

1.1.1 The Institution ensures effective curriculum delivery through a well-planned and documented process

Syllabus Scheme

R-2019

Syllabus Structure

Rev 2019

Computer Engineering

Program Structure for Second Year Computer Engineering
UNIVERSITY OF MUMBAI (With Effect from 2020-2021)
Semester III

Course Code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned				
		Theory	Pract.	Tut.	Theory	Pract.	Tut.	Total	
CSC301	Engineering Mathematics-III	3	--	1*	3	--	1	4	
CSC302	Discrete Structures and Graph Theory	3	--	--	3	--	--	3	
CSC303	Data Structure	3	--	--	3	--	--	3	
CSC304	Digital Logic & Computer Architecture	3	--	--	3	--	--	3	
CSC305	Computer Graphics	3	--	--	3	--	--	3	
CSL301	Data Structure Lab	--	2	--	--	1	--	1	
CSL302	Digital Logic & Computer Architecture Lab	--	2	--	--	1	--	1	
CSL303	Computer Graphics Lab	--	2	--	--	1	--	1	
CSL304	Skill base Lab course: Object Oriented Programming with Java	--	2+2*	--	--	2	--	2	
CSM301	Mini Project – 1 A	--	4 ^{\$}	--	--	2	--	2	
Total		15	14	1	15	07	1	23	
Course Code	Course Name	Examination Scheme							
		Theory					Term Work	Pract & oral	Total
		Internal Assessment			End Sem. Exam	Exam. Duration (in Hrs)			
		Test 1	Test2	Avg					
CSC301	Engineering Mathematics-III	20	20	20	80	3	25	--	125
CSC302	Discrete Structures and Graph Theory	20	20	20	80	3	--	--	100
CSC303	Data Structure	20	20	20	80	3	--	--	100
CSC304	Digital Logic & Computer Architecture	20	20	20	80	3	--	--	100
CSC305	Computer Graphics	20	20	20	80	3	--	--	100
CSL301	Data Structure Lab	--	--	--	--	--	25	25	50
CSL302	Digital Logic & Computer Architecture Lab	--	--	--	--	--	25	--	25
CSL303	Computer Graphics Lab	--	--	--	--	--	25	25	50
CSL304	Skill base Lab course: Object Oriented Programming with Java	--	--	--	--	--	50	25	75
CSM301	Mini Project – 1 A	--	--	--	--	--	25	25	50
Total		--	--	100	400	--	175	100	775

*Should be conducted batch wise and

\$ indicates workload of Learner (Not Faculty), Students can form groups with minimum 2 (Two) and not more than 4 (Four), Faculty Load: 1 hour per week per four groups



Program Structure for Second Year Computer Engineering
UNIVERSITY OF MUMBAI (With Effect from 2020-2021)
Semester IV

Course Code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned				
		Theory	Pract.	Tut.	Theory	Pract.	Tut.	Total	
CSC401	Engineering Mathematics-IV	3	--	1*	3	--	1	4	
CSC402	Analysis of Algorithm	3	--	--	3	--	--	3	
CSC403	Database Management System	3	--	--	3	--	--	3	
CSC404	Operating System	3	--	--	3	--	--	3	
CSC405	Microprocessor	3	--	--	3	--	--	3	
CSL401	Analysis of Algorithm Lab	--	2	--	--	1	--	1	
CSL402	Database Management System Lab	--	2	--	--	1	--	1	
CSL403	Operating System Lab	--	2	--	--	1	--	1	
CSL404	Microprocessor Lab	--	2	--	--	1	--	1	
CSL405	Skill Base Lab Course: Python Programming	--	2*+2	--	--	2	--	2	
CSM401	Mini Project 1-B	--	4 [§]	--	--	2	--	2	
Total		15	16	1	15	7	1	24	
Course Code	Course Name	Examination Scheme							
		Theory					Term Work	Pract & oral	Total
		Internal Assessment			End Sem. Exam.	Exam. Duration (in Hrs)			
		Test 1	Test 2	Avg.					
CSC401	Engineering Mathematics-IV	20	20	20	80	3	25	--	125
CSC402	Analysis of Algorithm	20	20	20	80	3	--	--	100
CSC403	Database Management System	20	20	20	80	3	--	--	100
CSC404	Operating System	20	20	20	80	3	--	--	100
CSC405	Microprocessor	20	20	20	80	3	--	--	100
CSL401	Analysis of Algorithm Lab	--	--	--	--	--	25	25	50
CSL402	Database Management System Lab	--	--	--	--	--	25	25	50
CSL403	Operating System Lab	--	--	--	--	--	25	25	50
CSL404	Microprocessor Lab	--	--	--	--	--	25	--	25
CSL405	Skill Base Lab Course: Python Programming	--	--	--	--	--	25	--	25
CSM401	Mini Project 1-B	--	--	--	--	--	25	25	50
Total		--	--	100	400	--	175	100	775

*Should be conducted batchwise and

§ indicates workload of Learner (Not Faculty), Students can form groups with minimum 2 (Two) and not more than 4 (Four), Faculty Load: 1 hour per week per four groups.



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

Semester V

Course Code	Course Name	Teaching Scheme (Contact Hours)		Credits Assigned					
		Theory	Pract.	Theory	Pract.	Total			
CSC501	Theoretical Computer Science	3	--	3	--	3			
CSC502	Software Engineering	3	--	3	--	3			
CSC503	Computer Network	3	--	3	--	3			
CSC504	Data Warehousing & Mining	3	--	3	--	3			
CSDLO501x	Department Level Optional Course- 1	3	--	3	--	3			
CSL501	Software Engineering Lab	--	2	--	1	1			
CSL502	Computer Network Lab	--	2	--	1	1			
CSL503	Data Warehousing & Mining Lab	--	2	--	1	1			
CSL504	Professional Comm. & Ethics II	--	2*+2	--	2	2			
CSM501	Mini Project: 2 A	--	4 ^{\$}	--	2	2			
Total		15	14	15	07	22			
Course Code	Course Name	Examination Scheme							
		Theory					Term Work	Pract & oral	Total
		Internal Assessment			End Sem Exam	Exam. Duration (in Hrs)			
		Test 1	Test 2	Avg					
CSC501	Theoretical Computer Science	20	20	20	80	3	25	--	125
CSC502	Software Engineering	20	20	20	80	3	--	--	100
CSC503	Computer Network	20	20	20	80	3	--	--	100
CSC504	Data Warehousing & Mining	20	20	20	80	3	--	--	100
CSDLO501x	Department Level Optional Course -1	20	20	20	80	3	--	--	100
CSL501	Software Engineering Lab	--	--	--	--	--	25	25	50
CSL502	Computer Network Lab	--	--	--	--	--	25	25	50
CSL503	Data Warehousing & Mining Lab	--	--	--	--	--	25	25	50
CSL504	Professional Comm. & Ethics II	--	--	--	--	--	50	--	50
CSM501	Mini Project : 2A	--	--	--	--	--	25	25	50
Total		--	--	100	400	--	175	100	775

* Theory class to be conducted for full class and \$ indicates workload of Learner (Not Faculty), students can form groups with minimum 2(Two) and not more than 4(Four). Faculty Load: 1hour per week per four groups.

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

Semester VI

Course Code	Course Name	Teaching Scheme (Contact Hours)		Credits Assigned					
		Theory	Pract. Tut.	Theory	Pract.	Total			
CSC601	System Programming & Compiler Construction	3	--	3	--	3			
CSC602	Cryptography & System Security	3	--	3	--	3			
CSC603	Mobile Computing	3	--	3	--	3			
CSC604	Artificial Intelligence	3	--	3	--	3			
CSDLO601x	Department Level Optional Course -2	3	--	3	--	3			
CSL601	System Programming & Compiler Construction Lab	--	2	--	1	1			
CSL602	Cryptography & System Security Lab	--	2	--	1	1			
CSL603	Mobile Computing Lab	--	2	--	1	1			
CSL604	Artificial Intelligence Lab	--	2	--	1	1			
CSL605	Skill base Lab Course: Cloud Computing	--	4	--	2	2			
CSM601	Mini Project Lab: 2B	--	4 ^s	--	2	2			
Total		15	16	15	08	23			
Course Code	Course Name	Examination Scheme							
		Theory					Term Work	Pract. & oral	Total
		Internal Assessment			End Sem Exam	Exam. Duration (in Hrs)			
		Test 1	Test 2	Avg					
CSC601	System Programming & Compiler Construction	20	20	20	80	3	--	--	100
CSC602	Cryptography & System Security	20	20	20	80	3	--	--	100
CSC603	Mobile Computing	20	20	20	80	3	--	--	100
CSC604	Artificial Intelligence	20	20	20	80	3	--	--	100
CSDLO601x	Department Level Optional Course -2	20	20	20	80	3	--	--	100
CSL601	System Programming & Compiler Construction Lab	--	--	--	--	--	25	25	50
CSL602	Cryptography & System Security Lab	--	--	--	--	--	25	--	25
CSL603	Mobile Computing Lab	--	--	--	--	--	25	-	25
CSL604	Artificial Intelligence Lab	--	--	--	--	--	25	25	50
CSL605	Skill base Lab Course: Cloud Computing	--	--	--	--	--	50	25	75
CSM601	Mini Project :2B	--	--	--	--	--	25	25	50
Total		--	--	100	400	--	175	100	775

Program Structure for Computer Engineering
UNIVERSITY OF MUMBAI (With Effect from 2021-2022)

Department Optional Courses

Department Level Optional Courses	Semester	Code & Course
Department Level Optional Course -1	V	CSDLO5011: Probabilistic Graphical Models CSDLO5012: Internet Programming CSDLO5013: Advance Database Management System
Department Level Optional Course -2	VI	CSDLO6011: Internet of Things CSDLO6012: Digital Signal & Image Processing CSDLO6013: Quantitative Analysis

Program Structure for Fourth Year Computer Engineering
UNIVERSITY OF MUMBAI (With Effect from 2022-2023)

Semester VII

Course Code	Course Name	Teaching Scheme (Contact Hours)		Credits Assigned		
		Theory	Pract. Tut.	Theory	Pract.	Total
CSC701	Machine Learning	3	--	3	--	3
CSC702	Big Data Analytics	3	--	3	--	3
CSDC 701X	Department Level Optional Course-3	3	--	3	--	3
CSDC 702X	Department Level Optional Course-4	3	--	3	--	3
ILO 701X	Institute Level Optional Course-1	3	--	3	--	3
CSL701	Machine Learning Lab	--	2	--	1	1
CSL702	Big Data Analytics Lab	--	2	--	1	1
CSDL 701X	Department Level Optional Course-3 Lab	--	2	--	1	1
CSDL 702X	Department Level Optional Course-4 Lab	--	2	--	1	1
CSP701	Major Project 1	--	6 [#]	--	3	3
Total		15	14	15	7	22

Course Code	Course Name	Examination Scheme							
		Theory					Term Work	Pract. & oral	Total
		Internal Assessment			End Sem Exam	Exam. Duration (in Hrs)			
		Test 1	Test 2	Avg					
CSC701	Machine Learning	20	20	20	80	3	--	--	100
CSC702	Big Data Analysis	20	20	20	80	3	--	--	100
CSDC 701X	Department Level Optional Course-3	20	20	20	80	3	--	--	100
CSDC 702X	Department Level Optional Course-4	20	20	20	80	3	--	--	100
ILO 701X	Institute Level Optional Course-1	20	20	20	80	3	--	--	100
CSL701	Machine Learning Lab	--	--	--	--	--	25	25	50
CSL702	Big Data Analytics Lab	--	--	--	--	--	25	25	50
CSDL 701X	Department Level Optional Course-3 Lab						25	-	25
CSDL 702X	Department Level Optional Course-4 Lab	--	--	--	--	--	25	-	25
CSP701	Major Project 1	--	--	--	--	--	50	25	75
Total		--	--	100	400	--	150	75	725

Program Structure for Computer Engineering

UNIVERSITY OF MUMBAI (With Effect from 2022-2023)

Department and Institute Optional Courses and Labs

Semester	Department/ Institute Optional Courses and Labs	Subject
VII	Department Optional Course -3	CSDC7011: Machine Vision CSDC7012: Quantum Computing CSDC7013: Natural Language Processing
	Department Optional Lab -3	CSDL7011: Machine Vision Lab CSDL7012: Quantum Computing Lab CSDL7013: Natural Language Processing Lab
	Department Optional Course -4	CSDC7021 : Augmented and Virtual Reality CSDC7022 : Block Chain CSDC7023 : Information Retrieval
	Department Optional Lab -4	CSDL7021 : Augmented and Virtual Reality Lab CSDL7022 : Block Chain Lab CSDL7023 : Information Retrieval Lab
	Institute level Optional Courses-I	ILO7011. Product Lifecycle Management ILO7012. Reliability Engineering ILO7013. Management Information System ILO7014. Design of Experiments ILO7015. Operation Research ILO7016. Cyber Security and Laws ILO7017. Disaster Management & Mitigation Measures ILO7018. Energy Audit and Management ILO7019. Development Engineering

Program Structure B.E. Computer Engineering, (Rev. 2016) w.e.f. AY 2019-20

B. E. Computer Engineering (Semester-VIII)

Course Code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned			
		Theory	Pract	Tut	Theory	TW/Pract	Tut	Total
CSC801	Human Machine Interaction	4	-	-	4	-	-	4
CSC802	Distributed Computing	4	-	-	4	-	-	4
CSDLO 801X	Department Level Optional Course -IV	4	-	-	4	-	-	4
ILO801X	Institute Level Optional Course-II	3	-	-	3	-	-	3
CSL801	Human Machine Interaction Lab	-	2	-	-	1		1
CSL802	Distributed Computing Lab	-	2	-	-	1		1
CSL803	Cloud Computing Lab	-	4	-	-	2		2
CSL804	Computational Lab-II	-	2	-	-	1		1
CSP805	Major Project-II	-	12			6	-	6
	Total	15	22	-	15	11	-	26

Course Code	Course Name	Examination Scheme								
		Theory					TW	Oral	Oral & Pract	Total
		Internal Assessment			End Sem. Exam	Exam Duration (in				
		Test 1	Test 2	Avg.						
CSC801	Human Machine Interaction	20	20	20	80	3	-	-	-	100
CSC802	Distributed Computing	20	20	20	80	3	-	-	-	100
CSDLO 801X	Department Level Optional Course -IV	20	20	20	80	3	-	-	-	100
ILO801X	Institute Level Optional Course-II	20	20	20	80	3	-	-	-	100
CSC801	Human Machine Interaction Lab						25	25	-	50
CSL802	Distributed Computing Lab	-	-	-	-	-	25	25		50
CSL803	Cloud Computing Lab	-	-	-	-	-	50	--	25	75
CSL804	Computational Lab-II	-	-	-	-	-	50	--	25	75
CSP805	Major Project-II						50	--	50	100
	Total	80	80	80	320	--	200	50	100	750

Sem.	Department Level Optional Course (DLOC)	Institute Level Optional Course (ILOC)
V	CSDLO5011: Multimedia System CSDLO5012: Advance Operating System CSDLO5013: Advance Algorithm	-----
VI	CSDLO6021: Machine Learning CSDLO6022: Advance Database System CSDLO6023: Enterprise Resource Planning CSDLO6024: Advance Computer Network	-----
VII	CSDLO7031: Advance System Security & Digital Forensics CSDLO7032: Big Data & Analytics CSDLO7033: Robotics	ILO7011. Product Lifecycle Management ILO7012. Reliability Engineering ILO7013. Management Information System ILO7014. Design of Experiments ILO7015. Operation Research ILO7016. Cyber Security and Laws ILO7017. Disaster Management & Mitigation Measures ILO7018. Energy Audit and Management ILO7019. Development Engineering
VIII	DLO8011: High Performance Computing DLO8012: Natural Language Processing DLO8013: Adhoc Wireless Network	ILO8021. Project Management ILO8022. Finance Management ILO8023. Entrepreneurship Development and Management ILO8024. Human Resource Management ILO8025. Professional Ethics and CSR ILO8026. Research Methodology ILO8027. IPR and Patenting ILO8028. Digital Business Management ILO8029. Environmental Management

Syllabus Structure

Rev 2019

Information Technology

**Program Structure for Second Year
Engineering Semester III & IV
UNIVERSITY OF MUMBAI
(With Effect from 2020-2021)**

Semester III

Course Code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned				
		Theory	Pract.	Tut.	Theory	Pract.	Tut.	Total	
ITC301	Engineering Mathematics-III	3	--	1	3	--	1	4	
ITC302	Data Structure and Analysis	3		--	3		--	3	
ITC303	Database Management System	3	--	--	3	--	--	3	
ITC304	Principle of Communication	3	--	--	3	--	--	3	
ITC305	Paradigms and Computer Programming Fundamentals	3	--	--	3	--	--	3	
ITL301	Data Structure Lab	--	2	--	--	1	--	1	
ITL302	SQL Lab	--	2	--	--	1	--	1	
ITL303	Computer programming Paradigms Lab	--	2	--	--	1	--	1	
ITL304	Java Lab (SBL)	--	4	--	--	2	--	2	
ITM301	Mini Project – 1 A Front end /backend Application using JAVA	--	4 ^{\$}	--	--	2	--	2	
Total		15	14	1	15	07	1	23	
Course Code	Course Name	Examination Scheme							
		Theory					Term Work	Pract/oral	Total
		Internal Assessment			End Sem. Exam	Exam. Duration (in Hrs)			
		Test 1	Test2	Avg.					
ITC301	Engineering Mathematics-III	20	20	20	80	3	25	--	125
ITC302	Data Structure and Analysis	20	20	20	80	3	--	--	100
ITC303	Database Management System	20	20	20	80	3	--	--	100
ITC304	Principle of Communication	20	20	20	80	3	--	--	100
ITC305	Paradigms and Computer Programming Fundamentals	20	20	20	80	3	--	--	100
ITL301	Data Structure Lab	--	--	--	--	--	25	25	50
ITL302	SQL Lab	--	--	--	--	--	25	25	50
ITL303	Computer programming Paradigms Lab	--	--	--	--	--	25	25	50
ITL304	Java Lab (SBL)	--	--	--	--	--	25	25	50
ITM301	Mini Project – 1 A Front end /backend Application using JAVA	--	--	--	--	--	25	25	50
Total		--	--	100	400	--	150	125	775

\$ indicates work load of Learner (Not Faculty), for Mini Project.



Program Structure for Second Year Engineering
Semester III & IV
UNIVERSITY OF MUMBAI
(With Effect from 2020-2021)

Semester IV

Course Code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned				
		Theory	Pract.	Tut.	Theory	Pract.	Tut.	Total	
ITC401	Engineering Mathematics-IV	3	--	1	3	--	1	4	
ITC402	Computer Network and Network Design	3	--	--	3	--	--	3	
ITC403	Operating System	3	--	--	3	--	--	3	
ITC404	Automata Theory	3	--	--	3	--	--	3	
ITC405	Computer Organization and Architecture	3	--	--	3	--	--	3	
ITL401	Network Lab	--	2	--	--	1	--	1	
ITL402	Unix Lab	--	2	--	--	1	--	1	
ITL403	Microprocessor Lab	--	2	--	--	1	--	1	
ITL404	Python Lab (SBL)	--	4	--	--	2	--	2	
ITM401	Mini Project – 1 B Python based automation projects	--	4 ^{\$}	--	--	2	--	2	
Total		15	14	1	15	7	1	23	
Course Code	Course Name	Examination Scheme							
		Theory					Term Work	Pract/oral	Total
		Internal Assessment			End Sem. Exam.	Exam. Duration (in Hrs)			
		Test 1	Test 2	Avg.					
ITC401	Engineering Mathematics-IV	20	20	20	80	3	25	--	125
ITC402	Computer Network and Network Design	20	20	20	80	3	--	--	100
ITC403	Operating System	20	20	20	80	3	--	--	100
ITC404	Automata Theory	20	20	20	80	3	--	--	100
ITC405	Computer Organization and Architecture	20	20	20	80	3	--	--	100
ITL401	Network Lab	--	--	--	--	--	25	25	50
ITL402	Unix Lab	--	--	--	--	--	25	25	50
ITL403	Microprocessor Lab	--	--	--	--	--	25	25	50
ITL404	Python Lab (SBL)	--	--	--	--	--	25	25	50
ITM401	Mini Project – 1 B Python based automation projects	--	--	--	--	--	25	25	50
Total		--	--	100	400	--	150	75	775

\$ indicates work load of Learner (Not Faculty), for Mini Project.



Program Structure for Third Year Engineering
Semester V & VI
UNIVERSITY OF MUMBAI
(With Effect from 2021-2022)

Semester V

Course Code	Course Name	Teaching Scheme (Contact Hours)		Credits Assigned					
		Theory	Pract.	Theory	Pract.	Total			
ITC501	Internet Programming	3	--	3	--	3			
ITC502	Computer Network Security	3	--	3	--	3			
ITC503	Entrepreneurship and E- business	3	--	3	--	3			
ITC504	Software Engineering	3	--	3	--	3			
ITDO501X	Department Optional Course – 1	3	--	3	--	3			
ITL501	IP Lab	-	2	--	1	1			
ITL502	Security Lab	-	2	--	1	1			
ITL503	DevOPs Lab	-	2	--	1	1			
ITL504	Advance DevOPs Lab	-	2	--	1	1			
ITL505	Business Communication and Ethics	-	2*+2	--	2	2			
ITM501	Mini Project – 2 A Web Based Business Model	-	4 ^s	--	2	2			
Total		15	16	15	08	23			
Course Code	Course Name	Examination Scheme							
		Theory					Term Work	Prac /oral	Total
		Internal Assessment			End Sem Exam	Exam. Duration (in Hrs)			
		Test1	Test2	Avg					
ITC501	Internet Programming	20	20	20	80	3	--	--	100
ITC502	Computer Network Security	20	20	20	80	3	--	--	100
ITC503	Entrepreneurship and E- business	20	20	20	80	3	--	--	100
ITC504	Software Engineering	20	20	20	80	3	--	--	100
ITDO501X	Department Optional Course – 1	20	20	20	80	3	--	--	100
ITL501	IP Lab	--	--	--	--	--	25	25	50
ITL502	Security Lab	--	--	--	--	--	25	25	50
ITL503	DevOPs Lab	--	--	--	--	--	25	25	50
ITL504	Advance DevOPs Lab	--	--	--	--	--	25	25	50
ITL505	Business Communication and Ethics	--	--	--	--	--	50	--	50



ITM501	Mini Project – 2 A Web Based Business Model	--	--	--	--	--	25	25	50
Total		--	--	100	400	--	175	125	800

* Theory class to be conducted for full class

\$ indicates work load of Learner (Not Faculty), for Mini Project

ITDO501X	Department Optional Course – 1
ITDO5011	Microcontroller Embedded Programming
ITDO5012	Advance Data Management Technologies
ITDO5013	Computer Graphics & Multimedia System
ITDO5014	Advanced Data structure and Analysis

Program Structure for Third Year Engineering
Semester V & VI
UNIVERSITY OF MUMBAI
(With Effect from 2021-2022)

Semester VI

Course Code	Course Name	Teaching Scheme (Contact Hours)		Credits Assigned					
		Theory	Pract. Tut.	Theory	Pract.	Total			
ITC601	Data Mining & Business Intelligence	3	--	3	--	3			
ITC602	Web X.0	3	--	3	--	3			
ITC603	Wireless Technology	3	--	3	--	3			
ITC604	AI and DS – 1	3	--	3	--	3			
ITDO601 X	Department Optional Course – 2	3	--	3	--	3			
ITL601	BI Lab	--	2	--	1	1			
ITL602	Web Lab	--	2	--	1	1			
ITL603	Sensor Lab	--	2	--	1	1			
ITL604	MAD & PWA Lab	--	2	--	1	1			
ITL605	DS using Python Skill based Lab	--	2	--	1	1			
ITM601	Mini Project – 2 B Based on ML	--	4 ^s	--	2	2			
Total		15	14	15	07	22			
Course Code	Course Name	Examination Scheme							
		Theory					Term Work	Prac /oral	Total
		Internal Assessment			End Sem Exam	Exam. Duration (in Hrs)			
		Test1	Test2	Avg					
ITC601	Data Mining & Business Intelligence	20	20	20	80	3	--	--	100
ITC602	Web X.0	20	20	20	80	3	--	--	100
ITC603	Wireless Technology	20	20	20	80	3	--	--	100
ITC604	AI and DS – 1	20	20	20	80	3	--	--	100
ITDO601 X	Department Optional Course – 2	20	20	20	80	3	--	--	100
ITL601	BI Lab	--	--	--	--	--	25	25	50
ITL602	Web Lab	--	--	--	--	--	25	25	50
ITL603	Sensor Lab	--	--	--	--	--	25	25	50
ITL604	MAD & PWA Lab	--	--	--	--	--	25	25	50
ITL605	DS using Python Lab (SBL)	--	--	--	--	--	25	25	50



ITM601	Mini Project – 2 B Based on ML	--	--	--	--	--	25	25	50
Total		--	--	100	400	--	150	150	800

\$ indicates work load of Learner (Not Faculty), for Mini Project

ITDO601X	Department Optional Course – 2
ITDO6011	Software Architecture
ITDO6012	Image Processing
ITDO6013	Green IT
ITDO6014	Ethical Hacking and Forensic

Program Structure for Fourth Year Engineering
Semester VII & VIII
UNIVERSITY OF MUMBAI
(With Effect from 2022-2023)
Semester VII

Course Code	Course Name	Teaching Scheme (Contact Hours)		Credits Assigned		
		Theory	Pract. Tut.	Theory	Pract.	Total
ITC701	AI and DS –II	3	--	3	--	3
ITC702	Internet of Everything	3	--	3		3
ITDO701 X	Department Optional Course – 3	3	--	3	--	3
ITDO702 X	Department Optional Course – 4	3	--	3	--	3
ITIO701X	Institute Optional Course – 1	3	--	3	--	3
ITL701	Data Science Lab	--	2	--	1	1
ITL702	IOE Lab	--	2	--	1	1
ITL703	Secure Application Development	--	2	--	1	1
ITL704	Recent Open Source Project Lab	--	2	--	1	1
ITP701	Major Project I	--	6 [#]	--	3	3
Total		15	14	15	7	22

Course Code	Course Name	Examination Scheme							
		Theory					Term Work	Prac/oral	Total
		Internal Assessment			End Sem Exam	Exam. Duration (in Hrs)			
		Test1	Test2	Avg					
ITC701	AI and DS –II	20	20	20	80	3	--	--	100
ITC702	Internet of Everything	20	20	20	80	3	--	--	100
ITDO701 X	Department Optional Course – 3	20	20	20	80	3	--	--	100
ITDO702 X	Department Optional Course – 4	20	20	20	80	3	--	--	100
ITIO701X	Institute Optional Course – 1	20	20	20	80	3	--	--	100
ITL701	Data Science Lab	--	--	--	--	--	25	25	50
ITL702	IOE Lab	--	--	--	--	--	25	25	50
ITL703	Secure Application Development	--	--	--	--	--	25	25	50
ITL704	Recent Open Source Project Lab	--	--	--	--	--	25	25	50
ITP701	Major Project I	--	--	--	--	--	25	25	50
Total		--	--	100	400	--	125	125	750



indicates work load of Learner (Not Faculty), for Major Project

ITDO701X	Department Optional Course –3
ITDO7011	Storage Area Network
ITDO7012	High Performance computing
ITDO7013	Infrastructure Security
ITDO7014	Software Testing and QA

ITDO702X	Department Optional Course –4
ITDO7021	MANET
ITDO7022	AR – VR
ITDO7023	Quantum Computing
ITDO7024	Information Retrieval System

ITIO701X	Institute Optional Course – 1 (Common for all branches will be notified)
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Program Structure for Fourth Year Engineering
Semester VII & VIII
UNIVERSITY OF MUMBAI
(With Effect from 2022-2023)

Semester VIII

Course Code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned				
		Theory	Pract. Tut.	Theory	Pract.	Total			
ITC801	Blockchain and DLT	3	--	3	--	3			
ITDO801 X	Department Optional Course – 5	3	--	3	--	3			
ITDO802 X	Department Optional Course – 6	3	--	3	--	3			
ITIO801X	Institute Optional Course – 2	3	--	3	--	3			
ITL801	Blockchain Lab	--	2	--	1	1			
ITL802	Cloud computing	--	2	--	1	1			
ITP801	Major Project II	--	12 [#]	--	6	6			
Total		12	16	12	8	20			
Course Code	Course Name	Examination Scheme							
		Theory					Term Work	Prac /oral	Total
		Internal Assessment			End Sem Exam	Exam. Duration (in Hrs)			
		Test1	Test2	Avg					
ITC801	Blockchain and DLT	20	20	20	80	3	--	--	100
ITDO801 X	Department Optional Course – 5	20	20	20	80	3	--	--	100
ITDO802 X	Department Optional Course – 6	20	20	20	80	3	--	--	100
ITIO801X	Institute Optional Course – 2	20	20	20	80	3	--	--	100
ITL801	Blockchain Lab	--	--	--	--	--	25	25	50
ITL802	Cloud computing	--	--	--	--	--	25	25	50
ITP801	Major Project II	--	--	--	--	--	100	50	150
Total		--	--	80	320	--	150	100	650

indicates work load of Learner (Not Faculty), for Major Project

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

ITDO801X	Department Optional Course – 5
ITDO8011	Big Data Analytics
ITDO8012	Reinforcement learning
ITDO8013	Simulation and Modeling
ITDO8014	Knowledge management

ITDO802X	Department Optional Course –6
ITDO8021	User Interface Design
ITDO8022	Robotics
ITDO8023	ERP
ITDO8024	Cloud computing and Services

ITIO801X	Institute Optional Course – 2 (Common for all branches will be notified)
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Syllabus Structure

Rev 2019

Electronics and Telecommunication

Program Structure for Second Year Engineering
Semester III & IV
UNIVERSITY OF MUMBAI
(With Effect from 2020-2021)
Semester III

Course Code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned			
		Theory	Pract.	Tut.	Theory	Pract.	Tut.	Total
ECC301	Engineering Mathematics-III	3	--	1*	3	--	1	4
ECC302	Electronic Devices & Circuits	3	--	--	3	--	--	3
ECC303	Digital System Design	3	--	--	3	--	--	3
ECC304	Network Theory	3	--	1	3	--	1	4
ECC305	Electronic Instrumentation & Control Systems	3	--	--	3	--	--	3
ECL301	Electronic Devices & Circuits Lab	--	2	--	--	1	--	1
ECL302	Digital System Design Lab	--	2	--	--	1	--	1
ECL303	Electronic Instrumentation & Control Systems Lab	--	2	--	--	1	--	1
ECL304	Skill Lab: C++ and Java Programming	--	4	--	--	2	--	2
ECM301	Mini Project 1A	--	4 [§]	--	--	2	--	2
Total		15	14	2	15	07	2	24

* Should be conducted batch wise.

§ Indicates work load of a learner (Not Faculty) for Mini Project 1A. Faculty Load: 1 hour per week per four groups.

Course Code	Course Name	Examination Scheme							
		Theory					Term Work	Pract. & oral	Total
		Internal Assessment			End Sem. Exam	Exam. Duration (in Hrs)			
		Test 1	Test 2	Avg.					
ECC301	Engineering Mathematics-III	20	20	20	80	3	25	--	125
ECC302	Electronic Devices & Circuits	20	20	20	80	3	--	--	100
ECC303	Digital System Design	20	20	20	80	3	--	--	100
ECC304	Network Theory	20	20	20	80	3	25	--	125
ECC305	Electronic Instrumentation & Control Systems	20	20	20	80	3	--	--	100
ECL301	Electronic Devices & Circuits Lab	--	--	--	--	--	25	25	50
ECL302	Digital System Design Lab	--	--	--	--	--	25	--	25
ECL303	Electronic Instrumentation & Control Systems Lab	--	--	--	--	--	25	--	25
ECL304	Skill Lab: C++ and Java Programming	--	--	--	--	--	25	25	50
ECM301	Mini Project 1A	--	--	--	--	--	25	25	50
Total		--	--	100	400	--	175	75	750

Semester IV

Course Code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned			
		Theory	Pract.	Tut.	Theory	Pract.	Tut.	Total
ECC401	Engineering Mathematics-IV	3	--	1*	3	--	1	4
ECC402	Microcontrollers	3	--	--	3	--	--	3
ECC403	Linear Integrated Circuits	3	--	--	3	--	--	3
ECC404	Signals & Systems	3	--	1	3	--	1	4
ECC405	Principles of Communication Engineering	3	--	--	3	--	--	3
ECL401	Microcontrollers Lab	--	2	--	--	1	--	1
ECL402	Linear Integrated Circuits Lab	--	2	--	--	1	--	1
ECL403	Principles of Communication Engineering Lab	--	2	--	--	1	--	1
ECL404	Skill Lab: Python Programming	--	4	--	--	2	--	2
ECM401	Mini Project 1B	--	4 ^s	--	--	2	--	2
Total		15	14	2	15	7	2	24

* Should be conducted batch wise.

§ Indicates work load of a learner (Not Faculty) for Mini Project 1B. Faculty Load: 1 hour per week per four groups.

Course Code	Course Name	Examination Scheme							
		Theory					Term Work	Pract. & oral	Total
		Internal Assessment			End Sem. Exam.	Exam. Duration (in Hrs)			
		Test 1	Test 2	Avg.					
ECC401	Engineering Mathematics-IV	20	20	20	80	3	25	--	125
ECC402	Microcontrollers	20	20	20	80	3	--	--	100
ECC403	Linear Integrated Circuits	20	20	20	80	3	--	--	100
ECC404	Signals & Systems	20	20	20	80	3	25	--	125
ECC405	Principles of Communication Engineering	20	20	20	80	3	--	--	100
ECL401	Microcontrollers Lab	--	--	--	--	--	25	--	25
ECL402	Linear Integrated Circuits Lab	--	--	--	--	--	25	25	50
ECL403	Principles of Communication Engineering Lab	--	--	--	--	--	25	25	50
ECL404	Skill Lab: Python Programming	--	--	--	--	--	25	25	50
ECM401	Mini Project 1B	--	--	--	--	--	25	25	50
Total		--	--	100	400	--	175	100	775

UNIVERSITY OF MUMBAI



Bachelor of Engineering

in

Electronics and Telecommunication Engineering

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 Engineering

Semester V & VI

UNIVERSITY OF MUMBAI

(With Effect from 2021-2022)

Semester V

Course Code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned			
		Theory	Pract.	Tut.	Theory	Pract.	Tut.	Total
ECC501	Digital Communication	3	--	--	3	--	--	3
ECC502	Discrete Time Signal Processing	3	--	--	3	--	--	3
ECC503	Digital VLSI	3	--	--	3	--	--	3
ECC504	Random Signal Analysis	3	--	1	3	--	1	4
ECCDLO 501X	Department Optional Course-1	3	--	--	3	--	--	3
ECL501	Digital Communication Lab	--	2	--	--	1	--	1
ECL502	Discrete Time Signal Processing Lab	--	2	--	--	1	--	1
ECL503	Digital VLSI Lab	--	2	--	--	1	--	1
ECL504	Professional Communication & Ethics - II	--	2*+2~	--	--	2	--	2
ECM501	Mini Project 2A- Embedded System Project	--	4 ^s	--	--	2	--	2
Total		15	14	1	15	07	1	23

* Theory should be conducted for the full class.

~ Batch-wise practical's to be conducted

\$ Indicates work load of a learner (Not Faculty) for Mini Project 2A. Faculty Load: 1 hour per week per four groups.

Course Code	Course Name	Examination Scheme							Total
		Theory					Term Work	Pract. & oral	
		Internal Assessment			End Sem. Exam	Exam. Duration (in Hrs)			
		Test 1	Test 2	Avg.					
ECC501	Digital Communication	20	20	20	80	3	--	--	100
ECC502	Discrete Time Signal Processing	20	20	20	80	3	--	--	100
ECC503	Digital VLSI	20	20	20	80	3	--	--	100
ECC504	Random Signal Analysis	20	20	20	80	3	25	--	125
ECCDLO 501X	Department Level Optional Course-1	20	20	20	80	3	--	--	100
ECL501	Digital Communication Lab	--	--	--	--	--	25	25	50
ECL502	Discrete Time Signal Processing Lab	--	--	--	--	--	25	25	50
ECL503	Digital VLSI Lab	--	--	--	--	--	25	25	50
ECL504	Business Communication and Ethics Lab	--	--	--	--	--	25	25	50
ECM501	Mini Project 2A- Embedded System Project	--	--	--	--	--	25	25	50
Total		--	--	100	400	--	150	125	775

Department Level Optional Course-1

Course Code	Department Level Optional Course-1
ECCDLO5011	Digital and IPTV Engineering
ECCDLO5012	Data Compression and Cryptography
ECCDLO5013	IT Infra and Security
ECCDLO5014	Data Structures and Algorithm
ECCDLO5015	Sensor Technology

Semester VI

Course Code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned			
		Theory	Pract.	Tut.	Theory	Pract.	Tut.	Total
ECC601	Electromagnetics and Antenna	3	--	--	3	--	--	3
ECC602	Computer Communication Networks	3	--	--	3	--	--	3
ECC603	Image Processing and Machine Vision	3	--	--	3	--	--	3
ECC604	Artificial Neural Network and Fuzzy Logic	3	--	--	3	--	--	3
ECCDLO 601X	Department Level Optional Course-2	3	--	--	3	--	--	3
ECL601	Electromagnetics and Antenna Lab	--	2	--	--	1	--	1
ECL602	Computer Communication Networks Lab	--	2	--	--	1	--	1
ECL603	Image Processing and Machine Vision Lab	--	2	--	--	1	--	1
ECL604	Skill Lab: Linux and Networking and Server Configuration	--	4	--	--	2	--	2
ECM601	Mini Project 2B- FPGA based Project	--	4 ^s	--	--	2	--	2
Total		15	14	--	15	07	--	22

§ Indicates work load of a learner (Not Faculty) for Mini Project 2B. Faculty Load: 1 hour per week per four groups.

Course Code	Course Name	Examination Scheme							
		Theory					Term Work	Pract. & oral	Total
		Internal Assessment			End Sem. Exam.	Exam. Duration (in Hrs)			
		Test 1	Test 2	Avg.					
ECC601	Electromagnetics and Antenna	20	20	20	80	3	--	--	100
ECC602	Computer Communication Networks	20	20	20	80	3	--	--	100
ECC603	Image Processing and Machine Vision	20	20	20	80	3	--	--	100
ECC604	Artificial Neural Network and Fuzzy Logic	20	20	20	80	3	--	--	100
ECCDLO 601X	Department Level Optional Course-2	20	20	20	80	3	--	--	100
ECL601	Electromagnetics and Antenna Lab	--	--	--	--	--	25	25	50
ECL602	Computer Communication Networks Lab	--	--	--	--	--	25	25	50
ECL603	Image Processing and Machine Vision Lab	--	--	--	--	--	25	25	50
ECL604	Skill Lab: Linux and Networking and Server Configuration	--	--	--	--	--	25	25	50
ECM601	Mini Project 2B- FPGA based Project	--	--	--	--	--	25	25	50
Total		--	--	100	400	--	125	125	750

Department Level Optional Course-2

Course Code	Department Level Optional Course-2
ECCDLO6011	Mixed Signal VLSI
ECCDLO6012	Computer Organization and Architecture
ECCDLO6013	Digital Forensic
ECCDLO6014	Database Management System
ECCDLO6015	IoT and Industry 4.0
ECCDLO6016	Radar Engineering

Program Structure for Final Year Engineering
Semester VII & VIII
UNIVERSITY OF MUMBAI
(With Effect from 2022-2023)
Semester VII

Course Code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned			
		Theory	Pract.	Tut.	Theory	Pract.	Tut.	Total
ECC701	Microwave Engineering	3	--	--	3	--	--	3
ECC702	Mobile Communication System	3	--	--	3	--	--	3
ECCDLO701X	Department Optional Course-3	3	--	--	3	--	--	3
ECCDLO702X	Department Optional Course-4	3	--	--	3	--	--	3
ECCILO701X	Institute Level Optional Course-1	3			3			3
ECL701	Microwave Engineering Laboratory	--	2	--	--	1	--	1
ECL702	Mobile Communication System Laboratory	--	2	--	--	1	--	1
ECP701	Major Project-I	--	6 [#]	--	--	3	--	3
Total		15	10	--	15	5	--	20

indicates work load of Learner (Not Faculty), for Major Project

Project Guide Load = ½ hour per week per project group

Course Code	Course Name	Examination Scheme									
		Theory					End Sem. Exam	Exam Duration (in Hrs)	Term Work	Practical & Oral	Total
		Internal Assessment			Avg.	Total					
		Test 1	Test 2	Avg.							
ECC701	Microwave Engineering	20	20	20	80	3	--	--	100		
ECC702	Mobile Communication System	20	20	20	80	3	--	--	100		
ECCDLO701X	Department Level Optional Course-3	20	20	20	80	3	--	--	100		
ECCDLO702X	Department Level Optional Course-4	20	20	20	80	3	--	--	100		
ECCILO701X	Institute Level Optional Course-1	20	20	20	80	3	--	--	100		
ECL701	Microwave Engineering Laboratory	--	--	--	--	--	25	25	50		
ECL702	Mobile Communication System Laboratory	--	--	--	--	--	25	25	50		
ECP701	Major Project-I	--	--	--	--	--	25	25	50		
Total				100	400		75	75	650		

Department Level Optional Course-3

Course Code	Course Name
ECCDLO 7011	Efficient Architectures for DSP Algorithms
ECCDLO 7012	Deep Learning
ECCDLO 7013	Cloud Computing and Security
ECCDLO 7014	Big Data Analytics
ECCDLO 7015	Software Defined Radio

Department Level Optional Course-4

Course Code	Course Name
ECCDLO 7021	Robotics
ECCDLO 7022	5G Technology
ECCDLO 7023	Internet Communication Engineering
ECCDLO 7024	Advanced Digital Signal Processing
ECCDLO 7025	Quantum Computing

Institute Level Optional Course-1

Course Code	Course Name
ECCILO 7011	Product Lifecycle Management
ECCILO 7012	Reliability Engineering
ECCILO 7013	Management Information System
ECCILO 7014	Design of Experiments
ECCILO 7015	Operation Research
ECCILO 7016	Cyber Security and Laws
ECCILO 7017	Disaster Management and Mitigation Measures
ECCILO 7018	Energy Audit and Management
ECCILO 7019	Development Engineering



Semester VIII

Course Code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned		
		Theory	Pracs	Tut	Theory	TW/ Pracs	Total
ECC801	RF Design	4	-	--	4	--	4
ECC802	Wireless Networks	4	-	-	4	-	4
ECCDLO 804X	Department Level Optional Course IV	4	-	-	4	-	4
ILO802X	Institute Level Optional Course II	3	-	-	3	-	3
ECL801	RF Design Lab	-	2	-	-	1	1
ECL802	Wireless Networks Lab	-	2	-	-	1	1
ECLDLO 804X	Department Level Optional Lab IV	-	2	-	-	1	1
ECL803	Project-II	-	12	-	-	6	6
Total		15	18	-	15	9	24

Course Code	Course Name	Examination Scheme							
		Theory					TW	Oral & Prac	Total
		Internal Assessment			End Sem Exam	Exam Duration (Hrs)			
		Test1	Test 2	Avg					
ECC801	RF Design	20	20	20	80	03	--	--	100
ECC802	Wireless Networks	20	20	20	80	03	--	--	100
ECCDLO 804X	Department Level Optional Course IV	20	20	20	80	03	--	--	100
ILO802X	Institute Level Optional Course II	20	20	20	80	03	--	--	100
ECL801	RF Design Lab	--	--	--	--	--	25	25	50
ECL802	Wireless Networks Lab	--	--	--	--	--	25	25	50
ECLDLO 804X	Department Level Optional Lab IV	--	--	--	--	--	25	25	50
ECL803	Project-II	--	--	--	--	--	100	50	150
Total				80	320		175	125	700

Course Code	Department Level Elective Course IV	Course Code	Institute Level Elective Course II [#]
ECCDLO8041	Optical Networks	ILO8021	Project Management
ECCDLO8042	Advanced Digital Signal Processing	ILO8022	Finance Management
ECCDLO8043	Satellite Communication	ILO8023	Entrepreneurship Development and Management
ECCDLO8044	Network management in Telecommunication	ILO8024	Human Resource Management
		ILO8025	Professional Ethics and CSR
		ILO8026	Research Methodology
		ILO8027	IPR and Patenting
		ILO8028	Digital Business Management
		ILO8029	Environmental Management

Common with all branches

Syllabus Structure

Rev 2019

Chemical Engineering

University of Mumbai
Program Structure for B.E. Chemical Engineering (Revised 2020-2021)
Semester III

Course code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned			Total
		Theory	Practical	Tutorial	Theory	Practical	Tutorial	
CHC301	Engineering Mathematics-III	3	-	1	3	-	1	4
CHC302	Industrial and Engineering Chemistry I	3	-	-	3	-	-	3
CHC303	Fluid Flow Operations	3	-	-	3	-	-	3
CHC304	Chemical Engineering Thermodynamics I	3	-	-	3	-	-	3
CHC305	Process Calculations	3	-	-	3	-	-	3
CHL301	Industrial and Engineering Chemistry I Lab	-	3	-	-	1.5	-	1.5
CHL302	Fluid Flow Operation Lab	-	3	-	-	1.5	-	1.5
CHL303	Basic Chemical Engineering Lab	-	3	-	-	1.5	-	1.5
CHL304	Skilled Based Lab: Chemical Technology Lab	-	2*2	-	-	2	-	2
CHM301	Mini Project 1A	-	3#	-	-	1.5	-	1.5
	Total	15	16	1	15	8	1	24

Course code	Course Name	Examination Scheme								
		Theory					Term Work	Pract /Oral	Oral	Total
		Internal Assessment			End Sem Exam	Exam Duration (in hrs)				
		Test 1	Test 2	Avg						
CHC301	Engineering Mathematics-III	20	20	20	80	3	25	-	-	125
CHC302	Industrial and Engineering Chemistry I	20	20	20	80	3	-	-	-	100
CHC303	Fluid Flow Operations	20	20	20	80	3	-	-	-	100
CHC304	Chemical Engineering Thermodynamics I	20	20	20	80	3	-	-	-	100
CHC305	Process Calculations	20	20	20	80	3	-	-	-	100
CHL301	Industrial and Engineering Chemistry I Lab	-	-	-	-	3	25	25	-	50
CHL302	Fluid Flow Operation Lab	-	-	-	-	3	25	25	-	50
CHL303	Basic Chemical Engineering Lab	-	-	-	-	-	25	-	25	50
CHL304	Skilled Based Lab: Chemical Technology Lab	-	-	-	-	-	25	-	25	50
CHM301	Mini Project 1A	-	-	-	-	-	25	-	25	50
	Total	-	-	100	400	-	150	50	75	775

*Indicates Theory class to be conducted for full class;

indicates work load of Learner (Not Faculty), for Mini Project;

For mini project faculty load: 1 hour per week per four groups

University of Mumbai
Program Structure for B.E. Chemical Engineering (Revised 2020-2021)
Semester IV

Course code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned			Total
		Theory	Practical	Tutorial	Theory	Practical	Tutorial	
CHC401	Engineering Mathematics-IV	3	-	1	3	-	1	4
CHC402	Industrial and Engineering Chemistry II	3	-		3	-	-	3
CHC403	Numerical Method in Chemical Engineering	3	-	-	3	-	-	3
CHC404	Solid Fluid Mechanical Operations	3	-	-	3	-	-	3
CHC405	Chemical Engineering Thermodynamics II	3	-	-	3	-	-	3
CHL401	Industrial and Engineering Chemistry II Lab	-	3	-	-	1.5	-	1.5
CHL402	Numerical Method in Chemical Engineering Lab	-	3	-	-	1.5	-	1.5
CHL403	Solid Fluid Mechanical Operation Lab	-	3	-	-	1.5	-	1.5
CHL404	Skilled based lab: Design Calculation of Auxiliary Plant Equipment	-	3	-	-	1.5	-	1.5
CHM401	Mini Project 1B	-	2#	--	-	1		1
	Total	15	14	1	15	7	1	23

Course code	Course Name	Examination Scheme								
		Theory					Term Work	Pract /Oral	Oral	Total
		Internal Assessment			End Sem Exam	Exam Duration (in hrs)				
		Test 1	Test 2	Avg						
CHC401	Engineering Mathematics-IV	20	20	20	80	3	25	-	-	125
CHC402	Industrial and Engineering Chemistry II	20	20	20	80	3	-	-	-	100
CHC403	Numerical Method in Chemical Engineering	20	20	20	80	3	-	-	-	100
CHC404	Solid Fluid Mechanical Operations	20	20	20	80	3	-	-	-	100
CHC405	Chemical Engineering Thermodynamics II	20	20	20	80	3	-	-	-	100
CHL401	Industrial and Engineering Chemistry II Lab	-	-	-	-	3	25	25	-	50
CHL402	Numerical Method in Chemical Engineering Lab	-	-	-	-	-	25	-	25	50
CHL403	Solid Fluid Mechanical Operation Lab	-	-	-	-	3	25	25	-	50
CHL404	Skilled based lab: Design Calculation of Auxiliary Plant Equipment	-	-	-	-	-	25	-	25	50
CHM401	Mini Project 1B	-	-	-	-	-	25	-	25	50
	Total	-	-	100	400	-	150	50	75	775

indicates work load of Learner (Not Faculty), for Mini Project;

For mini project faculty load : 1 hour per week per four groups

University of Mumbai
Program Structure for B.E. Chemical Engineering (Revised 2021-2022)
Semester V

Course code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned			
		Theory	Practical	Tutorial	Theory	Practical	Tutorial	Total
CHC501	Mass transfer Operations-I	3	-	-	3	-	-	3
CHC502	Heat transfer Operations	3	-	-	3	-	-	3
CHC503	Chemical Reaction Engineering-I	3	-	-	3	-	-	3
CHC504	Transport Phenomena	3	-	-	3	-	-	3
CHDO501X	Department Optional Course 1	3	-	-	3	-	-	3
CHL501	Mass transfer Operations-I Lab	-	3	-	-	1.5	-	1.5
CHL502	Heat transfer Operations Lab	-	3	-	-	1.5	-	1.5
CHL503	Chemical Reaction Engineering-I Lab	-	3	-	-	1.5	-	1.5
CHL504	Skilled Based Lab: Business Communication and Ethics Lab	-	2*2	-	-	2	-	2
CHM501	Mini Project-2A	-	3#	-	-	1.5	-	1.5
	Total	15	14	-	15	8	-	23

Course code	Course Name	Examination Scheme								
		Theory					Term Work	Pract /Oral	Oral	Total
		Internal Assessment			End Sem Exam	Exam Duration (in hrs)				
		Test 1	Test 2	Avg						
CHC501	Mass transfer Operations-I	20	20	20	80	3	-	-	-	100
CHC502	Heat transfer Operations	20	20	20	80	3	-	-	-	100
CHC503	Chemical Reaction Engineering-I	20	20	20	80	3	-	-	-	100
CHC504	Transport Phenomena	20	20	20	80	3	-	-	-	100
CHDO501X	Department Optional Course 1	20	20	20	80	3	-	-	-	100
CHL501	Mass transfer Operations-I Lab	-	-	-	-	3	25	25	-	50
CHL502	Heat transfer Operations Lab	-	-	-	-	3	25	25	-	50
CHL503	Chemical Reaction Engineering-I Lab	-	-	-	-	3	25	25	-	50
CHL504	Skilled Based Lab: Business Communication and Ethics Lab	-	-	-	-	-	25	-	25	50
CHM501	Mini Project-2A	-	-	-	-	-	25	-	25	50
	Total			100	400	-	125	75	50	750

Department Optional Course 1 (Semester V)

Engineering Stream (Elective Code)	Technology Stream (Elective Code)	Management Stream
Food Engineering(CHDO5011)	Advanced Material Sciences (CHDO5012)	Total Quality Management (CHDO5013)

*Indicates Theory class to be conducted for full class;

indicates work load of Learner (Not Faculty), for Mini Project;

For mini project faculty load: 1 hour per week per four groups

University of Mumbai
Program Structure for B.E. Chemical Engineering (Revised 2021-2022)
Semester VI

Course code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned			
		Theory	Practical	Tutorial	Theory	Practical	Tutorial	Total
CHC601	Mass Transfer Operation II	3	-	-	3	-	-	3
CHC602	Chemical Reaction Engineering II	3	-	-	3	-	-	3
CHC603	Pollution Control Technology	3	-	-	3	-	-	3
CHC604	Process Engineering and Economics	3	-	1	3	-	1	4
CHDO602X	Departmental Optional Course 2	3	-	-	3	-	-	3
CHL601	Mass Transfer Operation II Lab	-	3	-	-	1.5	-	1.5
CHL602	Chemical Reaction Engineering II Lab	-	3	-	-	1.5	-	1.5
CHL603	Pollution Control Technology Lab	-	3	-	-	1.5	-	1.5
CHL604	Skilled Based Lab: Piping Design Engineering Lab	-	3	-	-	1.5	-	1.5
CHM601	Mini Project – 2B	-	2#	-	-	1	-	1
	Total	15	14	1	15	7	1	23

Course code	Course Name	Examination Scheme								
		Theory					Term Work	Pract /Oral	Oral	Total
		Internal Assessment			End Sem Exam	Exam Duration (in hrs)				
		Test 1	Test 2	Avg						
CHC601	Mass Transfer Operation II	20	20	20	80	3	-	-	-	100
CHC602	Chemical Reaction Engineering II	20	20	20	80	3	-	-	-	100
CHC603	Pollution Control Technology	20	20	20	80	3	-	-	-	100
CHC604	Process Engineering and Economics	20	20	20	80	3	25	-	-	125
CHDO602X	Departmental Optional Course 2	20	20	20	80	3	-	-	-	100
CHL601	Mass Transfer Operation II Lab	-	-	-	-	3	25	25	-	50
CHL602	Chemical Reaction Engineering II Lab	-	-	-	-	3	25	25	-	50
CHL603	Pollution Control Technology Lab	-	-	-	-	3	25	25	-	50
CHL604	Skilled Based Lab: Piping Design Engineering Lab	-	-	-	-	-	25	-	25	50
CHM601	Mini Project – 2B	-	-	-	-	-	25	-	25	50
	Total			100	400	-	150	75	50	775

Department Optional Course 2 (Semester VI)

Engineering Stream (Elective Code)	Technology Stream (Elective Code)	Management Stream (Elective Code)
Piping Engineering (CHDO6021)	Polymer Technology (CHDO6022)	Industrial Organization and Management (CHDO6023)

indicates work load of Learner (Not Faculty), for Mini Project; For mini project faculty load : 1 hour per week per four groups

University of Mumbai
Program Structure for B.E. Chemical Engineering (Revised 2022-2023)
Semester VII

Course code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned			
		Theory	Practical	Tutorial	Theory	Practical	Tutorial	Total
CHC701	Instrumentation Process Dynamics and Control	3	-	-	3	-	-	3
CHC702	Chemical Engineering Equipment Design	3	-	-	3	-	-	3
CHDO703X	Department Optional Course 3	3	-	-	3	-	-	3
CHDO704X	Department Optional Course 4	3	-	-	3	-	-	3
IOC701X	Institute Optional Course 1	3	-	-	3	-	-	3
CHL701	Instrumentation Process Dynamics and Control Lab	-	3	-	-	1,5	-	1.5
CHL702	Chemical Engineering Equipment Design Lab	-	3	-	-	1.5	-	1.5
CHL703	Hazard and Risk Analysis Lab	-	2	-	-	1	-	1
CHP701	Major Project I	-	6#	-	-	3	-	3
	Total	15	8	-	15	7	-	22

Course code	Course Name	Examination Scheme								
		Theory					Term Work	Pract /Oral	Oral	Total
		Internal Assessment			End Sem Exam	Exam Duration (in hrs)				
		Test 1	Test 2	Avg						
CHC701	Instrumentation Process Dynamics and Control	20	20	20	80	3	-	-	-	100
CHC702	Chemical Engineering Equipment Design	20	20	20	80	3	-	-	-	100
CHDO703X	Department Optional Course 3	20	20	20	80	3	-	-	-	100
CHDO704X	Department Optional Course 4	20	20	20	80	3	-	-	-	100
IOC701X	Institute Optional Course 1	20	20	20	80	3	-	-	-	100
CHL701	Instrumentation Process Dynamics and Control Lab	-	-	-	-	3	25	25	-	50
CHL702	Chemical Engineering Equipment Design Lab	-	-	-	-	-	25	-	25	50
CHL703	Hazard and Risk Analysis Lab	-	-	-	-	-	25	-	25	50
CHP701	Major Project I	-	-	-	-	3	25	-	25	50
	Total	-	-	100	400	-	100	25	75	700

Department Optional Course 3 (Semester VII)

Engineering Stream (Elective Code)	Technology Stream (Elective Code)	Management Stream (Elective)
Corrosion Engineering (CHDO7031)	Fundamental of Colloids and Interface Science and Technology (CHDO7032)	Project Management for Chemical Process Industries (CHDO7033)

Department Optional Course 4 (Semester VII)

Engineering Stream (Elective Code)	Technology Stream (Elective Code)	Management Stream (Elective)
Chemical Plant Safety and Hazards (CHDO7041)	Petroleum Refining Technology (CHDO7042)	Operation Research (CHDO7043)

indicates work load of Learner (Not Faculty), for Major Project; faculty load: semester VII-½ hour per week per project group.

University of Mumbai
Program Structure for B.E. Chemical Engineering (Revised 2022-2023)
Semester VIII

Course code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned			
		Theory	Practical	Tutorial	Theory	Practical	Tutorial	Total
CHC801	Modelling Simulation and Optimization	3	-	-	3	-	-	3
CHDO805X	Department Optional Course 5	3	-	-	3	-	-	3
CHDO806X	Department Optional Course 6	3	-	-	3	-	-	3
IO802X	Institute Optional Course 2	3	-	-	3	-	-	3
CHL801	Modelling Simulation and Optimization Lab	-	3	-	-	1.5	-	1.5
CHL802	Software application in Chemical Engineering Lab	-	3	-	-	1.5	-	1.5
CHP801	Major Project II	-	12#	-	-	6	-	6
Total		12	18	-	12	9	-	21

Course code	Course Name	Examination Scheme								
		Theory					Term Work	Pract /Oral	Oral	Total
		Internal Assessment			End Sem Exam	Exam Duration (in hrs)				
		Test 1	Test 2	Avg						
CHC801	Modelling Simulation and Optimization	20	20	20	80	3	-	-	-	100
CHDO805X	Department Optional Course 5	20	20	20	80	3	-	-	-	100
CHDO806X	Department Optional Course 6	20	20	20	80	3	-	-	-	100
IO802X	Institute Optional Course 2	20	20	20	80	3	-	-	-	100
CHL801	Modelling Simulation and Optimization Lab	-	-	-	-	3	25	25	-	50
CHL802	Software application in Chemical Engineering Lab	-	-	-	-	-	25	-	25	50
CHP801	Major Project II	-	-	-	-	-	50	-	100	150
Total				80	320	-	175	25	50	650

Department Optional Course 4 (Semester VIII)

Engineering Stream (Course Code)	Technology Stream (Course Code)	Management Stream (Course Code)
Energy System Design (CHDO8041)	Advanced Separation Technology (CHDO8042)	Financial Management (CHDO8043)

Department Optional Course 5 (Semester VIII)

Engineering Stream (Course Code)	Technology Stream (Course Code)	Management Stream (Course Code)
Fuel Cell Electrochemical Engineering (CHDO8051)	1. Biotechnology Technology (CHDO8052) 2. Nanotechnology (CHDO8053)	Chemical Waste Management (CHDO8054)

indicates work load of Learner (Not Faculty), for Major Project; Faculty load: semester VIII – 1 hour per week per project group

UNIVERSITY OF MUMBAI



Bachelor of Engineering

First Year Engineering (Semester I & II), Revised course
(REV- 2019‘C’ Scheme) from Academic Year 2019 – 20
(Common for All Branches of Engineering)

Under

FACULTY OF SCIENCE & TECHNOLOGY

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

Program Structure for First Year Engineering
Semester I & II
UNIVERSITY OF MUMBAI
(With Effect from 2019-2020)

Semester I

Course Code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned				
		Theory	Pract.	Tut.	Theory	Pract.	Tut.	Total	
FEC101	Engineering Mathematics-I	3	--	1*	3	--	1	4	
FEC102	Engineering Physics-I	2		--	2		--	2	
FEC103	Engineering Chemistry-I	2	--	--	2	--	--	2	
FEC104	Engineering Mechanics	3	--	--	3	--	--	3	
FEC105	Basic Electrical Engineering	3	--	--	3	--	--	3	
FEL101	Engineering Physics-I	--	1	--	--	0.5	--	0.5	
FEL102	Engineering Chemistry-I	--	1	--	--	0.5	--	0.5	
FEL103	Engineering Mechanics	--	2	--	--	1	--	1	
FEL104	Basic Electrical Engineering	--	2	--	--	1	--	1	
FEL105	Basic Workshop practice-I	--	2	--	--	1	--	1	
Total		13	08	01	13	04	01	18	
Course Code	Course Name	Examination Scheme							
		Theory					Term Work	Pract. /oral	Total
		Internal Assessment			End Sem. Exam.	Exam. Duration (in Hrs)			
		Test1	Test 2	Avg.					
FEC101	Engineering Mathematics-I	20	20	20	80	3	25	--	125
FEC102	Engineering Physics-I	15	15	15	60	2	--	--	75
FEC103	Engineering Chemistry-I	15	15	15	60	2	--	--	75
FEC104	Engineering Mechanics	20	20	20	80	3	--	--	100
FEC105	Basic Electrical Engineering	20	20	20	80	3	--	--	100
FEL101	Engineering Physics-I	--	--	--	--	--	25	--	25
FEL102	Engineering Chemistry-I	--	--	--	--	--	25	--	25
FEL103	Engineering Mechanics	--	--	--	--	--	25	25	50
FEL104	Basic Electrical Engineering	--	--	--	--	--	25	25	50
FEL105	Basic Workshop practice-I	--	--	--	--	--	50	--	50
Total		--	--	90	360	--	175	50	675

* May be conducted batch-wise

Semester II

Course Code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned				
		Theory	Pract.	Tut.	Theory	Pract.	Tut.	Total	
FEC201	Engineering Mathematics-II	3	--	1*	3	--	1	4	
FEC202	Engineering Physics-II	2	--	--	2	--	--	2	
FEC203	Engineering Chemistry-II	2	--	--	2	--	--	2	
FEC204	Engineering Graphics	2	--	--	2	--	--	2	
FEC205	C programming	2	--	--	2	--	--	2	
FEC206	Professional Communication and Ethics- I	2	--	--	2	--	--	2	
FEL201	Engineering Physics-II	--	1	--	--	0.5	--	0.5	
FEL202	Engineering Chemistry-II	--	1	--	--	0.5	--	0.5	
FEL203	Engineering Graphics	--	4	--	--	2	--	2	
FEL204	C programming	--	2	--	--	1	--	1	
FEL205	Professional Communication and Ethics- I	--	2	--	--	1	--	1	
FEL206	Basic Workshop practice-II	--	2	--	--	1	--	1	
Total		13	12	01	13	06	01	20	
Course Code	Course Name	Examination Scheme							
		Theory					Term Work	Pract. /oral	Total
		Internal Assessment			End Sem. Exam.	Exam. Duration (in Hrs)			
		Test1	Test 2	Avg.					
FEC201	Engineering Mathematics-II	20	20	20	80	3	25	--	125
FEC202	Engineering Physics-II	15	15	15	60	2	--	--	75
FEC203	Engineering Chemistry-II	15	15	15	60	2	--	--	75
FEC204	Engineering Graphics	15	15	15	60	3	--	--	75
FEC205	C programming	15	15	15	60	2	--	--	75
FEC206	Professional Communication and Ethics- I	10	10	10	40	2	--	--	50
FEL201	Engineering Physics-II	--	--	--	--	--	25	--	25
FEL202	Engineering Chemistry-II	--	--	--	--	--	25	--	25
FEL203	Engineering Graphics	--	--	--	--	--	25	50	75
FEL204	C programming	--	--	--	--	--	25	25	50
FEL205	Professional Communication and Ethics- I	--	--	--	--	--	25	--	25
FEL206	Basic Workshop practice-II	--	--	--	--	--	50	--	50
Total		--	--	90	360	--	200	75	725

* May be conducted batch-wise