AC- 23/07/2020
Item No. - 123

UNIVERSITY OF MUMBAI

Program: Bachelor of Engineering in Electronics & Computer Science

Second Year with Effect from AY 2020-21
Third Year with Effect from AY 2021-22
Final Year with Effect from AY 2022-23

(REV- 2019 'C' Scheme) from Academic Year 2019 – 20
Under

FACULTY OF SCIENCE & TECHNOLOGY

(As per AICTE guidelines with effect from the academic year 2019–2020)

AC - 23/07/2020
Item No. - 123

UNIVERSITY OF MUMBAI

Syllabus for Approval

Sr. No.	Heading	Particulars
1	Title of the Course	**Second Year BE in Electronics & Computer Science**
2	Eligibility for Admission	**First Year Engineering passed in line with the Ordinance 0.6242**
3	Passing Marks	40%
4	Ordinances / Regulations (if any)	**Ordinance 0.6242**
5	No. of Years / Semesters	**8 Semesters**
6	Level	~~Certificate/Diploma/~~UG~~/PG~~ (Strike out which is not applicable)
7	Pattern	Semester/~~Yearly~~ (Strike out which is not applicable)
8	Status	~~Revised~~/New (Strike out which is not applicable)
9	To be implemented from Academic Year	**With effect from Academic Year: 2020-2021**

Date: 23rd July 2020   Signature:

Dr. S. K. Ukarande   **Dr Anuradha Muzumdar**
Associate Dean   Dean
Faculty of Science and Technology   Faculty of Science and Technology
University of Mumbai   University of Mumbai

Program Structure for Second Year Electronics and Computer Science

UNIVERSITY OF MUMBAI

(With Effect from 2020-2021)

Semester III

Course Code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned			
		Theory	Practical	Tutorial	Theory	Practical	Tutorial	Total
ECC 301	Engineering Mathematics - III	3	-	1	3	-	1	4
ECC 302	Electronic Devices	3	-	-	3	-	-	3
ECC 303	Digital Electronics	3	-	-	3	-	-	3
ECC 304	Data Structures and Algorithms	3	-	-	3	-	-	3
ECC 305	Database Management Systems	3	-	-	3	-	-	3
ECL301	Electronic Devices Lab	-	2	-	-	1	-	1
ECL302	Digital Electronics Lab	-	2	-	-	1	-	1
ECL303	Data Structures and Algorithms Lab	-	2	-	-	1	-	1
ECL304	Database Management Systems lab	-	2	-	-	1	-	1
ECL305	Skill-base Lab - OOPM: (C++ and Java)	-	4	-	-	2	-	2
ECM301	Mini-project -1 A	-	4$	-	-	2	-	2
	Total	15	16	1	15	08	1	24

$ indicates workload of learner(Not faculty), for mini-project

Programme Structure for Bachelor of Engineering (B.E.) – Electronics and Computer Science (Rev. 2019) 'C' Scheme

Course Code	Course Name	Examination Scheme							
		Theory					Term Work	Practical /Oral	Total
		Internal Assessment			End Sem. Exam	Exam. Duration (inHrs)			
		Test 1	Test 2	Avg.					
ECC 301	Engineering Mathematics III	20	20	20	80	03	25	-	125
ECC 302	Electronic Devices	20	20	20	80	03	-	-	100
ECC 303	Digital Electronics	20	20	20	80	03	-	-	100
ECC 304	Data Structures and Algorithms	20	20	20	80	03	-	-	100
ECC 305	Database Management Systems	20	20	20	80	03	-	-	100
ECL 301	Electronic Devices Lab	-	-	-	-	-	25	25	50
ECL 302	Digital Electronics Lab	-	-	-	-	-	25	25	50
ECL 303	Data Structures and Algorithms Lab	-	-	—	-	-	25	25	50
ECL 304	Database Management systems lab	-	-	-	-	-	25	25	50
ECL 305	Skill base Lab - OOPM: (C++ and Java)	-	-	-	-	-	50	-	50
ECM 301	Mini Project - 1A						25	25	25
	Total	-	-	100	400	-	200	125	825

Note:

1. Students group and load of faculty per week.

   Mini Project 1 and 2:
   Students can form groups with minimum 3 (Three) and not more than 4 (Four).

   Faculty Load:1 hour per week per four groups

   Major Project 1 and 2:
   Students can form groups with minimum 2 (Two) and not more than 4 (Four)

   Faculty Load: In Semester VII– ½ hour per week per project group

   In Semester VIII – 1 hour per week per project group

2. Out of 4 hours/week allotted for the mini-projects 1-A and 1-B, an expert lecture of at least one hour per week from industry/institute or a field visit to nearby domain specific industry should be arranged.

3. Mini-projects 2-A and 2-B should be based on DLOs.

AC- 29/06/2021
Item No. - 6.14

UNIVERSITY OF MUMBAI

Program: Bachelor of Engineering in Electronics & Computer Science

Second Year with Effect from AY 2020-21
Third Year with Effect from AY 2021-22
Final Year with Effect from AY 2022-23

(REV- 2019 'C' Scheme) from Academic Year 2019 – 20
Under

FACULTY OF SCIENCE & TECHNOLOGY

(As per AICTE guidelines with effect from the academic year 2019–2020)

AC – 29/06/2021

Item No. – 6.14

UNIVERSITY OF MUMBAI

Syllabus for Approval

Sr. No.	Heading	Particulars
1	Title of the Course	**Third Year BE in Electronics & Computer Science**
2	Eligibility for Admission	Second Year Engineering passed in line with the Ordinance 0.6243
3	Passing Marks	40%
4	Ordinances / Regulations (if any)	Ordinance 0.6243
5	No. of Years / Semesters	8 Semesters
6	Level	~~Certificate/Diploma/~~UG~~/PG~~ (Strike out which is not applicable)
7	Pattern	Semester/~~Yearly~~ (Strike out which is not applicable)
8	Status	Revised/~~New~~ (Strike out which is not applicable)
9	To be implemented from Academic Year	With effect from Academic Year: 2021-2022

Date: Signature:

Dr. S. K. Ukarande
Associate Dean
Faculty of Science and Technology
University of Mumbai

Dr Anuradha Muzumdar
Dean
Faculty of Science and Technology
University of Mumbai

Program Structure for Third Year Electronics Engineering
UNIVERSITY OF MUMBAI
(With Effect from 2021-2022)

Semester V

Course Code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned			
		TH	PR	Tut	TH	Pract	Tut	Total
ECC 501	Communication Engineering	3	-	-	3	-	-	3
ECC 502	Computer Organization and Architecture	3	-	-	3	-	-	3
ECC 503	Software Engineering	3	-	-	3	-	-	3
ECC 504	Web Technologies	3	-	-	3	-	-	3
ECC DO501	Department Optional (Course - I)	3	-	-	3	-	-	3
ECL501	Communication Engineering Lab	-	2			1		1
ECL502	Software Engineering and Web Technologies Lab	-	2	-	-	1	-	1
ECL503	Department Optional (Course - I) Lab	-	2	-	-	1	-	1
ECL504	Professional Communication and Ethics-II	-	4	-	-	2	-	2
ECM501	Mini project - 2A	-	4$	-	-	2	-	2
	Total	15	14	-	15	7	-	22

*Theory class; $ indicates workload of learner (Not faculty), for mini-project

Course Code	Course Name	Examination Scheme							
		Internal Assessment			End Sem Exam	Exam Duration (in Hrs)	TW	Pract/ Oral	Total
		Test 1	Test 2	Av					
ECC 501	Communication Engineering	20	20	20	80	03	-	-	100
ECC 502	Computer Organization and Architecture	20	20	20	80	03	-	-	100
ECC 503	Software Engineering	20	20	20	80	03	-	-	100
ECC 504	Web Technologies	20	20	20	80	03	-	-	100
ECC DO501	Department Level Optional Course - I	20	20	20	80	03	-	-	100
ECL501	Communication Engineering Lab	-	-	-	-	-	25	25	50
ECL502	Software Engineering and Web Technologies lab	-	-	-	-	-	25	25	50
ECL503	Department Optional Course -I lab	-	-	-	-	-	25	25	50
ECL504	Professional Communication and Ethics-II	-	-	-	-	-	25	25	50
ECM501	Mini project - 2A						25	25	50
	Total			100	400	-	150	100	750

Department Level Optional Course - I (DO 501):

1. Software Testing and Quality Assurance	3. Information Theory and Coding
2. ASIC Verification	4. Sensors and Applications

UNIVERSITY OF MUMBAI, B.E (ELECTRONICS AND COMPUTER SCIENCE)

Program Structure for Third Year Electronics Engineering
UNIVERSITY OF MUMBAI
(With Effect from 2021-2022)

Semester VI

Course Code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned			
		TH	PR	Tut	TH	Pract.	Tut	Total
ECC 601	Embedded Systems and RTOS	3	-	-	3	-	-	3
ECC 602	Artificial Intelligence	3	-	-	3	-	-	3
ECC 603	Computer Networks	3	-	-	3	-	-	3
ECC 604	Data Warehousing and Mining	3	-	-	3	-	-	3
ECC DO601	Department Level Optional Course -II	3	-	-	3	-	-	3
ECL 601	Embedded Systems Lab	-	2			1		1
ECL602	Artificial Intelligence and Computer Networks Lab	-	2	-	-	1	-	1
ECL603	Data Warehousing and Mining Lab	-	2	-	-	1	-	1
ECL 604	Skill-based Laboratory	-	4	-	-	2	-	2
ECM601	Mini Project 2B	-	4$	-	-	2	-	2
	Total	15	14	-	15	7	-	22

$ indicates workload of learner (Not faculty), for mini-project

Course Code	Course Name	Examination Scheme							
		Internal Assessment			End Sem Exam	Exam Duration (in Hrs)	TW	Pract/ Oral	Total
		Test 1	Test 2	Av					
ECC 601	Embedded Systems and RTOS	20	20	20	80	03	-	-	100
ECC 602	Artificial Intelligence	20	20	20	80	03	-	-	100
ECC 603	Computer Networks	20	20	20	80	03	-	-	100
ECC 604	Data Warehousing and Mining	20	20	20	80	03	-	-	100
ECC DO601	Department Level Optional Course -II	20	20	20	80	03	-	-	100
ECL 601	Embedded Systems Lab	-	-	-	-	-	25	25	50
ECL602	Artificial Intelligence and Computer Networks Lab	-	-	-	-	-	25	25	50
ECL603	Data Warehousing and Mining Lab	-	-	-	-	-	25	25	50
ECL 604	Skill-based Laboratory	-	-	-	-	-	50	-	50
ECM601	Mini Project - 2B						25	25	50
	Total			100	400	-	150	100	750

Department Level Optional Course - II (DO 601):

1. Machine Learning	3. Digital Signal Processing
2. Industrial Automation	4. Electronic Product Design

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UNIVERSITY OF MUMBAI

Scheme

for

Bachelor of Engineering

in

Electronics & Computer Science

Second Year with Effect from AY 2020-21
Third Year with Effect from AY 2021-22
Final Year with Effect from AY 2022-23

(REV- 2019 'C' Scheme) from Academic Year 2019 – 20
Under

FACULTY OF SCIENCE & TECHNOLOGY

(As per AICTE guidelines with effect from the academic year 2019–2020)

Program Structure for Third Year Electronics and Computer Science
UNIVERSITY OF MUMBAI
(With Effect from 2021-2022)

UNIVERSITY OF MUMBAI

Sr. No.	Heading	Particulars
1	Title of the Course	B.E in Electronics & Computer Science (ECS)
2	Eligibility for Admission	**After Passing Third Year Engineering as per the Ordinance 0.6244**
3	Passing Marks	**40%**
4	Ordinances / Regulations (if any)	**Ordinance 0.6244**
5	No. of Years / Semesters	**4 Years / 8 Semesters**
6	Level	~~P.G.~~ / U.G./ ~~Diploma / Certificate~~ (Strike out which ~~ ~~)
7	Pattern	~~Yearly~~ / Semester (Strike out which is not applicable)
8	Status	~~New~~ / Revised **REV- 2019 'C'**
9	To be implemented from Academic Year	**With effect from Academic Year: 2022-2023**

Date:

Dr. S. K. Ukarande
Associate Dean
Faculty of Science and Technology
University of Mumbai

Dr. Anuradha Majumdar
Dean
Faculty of Science and Technology
University of Mumbai

Program Structure for Final Year Electronics and Computer Science
UNIVERSITY OF MUMBAI
(With Effect from 2022-2023)

Semester VII

Course Code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned			
		TH	PR	Tut	TH	Pract	Tut	Total
ECC 701	VLSI Design	3	-	-	3	-	-	3
ECC 702	Internet of Things	3	-	-	3	-	-	3
ECC DO701	Department Level Optional Course - III	3	-	-	3	-	-	3
ECC DO702	Department Level Optional Course - IV	3	-	-	3	-	-	3
ECC IO701	Institute Level Optional Course - I	3	-	-	3	-	-	3
ECL701	VLSI Design Lab	-	2	-		1	-	1
ECL702	Internet of Things Lab	-	2	-	-	1	-	1
ECL703	Department Level Optional Course - III Lab	-	2	-	-	1	-	1
ECP701	Major Project - I	-	6	-	-	3	-	3
	Total	15	12	-	15	6	-	21

Course Code	Course Name	Examination Scheme							
		Internal Assessment			End Sem Exam	Exam Duration (in Hrs)	TW	Pract/ Oral	Total
		Test 1	Test 2	Av					
ECC 701	VLSI Design	20	20	20	80	03	-	-	100
ECC 702	Internet of Things	20	20	20	80	03	-	-	100
ECC DO701	Department Level Optional Course - III	20	20	20	80	03	-	-	100
ECC DO702	Department Level Optional Course - IV	20	20	20	80	03	-	-	100
ECC IO701	Institute Level Optional Course - I	20	20	20	80	03	-	-	100
ECL701	VLSI Design Lab	-	-	-	-	-	25	25	50
ECL702	Internet of Things Lab	-	-	-	-	-	25	25	50
ECL703	Department Level Optional Course - III Lab	-	-	-	-	-	25	25	50
ECP701	Major Project - I	-	-	-	-	-	50	-	50
	Total			100	400	-	125	75	700

Department Level Optional Courses:

Department Level Optional Course -III (DO701)	Department Level Optional Course -IV (DO702)
1. Deep Learning	1. Cloud Computing
2. Image Processing	2. Mobile Communication
3. Big Data Analytics	3. Cyber Security
4. Advanced Database Management Systems	4. Blockchain Technology

Program Structure for Final Year Electronics and Computer Science
UNIVERSITY OF MUMBAI
(With Effect from 2022-2023)

Semester VIII

Course Code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned			
		TH	PR	Tut	TH	Pract	Tut	Total
ECC 801	Robotics	3	-	-	3	-	-	3
ECC DO801	Department Level Optional Course -V	3	-	-	3	-	-	3
ECC DO802	Department Level Optional Course -VI	3	-	-	3	-	-	3
ECC IO801	Institute Level Optional Course - II	3	-	-	3	-	-	3
ECL 801	Robotics Lab	-	2	-	-	1	-	1
ECL 802	Department Level Optional Course - V Lab	-	2		-	1		1
ECP 801	Major Project II	-	12	-	-	6	-	6
	Total	12	16	-	12	8	-	20

Course Code	Course Name	Examination Scheme							
		Internal Assessment			End Sem Exam	Exam Duration (in Hrs)	TW	Pract/ Oral	Total
		Test 1	Test 2	Av					
ECC 801	Robotics	20	20	20	80	03	-	-	100
ECC DO801	Department Level Optional Course -V	20	20	20	80	03	-	-	100
ECC DO802	Department Level Optional Course -VI	20	20	20	80	03	-	-	100
ECC IO801	Institute Level Optional Course - II	20	20	20	80	03	-	-	100
ECL 801	Robotics Lab	-	-	-	-	03	25	25	50
ECL 802	Department Level Optional Course - V Lab	-	-	-	-	-	25	25	50
ECP 801	Major Project II	-	-	-	-	-	50	100	150
	Total			80	320	-	100	150	650

Department Level Optional Courses:

Department Level Optional Course -V (DO801)	Department Level Optional Course -VI (DO802)
1. MEMS Technology	1. Advanced Networking Technologies
2. Natural Language Processing	2. Multimedia and Virtual Reality
3. 3-D Printing and Design	3. Quantum Computing
4. Advanced Algorithms	4. System Security

Note:

1. Students group and load of faculty per week.

   Mini Project 1 and 2:
   Students can form groups with minimum 2 (Two) and not more than 4 (Four)
   Faculty Load: 1 hour per week per four groups

   Major Project 1 and 2:
   Students can form groups with minimum 2 (Two) and not more than 4 (Four)
   Faculty Load: In Semester VII– ½ hour per week per project group
   In Semester VIII – 1 hour per week per project group

2. Out of 4 hours/week allotted for the mini-projects 1-A and 1-B, an expert lecture of at least one hour per week from industry/institute or a field visit to nearby domain specific industry should be arranged.

3. Mini-projects 2-A and 2-B should be based on DLOs.