

**B.Tech. Degree**  
**in**  
**COMPUTER SCIENCE AND ENGINEERING**

**SYLLABUS FOR CREDIT BASED CURRICULUM**  
**(With effect from 2019-2020 onwards)**



**DEPARTMENT OF COMPUTER SCIENCE AND**  
**ENGINEERING**

**NATIONAL INSTITUTE OF TECHNOLOGY PUDUCHERRY**  
**KARAIKAL – 609 609**

**FIRST SEMESTER**

<b>CODE</b>	<b>COURSE TITLE</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
HM111	Business English	2	0	2	3
MA111	Algebra and Calculus	3	0	0	3
EE111	Basics of Electrical and Electronics Engineering	3	0	0	3
CH111	Engineering Chemistry	3	0	0	3
CS101	Programming Fundamentals	3	0	0	3
CH113	Chemistry Laboratory	0	0	3	2
CS103	Programming in C Laboratory	0	0	3	2
EE113	Workshop Practice	0	0	2	2
	NSS/NSO/NCC (C)	0	0	0	0
<b>Total Credits</b>					<b>21</b>

## SECOND SEMESTER

<b>CODE</b>	<b>COURSE TITLE</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
MA112	Vectors and Ordinary Differential Equations	3	0	0	3
PH112	Engineering Physics	2	0	2	3
ME112	Environmental Engineering	3	0	0	3
ME114	Engineering Graphics	0	0	3	3
CS102	Data Structures	3	0	0	3
CS104	Digital Computer Fundamentals	3	0	0	3
PH114	Engineering Physics Laboratory	0	0	3	2
CS106	Data Structures Laboratory	0	0	3	2
	NSS/NSO/NCC (C)	0	0	0	0
<b>Total Credits</b>					<b>22</b>

### THIRD SEMESTER

<b>CODE</b>	<b>COURSE TITLE</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
MA211	Discrete Mathematics	3	0	0	3
CS201	Design and Analysis of Algorithm	3	0	0	3
CS203	Programming Paradigms	3	0	0	3
CS205	Automata and Formal Languages	3	0	0	3
CS207	Computer Organization and Architecture	3	0	0	3
CS209	Data Communication	3	0	0	3
CS211	Programming Paradigms Laboratory	0	0	3	2
CS213	Design and Analysis of Algorithm Laboratory	0	0	3	2
<b>Total Credits</b>					<b>22</b>

### FOURTH SEMESTER

<b>CODE</b>	<b>COURSE OF STUDY</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
MA212	Probability and Statistics	3	0	0	3
CS202	Computer Networks	3	0	0	3
CS204	Software Engineering	3	0	0	3
CS206	Python Programming	3	0	0	3
EC212	Microprocessor and Microcontrollers	3	0	0	3
CS208	Computer Networks Laboratory	0	0	3	2
CS210	Python Programming Laboratory	0	0	3	2
EC214	Microprocessor and Microcontrollers Laboratory	0	0	3	2
<b>Total Credits</b>					<b>21</b>

**FIFTH SEMESTER**

<b>CODE</b>	<b>COURSE OF STUDY</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
CS301	Database Management System	3	0	0	3
CS303	Operating Systems	3	0	0	3
CS305	UNIX Programming	3	1	0	4
CS307	Artificial Intelligence and Expert Systems	3	0	0	3
CS3XX	Elective 1	3	0	0	3
	Global Elective 1	3	0	0	3
CS309	Database Management System Laboratory	0	0	3	2
CS311	Operating Systems Laboratory	0	0	3	2
<b>Total Credits</b>					<b>23</b>

**SIXTH SEMESTER**

<b>CODE</b>	<b>COURSE OF STUDY</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
HM312	Corporate Communication	3	0	0	3
CS302	Principles of Compiler Design	3	0	0	3
CS304	Web Technology	3	0	0	3
CS3XX	Elective 2	3	0	0	3
	Global Elective 2	3	0	0	3
HM312	Engineering Ethics and Precepts of Constitution of India	3	0	0	0
CS306	Compiler Design Laboratory	0	0	3	2
CS308	Web Technology Laboratory	0	0	3	2
<b>Total Credits</b>					<b>19</b>

**SEVENTH SEMESTER**

<b>CODE</b>	<b>COURSE OF STUDY</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
HM411	Industrial Economics & Management	3	0	0	3
CS401	Computer Graphics	3	0	0	3
CS403	Machine Learning	3	0	0	3
CS4XX	Elective 3	3	0	0	3
CS4XX	Elective 4	3	0	0	3
CS4XX	Elective 5	3	0	0	3
CS491	Project Work Phase – I	0	0	0	3
<b>Total Credits</b>					<b>21</b>



### EIGHTH SEMESTER

<b>CODE</b>	<b>COURSE OF STUDY</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
CS4XX	Elective 6	3	0	0	3
CS4XX	Elective 7	3	0	0	3
	Global Elective 3	3	0	0	3
CS492	Project Work Phase-II	0	0	0	6
<b>Total Credits</b>					<b>15</b>

### Summary

<b>Semester</b>	<b>I</b>	<b>II</b>	<b>III</b>	<b>IV</b>	<b>V</b>	<b>VI</b>	<b>VII</b>	<b>VIII</b>	<b>Total</b>
<b>Credits</b>	21	22	22	21	23	19	21	15	<b>164</b>

## **LIST OF DEPARTMENT ELECTIVES**

### **LIST OF ELECTIVES FOR FIFTH SEMESTER (ANY ONE)**

1. CS321 GRAPH THEORY
2. CS323 WIRELESS AD HOC NETWORKS
3. CS325 JAVA PROGRAMMING
4. CS327 INFORMATION THEORY AND CODING
5. CS329 COMPUTATIONAL COMPLEXITY
6. CS331 OBJECT ORIENTED ANALYSIS AND DESIGN
7. CS333 DISTRIBUTED SYSTEMS

### **LIST OF ELECTIVES FOR SIXTH SEMESTER (ANY ONE)**

1. CS322 SOFTWARE TESTING
2. CS324 ADVANCED COMPUTER ARCHITECTURE
3. CS326 MOBILE COMMUNICATION
4. CS328 RANDOMIZED ALGORITHM
5. CS330 NETWORK PROTOCOLS
6. CS332 PATTERN RECOGNITION
7. CS334 GAME THEORY

### **LIST OF ELECTIVES FOR SEVENTH SEMESTER (ANY THREE)**

1. CS421 INTERNET OF THINGS
2. CS423 MOBILE APPLICATION DEVELOPMENT
3. CS425 DESIGN AND ANALYSIS OF PARALLEL ALGORITHMS
4. CS427 FUNCTIONAL PROGRAMMING LANGUAGES
5. CS429 NETWORK SECURITY
6. CS431 KNOWLEDGE ENGINEERING
7. CS433 DATA WAREHOUSING AND DATA MINING
8. CS435 CYBER SECURITY
9. CS437 FAULT TOLERANT SYSTEM
10. CS439 DEEP LEARNING

**LIST OF ELECTIVES FOR EIGHTH SEMESTER (ANY TWO)**

1. CS422 ADVANCED DATABASE MANAGEMENT SYSTEMS
2. CS424 SOFT COMPUTING
3. CS426 BIG DATA ANALYTICS
4. CS428 MANAGEMENT INFORMATION SYSTEMS
5. CS430 REAL TIME SYSTEMS
6. CS432 NATURAL LANGUAGE PROCESSING
7. CS434 NUMBER THEORY AND CRYPTOGRAPHY
8. CS436 MULTIMEDIA ANALYSIS
9. CS438 CLOUD COMPUTING

**LIST OF GLOBAL ELECTIVES (OFFERED FOR STUDENTS OTHER THAN CSE)**

1. CS451 INTRODUCTION TO CLOUD COMPUTING
2. CS452 INFORMATION SECURITY
3. CS453 DATA STRUCTURES AND ALGORITHMS
4. CS454 OPERATING SYSTEM CONCEPTS
5. CS455 OBJECT ORIENTED PROGRAMMING WITH C++
6. CS456 WEB OF THINGS
7. CS457 COMMUNICATION AND COMPUTER NETWORKS
8. CS458 INTRODUCTION TO JAVA PROGRAMMING
9. CS459 MACHINE LEARNING TECHNIQUES
10. CS460 PYTHON PROGRAMMING FUNDAMENTALS
11. CS461 R PROGRAMMING

## LIST OF B.TECH PROGRAMME STRUCTURE

Category	S. No.	Subjects	Credits
Humanities and Social Science	1.	Business English	3
	2.	Corporate Communication	3
	3.	Engineering Ethics and Precepts of Constitution of India	0
	4.	Industrial Economics & Management	3
	<b>Total</b>		
Basic Science Courses	1.	Engineering Physics	3
	2.	Engineering Physics Laboratory	2
	3.	Engineering Chemistry	3
	4.	Chemistry Laboratory	2
	5.	Algebra and Calculus	3
	6.	Vectors and Ordinary Differential Equations	3
	7.	Discrete Mathematics	3
	8.	Probability and Statistics Theory	3
<b>Total</b>			<b>22</b>
Engineering Science Courses	1.	Basics of Electrical and Electronics Engineering	3
	2.	Engineering Graphics	3
	3.	Workshop Practice	2
	4.	Environmental Engineering	3
	5.	Programming Fundamentals	3
	6.	Programming in C Laboratory	2
<b>Total</b>			<b>16</b>
Professional Core Courses - Theory	1.	Data Structures	3
	2.	Design and Analysis of Algorithm	3
	3.	Programming Paradigms	3
	4.	Digital Computer Fundamentals	3
	5.	Computer Organization and Architecture	3
	6.	Data Communication	3
	7.	Computer Networks	3
	8.	Automata and Formal Languages	3
	9.	Python Programming	3
	10.	Microprocessor and Microcontrollers	3
	11.	Database Management System	3
	12.	Operating Systems	3
	13.	UNIX Programming	4
	14.	Software Engineering	3
	15.	Principles of Compiler Design	3
	16.	Web Technology	3
	17.	Artificial Intelligence and Expert Systems	3
	18.	Computer Graphics and Vision	3
	19.	Machine Learning	3
<b>Total</b>			<b>58</b>

Category	S. No.	Subjects	Credits
Professional Core Courses - Laboratory	1.	Data Structures Laboratory	2
	2.	Programming Paradigms Laboratory	2
	3.	Design and Analysis of Algorithm Laboratory	2
	4.	Computer Networks Laboratory	2
	5.	Python Programming Laboratory	2
	6.	Microprocessor and Microcontrollers Laboratory	2
	7.	Database Management System Laboratory	2
	8.	Operating Systems Laboratory	2
	9.	Compiler Design Laboratory	2
	10.	Web Technology Laboratory	2
			<b>Total</b>
Professional Elective Courses	1.	Elective 1 (Fifth Semester)	3
	2.	Elective 2 (Sixth Semester)	3
	3.	Elective 3 (Seventh Semester)	3
	4.	Elective 4 (Seventh Semester)	3
	5.	Elective 5 (Seventh Semester)	3
	6.	Elective 6 (Eighth Semester)	3
	7.	Elective 7 (Eighth Semester)	3
			<b>Total</b>
Open Elective Courses	1.	Global Elective 1 (Fifth Semester)	3
	2.	Global Elective 2 (Sixth Semester)	3
	3.	Global Elective 3 (Eighth Semester)	3
			<b>Total</b>
Project Work	1.	Project Work Phase – I (Seventh Semester)	3
	2.	Project Work Phase–II (Eighth Semester)	6
			<b>Total</b>
		<b>Total</b>	<b>164</b>