ANNA UNIVERSITY, CHENNAI
NON- AUTONOMOUS COLLEGES AFFILIATED ANNA UNIVERSITY
REGULATIONS 2021
B. E. COMPUTER SCIENCE AND ENGINEERING
CHOICE BASED CREDIT SYSTEM
I AND II SEMESTERS CURRICULA AND SYLLABI

I.**PROGRAM EDUCATIONAL OBJECTIVES (PEOs)**

Graduates can

- Apply their technical competence in computer science to solve real world problems, with technical and people leadership.
- Conduct cutting edge research and develop solutions on problems of social relevance.
- Work in a business environment, exhibiting team skills, work ethics, adaptability and lifelong learning.

II.**PROGRAM SPECIFIC OUTCOMES (PSOs)**

The Students will be able to

- Exhibit design and programming skills to build and automate business solutions using cutting edge technologies.
- Strong theoretical foundation leading to excellence and excitement towards research, to provide elegant solutions to complex problems.

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SEMESTER I

S. NO.	COURSE CODE	COURSE TITLE	CATE-GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
1.	IP3151	Induction Programme	-	-	-	-	-	0
THEORY								
2.	HS3151	Professional English - I	HSMC	3	1	0	4	4
3.	MA3151	Matrices and Calculus	BSC	3	1	0	4	4
4.	PH3151	Engineering Physics	BSC	3	0	0	3	3
5.	CY3151	Engineering Chemistry	BSC	3	0	0	3	3
6.	GE3151	Problem Solving and Python Programming	ESC	3	0	0	3	3
PRACTICALS								
7.	GE3171	Problem Solving and Python Programming Laboratory	ESC	0	0	4	4	2
8.	BS3171	Physics and Chemistry Laboratory	BSC	0	0	4	4	2
			TOTAL	15	2	8	25	21

SEMESTER II

S. NO.	COURSE CODE	COURSE TITLE	CATE-GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1.	HS3251	Professional English - II	HSMC	3	1	0	4	4
2.	MA3251	Statistics and Numerical Methods	BSC	3	1	0	4	4
3.	PH3256	Physics for Information Science	BSC	3	0	0	3	3
4.	BE3251	Basic Electrical and Electronics Engineering	ESC	3	0	0	3	3
5.	GE3251	Engineering Graphics	ESC	2	0	4	6	4
6.	CS3251	Programming in C	PCC	3	0	0	3	3
7.		NCC Credit Course Level 1*	-	2	0	0	2	2*
PRACTICALS								
8.	GE3271	Engineering Practices Laboratory	ESC	0	0	4	4	2
9.	CS3271	Programming in C Laboratory	PCC	0	0	4	4	2
			TOTAL	17	2	12	31	25

*NCC Credit Course level 1 is offered for NCC students only. The grades earned by the students will be recorded in the Mark Sheet, however the same shall not be considered for the computation of CGPA.

SEMESTER III

S. NO.	COURSE CODE	COURSE TITLE	CATE GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1.		Discrete Mathematics	BSC	3	1	0	4	4
2.		Digital System Design and Computer Organization	ESC / PCC	3	0	2	5	4
3.		Foundations of Data Science	PCC	3	0	0	3	3
4.		Data Structures	PCC	3	0	0	3	3
5.		Object Oriented Programming	PCC	3	0	0	3	3
PRACTICALS								
6.		Data Structures Lab	ESC / PCC	0	0	4	4	2
7.		OOPS Lab	PCC	0	0	4	4	2
8.		Data Science Lab	PCC	0	0	4	4	2
			TOTAL					**23**

SEMESTER IV

S. NO.	COURSE CODE	COURSE TITLE	CATE GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1.		Theory of Computation	PCC	3	0	0	3	3
2.		AI ML	PCC	3	0	2	5	4
3.		Soft Core1 (DBMS)	PCC	3	0	0	3	3
4.		Algorithms	PCC	3	0	2	5	4
5.		OS	PCC	3	0	0	3	3
6.		Environmental Science and Sustainability	BSC	2	0	0	2	2
7.		NCC Credit Course Level 2*		3	0	0	3	3 #
PRACTICALS								
8.		OS Lab	PCC	0	0	3	3	1.5
9.		DBMS Lab		0	0	3	3	1.5
			TOTAL					**22**

 # NCC Credit Course level 2 is offered for NCC students only. The grades earned by the students will be recorded in the Mark Sheet, however the same shall not be considered for the computation of CGPA.

S. NO.	COURSE CODE	COURSE TITLE	CATE GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1.		Soft Core 2 (Networks)	PCC	3	0	2	5	4
2.		Soft Core 3 (Compilers)	PCC	3	0	2	5	4
3.		Professional Elective I	PEC	2	0	2	3	3
4.		Professional Elective II	PEC	2	0	2	3	3
5.		Professional Elective III	PEC	2	0	2	3	3
6.		Professional Elective IV	PEC	2	0	2	3	3
7.		Mandatory Course-I*	MC	3	0	0	3	0
PRACTICALS								
8.		Life Skills and Soft Skills**	EEC	0	0	4	4	2
			TOTAL					22

* Mandatory Course is a Non-credit Course
**The Mandatory subject "Life Skills and Soft Skills" will be offered in the V / VI Semester.
*** Optional - 2 weeks for one credit. Internship during 4 Semester Summer Vacation/6 Semester Summer Vacation

S. NO.	COURSE CODE	COURSE TITLE	CATE GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1.		Soft Core 4 (Principles of Programming languages/Software Engineering/Cryptography and Cyber Security/Distributed systems and Cloud Computing	PCC	3	0	2	5	4
2.		IOT and Embedded	PCC	3	0	2	5	4
3.		Open Elective – I*	OEC	3	0	0	3	3
4.		Professional Elective V	PEC	2	0	2	3	3
5.		Professional Elective VI	PEC	2	0	2	3	3
6.		Professional Elective VII	PEC	2	0	2	3	3
7.		Professional Elective VIII	PEC	2	0	2	3	3
8.		Mandatory Course-II**	MC	3	0	0	3	0
9.		NCC Credit Course Level 3***		3	0	0	3	3 #
			TOTAL					23

*Open Elective I from a choice of emerging technologies
** Mandatory Course is a Non-credit Course
*** NCC Credit Course level 3 is offered for NCC students only. The grades earned by the students will be recorded in the Mark Sheet, however the same shall not be considered for the computation of CGPA

SEMESTER VII

S. NO.	COURSE CODE	COURSE TITLE	CATE GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1.		Ethics and Human values	HSMC	2	0	0	2	2
2.		Elective – Management	HSMC	3	0	0	3	3
3.		Open Elective – II*	OEC	3	0	0	3	3
4.		Open Elective – III**	OEC	3	0	0	3	3
5.		Open Elective – IV**	OEC	3	0	0	3	3
PRACTICALS								
6.		Summer internship***	EEC	0	0	0	0	2
			TOTAL					**16**

*Open Elective II from a choice of emerging technologies, if needed.
**Open Elective III and IV (Can be chosen from any other discipline)

"Ethics and Human values" will be offered in the VI / VII Semester.
*** Optional - 2 weeks for one credit. Internship during 6 or 4 Semester Summer Vacation

SEMESTER VIII

S. NO.	COURSE CODE	COURSE TITLE	CATE GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
PRACTICALS								
1.		Project Work/startup-incubation/Internship	EEC	0	0	20	20	10
			TOTAL					**10**

TOTAL CREDITS RANGE: 162

MATHEMATICS – III
(SOFT CORE)

SL. NO.	COURSE CODE	COURSE TITLE	CATE GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS	Syllabus in-charge
				L	T	P			
1.		Discrete Mathematics	BSC	4	0	0	4	4	S & H
2.			BSC	4	0	0	4	4	S & H
3.			BSC	4	0	0	4	4	S & H

MANAGEMENT
(SOFT CORE)

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS	Syllabus in-charge
				L	T	P			
1.		Principles of Management	HSMC	3	0	0	3	3	
2.		Total Quality Management	HSMC	3	0	0	3	3	
3.		Engineering Economics and Financial Accounting	HSMC	3	0	0	3	3	
4.									
5.									

OPEN ELECTIVE – I & II
(EMERGING TECHNOLOGIES)
COMMON TO ALL

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS	Syllabus in=charge
				L	T	P			
1.			OEC	3	0	0	3	3	I & C
2.			OEC	3	0	0	3	3	I & C
3.			OEC	3	0	0	3	3	I & C

OPEN ELECTIVE – II, III & IV
(TO BE OFFERED TO OTHER DEPARTMENT)

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS	Syllabus in-charge
				L	T	P			
1.		Artificial Intelligence and Machine Learning	OEC	3	0	0	3	3	
2.		Internet of Things	OEC	3	0	0	3	3	
3.		Data Analytics							

S.No.	Vertical I **Data Science**	Vertical II **Full Stack Development**	Vertical III **Cloud Computing and Data Centre Technologies**	Vertical IV **Cyber Security and Data Privacy**	Vertical V **Creative Media**	Vertical VI **Emerging Technologies**	Vertical VII **Artificial Intelligence and Machine Learning**
	Exploratory Data Analysis	Web Technologies	Distributed Computing / Cloud computing	Ethical Hacking (+ Penetration testing)	Visual Effects	Mixed Reality (Augmented Reality, Virtual Reality)	Neural networks and Deep Learning (+ Image and Video Analytics)
	Business Intelligence and Visualization	App Development (Native and Cross Platform - web application - latest tools)	Virtualization (and ?)	Network Security	3D Graphics & Animation	Game development(Title was changed)	Soft Computing (Fuzzy and Genetic)
	Computer Vision	Cloud Architectures (Containerization, Docker – Contents, kubernetes, serverless, microservices to be included)	Data Warehousing (Data lakes, and latest tech scala?)	Digital and Mobile Forensics ? (+ Criminology)	Video Creation and Editing + 12 ?	Quantum Computing	Knowledge Engineering
	Natural Language Processing (Text and speech analytics)	Software Testing and Automation	Security and Privacy in Cloud Security (Role Based Access Management, identity management, privacy)	Engineering Secure software systems (Coding – Java and .net , Secured Operation Centre)	UI/UX design	Cryptocurrency and Blockchain Technologies	TExt and Speech Analysis (NLP)
	Business Analytics (Case Studies)	UI/UX Design	Storage Technologies	Social Network Security (Access control, privacy and Security)	Digital marketing	Metaverse	Optimization Techniques (non-linear ?)
	Image and video analytics	Cloud services management	Software Defined Networks (Network Function Virtualization)	Modern Cryptography	Game Development (with GPU-based	Robotic Process Automation	Game Theory

					Lab) (Title was changed)		
	Neural networks and Deep learning?	Dev-ops (ML-ops?)	Stream processing	Security and Privacy in Cloud Security (Role Based Access Management, identity management, privacy)	Mixed Reality (AR+VR)+(Introduction to Metaverse)	Cyber security	Cognitive Science
	Big Data Analytics??	Web Application Security	Cloud Architectures (Containerization, Docker, Devops to be included + Cost Optimization related to data center, implementation cost)	Blockchain Technologies	Multimedia data storage and compression (+ Streaming media tools and technologies)	3D Printing / Autonomous systems (Robotics)??	Ethics And AI