Meeting of the Academic Council (Senate) Of IIIT Senapati, Manipur Held In November 2020 By Circulation

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भारतीय सूचना प्रौद्योगिकी संस्थान सेनापति, मणिपुर
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Minutes of the 4th meeting of Academic Council (Senate) of IIIT Senapati, Manipur held in November, 2020 by circulation:

The following members participated in the meeting:

SN	NAME OF THE MEMBERS	DESIGNATION
1.	Prof. Amarendra Kumar Das	Director/ Chairman
2.	Prof. P K Das	Professor, CSE Department, IIT Guwahati, External Member
3.	Prof. H B Nemade	Professor, ECE Department, IIT Guwahati, External Member
4.	Prof. A Srinivasan	Professor, Physics Department, IIT Guwahati, External Member
5.	Prof. B K Sharma	Professor, Mathematics Department, IIT Guwahati, External Member
6.	Dr Bhargab Deka	In-charge, Academic Section, HBS Department, IIIT Senapati Manipur
7.	Dr L. Sarbajit Singh	In-charge, Students' Affairs, HBS Department, IIIT Senapati Manipur
8.	Dr Nagesh Ch.	HOD ECE Department, IIIT Senapati Manipur
9.	Dr N. Kishorjit Singh	HOD CSE Department, IIIT Senapati Manipur
10.	Dr Subasit Borah	In-charge, Administration, ECE Department, IIIT Senapati Manipur (Invitee)
11.	Dr Kabita Th.	In-charge, Library, CSE Department, IIIT Senapati Manipur (Invitee)
12.	Dr Navanath Saharia	In-charge, Training and Placement, CSE Department, IIIT Senapati Manipur (Invitee)
13.	Dr R. C. Mishra	Coordinator, TEQIP III, ECE Department, IIIT Senapati Manipur (Invitee)
14.	Dr Sanjib Choudhury	Nodal Officer, Procurement, TEQIP III, HBS Department, IIIT Senapati Manipur (Invitee)
15.	Dr Gaurav Saxena	Asst. Professor, ECE Department, IIIT Senapati Manipur (Invitee)
16.	Dr Murli Manohar	Asst. Professor, ECE Department, IIIT Senapati Manipur (Invitee)
17.	Dr Prerna Mohit	Asst. Professor, CSE Department, IIIT Senapati Manipur (Invitee)
18.	Dr. Kaushal Bharadwaj	Technical Officer, CSE, IIIT Senapati Manipur (Invitee)
19.	Mr. Dibya Jyoti Goswami	Interim Registrar, IIIT Senapati Manipur (Secretary)

Prof. Amarendra Kumar Das, the Chairman, Senate, extended appreciations to all the external members for sparing their valuable time to put forward their valuable comments/ suggestions.

In the introduction, Dr Bhargab Deka, In-charge Academic Section, circulated the agenda items through mail on 26th November 2020. The items were presented over telephone to the external members by Dr Bhargab Deka for deliberation.

Item No. 1:

Revision of course structure and syllabus for 2020 Batch BTech students:

The B.Tech. Course structure for IIIT Senapati, Manipur was adopted from IIIT Guwahati with the approval from the 2nd Governing Body Meeting of IIIT Senapati for the batches starting from 2015 onwards. Thereon, the Senate reviewed and revised the course structure of IIIT Senapati, Manipur for two times i.e., in April 2019 and July 2020 respectively.

In view of meeting the demand of course curriculum with present days' industry readiness, it is realized to revise the course curriculum and syllabi for B.Tech. Programme in Computer Science and Engineering (CSE) and in Electronics and Communication Engineering (ECE) with effect from 2020 **B.Tech.** batches. Therefore, the new course structure from 1st to 8th semester and along with the revised syllabus for the 1st and 2nd semesters is proposed herein. The revised syllabus for the higher semesters, i.e., for 3rd semester onwards for the same batch will be placed in the senate for approval in due course after conducting the Course Curriculum meeting with academic and industry experts.

Resolution 1: The Senate resolved to approve the new course structure from 1st to 8th semester with modifications as suggested a) in the credit to reduce the credit load, and b) to revise the Text and Reference books for EC103. The new course structure from 1st to 8th semester and the syllabus for the 1st and 2nd semesters for B.Tech. Programme in Computer Science and Engineering (CSE) and in Electronics and Communication Engineering (ECE) are enclosed as Annexure B and C respectively.

Item No. 2:

Academic Calendar for 1st year BTech students:

In view of the prevailing situation due to the COVID-19 pandemic, the admission process for 2020 Batch BTech students is delayed, and will be over by 1st December 2020. Considering this delay in admission, the Academic Calendar for the 1st year BTech students is revised and given in Annexure- D and put up for approval.

Resolution 2: The Senate resolved to approve the Academic Calendar for 1st year BTech students as given in Annexure D.

Item No. 3:

Mode of teaching for 1st year BTech students:

The academic session for 1st year BTech 2020 Batch has already been delayed, and physical reporting of students to the IIIT Senapati, Manipur campus in the coming weeks is highly unlikely. Therefore, the Institute proposes to start the classes for the 1st Semester BTech from 3rd December 2020 through online mode. However, post Mid Semester Examination classes will be conducted through offline mode.

Resolution 3: The Senate resolved to approve the Mode of teaching as proposed for 1st year BTech 2020 Batch with suggestions that: (a) post Mid Semester Examination classes may be conducted through offline mode, *if possible*, depending on the pandemic situation, and (b) proper planning, arrangements and instructions may be given to instructors regarding conduct of lab courses in case of online mode of instruction.

ANNEXURE-A

WebMail

Bhargab Deka <bhargab@iiitmanipur.ac.in>

Agenda for Fourth Academic Council (Senate), IIIT Senapati Manipur

Bhaba Kumar Sarma <bks@iitg.ac.in> Sun, Nov 29, 2020 at 11:30 AM
To: Bhargab Deka <bhargab@iiitmanipur.ac.in>, A Srinivasan <asrini@iitg.ac.in>, Pradip Kumar Das <pkdas@iitg.ac.in>, Harshal Bhalchandra Nemade <harshal@iitg.ac.in>, Director IIIT Manipur <director@iiitmanipur.ac.in>

Dear Dr. Deka,

I have gone through the Agenda Items. Here are my comments:

Item No. 1: The Credit load in the first six semesters seem to be slightly high. However, if the Departments suggested that course load is fine taking the students abilities are concerned, then the Course structures for CSE and ECE may be approved.

Item No. 2: May be approved.
Item No. 3: The proposal that "However, post Mid Semester Examination classes will be conducted through offline mode" may be revised as "However, post Mid Semester Examination classes will be conducted through offline mode, if possible depending on the pandemic situation".

With best regards,
Bhaba Sarma

From: Bhargab Deka <bhargab@iiitmanipur.ac.in>
Sent: 26 November 2020 19:03
To: A Srinivasan <asrini@iitg.ac.in>; Bhaba Kumar Sarma <bks@iitg.ac.in>; Pradip Kumar Das <pkdas@iitg.ac.in>; Harshal Bhalchandra Nemade <harshal@iitg.ac.in>; Director IIIT Manipur <director@iiitmanipur.ac.in>
Subject: Agenda for Fourth Academic Council (Senate), IIIT Senapati Manipur

[Quoted text hidden]

WebMail

Bhargab Deka <bhargab@iiitmanipur.ac.in>

Agenda for Fourth Academic Council (Senate), IIIT Senapati Manipur

A Srinivasan <asrini@iitg.ac.in> Sun, Nov 29, 2020 at 12:09 PM
To: Bhargab Deka <bhargab@iiitmanipur.ac.in>, Bhaba Kumar Sarma <bks@iitg.ac.in>, Pradip Kumar Das <pkdas@iitg.ac.in>, Harshal Bhalchandra Nemade <harshal@iitg.ac.in>, Director IIIT Manipur <director@iiitmanipur.ac.in>

Dear Dr. Deka,
I fully agree with the suggestions of Prof. BKS. Additionally, I have the following suggestions:
1) One way to reduce the credit load of I and I sem BTech is to make the HS101 and HS102 as audit courses or P/NP course.
2) There are two lab courses (EC101 and CS111) as well as two other courses with lab components in the I BTech syllabus. There is no clarity as to how these lab courses are to be taught for the new batch of students. Please note that unlike other students, these first year students have not taken any courses during covid times and may not be conversant with online mode of teaching at all! [Actually IITG is already facing such a situation with its I BTecg students]. Hence, proper arrangemens and instructions may be given to instructors regarding these lab courses.
3) Othereise, I hage no further comments and other items may be approved with the consent of other senators.
with best regards,
srinivasan

Dr. A Srinivasan
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WebMail

Bhargab Deka <bhargab@iiitmanipur.ac.in>

Agenda for Fourth Academic Council (Senate), IIIT Senapati Manipur

Pradip Kumar Das <pkdas@iitg.ac.in> Sun, Nov 29, 2020 at 3:20 PM
To: Bhargab Deka <bhargab@iiitmanipur.ac.in>

Dear Dr Deka,
I have gone through the agenda items and details. Also comments from Prof. Sharma and Prof. Srinivasan. I agree to them.
I do not have to add anything as comments.

With best wishes,

Prof P K Das

From: Bhargab Deka <bhargab@iiitmanipur.ac.in>
Sent: Thursday, November 26, 2020 7:03:41 PM
To: A Srinivasan <asrini@iitg.ac.in>; Bhaba Kumar Sarma <bks@iitg.ac.in>; Pradip Kumar Das <pkdas@iitg.ac.in>; Harshal Bhalchandra Nemade <harshal@iitg.ac.in>; Director IIIT Manipur <director@iiitmanipur.ac.in>
Subject: Agenda for Fourth Academic Council (Senate), IIIT Senapati Manipur

[Quoted text hidden]

WebMail

Bhargab Deka <bhargab@iiitmanipur.ac.in>

Agenda for Fourth Academic Council (Senate), IIIT Senapati Manipur

Harshal Bhalchandra Nemade <harshal@iitg.ac.in> Sun, Nov 29, 2020 at 5:32 PM
To: Bhargab Deka <bhargab@iiitmanipur.ac.in>
Cc: Director IIIT Manipur <director@iiitmanipur.ac.in>, A Srinivasan <asrini@iitg.ac.in>, Bhaba Kumar Sarma <bks@iitg.ac.in>, Pradip Kumar Das <pkdas@iitg.ac.in>

Dear Dr Deka

I agree and support the suggestions given by Prof Bhaba Sarma and Prof Srinivasan. The only suggestion I have is in the syllabus of EC103. The textbook and reference given are on integrated circuits, not suitable for I-year courses. I am suggesting following books for EC103.

Text:
A. Malvino and D. Bates, Electronic Principles, McGraw-Hill, 2015.

Reference:
R. L. Boylestad and L. Nashelsky, Electronic Devices and Circuit Theory, 11th ed., Pearson Education, 2013.

Best regards

Harshal Nemade

Dr Harshal B. Nemade
Professor
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ANNEXURE-B

Proposed Revised Course Curriculum for B.Tech. Programme in CSE and ECE

1. Proposed Course Structure for B.Tech. CSE

1st Semester

Sem	Subject Code	Course Name	L	T	P	C
I	MA101	Mathematics I	3	1	0	8
I	CS101	Computer Programming	3	0	0	6
I	CS111	Computer Programming Lab	0	0	3	3
I	EC101	Digital Design	3	0	0	6
I	EC111	Digital Design Lab	0	0	3	3
I	EC102	Electrical Circuit Analysis	3	1	0	8
I	SC101	Physics I	3	0	0	6
I	HS101	English Language Skills I	1	0	2	4
I	GE101	Induction Programme (Audit)	1	0	3	0
			17	2	11	44
		Contact Hours / Week	30			

Course	Humanities & Social Science (HS)	Basic Science (BS)	Basic Engineering (BE)	Professional Core (PC)	Professional Elective (PE)	Open Elective (OE)	Internship / Project
Credit	4	14	26	--	--	--	--

2nd Semester

Sem	Subject Code	Course Name	L	T	P	C
II	MA102	Mathematics II	3	1	0	8
II	CS102	Data Structures	3	0	0	6
II	CS112	Data Structures Lab	0	0	3	3
II	CS103	Computer Organization and Microprocessors	3	1	0	8
II	EC103	Basic Electronic Circuits	3	0	0	6
II	EC112	Basic Electronics Lab	0	0	3	3
II	SC102	Physics II	3	0	0	6
II	HS102	English Language Skills II	1	0	2	4
		Total	16	2	8	44
		Contact Hours / Week	26			

Course	Humanities & Social Science (HS)	Basic Science (BS)	Basic Engineering (BE)	Professional Core (PC)	Professional Elective (PE)	Open Elective (OE)	Internship / Project
Credit	4	14	26	--	--	--	--

3rd Semester

Sem	Code	Course Name	L	T	P	C
III	MA201	Mathematics III	3	0	0	6
III	CS201	Discrete Mathematics	3	0	0	6
III	CS202	Design and Analysis of Algorithms	3	0	0	6
III	CS203	Object Oriented Programming	3	0	0	6
III	CS204	Operating Systems	3	0	0	6
III	EC201	Signal and Systems	3	0	0	6
III	EC211	Signal and Systems Lab	0	0	3	3
III	CS211	Object Oriented Programming Lab	0	0	3	3
III	CS212	Operating Systems Lab	0	0	3	3
		Total	18	0	9	45
		Contact Hours / Week	27			

Course	Humanities & Social Science (HS)	Basic Science (BS)	Basic Engineering (BE)	Professional Core (PC)	Professional Elective (PE)	Open Elective (OE)	Internship / Project
Credit	--	6	9	30	--	--	--

4th Semester

Sem	Code	Course Name	L	T	P	C
IV	HS201	Engineering Economics	3	0	0	6
IV	CS205	Theory of Computing	3	0	0	6
IV	CS206	Software Engineering	3	0	0	6
IV	CS207	Computer Networks	3	0	0	6
IV	CS208	Database Management Systems	3	0	0	6
IV	EC204	Digital Signal Processing	3	0	0	6
IV	EC214	Digital Signal Processing Lab	0	0	3	3
IV	CS213	Computer Networks Lab	0	0	3	3
IV	CS214	Database Management Systems Lab	0	0	3	3
		Total	18	0	9	45
		Contact Hours / Week	27			

Course	Humanities & Social Science (HS)	Basic Science (BS)	Basic Engineering (BE)	Professional Core (PC)	Professional Elective (PE)	Open Elective (OE)	Internship / Project
Credit	6	--	9	30	--	--	--

5th Semester

Sem	Code	Course Name	L	T	P	C
V	HS35X	HSS Elective – I	3	0	0	6
V	SC301	Bio-Physics	3	0	0	6
V	CS301	Artificial Intelligence	3	0	0	6
V	CS302	Compiler Design	3	0	0	6
V	CS303	Data Communication & Internet Protocol	3	0	0	6
V	CS304	Distributed Systems and Application	3	0	0	6
V	CS321	Project – I	0	0	6	6
V	CS311	Compiler Design Lab	0	0	3	3
		TOTAL	18	0	9	45
		Contact Hours / Week	27			

Course	Humanities & Social Science (HS)	Basic Science (BS)	Basic Engineering (BE)	Professional Core (PC)	Professional Elective (PE)	Open Elective (OE)	Internship / Project
Credit	6	6	--	27	--	--	6

6th Semester

Sem	Code	Course Name	L	T	P	C
VI	MA301	Optimization Techniques	3	0	0	6
VI	HS36X	HSS Elective - II	3	0	0	6
VI	CS305	Computer Graphics	3	0	0	6
VI	CS306	Statistical Machine Learning	3	0	0	6
VI	CS307	Web Technology	2	0	2	6
VI	CS36X	Professional Elective I	3	0	0	6
VI	CS312	Computer Graphics Lab	0	0	3	3
V	CS322	Project – II	0	0	6	6
		Total	17	0	5	45
		Contact Hours / Week	22			

Course	Humanities & Social Science (HS)	Basic Science (BS)	Basic Engineering (BE)	Professional Core (PC)	Professional Elective (PE)	Open Elective (OE)	Internship / Project
Credit	6	6	--	21	6	--	6

7th Semester

Sem	Code	Course Name	L	T	P	C
VII	CS401	Cloud Computing	3	0	0	6
VII	CS402	Computer and Network Security	3	0	0	6
VII	CS47X	Professional Electives – II	3	0	0	6
VII	CS47X	Professional Electives – III	3	0	0	6
VII	OE47X	Open Elective-I	3	0	0	6
VII	CS421	Project – III	0	0	12	12
VII	CS422	Internship	0	0	3	3
		Total	15	0	15	45
		Contact Hours / Week	30			

Course	Humanities & Social Science (HS)	Basic Science (BS)	Basic Engineering (BE)	Professional Core (PC)	Professional Elective (PE)	Open Elective (OE)	Internship / Project
Credit	--	--	--	12	12	6	15

8th Semester

Sem	Code	Course Name	L	T	P	C
VIII	CS48X	Professional Electives – IV	3	0	0	6
VIII	OE48X	Open Elective– II	3	0	0	6
VIII	CS423	Project/Internship - IV	0	0	18	18
		Total	6	0	18	30
		Contact Hours / Week	24			

Course	Humanities & Social Science (HS)	Basic Science (BS)	Basic Engineering (BE)	Professional Core (PC)	Professional Elective (PE)	Open Elective (OE)	Internship / Project
Credit	--	--	--	--	6	6	18

Professional Electives:

Sl. No.	Course Title	Hours per week			Credits	Preferred semester
		L	T	P		
1	Advanced graph algorithms	3	0	0	6	
2	Cyber Security	3	0	0	6	
3	Number Theory in Cryptography	3	0	0	6	
4	Advance Graph Algorithm	3	0	0	6	
5	Parallel Programming	3	0	0	6	
6	Pattern Classification	3	0	0	6	
7	Information Theory and Coding	3	0	0	6	
8	Advance Topics in Algorithms	3	0	0	6	
9	Information Security, web as a special case	3	0	0	6	
10	Natural Language Processing	3	0	0	6	
11	Foundations of Data Science	3	0	0	6	
12	Audio and Speech Processing	3	0	0	6	
13	Game Theory	3	0	0	6	
14	Data Engineering	3	0	0	6	
15	High Performance Computing	3	0	0	6	
16	Data Privacy	3	0	0	6	
17	Software Testing	3	0	0	6	
18	Modelling Data on the Web	3	0	0	6	
19	Introduction to Blockchain Technology	3	0	0	6	
20	Enterprise Web Development	3	0	0	6	
21	Information Retrieval	3	0	0	6	
22	System software	3	0	0	6	
23	Smartphone Computing and Applications	3	0	0	6	
24	Quantum Computing and Quantum Information Processing	3	0	0	6	
25	Blockchain	3	0	0	6	
26	Software Quality Assurance	3	0	0	6	

Open Elective (OE)

Sl. No.	Course Title	Hours per week			Credits	Preferred semester
		L	T	P		
1	Mobile Computing	3	0	0	6	
2	Cyber Security	3	0	0	6	
3	Big Data Processing and Management	3	0	0	6	
4	Internet of Things	3	0	0	6	
5	Embedded System	3	0	0	6	
6	Deep Learning	3	0	0	6	
7	Image and Video Processing	3	0	0	6	
8	Advance Architecture	3	0	0	6	
9	Wireless Ad Hoc and Sensor Networks	3	0	0	6	
10	Robotics	3	0	0	6	
11	Computer Vision	3	0	0	6	
12	Ethical Hacking	3	0	0	6	
13	Human Computer Interface	3	0	0	6	
14	Data Mining	3	0	0	6	
15	Network Security and Cryptography	3	0	0	6	
16	Virtual and Augmented Reality	3	0	0	6	
17	Information Security, web as a special case	3	0	0	6	
18	Business Intelligence	3	0	0	6	
19	Research Methodology and Technical Writing	3	0	0	6	

HSS Elective (HS)

Sl. No.	Course Code	Course Title	Hours per week			Credits	Branch	Preferred semester
			L	T	P			
1	HS351	Introduction to Linguistics	2	0	2	6	All	V
	HS352	Environmental Sciences	3	0	0	6	All	V
	HS353	Professional Ethics for Engineers/ Ethics and Human Values	3	0	0	6	All	V
2	HS361	Principles of Management	3	0	0	6	All	VI
	HS362	Entrepreneurship and Management Functions	3	0	0	6	All	VI
	HS363	Organizational Behaviour	3	0	0	6	All	VI

2. Proposed Course Structure for B.Tech. ECE

1st Semester

Sem.	Course Code	Course Name	L	T	P	C
I	MA101	Mathematics I	3	1	0	8
I	CS101	Computer Programming	3	0	0	6
I	CS111	Computer Programming Lab	0	0	3	3
I	EC101	Digital Design	3	0	0	6
I	EC111	Digital Design Lab	0	0	3	3
I	EC102	Electrical Circuit Analysis	3	1	0	8
I	SC101	Physics I	3	0	0	6
I	HS101	English Language Skills I	1	0	2	4
I	GE101	Induction Programme (Audit)	1	0	3	0
			17	2	11	44
Contact Hours / Week			30			

Course	Humanities & Social Science (HS)	Basic Science (BS)	Basic Engineering (BE)	Professional Core (PC)	Professional Elective (PE)	Open Elective (OE)	Internship / Project
Credit	4	14	26	--	--	--	--

2nd Semester

Sem.	Course code	Course Name	L	T	P	C
ii	MA102	Mathematics II	3	1	0	8
ii	CS102	Data Structures	3	0	0	6
ii	CS112	Data Structures Lab	0	0	3	3
ii	CS103	Computer Organization and Microprocessors	3	1	0	8
ii	EC103	Basic Electronic Circuits	3	0	0	6
ii	EC112	Basic Electronics Lab	0	0	3	3
ii	SC102	Physics II	3	0	0	6
ii	HS102	English Language Skills II	1	0	2	4
Total			16	2	8	44
Contact Hours / Week			26			

Course	Humanities & Social Science (HS)	Basic Science (BS)	Basic Engineering (BE)	Professional Core (PC)	Professional Elective (PE)	Open Elective (OE)	Internship / Project
Credit	4	14	26	--	--	--	--

3rd Semester

Sem.	Course Code	Course Name	L	T	P	C
III	MA201	Mathematics III	3	0	0	6
III	EC201	Signals and Systems	3	0	0	6
III	EC211	Signals and Systems Lab	0	0	3	3
III	EC202	Analog Circuits	3	0	0	6
III	EC212	Analog Circuits Lab	0	0	3	3
III	CS204	Operating Systems	3	0	0	6
III	CS202	Design and Analysis of Algorithms	3	0	0	6
III	CS203	Object Oriented Programming	3	0	0	6
III	CS211	Object Oriented Programming lab	0	0	3	3
Total			18	0	9	45
Contact Hours / Week			27			

Course	Humanities & Social Science (HS)	Basic Science (BS)	Basic Engineering (BE)	Professional Core (PC)	Professional Elective (PE)	Open Elective (OE)	Internship / Project
Credit	--	6	21	18	--	--	--

4th Semester

Sem.	Course code	Course Name	L	T	P	C
IV	MA202	Mathematics IV	3	0	0	6
IV	EC203	Principles of Communication	3	0	0	6
IV	EC213	Communications Lab	0	0	3	3
IV	EC204	Digital Signal Processing	3	0	0	6
IV	EC214	Digital Signal Processing Lab	0	0	3	3
IV	EC205	Semiconductor Devices	3	0	0	6
IV	HS201	Engineering Economics	3	0	0	6
IV	CS208	Database Management Systems	3	0	0	6
IV	CS214	Database Management Systems Lab	0	0	3	3
Total			18	0	9	45
Contact Hours / Week			27			

Course	Humanities & Social Science (HS)	Basic Science (BS)	Basic Engineering (BE)	Professional Core (PC)	Professional Elective (PE)	Open Elective (OE)	Internship / Project
Credit	6	6	9	24	--	--	--

5th Semester

Sem.	Course Code	Course Name	L	T	P	C
V	EC301	Digital Communication	3	0	0	6
V	EC311	Digital Communication Lab	0	0	3	3
V	EC302	Analog Integrated Circuits	3	0	0	6
V	EC312	Analog Integrated Circuit Lab	0	0	3	3
V	EC303	Electromagnetics	3	1	0	8
V	EC304	Control Systems	3	1	0	8
V	SC301	Bio-Physics	3	0	0	6
V	HS35X	HSS Elective – I	3	0	0	6
Total			18	2	6	46
Contact Hours / Week			26			

Course	Humanities & Social Science (HS)	Basic Science (BS)	Basic Engineering (BE)	Professional Core (PC)	Professional Elective (PE)	Open Elective (OE)	Internship / Project
Credit	6	6	--	34	--	--	--

6th Semester

Sem.	Course Code	Course Name	L	T	P	C
VI	EC305	Information Theory and Coding	3	0	0	6
VI	EC306	VLSI Design	3	0	0	6
VI	EC313	VLSI Design Lab	0	0	3	3
VI	EC307	Microwave Engineering	3	0	0	6
VI	EC314	Microwave Engineering Lab	0	0	3	3
VI	EC308	Embedded Systems	3	0	0	6
VI	EC315	Embedded Systems Lab	0	0	3	3
VI	EC309	Communication Networks	3	0	0	6
VI	HS36X	HSS Elective - II	3	0	0	6
Total			18	0	9	45
Contact Hours / Week			27			

Course	Humanities & Social Science (HS)	Basic Science (BS)	Basic Engineering (BE)	Professional Core (PC)	Professional Elective (PE)	Open Elective (OE)	Internship / Project
Credit	6	--	--	33	6	--	--

7th Semester

Sem.	Course Code	Course Name	L	T	P	C
VII	EC401	Mobile Communication	3	0	0	6
VII	EC47X	Professional Elective - I	3	0	0	6
VII	EC47X	Professional Elective - II	3	0	0	6
VII	EC47X	Professional Elective - III	3	0	0	6
VII	OE47X	Open Elective - I	3	0	0	6
VII	EC421	Project – I	0	0	12	12
VII	EC422	Internship	0	0	3	3
Total			15	0	15	45
Contact Hours / Week			30			

Course	Humanities & Social Science (HS)	Basic Science (BS)	Basic Engineering (BE)	Professional Core (PC)	Professional Elective (PE)	Open Elective (OE)	Internship / Project
Credit	--	--	--	6	18	6	15

8th Semester

Sem.	Course Code	Course Name	L	T	P	C
VIII	EC47X	Professional Elective - IV	3	0	0	6
VIII	OE47X	Open Elective - II	3	0	0	6
VIII	EC423	Project/Internship - II	0	0	18	18
Total			6	0	18	30
Contact Hours / Week			24			

Course	Humanities & Social Science (HS)	Basic Science (BS)	Basic Engineering (BE)	Professional Core (PC)	Professional Elective (PE)	Open Elective (OE)	Internship / Project
Credit	--	--	--	--	6	6	18

Professional Elective (PE)

Sl.No.	Course Title	Hours per week			Credits	Preferred Semester
		L	T	P		
1	Measurement and Instrumentation	3	0	0	6	VII
2	Detection and Estimation Theory	3	0	0	6	VII
3	Antenna and Wave Propagation	3	0	0	6	VII
4	Microwave system Design	3	0	0	6	VIII
5	VLSI Technology	3	0	0	6	VII
6	Communication Systems	3	0	0	6	VII
7	Advanced Topics in Communication Systems	3	0	0	6	VIII
8	Error correcting codes	3	0	0	6	VII
9	Adaptive Signal Processing	3	0	0	6	VII
10	Mixed Signal Design	3	0	0	6	VIII
11	CMOS Design	3	0	0	6	VIII
12	Nano electronics	3	0	0	6	VII
13	Micro Electromechanical Systems	3	0	0	6	VII
14	Fundamentals of VLSI CAD	3	0	0	6	VII

Open Elective (OE)

Sl. No.	Course Title	Hours per week			Credits	Preferred semester
		L	T	P		
1	Wireless Sensor Networks	3	0	0	6	VIII
2	Image Processing	3	0	0	6	VII
3	Speech and Audio Processing	3	0	0	6	VII
4	Biomedical Signal Processing	3	0	0	6	VIII
5	Intelligent Sensors and Actuators	3	0	0	6	VII
6	Statistical Machine Learning	3	0	0	6	VIII
7	Artificial Intelligence	3	0	0	6	VII
8	Internet of Things	3	0	0	6	VII
9	Introduction to Parallel Computing	3	0	0	6	VII
10	Game Theory	3	0	0	6	VII

HSS Elective (HS)

Sl. No.	Course Code	Course Title	Hours per week			Credits	Branch	Preferred semester
			L	T	P			
1	HS351	Introduction to Linguistics	2	0	2	6	All	V
	HS352	Environmental Sciences	3	0	0	6	All	V
	HS353	Professional Ethics for Engineers/ Ethics and Human Values	3	0	0	6	All	V
2	HS361	Principles of Management	3	0	0	6	All	VI
	HS362	Entrepreneurship and Management Functions	3	0	0	6	All	VI
	HS363	Organizational Behaviour	3	0	0	6	All	VI

ANNEXURE-C

Proposed detailed Syllabi for 1st and 2nd Semester B.Tech. courses

1st Semester

Sem	Subject Code	Course Name	L	T	P	C
I	MA101	Mathematics I	3	1	0	8
I	CS101	Computer Programming	3	0	0	6
I	CS111	Computer Programming Lab	0	0	3	3
I	EC101	Digital Design	3	0	0	6
I	EC111	Digital Design Lab	0	0	3	3
I	EC102	Electrical Circuit Analysis	3	1	0	8
I	SC101	Physics I	3	0	0	6
I	HS101	English Language Skills I	1	0	2	4
I	GE101	Induction Programme (Audit)	1	0	3	0
			17	**2**	**11**	**44**
		Contact Hours / Week	**30**			

MA101	**Mathematics I**	**3-1-0-8**
Syllabus: Linear Algebra: Systems of linear equations and their solutions; vector space Rn and its subspaces; spanning set and linear independence; matrices, inverse and determinant; range space and rank, null space and nullity, eigenvalues and eigenvectors; diagonalization of matrices; similarity; inner product, Gram-Schmidt process; vector spaces (over the field of real and complex numbers), linear transformations. Single Variable Calculus: Convergence of sequences and series of real numbers; continuity of functions; differentiability, Rolle's theorem, mean value theorem, Taylor's theorem; power series; Riemann integration, fundamental theorem of calculus, improper integrals; application to length, area, volume and surface area of revolution.		
Texts: 1. G. Strang, *Linear Algebra and Its Applications*, 4th Edition (South Asian Edition), Wellesley-Cambridge Press, 2009(ISBN: 9788175968110). 2. S. R. Ghorpade and B. V. Limaye, *An Introduction to Calculus and Real Analysis*, Springer India, 2006 (ISBN: 9788181284853).		
References: 1. D. Poole, *Linear Algebra: A Modern Introduction*, 2nd Edition, Brooks/Cole, 2005. 2. K. Hoffman and R. Kunze, *Linear Algebra*, 2nd Edition, Prentice Hall India, 2009. 3. R. G. Bartle and D. R. Sherbert, *Introduction to Real Analysis*, 3rd Edition, Wiley India, 2007.		

CS101	**Computer Programming**	**3-0-0-6**
Syllabus: Procedural programming through Language 'C': Basic Syntax and Semantics, Variables, Types, Expressions, Assignment statements, Conditional and Iterative Control Structures, Simple I/O, Functions and parameter passing, Strings and string processing, Pointers and References, Structures, Recursion. Algorithm development: Techniques of problem solving, Stepwise Refinement, Simple numerical examples, algorithms for searching and sorting, merging order lists. Examples taken from real-world applications involving data manipulation.		
Texts: 1. **Bryon Gottfried**, Programming with C, McGraw Hill, Third edition (ISBN: 9780070145900).		

References:

1. **Horowitz, Sahni**, and **Anderson-Freed**, Fundamentals of Data Structures in C, Universities Press, Second edition (ISBN: 9788173716058).
2. **Kernighan** and **Ritchie**, The C Programming Language, PHI, Second edition, (ISBN:9788120305960).

CS 111	**Computer Programming Lab**	**0-0-3-3**

Programming assignments on:

Basic Assignment Statement, Conditional and Iterative Control Structures, Some Numerical Examples, Functions and parameter passing, Array and String, Pointer, Structure, Recursion, Dynamic Memory Allocation, File Handling, Linked List, Sorting, Command Line Arguments

EC101	**Digital Design**	**3-1-0-8**

Syllabus:

Number System: Introduction to number systems, binary, Integer and floating-point- numbers, octal, hexadecimal and decimal number system and their conversion.

Arithmetic Operations: Binary addition & subtraction; 1's and 2's complement, subtraction using 2's complement; binary codes, addition and subtraction operations on binary-coded numbers; Algorithms for performing multiplication and division.

Combinational Circuits: Basic Logic Operations, AND, OR, NOR, NAND, EX-OR, EX-NOR Gates, boolean expressions and their minimization using algebraic identities; Karnaugh map representation and minimization of Boolean functions using K-map; Don't care conditions, NAND and NOR logic implementations, two-level realizations using gates -- AND-OR, OR-AND, NAND-NAND and NOR-NOR structures.

Combinational Circuits using MSI Modules: Adders, subtractors, BCD arithmetic, serial adder, carry look-ahead adder, Multi-bit adder, Multiplexers, De-multiplexers, Decoders, Multiplexer-based realization of K-maps; Combinational circuit design using multiplexers and gates.

Sequential Circuits: Latches and Flip-flops; Ripple counters using T flip-flops; Synchronous counters; Shift Registers; Ring and MLS counters; Sequence generator using J-K / D flip-flops, Finite state machines, propagation delay, setup and hold time, critical path delay.

Memories and Programmable Logic: ROM, SRAM, DRAM, PLA, PAL

Texts:

1. M. Morris Mano, Digital Logic and Computer Design, 11th Edition, Pearson Education, 2009.

References:

2. Ronald J Tocci, Neal S Wisdmer and Gregory L. Moss, Digital Systems: Principle and Applications, 10th Edition, Pearson Education, 2011.
3. Albert Paul Malvino, Donald P Leach and Gautam Saha, Digital Principles and Applications 7th Edition, Tata McGraw - Hill Education, 2011.

EC 111	**Digital Design Lab**	**0-0-3-3**

Familiarization with digital IC family 74LS00 and 74HS00. Familiarization with laboratory equipment – voltage generator, function generator, oscilloscope. Study of digital IC characteristics – input voltage, input current, output voltage, output current, fan out, noise margin and propagation delay. Combinational logic circuits: Implementation of Boolean functions using logic gates; Arithmetic operations using logic gates; Implementation of Multiplexers, De-multiplexers, Encoders, Decoders; Implementation of Boolean functions using Multiplexers/Decoders Study of sequential logic circuits: Implementation of flip flops, Implementation of counters, Implementation of sequence generators

EC102	Electrical Circuit Analysis	3-0-0-6

Syllabus:

Basic components and circuit analysis: Charge, current, voltage and power, voltage and current sources, Ohm's law; Voltage and current laws: nodes, paths, loops and branches, Kirchoff's current law, Kirchoff's voltage law, independent sources, voltage and current division; Basic nodal and mesh analysis: nodal analysis, super-node, mesh analysis, super-mesh; Network theorems: linearity and superposition, source transformations, Thevenin's theorem, Norton's theorem, reciprocity, maximum power transfer;

Magnetically coupled circuits: mutual inductance, energy considerations, linear transformer, ideal transformer;

Poly-phase circuits: Poly-phase systems, single-phase three-wire systems, three-phase Y-Y connection, wye-delta transformation, power measurement in three-phase systems;

Time and frequency domain analysis of linear circuits: Solution of first and second order differential equations for Series and parallel R-L, R-C, R-L-C circuits, initial and final conditions in network elements, forced and free response, time constants, steady state and transient state response.

Sinusoidal steady-state analysis: Forced response to sinusoidal functions, complex forcing function, phasor, phasor relationship for R, L and C, impedance, admittance, phasor diagrams, instantaneous power, average power, apparent power and power factor, complex power;

Two-port networks: one-port networks, linear 2-port network parameters, admittance parameters, impedance parameters, hybrid parameters, transmission parameters.

Texts:

1. . W. H. Hayt, J. E. Kemmerly, S. M. Durbin, Engineering Circuit Analysis, Tata-McGraw-Hill Publishing Company Limited, 7th / 8th Edition, 2010/ 2012.

References:

2. Bruce Carlson, Circuits: Engineering Concepts and Analysis of Linear Electric Circuits, 2nd Reprint, Thomson Asia Pvt. Ltd., 2006.
3. R. A. De Carlo and P. M. Lin, Linear Circuit Analysis, 2nd Edition, Oxford University Press, 2001.

SC101	Physics I	3-0-0-6

Syllabus:

Special Theory of Relativity: Michelson-Morley experiment, Postulates of STR. Galilean transformation. Lorentz transformation. Simultaneity. Length Contraction. Time dilation. Relativistic addition of velocities. Energy momentum relationships.

Quantum Mechanics: Two---slit experiment. De Broglie's hypothesis. Uncertainty Principle, wave function and wave packets, phase and group velocities. Schrödinger Equation. Probabilities and Normalization. Expectation values. Eigenvalues and eigenfunctions. particle in a box, potential barrier, harmonic oscillator

Solid State Physics: Crystal lattices and symmetry groups, reciprocal lattice, Brillouin zone, Miller indices, crystal structure by X-ray diffraction; free electron theory, electrons in a periodic potential, Bloch's theorem, Kronig-Penny model, formation of bands, effective mass, holes, classification of metal, insulator and semiconductor, intrinsic and extrinsic semiconductors, law of mass action, Hall effect; Curie law, concepts of ferro, ferri, and anti-ferro magnetism

Texts:

1. Kenneth S. Krane, Mondern Physics, John Wiley &Sons, Inc, 3rd Edition, 2012
2. C. Kittel, Introduction to Solid State Physics, John Wiley & Sons, 2005.

References:

1. Beiser, Concepts of Modern Physics, Tata McGraw-Hill, New Delhi, 1995.

2. A.J. Dekker, Solid State Physics, Mcmillan, 1986.

HS101	English Language Skills I	1-0-2-4

Syllabus:

Basic Grammar: *articles, quantifiers, punctuation, use of tenses, gerunds and infinitives, present participles, subject verb concord, adverbs, nouns, pronouns, prepositions, use of connectives, use of adjectives and adverbs; common errors; Lexicon- Enriching vocabulary through one-word substitutes, synonyms, antonyms, etc.*

Spoken English: *importance for effective communication; linguistic aspects of mishearing; fluency; speaking to multicultural/multidisciplinary audience; standard varieties of spoken English; understanding vowels, consonants and syllable in English; tempo of speech & phrasal pause in English; English rhythm; stress on simple and derived words in English; practice and learning to improve pronunciation of numbers, units of weights, distance, etc.*

Aspects of Theatre in Spoken Communication: *grooming, eye contact, body language, amplitude.*

Preparing a Presentation: *charts, graphs, drawings, maps, diagrams, tables, etc.; using power point slides and other presentation aids; making presentations and self-evaluation.*

Texts:

1. Shreesh Chaudhary. *Better Spoken English*, New Delhi: Vikas Publishing. (1992/2004)
2. J. D. O'Connor. *Better English Pronunciation, Cambridge* University Press. (1980)
3. F.T. Wood. *A Remedial English Grammar for Foreign Students*. New Delhi: Macmillan. (1965)

References:

1. Marilyn Anderson, Pramod K. Nayar, and Madhucchanda Sen. *Critical Reasoning, Academic Writing and Presentation Skills*. Rev. ed. New Delhi: Longman-Pearson. (2010)
2. Oxford Advanced Learner's Dictionary of English, Ninth Edition. (2016)
3. Michael Swan and Catherine Walter. *Oxford English Grammar Course: Advanced*. Oxford: OUP. (2011)
4. Allan Pease and Barbara Pease. *The Definitive Book of Body Language*. New Delhi: Manjul Publishing House. (2005)

GE101	Induction Programme	1-0-3-0(Audit)

- Physical activity
- Creative Arts
- Universal Human Values
- Literary
- Proficiency Modules
- Lectures by Eminent People
- Visits to local Areas
- Familiarization to Dept./Branch & Innovations

2nd Semester

Sem	Subject Code	Course Name	L	T	P	C
II	MA102	Mathematics II	3	1	0	8
II	CS102	Data Structures	3	0	0	6
II	CS112	Data Structures Lab	0	0	3	3
II	CS103	Computer Organization and Microprocessors	3	1	0	8
II	EC103	Basic Electronic Circuits	3	0	0	6
II	EC112	Basic Electronics Lab	0	0	3	3
II	SC102	Physics II	3	0	0	6
II	HS102	English Language Skills II	1	0	2	4
		Total	16	2	8	44
		Contact Hours / Week	26			

MA102	**Mathematics II**	**3-1-0-8**

Syllabus:

Multivariable Calculus: Vector functions of one variable – continuity, differentiation and integration; functions of several variables - continuity, partial derivatives, directional derivatives, gradient, differentiability, chain rule; tangent planes and normals, maxima and minima, Lagrange multiplier method; repeated and multiple integrals with applications to volume, surface area, moments of inertia, change of variables; vector fields, line and surface integrals; Green's, Gauss's and Stokes' theorems and their applications.

Ordinary Differential Equation: First order differential equations - exact differential equations, integrating factors, Bernoulli equations, existence and uniqueness theorem, applications; higher-order linear differential equations - solutions of homogeneous and non-homogeneous equations, method of variation of parameters, series solutions of linear differential equations, Legendre equation and Legendre polynomials, Bessel equation and Bessel functions of first and second kinds. Laplace and inverse Laplace transforms; properties, convolutions; solution of ODE by Laplace transform. Systems of first-order equations, two-dimensional linear autonomous system, phase plane, critical points, stability.

Texts:

1. G. B. Thomas, Jr. and R. L. Finney, *Calculus and Analytic Geometry*, 9th Edition, Pearson Education India, 1996.
2. S. L. Ross, *Differential Equations*, 3rd Edition, Wiley India, 1984.

References:

1. H. Anton, I. C. Bivens and S. Davis, *Calculus*, 10th Edition, Wiley, 2011.
2. T. M. Apostol, *Calculus*, Volume 2, 2nd Edition, Wiley India, 2003.
3. W. E. Boyce and R. C. Di Prima, *Elementary Differential Equations and Boundary Value Problems*, 9th Edition, Wiley India, 2009.
4. E. A. Coddington, *An Introduction to Ordinary Differential Equations*, Prentice Hall India, 1995.

CS102	**Data Structures**	**3-0-0-6**

Syllabus: Performance of algorithms: space and time complexity, asymptotic; Fundamental Data structures: linked lists, arrays, matrices, stacks, queues, binary trees, tree traversals; Algorithms for sorting and searching: linear search, binary search, insertion-sort, selection sort, bubble-sort, quicksort, mergesort, heapsort, shellsort; Priority Queues: lists, heaps, binomial heaps, Fibonacci heaps; Graphs: representations, depth first search, breadth first search; Hashing: separate chaining, linear probing, quadratic probing; Search Trees: binary search trees, red-black trees, AVL trees, splay trees, B-trees; Strings: suffix arrays, tries; Randomized data structures: skip lists.

Text:

1. Seymour Lipschutz, Data Structures with C, SCHAUM SERIES, Tata McGraw-Hill, 1st edition, 2010

References:

1. M A Weiss, Data Structures and Problem-Solving Using Java, Addison-Wesley, 1997.
2. A M Tannenbaum, Y Langsam and M J Augenstein, Data Structures Using C++, Prentice Hall India, 1996.
3. A H Aho, J E Hopcroft and J Ullman, Data Structures and Algorithms, Addison-Wesley, 1987.
4. Robert Sedgewick, Algorithms in C++ Parts 1-4, Pearson Education, Third Edition, 1998.
5. Robert Sedgewick, Algorithms in C++ Part 5, Pearson Education, Third Edition, 2002.

CS111	**Data Structure Lab**	**0-0-3-3**

Programming assignments on:

Using C Programming Language, Implementation of linked lists, stacks, queues, binary trees, tree traversals:

Implementation of algorithms for sorting: Insertion-sort, selection sort, bubble-sort, quicksort, mergesort, heapsort, shellsort; Implementation of algorithms for searching: linear search, binary search.

Assignments on Priority Queues: lists, heaps, binomial heaps, Fibonacci heaps; Graphs: representations, depth first search, breadth first search; Hashing: separate chaining, linear probing, quadratic probing;

Assignments on search Trees: binary search trees, red-black trees, AVL trees, splay trees, B-trees; Strings: suffix arrays, tries; Randomized data structures: skip lists.

CS103	**Computer Organization and Microprocessors**	**3-1-0-8**

Syllabus:

Fundamentals of Microprocessors: Fundamentals of microprocessor architecture, 8-bitmicroprocessor and microcontroller architecture, Internal block diagram, CPU, ALU, address, data and control bus, working registers, SFRS, clock and reset circuits, stack and stack pointer, program counter, i/o ports, memory structures, data and program memory, timing diagrams and execution cycles. Comparison of 8-bit, 16-bit and 32-bit microcontrollers.

Instruction Set and Programming: Addressing modes: introduction, instruction syntax, data types, subroutines immediate addressing, register addressing, direct addressing, indirect addressing, relative addressing, indexed addressing, bit inherent addressing, bit direct addressing. 8085 & 8051 instruction set, instruction timings. Data transfer instructions, arithmetic instructions, logical instructions, branch instructions, subroutine instructions, bit manipulation instruction, assembly language programs.

Computer Organization: Basic Computer Architecture; ARM Instruction Set and Assembly Language Programming; Computer Arithmetic: integer addition (carry look-ahead), multiply (booth's algorithm), division (restoring and non-restoring), floating point arithmetic; Processor Design – single cycle, multi-cycle; pipelined design; memory architecture (static and Dynamic RAM; row and column addressing; interleaving, banks), cache memory (direct, set-associative, multi-level); storage basics: disks, tapes, printers, displays, flash memory; Buses (daisy chaining; synchronous and asynchronous; point-to-point; PCI, PCIe; Intel Sandy Bridge Architecture; Intel X86 instruction set introduction.

Texts:

1. David A. Patterson and John L. Hennesy, Computer Organization and Design: The Hardware Software Interface, ARM Edition, 4th edition, Elsevier India, 2010.
2. R. S. Gaonkar, ", Microprocessor Architecture: Programming and Applications with the 8085", Penram International Publishing, 1996
3. M. A. Mazidi, J. G. Mazidi and R. D. McKinlay, "The 8051 Microcontroller and Embedded Systems: Using Assembly and C", Pearson Education, 2007.

References:

K. J. Ayala, “8051 Microcontroller”, Delmar Cengage Learning, 2004.

EC103	**Basic Electronic Circuits**	**3-0-0-6**

Syllabus:

Course Topics - Examples of Electronic Systems: Music System, Radio, Television

Diodes and Applications: Semiconductor diode - ideal versus practical, resistance levels, diode equivalent circuits, load line analysis; diode as a switch, diode as a rectifier, half wave and full wave rectifiers with and without filters; clipping circuits, clamper circuits, breakdown mechanisms, zener diode – operation and applications; regulated d-c power supply.

Transistor Characteristics: Bipolar junction transistor (BJT) – construction, operation, amplifying action, common base, common emitter and common collector configurations, operating point, voltage divider bias configuration; Differential Amplifier.

Operational Amplifiers and Applications: Introduction to op-amp, characteristics of ideal op-amp, controlled source models, classification, the operational amplifier (op-amp) as a linear active device, the VCVS model of an op-amp, different amplifier configurations using op-amp, concept of virtual ground; op-amp operations, integrator and differentiator, frequency response of op-amp and op-amp based amplifiers. CMRR, PSRR, slew rate; pin configuration of 741 op-amp

Filters: Concepts of low-pass, high-pass and band-pass filters, ideal (brick-wall) filter response, frequency response of simple RC filters, active RC filters using Op-amp.

Oscillators: Effects of negative and positive feedback of an amplifier, condition of harmonic oscillation, RC and LC oscillator circuits.

Comparator: Op-amp as a comparator, digital inverters (TTL/CMOS) as comparators, comparator with hysteresis, Schmitt trigger using Op-amp, 555 timer as a two dimensional comparator. Waveform generators: Concept of bistable, monostable and astable circuits, timer and relaxation oscillator based on comparator and RC timing circuit, square wave generator using 555 timer, crystal clock generator.

Data Converters: Sample and hold circuits, Digital to Analog Converter (DAC) using binary resistor scheme, R-2R ladder DAC, DAC using switched current resources, Analog to Digital converter (ADC) using capacitor charge/discharge: single-slope and dual-slope ADCs, ADC using counter and DAC, ADC using successive approximation.

Texts:

1. Albert Malvino and David Bates, Electronic Principles, McGraw Hill Education; 2015.

References:

1. R. L. Boylestad and L. Nashelsky, Electronic Devices and Circuit Theory, 11th ed., Pearson Education, 2013.
2. Jacob Millman, Christos Halkias, Chetan Parikh, Millman's Integrated Electronics - Analog and Digital Circuit and Systems, McGraw Hill Education; 2nd edition, 2017
3. Adel S. Sedra, Kenneth C. Smith & Arun N. Chandorkar, Microelectronic Circuits, International Version 6th Edition, 2013, Oxford University Press India

EC 112	Basic Electronics Lab	0-0-3

Experiments using diodes: Diode characteristics, design and analysis of half-wave and full-wave rectifier circuits without and with filter, clipping circuits, clamper circuits,

Experiments using operational amplifier: Inverting amplifier, non-inverting amplifier, voltage follower, integrator, differentiator, comparators, Multivibrators, Wien's Bridge Oscillator, first-order filters, D/A and A/D converters.

SC102	Physics II	3-0-0-6

Syllabus:

Vector Calculus: Gradient, Divergence and Curl, Line, Surface, and Volume integrals, Gauss's divergence theorem and Stokes' theorem in Cartesian, Spherical polar and cylindrical polar coordinates, Dirac Delta function.

Electrostatics: Gauss's law and its applications, Divergence and Curl of Electrostatic fields, Electrostatic Potential, Boundary conditions, Work and Energy, Conductors, Capacitors, Laplace's equation, Method of images, Boundary value problems in Cartesian Coordinate Systems, Dielectrics, Polarization, Bound Charges, Electric displacement, Boundary conditions in dielectrics, Energy in dielectrics, Forces on dielectrics.

Magnetostatics: Lorentz force, Biot---Savart and Ampere's laws and their applications, Divergence and Curl of Magnetostatic fields, Magnetic vector Potential, Force and torque on a magnetic dipole, Magnetic materials, Magnetization, Bound currents, Boundary conditions.

Electrodynamics: Ohm's law, Motional EMF, Faraday's law, Lenz's law, Self and Mutual inductance, Energy stored in magnetic field, Maxwell's equations, Continuity Equation, Poynting Theorem, Wave solution of Maxwell Equations.

Electromagnetic waves: Polarization, reflection & transmission at oblique incidences.

Texts:

1. Introduction to Electrodynamics by D. J. Griffiths, , 3rd Ed., Prentice Hall of India, 2005.
2. Elements of Electromagnetics by M. N. O. Sadiku, Oxford, 2006.

References:

3. C. A. Balanis, Advanced Engineering Electromagnetics, 2nd Edition, John Wiley, 2012.
4. The Feynman Lectures on Physics, Vol.II by R. P. Feynman, R. B. Leighton and M. Sands, Narosa Publishing House, 1998.

HS102	English Language Skills II	1-0-2-4

Syllabus:

Introduction to Communication: need for effective communication; the process of communication; significance of technical communication; barriers to communication.

Listening Skills: listening as an active skill; listening for specific information; developing effective listening skills; barriers to effective listening skills.

Reading Skills: skimming; scanning; understanding the gist of an argument; identifying the topic sentence; inferring lexical and contextual meaning.

Writing Skills: sentence formation; use of appropriate diction; paragraph and essay writing; coherence and cohesion; technical writing; letter writing; job application; report writing.

Speaking Skills: non-verbal communication; group discussion; presentation skills; technology-based communication.

Texts:

1. V.N. Arora and Lakshmi Chandra. *Improve Your Writing*. New Delhi: OUP, 1981.
2. Marilyn Anderson, Pramod K. Nayar, and Madhucchanda Sen. *Critical Reasoning, Academic Writing and Presentation Skills*. Rev. ed. New Delhi: Longman-Pearson, 2010.
3. Allan Pease and Barbara Pease. The Definitive Book of Body Language. New Delhi: Manjul Publishing House, 2005.

References:

1. F.T. Wood. A Remedial English Grammar for Foreign Students. New Delhi: Macmillan, 1965.
2. Nitin Bhatnagar and Mamta Bhatnagar. Communicative English for Engineers and Professionals. Pearson. (2010)
3. N. Krishnaswami and T. Sriraman. Current English for Colleges. Chennai: Macmillan, 1990.
4. N. Krishnaswami and T. Sriraman. Creative English for Communication. 2nded. New Delhi: Macmillan, 2009.
5. Michael Swan. Practical English Usage. 3rd ed. Oxford: OUP, 2005.
6. Michael Swan and Catherine Walter. Oxford English Grammar Course: Advanced. Oxford: OUP, 2011.

ANNEXURE-D

Proposed revised Academic Calendar for the 1st year BTech students

Events	**1st Semester of AY 2020-2021**	**2nd Semester of AY 2020-2021**
Registration for New Students	**25 Nov - 01 Dec 2020**	**30 March, 2021**
First day of Instruction	03 December 2020	**31 March, 2021**
Mid Semester Examination	**25 -31 January 2021**	**24-29 May 2021**
Last day of Instruction	19 March 2021	09 July 2021
End Semester Examination	**22-27 March, 2021**	**13-18 July 2021**
Vacation for 1st year Students	---------	**19 July-08 August 2021**