NANDHA ENGINEERING COLLEGE
(Autonomous)

Affiliated to Anna University Chennai ✦ Approved by AICTE ✦ Accredited by NBA - New Delhi

Pitchandampalayam (P.O), Vaikkalmedu, Erode - Perundural Road, Erode - 638 052

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1.1.2. Details of courses where syllabus revision was carried out in B.E-Computer Science and Engineering R17-Curriculum

Course Code	Course Name	% of Change
17ITX17	Building Enterprise Applications	100
17ITX37	Problem Solving Using JAVA	100
	Average	**100%**

NEC AUTONOMOUS CSE ERODE - 52.

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NANDHA ENGINEERING COLLEGE

(An Autonomous Institution affiliated to Anna University Chennai and approved by AICTE, New Delhi)
Erode-638 052, Tamilnadu, India, Phone: 04294 – 225585

Curriculum and Syllabi
for
B.E – Computer Science and Engineering [R17]

[CHOICE BASED CREDIT SYSTEM]

(This Curriculum and Syllabi are applicable to Students admitted from the academic year 2017-2018 onwards)

SEPTEMBER 2021

COMPUTER SCIENCE AND ENGINEERING DEPARTMENT PEOs, PSOs and POs

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

The following Programme Educational Objectives are designed for B.E. Computer Science and Engineering programme in Computer Science and Engineering based on the Department Vision & Mission to provide higher engineering education and motivate research in the field of Computer Engineering.

- **PEO 1.** Graduates will be employed in IT industries to solve industrial technological issues.
- **PEO 2.** Graduates will take up masters and pursue career paths in teaching and research.
- **PEO 3.** Graduates will be an entrepreneur who develops, deploys and maintains Real-time software.
- **PEO 4.** Graduates will continuously learn and adopt new technologies to solve communal issues.
- **PEO 5.** Graduates will enhance leadership skills and contribute towards societal growth.

PROGRAM SPECIFIC OUTCOMES (PSOs):

- **PSO1.** Ability to understand the principles and working of hardware and software aspects in a computer system
- **PSO2.** Ability to demonstrate knowledge in mathematical models, algorithms and software development methodologies
- **PSO3.** Ability to develop practical competency in programming languages and open source platforms
- **PSO4.** Ability to provide a foundation for higher studies, research and entrepreneurship

PROGRAM OUTCOMES (POs)

a-l	GRADUATE ATTRIBUTES	PO No.	PROGRAMME OUTCOMES
a	Engineering Knowledge	**PO1**	Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
b	Problem Analysis	**PO2**	Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
c	Design and Development of Solutions	**PO3**	Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
d	Investigation of Complex Problems	**PO4**	Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
e	Modern Tool Usage	**PO5**	Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
f	The Engineer and Society	**PO6**	Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
g	Environment and Sustainability	**PO7**	Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
h	Ethics	**PO8**	Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
i	Individual and Team Work.	**PO9**	Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
j	Communication	**PO10**	Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
k	Project Management and Finance	**PO11**	Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
l	Lifelong Learning	**PO12**	Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

MAPPING OF PROGRAMME EDUCATIONAL OBJECTIVES WITH PROGRAMME OUTCOMES

A broad relation between the Programme educational objectives and the Program Outcomes is given in the following table

PROGRAMME EDUCATIONAL OBJECTIVES	PROGRAMME OUTCOMES											
	a	b	c	d	e	f	g	h	i	j	k	l
1	3	3	3	3	3	2	2	2	3	3	3	3
2	3	3	3	3	3	2	2	1	3	3	2	3
3	3	3	3	3	3	2	2	2	3	3	3	3
4	3	3	3	3	3	2	2	1	3	3	2	3
5	3	3	3	3	3	3	2	2	2	3	3	3

MAPPING OF PROGRAM SPECIFIC OUTCOMES WITH PROGRAMME OUTCOMES

A broad relation between the Program Specific Outcomes and the Programme Outcomes is given in the following table

PROGRAM SPECIFIC OUTCOMES	PROGRAMME OUTCOMES											
	a	b	c	d	e	f	g	h	i	j	k	l
1	3	3	2	2	2	1	1	1	1	1	1	2
2	3	3	3	3	2	2	1	3	1	2	3	3
3	3	3	3	3	3	3	1	2	1	1	2	3
4	3	3	2	3	3	2	2	3	1	2	2	3

*** Contribution** **1: Reasonable** **2: Significant** **3: Strong**

NANDHA ENGINEERING COLLEGE (AUTONOMOUS), ERODE – 638 052

REGULATIONS – 2017 **CHOICE BASED CREDIT SYSTEM**

B.E. COMPUTER SCIENCE AND ENGINEERING

CURRICULA: I – VIII SEMESTERS **SYLLABI I - VIII SEMESTER**

SEMESTER: I									
SL. NO.	**COURSE CODE**	**COURSE TITLE**	**CATEGORY**	**PRERQUISITE**	**CONTACT PERIODS**	**L**	**T**	**P**	**C**
THEORY									
1.	17EYA01	Professional English- I	HS	-	4	2	0	2	3
2.	17MYB01	Calculus and Solid Geometry	BS	-	5	3	2	0	4
3.	17PYB02	Physics for Computer Engineers	BS	-	5	3	0	2	4
4.	17CYB03	Environmental Science	BS	-	3	3	0	0	3
5.	17CSC02	Python Programming	ES	-	3	3	0	0	3
PRACTICAL									
6.	17MEP01	Engineering Graphics Laboratory	ES	-	4	0	0	4	2
7.	17CSP02	Python Programming Laboratory	ES	-	4	0	0	4	2
8.	17GEP01	Personal Values	HS	-	2	0	0	2	0
				TOTAL	**30**	**14**	**2**	**14**	**21**

SEMESTER: II									
SL. NO.	**COURSE CODE**	**COURSE TITLE**	**CATEGORY**	**PRERQUISITE**	**CONTACT PERIODS**	**L**	**T**	**P**	**C**
THEORY									
1.	17EYA02	Professional English- II	HS	17EYA01	4	2	0	2	3
2.	17MYB02	Complex Analysis and Laplace Transforms	BS	17MYB01	5	3	2	0	4
3.	17PYB04	Applied Physics	BS	17PYB02	3	3	0	0	3
4.	17CYB04	Chemistry for Computer Engineers	BS	-	5	3	0	2	4
5.	17CSC03	Structured Programming	ES	-	3	3	0	0	3
6.	17ECC04	Basics of Electronics Engineering	ES	-	4	3	0	0	3
PRACTICAL									
7.	17CSP03	Structured Programming Laboratory	ES	-	4	0	0	4	2
8.	17ECP02	Electronics Laboratory	ES	-	4	0	0	4	2
9.	17GEP02	Interpersonal Values	HS	17GEP01	2	0	0	2	0
				TOTAL	**34**	**17**	**2**	**14**	**24**

SEMESTER: III									
SL. NO.	**COURSE CODE**	**COURSE TITLE**	**CATEGORY**	**PRERQUISITE**	**CONTACT PERIODS**	**L**	**T**	**P**	**C**
THEORY									
1.	17MYB04	Probability and Statistics	BS	-	4	2	2	0	3
2.	17CSC04	Data Structures using Python	PC	17CSC02	5	3	0	2	4
3.	17ITC01	OOPS using JAVA	PC	-	3	3	0	0	3
4.	17CSC05	Operating Systems	PC	-	3	3	0	0	3
5.	17ECC09	Digital Principles and System Design	ES	17ECC04	3	3	0	0	3
6.	17CSC06	Microprocessor and Computer Architecture	PC	-	3	3	0	0	3
PRACTICAL									
7.	17ITP01	OOPS using JAVA Laboratory	PC	-	4	0	0	4	2
8.	17CSP04	Operating Systems Laboratory	PC	-	2	0	0	2	1
9.	17GED01	Soft Skills – Listening & Speaking	EEC	-	2	0	0	2	0
				TOTAL	**29**	**17**	**2**	**10**	**22**

SEMESTER: IV									
SL. NO.	**COURSE CODE**	**COURSE TITLE**	**CATEGORY**	**PRERQUISITE**	**CONTACT PERIODS**	**L**	**T**	**P**	**C**
THEORY									
1.	17MYB08	Discrete Mathematics	BS	-	4	2	2	0	3
2.	17ITC04	Design and Analysis of Algorithms	PC	17CSC04	5	3	2	0	4
3.	17CSC07	Database Management System	PC	-	3	3	0	0	3
4.	17CSC08	Computer Networks	PC	-	3	3	0	0	3
5.	17CSC09	Artificial Intelligence	PC	-	3	3	0	0	3
6.	17GEA01	Engineering Economics and Financial Accounting	HS	-	3	3	0	0	3
PRACTICAL									
7.	17CSP05	Database Management System Laboratory	PC	-	4	0	0	4	2
8.	17CSP06	Computer Networks Laboratory	PC	-	2	0	0	2	1
9.	17GED02	Soft Skills – Reading and Writing	EEC	-	2	0	0	2	0
10.	17GED03	Personality and Character Development	EEC	-	1	0	0	1	0
				TOTAL	**30**	**17**	**4**	**9**	**22**

SEMESTER: V									
SL. NO.	**COURSE CODE**	**COURSE TITLE**	**CATEGORY**	**PRERQUISITE**	**CONTACT PERIODS**	**L**	**T**	**P**	**C**
THEORY									
1.	17CSC10	Theory of Computation	PC	17MYB08	3	3	0	0	3
2.	17ITC09	Internet and Web Programming	PC	17ITC01	4	2	0	2	3
3.	17CSC11	Object Oriented Software Engineering	PC	17CSC07	3	3	0	0	3
4.	17CSC12	Graphics and Multimedia	PC	-	3	3	0	0	3
5.	E1	Elective (PSE)	PSE	-	3	3	0	0	3
6.	E2	Elective (PSE/OE)	PSE/OE	-	3	3	0	0	3
PRACTICAL									
7.	17CSP07	Case Tools Laboratory	PC	-	4	0	0	4	2
8.	17CSP08	Graphics and Multimedia Laboratory	PC	-	4	0	0	4	2
9.	17GED08	Essence of Indian Traditional Knowledge	MC	-	2	2	0	0	0
				TOTAL	**29**	**19**	**0**	**10**	**22**

SEMESTER:VI									
SL. NO.	**COURSE CODE**	**COURSE TITLE**	**CATEGORY**	**PRERQUISITE**	**CONTACT PERIODS**	**L**	**T**	**P**	**C**
THEORY									
1.	17CSC14	Cloud Computing	PC	-	3	3	0	0	3
2.	17CSC15	Security in Computing	PC	17CSC07, 17CSC08	3	3	0	0	3
3.	17CSC16	Principles of Compiler Design	PC	17CSC10	3	3	0	0	3
4.	E3	Elective (PSE)	PSE	-	3	3	0	0	3
5.	E4	Elective (PSE)	PSE	-	3	3	0	0	3
6.	E5	Elective (PSE/OE)	PSE/OE	-	3	3	0	0	3
PRACTICAL									
7.	17CSP09	Internet of Things Laboratory	ES	-	4	0	0	4	2
8.	17GED06	Comprehension	PC	-	2	0	0	2	0
9.	17GED07	Constitution of India	MC	-	2	2	0	0	0
				TOTAL	**27**	**19**	**0**	**8**	**20**

SEMESTER: VII									
SL. NO.	**COURSE CODE**	**COURSE TITLE**	**CATEGORY**	**PRERQUISITE**	**CONTACT PERIODS**	**L**	**T**	**P**	**C**
THEORY									
1.	17CSC17	Mobile Computing	PC	17CSC08	3	3	0	0	3
2.	17ITC15	Machine Learning Techniques	PC	17MYB01	3	3	0	0	3
3.	17CSC18	Full Stack Development	PC	-	3	3	0	0	3
4.	E6	Elective (PSE/ OE)	PSE/OE	-	3	3	0	0	3
5.	E7	Elective (OE)	OE	-	3	3	0	0	3
PRACTICAL									
6.	17CSP10	Mobile Computing Laboratory	PC	-	2	0	0	2	1
7.	17CSD01	Project Work I	EEC	-	8	0	0	8	4
				TOTAL	**25**	**15**	**0**	**10**	**20**

SEMESTER: VIII									
SL. NO.	**COURSE CODE**	**COURSE TITLE**	**CATEGORY**	**PRERQUISITE**	**CONTACT PERIODS**	**L**	**T**	**P**	**C**
THEORY									
1.	E8	Elective (PSE)	PSE	-	3	3	0	0	3
2.	E9	Elective (OE)	OE	-	3	3	0	0	3
PRACTICAL									
3.	17CSD02	Project Work II	EEC	-	16	0	0	16	8
				TOTAL	**22**	**6**	**0**	**16**	**14**

LIST OF PROGRAMME SPECIFIC ELECTIVES

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PRERQUISITE	CONTACT PERIODS	L	T	P	C
1	17CSX04	TCP/IP Design and Implementation	PSE	17CSC08	3	3	0	0	3
2	17CSX05	Network Analysis and Management	PSE	17CSC08	3	3	0	0	3
3	17CSX06	Wireless Communication and Networks	PSE	17CSC08	3	3	0	0	3
4	17CSX07	Embedded systems	PSE	-	3	3	0	0	3
5	17CSX08	Graph Theory	PSE	17CSC04	3	3	0	0	3
6	17CSX10	Mobile Application Development	PSE	-	3	3	0	0	3
7	17CSX11	Human Computer Interaction	PSE	17CSC08	3	3	0	0	3
8	17CSX12	Green Computing	PSE	17CSC08	3	3	0	0	3
9	17CSX13	Nano Computing	PSE	17CSC08	3	3	0	0	3
10	17CSX15	Knowledge Management	PSE	-	3	3	0	0	3
11	17ITX05	PHP programming	PSE	17ITC09	3	3	0	0	3
12	17ITX06	Programming with Java2 Enterprise Edition	PSE	17ITC01	3	3	0	0	3
13	17ITX08	C# and .Net	PSE	17ITC01	3	3	0	0	3
14	17ITX09	Ruby programming	PSE	-	3	3	0	0	3
15	17CSX23	Text Mining	PSE	17CSX22	3	3	0	0	3
16	17CSX24	Distributed Systems	PSE	-	3	3	0	0	3
17	17CSX25	Game Programming	PSE	-	3	3	0	0	3
18	17CSX27	Quantum Computing	PSE	17MYB04	3	3	0	0	3
19	17CSX28	Container OrchestrationUsing Kubernetes	PSE	17CSC14	3	3	0	0	3
20	17CSX29	Internet of Things	PSE	17CSC08	3	3	0	0	3
21	17MYB12	Basic Statistics andNumerical Analysis	PSE	-	3	3	0	0	3
22	17CSX31	Problem Solving and Programming	PSE	-	3	3	0	0	3
23	17CSX32	Social network Analysis	PSE	-	3	3	0	0	3
24	17ITX26	Problem Solving and Algorithmic Skills	PSE	-	3	3	0	0	3
25	17ECX16	Internet of Things and its applications	PSE	-	3	3	0	0	3
26	17CSX33	Google Cloud Platform	PSE		3	3	0	0	3

27	17CSX34	Tableau	PSE	-	3	3	0	0	3
28	17CSX35	Node JS	PSE	17ITC09, 17ITX05	3	3	0	0	3
29	17CSX36	React JS	PSE	17ITC09, 17ITX05	3	3	0	0	3
30	17ITX29	IT operations	PSE	-	3	3	0	0	3
31	17ITX30	IT operations Advanced	PSE	17ITX29	3	3	0	0	3
32	17CSX37	Professional Readiness for Innovation, Employability and Entrepreneurship	PSE	-	3	3	0	0	3
33	17ITX32	Test Driven Programming	PSE	-	3	3	0	0	3
34	17ITX33	Java - Full Stack Implementation	PSE	-	3	3	0	0	3
35	17ITX17	Building Enterprise Applications	PSE	-	3	3	0	0	3
36	17ITX37	Problem Solving Using Java	PSE	-	3	3	0	0	3

HUMANITIES AND SOCIAL SCIENCES (HS)

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PRERQUISITE	CONTACT PERIODS	L	T	P	C
1.	17EYA01	Professional English- I	HS	-	4	2	0	2	3
2.	17GEP01	Personal Values	HS	-	2	0	0	2	0
3.	17EYA02	Professional English- II	HS	17EYA01	4	2	0	2	3
4.	17GEP02	Interpersonal Values	HS	17GEP01	2	0	0	2	0
5.	17GEA01	Engineering Economics andFinancial Accounting	HS	-	3	3	0	0	3

BASIC SCIENCES (BS)

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PRERQUISITE	CONTACT PERIODS	L	T	P	C
1.	17MYB01	Calculus and Solid Geometry	BS	-	5	3	2	0	4
2.	17PYB02	Physics for Computer Engineers	BS	-	5	3	0	2	4
3.	17CYB03	Environmental Science	BS	-	3	3	0	0	3
4.	17MYB02	Complex Analysis andLaplace Transforms	BS	17MYB01	5	3	2	0	4
5.	17PYB04	Applied Physics	BS	17PYB02	3	3	0	0	3
6.	17CYB04	Chemistry for Computer Engineers	BS	-	5	3	0	2	4
7.	17MYB04	Probability and Statistics	BS	-	4	2	2	0	3
8.	17MYB08	Discrete Mathematics	BS	-	4	2	2	0	3

ENGINEERING SCIENCES (ES)									
SL. NO.	**COURSE CODE**	**COURSE TITLE**	**CATEGORY**	**PRERQUISITE**	**CONTACT PERIODS**	**L**	**T**	**P**	**C**
1.	17CSC02	Python Programming	ES	-	3	3	0	0	3
2.	17MEP01	Engineering Graphics Laboratory	ES	-	4	0	0	4	2
3.	17CSP02	Python Programming Laboratory	ES	-	4	0	0	4	2
4.	17CSC03	Structured Programming	ES	-	3	3	0	0	3
5.	17ECC04	Basics of Electronics Engineering	ES	-	4	3	0	0	3
6.	17CSP03	Structured Programming Laboratory	ES	-	4	0	0	4	2
7.	17ECP02	Electronics Laboratory	ES	-	4	0	0	4	2
8.	17ECC09	Digital Principles and System Design	ES	17ECC04	3	3	0	0	3
9.	17CSC13	Internet of Things	ES	-	3	3	0	0	3
10.	17CSP09	Internet of Things Laboratory	ES	-	4	0	0	4	2
EMPLOYABILITY ENHANCEMENT COURSES									
SL. NO.	**COURSE CODE**	**COURSE TITLE**	**CATEGORY**	**PRERQUISITE**	**CONTACT PERIODS**	**L**	**T**	**P**	**C**
1.	17GED01	Soft Skills – Listening & Speaking	EEC	-	2	0	0	2	0
2.	17GED02	Soft Skills – Reading & Writing	EEC	-	2	0	0	2	0
3.	17GED03	Personality and Character Development	EEC	-	1	0	0	1	0
4.	17GED08	Essence of Indian Traditional Knowledge	MC	-	2	2	0	0	0
5.	17GED07	Constitution of India	MC	-	2	2	0	0	0
6.	17CSD01	Project Work I	EEC	-	8	0	0	8	4
7.	17CSD02	Project Work II	EEC	-	16	0	0	16	8
PROFESSIONAL CORE (PC)									
SL. NO.	**COURSE CODE**	**COURSE TITLE**	**CATEGORY**	**PRERQUISITE**	**CONTACT PERIODS**	**L**	**T**	**P**	**C**
1.	17CSC04	Data Structures using Python	PC	17CSC02	4	2	0	2	3
2.	17ITC01	OOPS using JAVA	PC	-	3	3	0	0	3
3.	17CSC05	Operating Systems	PC	-	3	3	0	0	3

4.	17CSC06	Microprocessor and Computer Architecture	PC	-	3	3	0	0	3
5.	17ITP01	OOPS using JAVA Laboratory	PC	-	4	0	0	4	2
6.	17CSP04	Operating Systems Laboratory	PC	-	2	0	0	2	1
7.	17CSC07	Database Management System	PC	-	3	3	0	0	3
8.	17CSC08	Computer Networks	PC	-	3	3	0	0	3
9.	17ITC04	Design and Analysis of Algorithms	PC	17CSC04	4	3	2	0	4
10.	17CSC09	Artificial Intelligence	PC	-	3	3	0	0	3
11.	17CSP05	Database Management System Laboratory	PC	-	4	0	0	4	2
12.	17CSP06	Computer Networks Laboratory	PC	-	2	0	0	2	1
13.	17CSC10	Theory of Computation	PC	17MYB08	3	3	0	0	3
14.	17CSC11	Object Oriented Software Engineering	PC	17CSC07	3	3	0	0	3
15.	17ITC09	Internet and Web Programming	PC	-	4	2	0	2	3
16.	17CSC12	Graphics and Multimedia	PC	-	3	3	0	0	3
17.	17CSP07	Case Tools Laboratory	PC	-	4	0	0	4	2
18.	17CSP08	Graphics and Multimedia Laboratory	PC	-	4	0	0	4	2
19.	17CSC14	Cloud Computing	PC	-	3	3	0	0	3
20.	17CSC15	Security in Computing	PC	17CSC07, 17CSC08	3	3	0	0	3
21.	17CSC16	Principles of Compiler Design	PC	17CSC10	3	3	0	0	3
22.	17GED06	Comprehension	PC	-	2	0	0	2	0
23.	17ITC15	Machine Learning Techniques	PC	17MYB01	3	3	0	0	3
24.	17CSC17	Mobile Computing	PC	17CSC08	3	3	0	0	3
25.	17CSP10	Mobile Computing Laboratory	PC	-	2	0	0	2	1
26.	17CSC18	Full Stack Development	PC	-	3	3	0	0	3

(b)Open Electives			AICTE Credit Distribution Norm:18							
SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PRERQUISITE	CONTACT PERIODS	L	T	P	C	P.S
1.	17AGZ01	Baking and Confectionery Technology	OE	-	3	3	0	0	3	VII
2.	17AGZ02	Food safety and quality control system	OE	-	3	3	0	0	3	VII
3.	17AGZ03	Farm Mechanization	OE	-	3	3	0	0	3	VIII
4.	17AGZ04	Processing of Fruits and Vegetables	OE	-	3	3	0	0	3	VIII
5.	17CHZ01	Waste Water Treatment	OE	-	3	3	0	0	3	VII
6.	17CHZ02	Piping Engineering	OE	-	3	3	0	0	3	VII
7.	17CHZ03	Process Automation	OE	-	3	3	0	0	3	VII
8.	17CHZ04	Process Instrumentation	OE	-	3	3	0	0	3	VII
9.	17CEZ01	Energy conservation in buildings	OE	-	3	3	0	0	3	VII
10.	17CEZ02	Air Pollution Management	OE	-	3	3	0	0	3	VIII
11.	17CEZ03	Building Services	OE	-	3	3	0	0	3	VIII
12.	17CEZ04	Road Safety Management	OE	-	3	3	0	0	3	VII
13	17CEZ05	Waste Management	OE	-	3	3	0	0	3	VII/VII I
14.	17CSZ01	Design Thinking	OE	-	3	3	0	0	3	VII
15.	17CSZ02	Digital Marketing	OE	-	3	3	0	0	3	VII
16.	17CSZ03	Software Engineering	OE	-	3	3	0	0	3	VIII
17.	17CSZ04	Unified Functional Testing	OE	-	3	3	0	0	3	VIII
18	17CSZ05	C Programming	OE	-	3	3	0	0	3	VI
19.	17CSZ06	Data Structures	OE	-	3	3	0	0	3	VI
20.	17CSZ07	Web Services Using Java	OE	-	3	3	0	0	3	VI
21.	17ECZ01	Modern wireless communication system	OE	-	3	3	0	0	3	VII
22.	17ECZ02	Consumer Electronics	OE	-	3	3	0	0	3	VII
23.	17ECZ03	Automotive Electronics	OE	-	3	3	0	0	3	VIII
24.	17ECZ04	Electronic Testing	OE	-	3	3	0	0	3	VIII
25.	17EEZ01	Renewable Energy Technology	OE	-	3	3	0	0	3	VII
26.	17EEZ02	Smart Grid	OE	-	3	3	0	0	3	VII

27.	17EEZ03	Energy Auditing, Conservation and Management	OE	-	3	3	0	0	3	VIII
28.	17EEZ04	Electrical Machines	OE	-	3	3	0	0	3	VIII
29	17EIZ01	Autotronix	OE	-	3	3	0	0	3	VII
30	17EIZ02	Industrial Automation	OE	-	3	3	0	0	3	VII
31.	17EIZ03	Fiber Optic Sensors	OE	-	3	3	0	0	3	VIII
32.	17EIZ04	Ultrasonic Instrumentation	OE	-	3	3	0	0	3	VIII
33.	17ITZ01	Software Testing Tool	OE	-	3	3	0	0	3	VII
34.	17ITZ02	User Experience	OE	-	3	3	0	0	3	VII
35.	17ITZ03	Developing Mobile Apps	OE	-	3	3	0	0	3	VIII
36.	17ITZ04	Software Project Management	OE	-	3	3	0	0	3	VIII
37.	17ITZ05	Java Programming	OE	-	3	3	0	0	3	VI
38.	17MEZ01	Engineering Ergonomics	OE	-	3	3	0	0	3	VII / VIII
39.	17MEZ02	Energy Audit and Resource Management	OE	-	3	3	0	0	3	VII / VIII
40.	17MEZ03	Electric Vehicle Technology	OE	-	3	3	0	0	3	VII / VIII
41.	17MEZ04	Value Engineering	OE	-	3	3	0	0	3	VII / VIII
42.	17MEZ05	Smart Mobility	OE	-	3	3	0	0	3	VII / VIII
43.	17MEZ06	Smart Sensor Systems	OE	-	3	3	0	0	3	VII / VIII
44.	17MYZ01	Mathematical Structures	OE	-	3	3	0	0	3	VII
45.	17MYZ02	Optimization Techniques	OE	-	3	3	0	0	3	VII
46.	17MYZ03	Statics for Engineers	OE	-	3	3	0	0	3	VII
47.	17MYZ04	Statistics for Engineers	OE	-	3	3	0	0	3	VII
48.	17PYZ01	Nanomaterials	OE	-	3	3	0	0	3	VII
49.	17PYZ02	Nuclear physics and Reactors	OE	-	3	3	0	0	3	VII
50.	17PYZ03	Space science and technology	OE	-	3	3	0	0	3	VII
51.	17CYZ01	Chemistry for Every DayLife	OE	-	3	3	0	0	3	VII

52.	17CYZ02	E - Waste Management	OE	-	3	3	0	0	3	VII
53.	17CYZ03	Industrial Chemistry	OE	-	3	3	0	0	3	VII
54.	17EYZ01	Communicative Hindi	OE	-	3	3	0	0	3	VII
55.	17EYZ02	Fundamentals of German	OE	-	3	3	0	0	3	VII
56.	17EYZ03	Basics of Japanese	OE	-	3	3	0	0	3	VII
57.	17EYZ04	Employability Enhancement and Analytical Skills	OE	-	3	3	0	0	3	VII
58.	17EYX01	Effective Communication	OE	-	3	3	0	0	3	VII
59.	17EYZ05	Workplace Communication	OE	-	3	3	0	0	3	VII
60.	17GYZ01	Biology for Engineers	OE	-	3	3	0	0	3	VII
61.	17BMZ01	Health care technology	OE	-	3	3	0	0	3	VII
62.	17BMZ02	Telemedicine	OE	-	3	3	0	0	3	VII
63.	17BMZ03	Epidemiology and Pandemic Management	OE	-	3	3	0	0	3	VII
64.	17BMZ04	Medical Ethics	OE	-	3	3	0	0	3	VII
65.	17AIZ01	Fundamentals of Artificial Intelligence and Machine Learning	OE	-	3	3	0	0	3	VII
66.	17AIZ02	Data Science Fundamentals	OE	-	3	3	0	0	3	VII
67.	17AIZ03	Introduction to Business Analytics	OE	-	3	3	0	0	3	VII
68.	17AIZ04	Augmented Reality/Virtual Reality Technologies	OE	-	3	3	0	0	3	VII
69	17ITZ06	Data Structures using C	OE	-	3	3	0	0	3	VII
70	17ITZ07	Product Lifecycle Management for Engineers	OE		3	3	0	0	3	VII

Honor Degree Courses								
Vertical I - Software Engineering								
SL. NO.	**COURSE CODE**	**COURSE TITLE**	**PRERQUISITE**	**CONTACT PERIODS**	**L**	**T**	**P**	**C**
1.	17ITX07	Advanced Web Programming	17ITC09	3	3	0	0	3
2.	17CSX17	Software Design and Architecture	-	3	3	0	0	3
3.	17CSX18	Software Testing Methodologies	-	3	3	0	0	3
4.	17CSX19	Software Agents	-	3	3	0	0	3
5.	17CSX20	Software Quality Assurance	-	3	3	0	0	3
6.	17CSX21	Software Project Management	-	3	3	0	0	3
7.	17CSX30	Agile methodologies	-	3	3	0	0	3
8.	17CSX38	Devops	-i	3	3	0	0	3
Vertical II - Data Science								
SL. NO.	**COURSE CODE**	**COURSE TITLE**	**PRERQUISITE**	**CONTACT PERIODS**	**L**	**T**	**P**	**C**
1.	17CSX01	Data Science	17MYB04, 17CSC07	3	3	0	0	3
2.	17CSX02	Data Warehousing and Data Mining	17CSC07	3	3	0	0	3
3.	17CSX03	Data Analytics	17CSC07	3	3	0	0	3
4.	17CSX09	Information Retrieval Techniques	17CSC07	3	3	0	0	3
5.	17CSX14	Deep Learning	17MYB02, 17MYB04	3	3	0	0	3
6.	17CSX16	Image Processing Techniques	-	3	3	0	0	3
7.	17CSX22	Natural Language Processing	-	3	3	0	0	3
8.	17CSX26	Block chain Technologies	17ITC09	3	3	0	0	3

Minor Degree Courses								
Full Stack Development								
SL. NO.	**COURSE CODE**	**COURSE TITLE**	**PRE-RQUISITE**	**CONTACT PERIODS**	**L**	**T**	**P**	**C**
1.	17CSM01	User Interface design	-	3	3	0	0	3
2.	17CSM02	Programming using Java	-	3	3	0	0	3
3.	17CSM03	Database System Concepts	-	3	3	0	0	3
4.	17CSM04	XML and Web Services	-	3	3	0	0	3
5.	17CSM05	Web Technologies	-	3	3	0	0	3
6.	17CSM06	Open source systems	-	3	3	0	0	3
7.	17CSM07	UI and UX Design	-	3	3	0	0	3
8.	17CSM08	C# and .Net frame work	17CSM02	3	3	0	0	3

CREDIT DISTRIBUTION

SEM	HS	BS	PC	ES	EEC	PSE	OE	TOTAL
I	3	11	-	7	-	-	-	**21**
II	3	11	-	10	-	-	-	**24**
III	-	3	16	3	-	-	-	**22**
IV	3	3	16	-	-	-	-	**22**
V	-	-	16	-	-	6	-	**22**
VI	-	-	9	2	0	9	-	**20**
VII	-	-	10	-	4	3	3	**20**
VIII	-	-	-	-	8	3	3	**14**
TOTAL	**9**	**28**	**64**	**22**	**12**	**24**	**6**	**165**
%	**5.5**	**17.0**	**38.8**	**13.3**	**7.3**	**14.5**	**3.6**	
AICTE %	**5-10**	**15-20**	**30-40**	**15-20**	**-**	**10-15**	**5-10**	

TOTAL CREDITS (21+24+22+22+22+20+20+14) = 165 CREDITS

17ITX17 - BUILDING ENTERPRISE APPLICATIONS					
		L	T	P	C
		3	0	0	3
PRE REQUISITE : 17ITX06		**QUESTION PATTERN: TYPE - III**			
COURSE OBJECTIVES AND OUTCOMES:					
Course Objectives		**Course Outcomes**		**Related Program outcomes**	
1.0	To infer the basics of enterprise applications	**1.1**	The students will be able to outline the basics of enterprise applications.	**a,e,l**	
2.0	To interpret the enterprise applications	**2.1**	The students will be able to demonstrate the enterprise applications further	**a,c**	
3.0	To build engineering and intriguing of enterprise applications	**3.1**	The students will be able to experiment with various architectures and designs of enterprise applications	**a,c**	
4.0	To develop enterprise applications	**4.1**	The students will be able to construct enterprise applications	**c,d,e,i**	
5.0	To know about testing and rising of enterprise applications	**5.1**	The students will be able to measure the quality of enterprise applications	**h,k**	

UNIT I INTRODUCTION	**(9)**
Introduction to enterprise applications and their types, software engineering methodologies, life cycle of raising an enterprise application, introduction to skills required to build an enterprise application, key determinants of successful enterprise applications, and measuring the success of enterprise applications	
UNIT II INCEPTING ENTERPRSIE APPLICATIONS	**(9)**
Inception of enterprise applications, enterprise analysis, business modeling, requirements elicitation, use case modeling, prototyping, non-functional requirements, requirements validation, planning and estimation	
UNIT III ARCHITECTING AND DESIGNING ENTERPRISE APPLICATIONS	**(9)**
Concept of architecture, views and viewpoints, enterprise architecture, logical architecture, technical architecture-design, different technical layers, best practices, data architecture and design – relational, XML, and other structured data representations, Infrastructure architecture and design elements - Networking, Internetworking, and Communication Protocols, IT Hardware and Software, Middleware, Policies for Infrastructure Management, Deployment Strategy, Documentation of application architecture and design	
UNIT IV CONSTRUCTING ENTERPRISE APPLICATIONS	**(9)**
Construction readiness of enterprise applications - defining a construction plan, defining a package structure, setting up a configuration management plan, setting up a development environment, introduction to the concept of Software Construction Maps, construction of technical solutions layers, methodologies of code review, static code analysis, build and testing, dynamic code analysis – code profiling and code coverage	
UNIT V TESTING AND ROLLING OUT ENTERPRISE APPLICATIONS	**(9)**
Types and methods of testing an enterprise application, testing levels and approaches, testing environments, integration testing, performance testing, penetration testing, usability testing, globalization testing and interface testing, user acceptance testing, rolling out an enterprise application.	
TOTAL (L: 45) = 45 PERIODS	

TEXT BOOK:

1. Anubhav Pradhan, Satheesha B. Nanjappa, Senthil K. Nallasamy, Veerakumar Esakimuthu "Raising Enterprise Applications", John Wiley Publication 2015.(Unit 1 to 5)

REFERENCES:

1. Brett McLaughlin, “Building Java Enterprise Applications”, O'Reilly Media Publication 2002.
2. “Software Requirements: Styles & Techniques”, Addison-Wesley Professional.
3. “Software Systems Requirements Engineering: In Practice”, McGraw-Hill Osborne Media.
4. “Managing Software Requirements: A Use Case Approach”, Second Edition, Pearson Publication.
5. “Software Architecture: A Case Based Approach”, Pearson Publication.

17ITX37 PROBLEM SOLVING USING JAVA

L	T	P	C
3	0	0	3

PRE REQUISITE : NIL

COURSE OBJECTIVES AND OUTCOMES:

	Course Objectives		Course Outcomes	Related Program outcome
1.0	To understand the basics of Java Programming Language	**1.1**	The Students will be able to solve simple problems using Java.	**a,b,c,d,e, h,j,k,l**
2.0	To understand fundamentals of programming such as conditional and iterative execution	**2.1**	The students will be able to write programs using branching and looping statements	**a,b,c,d,e, h,i,j,k,l**
3.0	To understand the concepts of Java arrays and Strings.	**3.1**	The students will be able to Be able to develop confidently with Strings and implement arrays.	**a,b,c,d,e, h,i,j,k,l**
4.0	To understand fundamentals of object-oriented programming in Java, including defining classes, invoking methods.	**4.1**	The students will be able to understand basic oops concepts and develop applications using inheritance and interfaces.	**a,b,c,d,e, h,i,j,k,l**
5.0	To understand threads and collection concepts	**5.1**	The students will be able to build applications using threads and collection framework.	**a,b,c,d,e, h,i,j,k,l**

UNIT I - INTRODUCTION TO JAVA (9)

History of java-Features-Glimpse of java-Data types and Variables-Local variable-Instance variable-static variable-Keywords: this, super, final- Type conversion & casting- Importance of Scanner class-Getting started with Eclipse IDE and VSCode.

UNIT II-OPERATORS AND DECISION MAKING STATEMENTS (9)

Operators- Arithmetic Operator, Bitwise Operator, Conditional Operator, Unary Operator-Relational and Logical operators-Conditional statements: If else, If else if, Nested if -Looping Statements: For Loop, while Loop, do while loop-switch-break-continue- auto boxing and unboxing**.**

UNIT III-ARRAYS AND STRINGS (9)

Arrays: One Dimensional Array-Two Dimensional Array-Inbuilt functions in arrays. Strings-String array-Inbuilt functions in Strings-String Buffer class-String Builder class-String Tokenizer class

UNIT IV-OBJECT-ORIENTED PROGRAMMING PARADIGM (9)

Class-objects-Encapsulation-Inheritance and its types-Polymorphism: Static binding and dynamic binding-Methods –Constructors and its types-Abstract class-Interface.

UNIT V- MULTITHREADING AND COLLECTIONS (9)

Throwable classes-Exception types-Exception keywords-Collection classes: List, Set-Thread-Ways of thread creation-methods-thread priorities-Synchronization-multithreading-Lambda Expression.

TOTAL (L: 45) = 45 PERIODS

TEXT BOOK:

1. Herbert Schildt, “Java:The Complete Reference”,McGraw Hill Education, Twelfth edition,2021.

REFERENCE:

1. Cay.S.Horstmann,GaryCornell, “Core Java-JAVA Fundamentals”, Prentice Hall,Eleventh edition, 2020.