

K.L.N. COLLEGE OF ENGINEERING

Pottapalayam, Sivagangai District

(An Autonomous Institution, Affiliated to Anna University, Chennai)



Estd: 1994

B.E. COMPUTER SCIENCE AND ENGINEERING

CHOICE BASED CREDIT SYSTEM

I - VIII SEMESTERS CURRICULUM

REGULATIONS 2020

(For the students admitted from the academic year 2020-2021 onwards)

VISION OF THE INSTITUTION

To become a Premier Institute of National Repute by Providing Quality Education, Successful Graduation, Potential Employability and Advanced Research & Development through Academic Excellence.

MISSION OF THE INSTITUTION

To Develop and Make Students Competent Professional in the Dynamic Environment in the field of Engineering, Technology and Management by emphasizing Research, Social Concern and Ethical Values through Quality Education System.

VISION OF THE DEPARTMENT

To be a competent Professional in the field of Computer Science & Engineering through quality education, training and innovative research.

MISSION OF THE DEPARTMENT

- Imparting proficient education through quality teaching –learning process in tune with the interdisciplinary needs of global work environment.
- Inculcating the attitude of continuous learning through industry institution interaction, consultancy and research activities.
- Cultivating professionalism, Ethics and integrity of character for positive contributions to society.

PROGRAM EDUCATIONAL OBJECTIVES

PEO I	Contribute effectively to the society by applying principles of Computer Science and Engineering for analyzing the real world problems to produce optimal and acceptable technical solutions.
PEO II	Sustain as good professionals by pursuing career / advanced studies and practice innovation in emerging technologies through lifelong learning.
PEO III	Build professionalism, team work, effective communication, ethical values and leadership qualities.

PROGRAM SPECIFIC OUTCOMES

PSO 1	Ability to apply good analytical, design and implementation skills to formulate and solve scientific and business applications pertaining to Algorithms, Computer Systems, Networks, Security, Data Analytics and Artificial Intelligence.
PSO 2	Ability to update knowledge continuously in the tools like Rational Rose, MS VISIO, NS, VMware workstation, Mobile Application Development tools and technologies like storage, Computing, communication to meet the industry requirements.

PROGRAM OUTCOMES

Computer Science and Engineering Graduates will be able to:

PO1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. Design/development of solutions: 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.

PO4. Conduct investigations of complex problems: 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.

PO5. Modern tool usage: 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.

PO6. The engineer and society: 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.

PO7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10. Communication: 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.

PO11. Project management and finance: 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.

PO12. Life-long learning: 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.

CATEGORY OF COURSES

- i. **Humanities and Social Sciences (HS) Courses** include Technical English, Environmental Science and Engineering, Engineering Ethics and human values, Communication Skills and Management courses.
- ii. **Basic Sciences (BS) Courses** include Mathematics, Physics, and Chemistry.
- iii. **Engineering Sciences (ES) Courses** include Engineering practices, Engineering Graphics, Basics of Electrical / Electronics / Mechanical / Computer Engineering / Instrumentation etc.
- iv. **Professional Core (PC) Courses** include the core courses relevant to the chosen programme of study.
- v. **Professional Elective (PE) Courses** include the elective courses relevant to the chosen programme of study.
- vi. **Open Elective (OE) Courses** include courses from other branches which a student can choose from the list specified in the curriculum of the students B.E. / B.Tech. Programmes.
- vii. **Employability Enhancement Courses (EEC)** include Project Work and/or Internship, Seminar, Professional Practices, Case Study and Industrial/Practical Training.
- viii. **Mandatory (MC) courses** include Personality and Character development and the courses recommended by the regulatory bodies such as AICTE, UGC, etc

K.L.N. COLLEGE OF ENGINEERING, POTTAPALAYAM – 630 612
(An Autonomous Institution, Affiliated to Anna University, Chennai)
B.E. COMPUTER SCIENCE AND ENGINEERING
REGULATIONS – 2020
CHOICE BASED CREDIT SYSTEM
I - VIII SEMESTERS CURRICULUM

SEMESTER I

Sl. No.	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
THEORY								
1	20HS101	English for Technical Communication	HS	3	3	0	0	3
2	20BS101	Fundamentals of Engineering Mathematics	BS	4	3	1	0	4
3	20BS102	Engineering Physics	BS	3	3	0	0	3
4	20BS103	Engineering Chemistry	BS	3	3	0	0	3
5	20GE101	Problem Solving using Python Programming	ES	3	3	0	0	3
PRACTICALS								
6	20BS1L1	Basic Science Laboratory	BS	3	0	0	3	1.5
7	20GE1L1	Python Programming Laboratory	ES	4	0	0	4	2
8	20GE1L2	Industrial Practices Workshop	ES	3	0	0	3	1.5
TOTAL				26	15	1	10	21

SEMESTER II

Sl. No.	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
THEORY								
1	20HS201	Advanced Technical Communication	HS	3	3	0	0	3
2	20BS201	Laplace Transform and Advanced Calculus	BS	4	3	1	0	4
3	20BS204	Physics for Information Science	BS	3	3	0	0	3
4	20GE205	Basic Electrical and Electronics Engineering	ES	3	3	0	0	3
5	20CS201	Programming in C	PC*	3	3	0	0	3
6	20GE201	Engineering Graphics	ES	4	2	0	2	3
PRACTICALS								
7	20HS2L1	Communication Skills Laboratory	HS	2	0	0	2	1
8	20CS2L1	C Programming Laboratory	PC*	4	0	0	4	2
TOTAL				26	17	1	8	22

* Common to B.E CSE, EEE, EIE & B.Tech IT programmes

SEMESTER III

SI. No.	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
THEORY								
1	20BS303	Discrete Mathematics	BS	4	3	1	0	4
2	20CS301	Digital Principles and System Design	ES [#]	4	3	1	0	4
3	20CS302	Data Structures and Algorithms	PC [#]	3	3	0	0	3
4	20EC304	Analog and Digital Communication	ES	3	3	0	0	3
5	20HS301	Universal Human Values	MC	3	2	1	0	3
PRACTICALS								
6	20CS3L1	Digital Systems Laboratory	ES [#]	4	0	0	4	2
7	20CS3L2	Data Structures and Algorithms Laboratory	PC [#]	4	0	0	4	2
8	20CS3L3	Object Oriented Programming Laboratory	PC	4	0	0	4	2
TOTAL				29	14	3	12	23

Common to B.E.CSE & B.Tech IT programmes

SEMESTER IV

SI. No.	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
THEORY								
1	20BS403	Probability Statistics and Queuing Theory	BS	4	3	1	0	4
2	20CS401	Computer Organization and Architecture	PC	3	3	0	0	3
3	20CS402	Database Management Systems	PC [#]	3	3	0	0	3
4	20CS403	Design and Analysis of Parallel Algorithms	PC	3	3	0	0	3
5	20HS401	Environmental Science and Engineering	HS	2	2	0	0	2
THEORY CUM PRACTICAL								
6	20CS404	Operating Systems	PC [#]	5	3	0	2	4
PRACTICALS								
7	20CS4L1	Database Management Systems Laboratory	PC [#]	4	0	0	4	2
8	20HS4L2	Professional Communication Laboratory	EEC	2	0	0	2	1
TOTAL				26	17	1	8	22

Common to B.E.CSE & B.Tech IT programmes

SEMESTER V

Sl. No.	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
THEORY								
1	20CS501	Computer Networks	PC [#]	3	3	0	0	3
2	20CS502	Software Engineering	PC [#]	3	3	0	0	3
3	20CS503	Theory of Computation	PC	4	3	1	0	4
4	20EC506	Microcontrollers and Embedded Systems	PC [#]	3	3	0	0	3
5		Open Elective I	OE	3	3	0	0	3
6	20MC501	Constitution of India	MC	1	1	-	-	-
PRACTICALS								
7	20CS5L1	Networks Laboratory	PC [#]	4	0	0	4	2
8	20CS5L2	Software Engineering Laboratory	PC [#]	4	0	0	4	2
9	20EC5L3	Microcontrollers and Embedded Systems Laboratory	PC [#]	4	0	0	4	2
TOTAL				29	16	1	12	22

[#]Common to B.E.CSE & B.Tech IT programmes

SEMESTER VI

Sl. No.	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
THEORY								
1	20HS602	Principles of Management	HS [#]	3	3	0	0	3
2	20CS601	Mobile Architecture and Programming	PC	3	3	0	0	3
3	20CS602	Cryptography and Network Security	PC	3	3	0	0	3
4	20CS603	Compiler Design	PC	3	3	0	0	3
5		Professional Elective I	PE	3	3	0	0	3
6	20MC601	Essence of Indian Traditional Knowledge	MC	1	1	-	-	-
THEORY CUM PRACTICAL								
6	20CS604	Machine Learning	PC [#]	5	3	0	2	4
PRACTICALS								
7	20CS6L1	Mobile Application Development Laboratory	PC [#]	4	0	0	4	2
8	20CS6L2	Web Technology Laboratory	PC	4	0	0	4	2
TOTAL				29	19	0	10	23

[#]Common to B.E.CSE & B.Tech IT programmes

SEMESTER VII

SI. No.	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
THEORY								
1	20CS701	Data Analytics (Common to B.Tech IT programme)	PC	3	3	0	0	3
2	20CS702	Artificial Intelligence	PC	3	3	0	0	3
3		Open Elective II	OE	3	3	0	0	3
4		Professional Elective II	PE	3	3	0	0	3
5		Professional Elective III / Project Based Learning	PE	3	3	0	0	3
PRACTICALS								
6	20CS7L1	Data Analytics Laboratory (Common to B.Tech IT programme)	PC	4	0	0	4	2
7	20CS7L2	Mini Project	EEC	4	0	0	4	2
TOTAL				23	15	0	8	19

SEMESTER VIII

SI. No.	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
THEORY								
1		Professional Elective IV	PE	3	3	0	0	3
2		Professional Elective V	PE	3	3	0	0	3
PRACTICALS								
3	20CS8L1	Project Work	EEC	20	0	0	20	10
TOTAL				26	6	0	20	16

HUMANITIES AND SOCIAL SCIENCES (HS)

SI. No.	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
1	20HS101	English for Technical Communication	HS	3	3	0	0	3
2	20HS201	Advanced Technical Communication	HS	3	3	0	0	3
3	20HS2L1	Communication Skills Laboratory	HS	2	0	0	2	1
4	20HS401	Environmental Science and Engineering	HS	2	2	0	0	2
5	20HS602	Principles of Management	HS	3	3	0	0	3
Total					11	0	2	12

BASIC SCIENCES (BS)

SI. No.	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
1	20BS101	Fundamentals of Engineering Mathematics	BS	4	3	1	0	4
2	20BS102	Engineering Physics	BS	3	3	0	0	3
3	20BS103	Engineering Chemistry	BS	3	3	0	0	3
4	20BS1L1	Basic Science Laboratory	BS	3	0	0	3	1.5
5	20BS201	Laplace Transform and Advanced Calculus	BS	4	3	1	0	4
6	20BS204	Physics for Information Science	BS	3	3	0	0	3
7	20BS303	Discrete Mathematics	BS	4	3	1	0	4
8	20BS404	Probability , Queuing Theory and Statistics	BS	4	3	1	0	4
Total					21	4	3	26.5

ENGINEERING SCIENCES (ES)

SI. No.	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
1	20GE101	Problem Solving using Python Programming	ES	3	3	0	0	3
2	20GE1L1	Python Programming Laboratory	ES	4	0	0	4	2
3	20GE1L2	Industrial Practices Workshop	ES	3	0	0	3	1.5
4	20GE201	Engineering Graphics	ES	4	2	0	2	3
5	20GE205	Basic Electrical and Electronics Engineering	ES	3	3	0	0	3
6	20CS301	Digital Principles and Systems Design	ES	4	3	1	0	4
7	20EC304	Analog and Digital Communication	ES	3	3	0	0	3
8	20CS3L1	Digital Systems Laboratory	ES	4	0	0	4	2
Total					14	1	13	21.5

PROFESSIONAL CORE (PC)

Sl. No.	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
1	20CS201	Programming in C	PC	3	3	0	0	3
2	20CS2L1	C Programming Laboratory	PC	4	0	0	4	2
3	20CS302	Data Structures and Algorithms	PC	3	3	0	0	3
4	20CS3L2	Data Structures and Algorithms Laboratory	PC	4	0	0	4	2
5	20CS3L3	Object Oriented Programming Laboratory	PC	4	0	0	4	2
6	20CS401	Computer Organization and Architecture	PC	3	3	0	0	3
7	20CS402	Database Management Systems	PC	3	3	0	0	3
8	20CS403	Design and Analysis of Parallel Algorithms	PC	3	3	0	0	3
9	20CS404	Operating Systems	PC	5	3	0	2	4
10	20CS4L1	Database Management Systems Laboratory	PC	4	0	0	4	2
11	20CS501	Computer Networks	PC	3	3	0	0	3
12	20CS503	Software Engineering	PC	3	3	0	0	3
13	20EC506	Microcontrollers and Embedded systems	PC	3	3	0	0	3
14	20CS504	Theory of Computation	PC	4	3	1	0	4
15	20CS5L1	Networks Laboratory	PC	4	0	0	4	2
16	20CS5L2	Software Engineering Laboratory	PC	4	0	0	4	2
17	20EC5L3	Microcontrollers and Embedded systems Laboratory	PC	4	0	0	4	2
18	20CS601	Mobile Architecture and Programming	PC	3	3	0	0	3
19	20CS602	Cryptography and Network Security	PC	3	3	0	0	3
20	20CS603	Compiler Design	PC	3	3	0	0	3
21	20CS604	Machine Learning	PC	5	3	0	2	4
22	20CS6L1	Mobile Application Development Laboratory	PC	4	0	0	4	2
23	20CS6L2	Web Technology Laboratory	PC	4	0	0	4	2
24	20CS701	Data Analytics	PC	3	3	0	0	3
25	20CS702	Artificial Intelligence	PC	3	3	0	0	3
26	20CS7L1	Data Analytics Laboratory	PC	4	0	0	4	2
Total					48	1	44	71

PROFESSIONAL ELECTIVES (PE)**SEMESTER VI ELECTIVE – I**

Sl. No.	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
1	20CS6A1	Data Warehousing and Data Mining	PE*	3	3	0	0	3
2	20CS6A2	Computer Graphics and Multimedia	PE	3	3	0	0	3
3	20CS6A3	Graph Theory and Applications	PE	3	3	0	0	3
4	20CS6A4	System Software	PE	3	3	0	0	3
5	20HS6A2	Entrepreneurship Development	PE	3	3	0	0	3
6	20IT6A3	Software Testing	PE*	3	3	0	0	3
7	20IT6A6	Real Time Systems	PE*	3	3	0	0	3

SEMESTER VII ELECTIVE II

Sl. No.	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
1	20CS7A1	Cloud Computing	PE	3	3	0	0	3
2	20CS7A2	Agile Methodologies	PE*	3	3	0	0	3
3	20CS7A3	Java Scripting	PE	3	3	0	0	3
4	20CS7A4	Natural Language Processing	PE*	3	3	0	0	3
5	20CS7A5	Advanced Topics on Databases	PE	3	3	0	0	3
6	20IT601	Internet of Things	PE*	3	3	0	0	3
7	20HS7A3	Total Quality Management	PE	3	3	0	0	3

SEMESTER VII ELECTIVE III

Sl. No.	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
1	20CS7B1	C# and .Net Programming	PE	3	3	0	0	3
2	20CS7B2	Wireless Adhoc and Sensor Networks	PE*	3	3	0	0	3
3	20CS7B3	Multi-core Architectures and Programming	PE	3	3	0	0	3
4	20CS7B4	Distributed Systems	PE	3	3	0	0	3
5	20IT7B2	User Interface Design	PE*	3	3	0	0	3
6	20IT7B4	Service Oriented Architecture	PE*	3	3	0	0	3
7	20HS601	Operations Research	PE	3	3	0	0	3

SEMESTER VIII ELECTIVE IV

Sl. No.	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
1	20CS8A1	Social Network Analysis	PE	3	3	0	0	3
2	20CS8A2	Software Defined Networks	PE	3	3	0	0	3
3	20CS8A3	Digital Forensics	PE	3	3	0	0	3
4	20CS8A4	Soft Computing	PE	3	3	0	0	3
5	20IT7B1	Cyber Physical Systems	PE*	3	3	0	0	3
6	20IT8A3	Information Security	PE*	3	3	0	0	3
7	20EC8A3	Robotics and Automation	PE	3	3	0	0	3

SEMESTER VIII ELECTIVE V

Sl. No.	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
1	20CS8B1	Information Retrieval Techniques	PE*	3	3	0	0	3
2	20CS8B2	Green Computing	PE*	3	3	0	0	3
3	20CS8B3	Virtual Reality and Augmented Reality	PE*	3	3	0	0	3
4	20CS8B4	Block Chain Technology	PE*	3	3	0	0	3
5	20IT8B2	Software Project Management	PE	3	3	0	0	3
6	20HS6A1	Intellectual Property Rights	PE	3	3	0	0	3
7	20HS8B2	Economics for Engineers	PE	3	3	0	0	3

*Common to B.E.CSE & B.Tech IT programmes

EMPLOYABILITY ENHANCEMENT COURSES (EEC)

Sl. No.	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
1	20HS4L2	Professional Communication Laboratory	EEC	2	0	0	2	1
2	20CS7L2	Mini Project	EEC	4	0	0	4	2
3	20CS8L1	Project Work	EEC	20	0	0	20	10
Total					0	0	26	13

MANDATORY COURSES (MC)

Sl. No.	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
1	20HS301	Universal Human Values	MC	3	2	1	0	3
2	20MC501	Constitution of India	MC	1	1	-	-	-
3	20MC601	Essence of Indian Traditional Knowledge	MC	1	1	-	-	-
Total					4	1	0	3

SUMMARY

S.NO.	SUBJECT CATEGORY	CREDITS AS PER SEMESTER								CREDITS TOTAL	Percentage
		I	II	III	IV	V	VI	VII	VIII		
1	HS	3	4		2		3			12	7.14%
2	BS	11.5	7	4	4					26.5	15.77%
3	ES	6.5	6	9						21.5	12.8%
4	PC		5	7	15	19	17	8		71	42.26 %
5	PE						3	6	6	15	8.93%
6	OE					3		3		6	3.57%
7	EEC				1			2	10	13	7.74%
8.	Mandatory Credit / Non Credit			3		#	#			3	1.79%
Total		21	22	23	22	22	23	19	16	168	

- Non-Credit Mandatory Course

LIST OF OPEN ELECTIVES

Courses offered to other departments

S. No.	COURSE CODE	COURSE TITLE	S. No.	COURSE CODE	COURSE TITLE
<u>V Semester</u>			<u>VII Semester</u>		
1.	20OE401	Fundamentals of Artificial Intelligence	1.	20OE405	Machine Learning Techniques
2.	20OE402	Introduction to Database Management Systems	2.	20OE406	Java Script Programming
3.	20OE403	Computer Communication Networks	3.	20OE407	Computer Graphics
4.	20OE404	Cloud Infrastructure and Technologies	4.	20OE408	Essentials of Data Analytics