SRI KRISHNA ARTS AND SCIENCE COLLEGE

An Autonomous College Affiliated to Bharathiar University
Re-Accredited by NAAC with 'A' Grade
Coimbatore -641008, Tamil Nadu, India.

LEARNING OUTCOMESBASED CURRICULUM FRAMEWORK (LOCF)

B.Sc. Electronics and Communication Systems
(I to VI Semester)

for 2021-22 admitted students

DEPARTMENT OF ELECTRONICS AND COMMUNICATION SYSTEMS

SRI KRISHNA ARTS AND SCIENCE COLLEGE

COIMBATORE – 641008

DEPARTMENT OF ELECTRONICS AND COMMUNICATION SYSTEMS

I. Programme Educational Objectives (PEOs)

The Programme Educational Objectives of the B.Sc. Electronics and Communication Systems are:

PEO 1	Graduates will be practitioner and leaders in the field of Electronics and Communication Systems who would aid the industries to solve the technological problems.
PEO 2	Graduates will be professional, innovators or entrepreneurs engage in development, deployment and implementation of Electronics and Communication technologies in industry.
PEO 3	Graduates will perform in their profession with utmost social awareness and responsibilities.
PEO 4	Graduates will communicates with their peers in the discipline in industrial society to contribute the development of the economy in the country.
PEO 5	Graduates will be successful in pursuing higher education and pursue career paths in teaching or research.

II. ProgrammeLearning Outcomes (PLOs)

The following Programme Learning Outcomes have been identified for B.Sc. Electronics and Communication Systems:

PLO 1	**Knowledge:** Apply knowledge of Mathematics and Science in solving Electronics related problems. ***(Cognitive)***
PLO 2	**Critical Thinking Skills:** Demonstrate critical thinking skills in understanding of complex problems and to develop fully reasoned opinions on such contemporary issues. ***(Cognitive)***
PLO 3	**Practical Skills:** Design and conduct electronics experiments, as well as to analyse and interpret data using scientific/engineering methods. ***(Psychomotor)***
PLO 4	**Team Work Skills:** Function as a member of a multidisciplinary team with sense of ethics, integrity and social responsibility. ***(Affective)***
PLO 5	**Communication Skills:** Communicate effectively in both verbal and written forms. ***(Affective)***

PLO 6	**Digital Skills:** Design and manage electronic systems or processes that conforms digital skills within ethical and economic constraints. ***(Affective)***
PLO 7	**Numeracy Skills:** Identify, formulate, solve and analyse the problems in various disciplines of Electronics. ***(Cognitive)***
PLO 8	**Leadership Skills:** Become competent by applying their technical and managerial skills. ***(Affective)***
PLO 9	**Lifelong Learning Skills:** Recognize the need for, and be able to engage in higher studies, research and lifelong learning. ***(Affective)***
PLO 10	**Entrepreneurial Skills:** Pursue the opportunity to create value and wealth for the betterment of the individual and society at large. ***(Affective)***
PLO 11	**Ethics & Professional Skills:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice. ***(Affective)***

III. Programme Learning Outcomes Vs Graduate Attributes Vs Taxonomy of Verbs

PLO	Graduate Attributes											Blooms		
	Knowledge	Critical Thinking	Practical Skills	Team work	Communication skills	Digital skills	Numeracy	Leadership skills	Lifelong learning	Entrepreneurial skills	Ethics & Professionalism	Cognitive	Psychomotor	Affective
1	√											√		
2		√										√		
3			√										√	
4				√										√
5					√									√
6						√								√
7							√					√		
8								√						√
9									√					√
10										√				√
11											√			√

IV. Mapping of PEOs and PLOs

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11
PEO1											
PEO2											
PEO3											
PEO4											
PEO5											

V. Additional Programme Outcomes (APOs)

The Additional Programme Outcomes for B.Sc. Electronics and Communication Systems are:

APO 1	Graduates will have ability with social intelligence with good Intelligent Quotient (IQ) and Emotional Quotient (EQ).
APO 2	Graduates will have a sense of creating and observing unique insights in what is seen and observed.
APO 3	Graduates will have design thinking capabilities.
APO 4	Graduates will have computational thinking capabilities (ability to translate vast data in the abstract concept) and understand database reasoning.
APO 5	Graduates will have virtual collaborative ability.
APO 6	Graduates will have ability to use social and open source media effectively for productive use.
APO 7	Graduates will have critical thinking and innovative skills.
APO 8	Graduates will have good digital foot prints.

VI. Programme Specific Outcomes (PSOs)

On the completion of B.Sc. Electronics and Communication Systems, the graduates will able to

PSO 1	Design and develop systems for applications including Communication Systems, Signal Processing, Embedded Systems, Networking, VLSI, Control Systems, IoT and Robotics.
PSO 2	Use modern tools and techniques to solve raising problems in the field of Electronics and Communication.
PSO 3	Analyse and understand in depth problems and provide innovative design solution to high level thinking to achieve desired outcomes.

VII. Curriculum Structure for B.Sc Electronics and Communication Systems

Course Components, Credits & Marks Distribution

Part No	Group	Distribution of Courses	Number of Courses	Total Credits	Total Marks
I - IV	1	AEC – Ability Enhancement Courses	10	31	1000
III	2	DSC – Discipline Specific Courses	19	58	1500
	3	DSE – Discipline Specific Electives	13	36	1000
III & IV	4	GEC – General Elective Courses	5	15	500
IV	5	ANCC I & II – Audit Non-Credit Courses	2	-	-
V		ANCC III – Audit Non-Credit Courses	1	-	-
-	6	DTC – Drive Through Courses (SWAYAM-NPTEL, Coursera, Any courses certified by statutory bodies, etc)	Any number	Addl. Credits	-
Total				**140**	**4000**

1. Ability Enhancement Courses (AECs)(10 Courses)

AEC are the courses based upon the content that leads to knowledge enhancement. These are mandatory for all disciplines.

Ability Enhancement Courses (AEC) are the following,

S. No.	Course Code	Course Title	Semester	Ownership Department	Contact Hours	Credits	Marks
1	21AEC02/ 21AEC07/ 21AEC17/ 21AEC11	Languages I: Tamil-I: Tamil Aruvi - I/ Hindi - I/ Malayalam – I/ French – I	I	Language	6	3	100
2	21AEC22	English-I: English for Professional Communication	I	English	6	3	100
3	21AEC04/ 21AEC08/ 21AEC18/ 21AEC12	Languages II: Tamil-II: Tamil Aruvi - II/ Hindi - II/ Malayalam – II/ French – II	II	Language	6	3	100
4	21AEC24	English-II: Campus to Corporate	II	English	6	3	100
5	21AEC34	Academic Skills for Electronic Science	II	ECS	3	3	100
6	21AEC42	Statistics for Science	III	Mathematics	5	3	100
7	21AEC55	Effective Communication	III	English	3	3	100
8	21AEC50	Capstone Project	IV	ECS	-	4	100
9	21AEC51	Environmental Studies	IV	Bio-Science	3	3	100
10	21AEC57	Ethics and Values for Electronic Science	VI	ECS	3	3	100
Total						**31**	**1000**

Part I: Languages I, Languages II

Part II: English – I, English – II

Part III: Academic Skills for Electronic Science, Statistics for Science, Capstone Project

Part IV: Effective Communication, Environmental Studies, Ethics and Values for Electronic Science

2. Part III: Discipline Specific Courses (DSCs)(19 Courses)

These courses are to be studied compulsorily by the students as a core requirement. The students are required to take DSCs across six semesters. The courses designed under this category aim to cover the basics that a student is expected to imbibe in the particular discipline. It includes project work.

S. No.	Course Code	Course Title	Semester	Contact Hours	Credits	Marks
1	21EDC01	Basic Electronics and Network Analysis	I	4	3	100
2	21EDC02	Basic Electronics and Network Analysis Lab	I	3	2	50
3	21EDC03	Semiconductor Devices	I	4	3	100
4	21EDC04	Semiconductor Devices Lab	I	3	2	50
5	21EDC05	Mathematics - I	I	4	4	100
6	21EDC06	Electronic Circuits	II	5	4	100
7	21EDC07	Electronic Circuits Lab	II	3	2	50
8	21EDC08	Mathematics - II	II	4	4	100
9	21EDC09	Communication Electronics	III	4	3	100
10	21EDC10	Communication Electronics Lab	III	3	2	50
11	21EDC11	Digital Electronics and VHDL	III	5	4	100
12	21EDC12	Digital Electronics and VHDL Lab	III	3	2	50
13	21EDC13	Integrated Circuits and Instrumentation	IV	5	4	100
14	21EDC14	Linear Integrated Circuits Lab	IV	3	2	50
15	21EDC15	Embedded Systems	IV	6	4	100
16	21EDC16	Embedded Systems Lab	IV	3	2	50
17	21EDC17	Industrial and Power Electronics	V	4	3	100
18	21EDC18	Industrial and Power Electronics Lab	V	3	2	50
19	21EDC19	Project Work	VI	5	6	100
Total					**58**	**1500**

Project Work

During the sixth semester, every student shall prepare a project report. A Guide will be allotted to each student by the department. Student can select any relevant topic in discussion with the Guide.The project report shall be subject to internal evaluation followed by a Viva-Voce. The project should be demonstrated at the time of examination.

3 Reviews – 60 Marks

Report – 20 Marks
Attendance – 20 Marks
Total – 100 Marks will be converted to 50 (Internal) Marks
End Semester Viva-Voce will be conducted for 50 (External) Marks.
(Dissertation - 35 Marks & Viva-voce - 15 Marks)

3. Part III: Discipline Specific Electives (DSEs) (13 Courses)

Discipline Specific Elective Courses offered under the main discipline of study which may be specialized or advanced or supportive to the discipline of study. Students can choose any thirteen courses from the following list.

S. No.	Course Code	Course Title	Ownership Department	Contact Hours	Credits	Marks
1	21EDE01	Circuit Simulation Lab	ECS	3	2	50
2	21EDE02	PCB Design Lab	ECS	3	2	50
3	21EDE03	C Programming and Data Structures	Computer Applications	4	3	100
4	21EDE04	C Programming and Data Structures Lab	Computer Applications	3	2	50
5	21EDE05	Internet and Java Programming	Computer Applications	4	3	100
6	21EDE06	Internet and Java Programming Lab	Computer Applications	3	2	50
7	21EDE07	Python Programming	Computer Applications	4	3	100
8	21EDE08	Python Programming Lab	Computer Applications	3	2	50
9	21EDE09/ 21EDE10	Industrial Exposure Training / Introduction to Data Science	ECS/ Computer Applications	4 Weeks / 4	4	100
10	21EDE11	Microwave and Fiber Optic Communication Systems	ECS	4	3	100
11	21EDE12	Photonics	ECS	4	3	100
12	21EDE13	Robotics and Arduino Programming	ECS	4	3	100
13	21EDE14	Robotics and Arduino Programming Lab	ECS	3	2	50
14	21EDE15	Digital Image Processing	ECS	4	3	100
15	21EDE16	Digital Image Processing Lab	ECS	3	2	50
16	21EDE17	Modern Communication Systems	ECS	4	4	100
17	21EDE18	Modern Communication Systems Lab	ECS	3	2	50
18	21EDE19	Programmable Logic Controller	ECS	4	4	100
19	21EDE20	Programmable Logic Controller Lab	ECS	3	2	50

20	21EDE21	Medical Electronics	ECS	4	4	100
21	21EDE22	Medical Electronics Lab	ECS	3	2	50

Industrial Exposure Training (IET):

Students can opt for Industrial Exposure Training during fifth semester for a period of 4 weeks; in such case one DSE course will be exempted.

The Continuous Internal Assessment mark distribution for IET is as follows:

Component	Mode of Conduct	Project Coverage	Marks	Conversion
3 Reviews	Presentation	Phase by Phase	60	60
Work Diary	Written	Phase by Phase	10	10
Time Sheet	Online	Online Portal	10	10
Attendance	Based on rubrics			20
Total				**100**

The maximum marks obtained for 100 shall be further converted to 50 marks.

Viva-voce Marks for the Industrial Exposure Training will be given based on the report and viva-voce examination conducted by the Department.

Report – 35 Marks
Viva-voce – 15 Marks

4. Generic Elective Courses (GECs)(5 Courses)

Generic Elective Courses are advanced level courses for the discipline. They are not specialization specific. No overlapping with specialization courses. A student of specific discipline of any specialization can subscribe. These courses cover the future and recent developments in the respective discipline. The student has to subscribe any 5 courses in the following list:

Sl.No.	Course Code	Course Title	Semester	Ownership Depart.	Contact Hours	Credits	Marks
1	21GEC01	Spoken Tamil	IV	Language	3	3	100
	21GEC02	Spoken Hindi					
	21GEC03	Spoken Telugu					
	21GEC04	Spoken Malayalam					
	21GEC05	Spoken French					
2	21EGE01	Computer Networks	V	ECS	4	3	100
	21EGE02	Mobile and Cellular Network Security					
3	21EGE03	Internet of Things	V	ECS	4	3	100
	21EGE04	Introduction to Cloud Computing					
4	21EGE05	5G Mobile Networks	VI	ECS	4	3	100

	21EGE06	Mobile Application Development					
5	21EGE07	Artificial Intelligence	VI	ECS	4	3	100
	21EGE08	Soft Computing Techniques					
Total						**15**	**500**

Part III: Computer Networks/ Mobile and Cellular Network Security
Internet of Things/ Automatic Control Systems
5G Mobile Networks/ Mobile Application Development
Artificial Intelligence/ Soft Computing Techniques

Part IV: Spoken Tamil/ Spoken Hindi/ Spoken Telegu/ Spoken Malayalam/ Spoken French

5. Audit Non-Credit Courses (ANCC)

Non Credit Courses are intended for students who want to gain general knowledge, learn a new skill, upgrade existing skills, enrich their understanding of a wide range of topics, or develop personal interests. A student has to complete any two courses during Semester I and II.

Part IV - Semester I - ANCC 1 & Semester II - ANCC 2			
S. No.	**Course Code**	**Course Title**	**Marks**
1	21ANC01	Human Rights	Completed
2	21ANC02	Women's Rights	
3	21ANC03	Yoga for Human Excellence	
4	21ANC04	Indian Culture and Heritage	
5	21ANC05	Introduction to Cyber Security	
6	21ANC06	Consumer Protection	
7	21ANC07	Constitution of India	
8	21ANC08	Waste Management	

Student has to take part in any one extension activity during their course of study.

Part V: ANCC 3 - Extension Activities		
S. No.	**Course Code**	**Course Title**
1	21ANC09	National Service Scheme
2	21ANC10	National Cadet Corps
3	21ANC11	Youth Red Cross
4	21ANC12	Red Ribbon Club
5	21ANC13	Rotaract Club
6	21ANC14	Sports
7	21ANC15	Association Activities
8	21ANC16	Club Activities

6. Drive-Through Course (DTC) (Optional)

These courses are intended to bring out and promote the self-learning initiative of the students – where their own motivation is what drives them to complete the course and not external compulsions. This fosters the habit of keeping oneself updated always by means of self-study. It gives the students the opportunities to explore new areas of interest and earn additional credits. Students can take any number of courses under this cafeteria system. The credits will not be taken for CGPA calculation. Additional 4 credits per Course will be given on submission of certificate.

1. SWAYAM-NPTEL
2. Coursera
3. Any courses certified by statutory bodies

VIII. Semester-wise Scheme

Semester I								
Course Code	Course Title	T/ P	Ins. Hrs/ Week	Examination				Credits
				ESE Hrs	CIA Marks	ES Marks	Total Marks	
21AEC02/ 21AEC07/ 21AEC17/ 21AEC11	**AEC-1: Languages I** Tamil – I: Tamil Aruvi - I/ Hindi – I/ Malayalam – I/ French – I	T	6	3	50	50	100	3
21AEC22	**AEC-2** English-I : English for Professional Communication	T	6	3	50	50	100	3
21EDC01	**DSC-1** Basic Electronics and Network Analysis	T	4	3	50	50	100	3
21EDC02	**DSC-2** Basic Electronics and Network Analysis Lab	P	3	3	25	25	50	2
21EDC03	**DSC-3** Semiconductor Devices	T	4	3	50	50	100	3
21EDC04	**DSC-4** Semiconductor Devices Lab	P	3	3	25	25	50	2
21EDC05	**DSC-5** Mathematics - I	T	4	3	50	50	100	4
21ANC01 / 21ANC02 / 21ANC03 / 21ANC04 / 21ANC05 / 21ANC06 / 21ANC07 / 21ANC08	**ANCC-1** Human Rights / Women's Rights / Yoga for Human Excellence / Indian Culture and Heritage / Introduction to Cyber Security / Consumer Protection / Constitution of India / Waste Management	T	2	-	-	-	Completed	-
Total			**30 + 2**				**600**	**20**

Semester II								
Course Code	Course Title	T/ P	Ins. Hrs/ Week	Examination				Credits
				ESE Hrs	CIA Marks	ES Marks	Total Marks	
21AEC04/ 21AEC08/ 21AEC18/ 21AEC12	**AEC-3: Languages II** Tamil – II: Tamil Aruvi– II/ Hindi – II/ Malayalam – II/ French – II	T	6	3	50	50	100	3
21AEC24	**AEC-4** English-II: Campus to Corporate	T	6	3	50	50	100	3
21AEC34	**AEC-5** Academic Skills for Electronic Science	T	3	3	50	50	100	3
21EDC06	**DSC-6** Electronic Circuits	T	5	3	50	50	100	4
21EDC07	**DSC-7** Electronic Circuits Lab	P	3	3	25	25	50	2
21EDC08	**DSC-8** Mathematics - II	T	4	3	50	50	100	4
21EDE01/ 21EDE02	**DSE-1** Circuit Simulation Lab / PCB Design Lab	P	3	3	25	25	50	2
21ANC01 / 21ANC02 / 21ANC03 / 21ANC04 / 21ANC05 / 21ANC06 / 21ANC07 / 21ANC08	**ANCC-2** Human Rights / Women's Rights / Yoga for Human Excellence / Indian Culture and Heritage / Introduction to Cyber Security / Consumer Protection / Constitution of India / Waste Management	T	2	-	-	-	Completed	-
Total			**30 + 2**				**600**	**21**

Semester III								
Course Code	Course Title	T/ P	Ins. Hrs/ Week	Examination				Credits
				ESE Hrs	CIA Marks	ES Marks	Total Marks	
21AEC42	**AEC-6** Statistics for Science	T	5	3	50	50	100	3
21EDC09	**DSC-9** Communication Electronics	T	4	3	50	50	100	3
21EDC10	**DSC-10** Communication Electronics Lab	P	3	3	25	25	50	2
21EDC11	**DSC-11** Digital Electronics and VHDL	T	5	3	50	50	100	4

21EDC12	**DSC-12** Digital Electronics and VHDL Lab	P	3	3	25	25	50	2
21EDE03/ 21EDE05 / 21EDE07	**DSE-2** C Programming and Data Structures/ Internet and Java Programming/ Python Programming	T	4	3	50	50	100	3
21EDE04 / 21EDE06 / 21EDE08	**DSE-3** C Programming and Data Structures Lab / Internet and Java Programming Lab/ Python Programming Lab	P	3	3	25	25	50	2
21AEC55	**AEC-7** Effective Communication	T	3	3	50	50	100	3
Total			**30**				**650**	**22**

Semester IV

Course Code	Course Title	T/ P	Ins. Hrs/ Week	Examination				Credits
				ESE Hrs	CIA Marks	ES Marks	Total Marks	
21AEC50	**AEC-8** Capstone Project	-	-	-	50	50	100	4
21EDC13	**DSC-13** Integrated Circuits and Instrumentation	T	5	3	50	50	100	4
21EDC14	**DSC-14** Linear Integrated Circuits Lab	P	3	3	25	25	50	2
21EDC15	**DSC-15** Embedded Systems	T	6	3	50	50	100	4
21EDC16	**DSC-16** Embedded Systems Lab	P	3	3	25	25	50	2
21EDE03/ 21EDE05 / 21EDE07	**DSE-4** C Programming and Data Structures/ Internet and Java Programming/ Python Programming	T	4	3	50	50	100	3
21EDE04 / 21EDE06 / 21EDE08	**DSE-5** C Programming and Data Structures Lab / Internet and Java Programming Lab/ Python Programming Lab	P	3	3	25	25	50	2
21GEC01 / 21GEC02 / 21GEC03 / 21GEC04 / 21GEC05	**GEC-1** Spoken Tamil / Spoken Hindi / Spoken Telugu / Spoken Malayalam / Spoken French	T	3	3	100	-	100	3

21AEC51	**AEC-9** Environmental Studies	T	3	3	50	50	100	3
Total			**30**				**750**	**27**

Semester V

Course Code	Course Title	T/ P	Ins. Hrs/ Week	Examination				Credits
				ESE Hrs	CIA Marks	ES Marks	Total Marks	
21EDE09	**DSE–6** Industrial Exposure Training	-	4 Weeks	-	50	50	100	4
	OR							
21EDE10	**DSE–6** Introduction to Data Science	T	4	3	50	50	100	4
	AND							
21EDC17	**DSC–17** Industrial and Power Electronics	T	4	3	50	50	100	3
21EDC18	**DSC–18** Industrial and Power Electronics Lab	P	3	3	25	25	50	2
21EDE11 / 21EDE12	**DSE–7** Microwave and Fiber Optic Communication Systems / Photonics	T	4	3	50	50	100	3
21EDE13 / 21EDE15	**DSE-8** Robotics and Arduino Programming / Digital Image Processing	T	4	3	50	50	100	3
21EDE14 / 21EDE16	**DSE-9** Robotics and Arduino Programming Lab/ Digital Image Processing Lab	P	3	3	25	25	50	2
21EGE01 / 21EGE02	**GEC–2** Computer Networks / Mobile and Cellular Network Security	T	4	3	50	50	100	3
21EGE03 / 21EGE04	**GEC–3** Internet of Things / Introduction to Cloud Computing	T	4	3	50	50	100	3
Total			**30**				**700**	**23**

Semester VI

Course Code	Course Title	T/ P	Ins. Hrs/ Week	Examination				Credits
				ESE Hrs	CIA Marks	ES Marks	Total Marks	
21EDC19	**DSC-19** Project Work	-	5	-	50	50	100	6

21EDE17 / 21EDE19 / 21EDE21	**DSE–10** Modern Communication Systems / Programmable Logic Controller / Medical Electronics	T	4	3	50	50	100	4
21EDE18 / 21EDE20 / 21EDE22	**DSE–11** Modern Communication Systems Lab / Programmable Logic Controller Lab / Medical Electronics Lab	P	3	3	25	25	50	2
21EDE17 / 21EDE19 / 21EDE21	**DSE–12** Modern Communication Systems / Programmable Logic Controller / Medical Electronics	T	4	3	50	50	100	4
21EDE18 / 21EDE20 / 21EDE22	**DSE–13** Modern Communication Systems Lab / Programmable Logic Controller Lab / Medical Electronics Lab	P	3	3	25	25	50	2
21EGE05 / 21EGE06	**GEC-4** 5G Mobile Networks / Mobile Application Development	T	4	3	50	50	100	3
21EGE07 / 21EGE08	**GEC-5** Artificial Intelligence / Soft Computing Techniques	T	4	3	50	50	100	3
21AEC57	**AEC-10** Ethics and Values for Electronic Science	T	3	3	50	50	100	3
	ANCC-3 Extension Activities	-	-	-	-	-	Completed	-
Total			**30**				**700**	**27**
Total							**4000**	**140**

Drive-Through Course (DTC) (Optional): Courses offered in SWAYAM-NPTEL, Coursera or Any courses certified by statutory bodies.	Additional 4 credits per Course will be given on submission of Certificate.	During Semester I to Semester VI

Semester-wise Distribution of Marks and Credits:

Semester	Total Marks	Total Credits
I	600	20
II	600	21
III	650	22
IV	750	27
V	700	23
VI	700	27
Total	**4000**	**140**

List of Courses Offered by Mathematics Department

Semester	Course Code	Course Name	Programme	T/ P	Ins. hrs	CIA	ES	Total Marks	Credit
I	21EDC05	Mathematics - I	B.Sc ECS	T	4	50	50	100	4
II	21EDC08	Mathematics - II	B.Sc ECS	T	4	50	50	100	4
III	21AEC42	**AEC:** Statistics for Science	B.Sc ECS	T	5	50	50	100	3

List of Courses Offered by Computer Applications Department
(Any 2 out of 3) during Semester III & IV

Semester	Course Code	Course Name	Programme	T/ P	Ins. hrs	CIA	ES	Total Marks	Credit
III / IV	21EDE03	C Programming and Data Structures	B.Sc ECS	T	4	50	50	100	3
	21EDE04	C Programming and Data Structures Lab	B.Sc ECS	P	3	25	25	50	2
III / IV	21EDE05	Internet and Java Programming	B.Sc ECS	T	4	50	50	100	3
	21EDE06	Internet and Java Programming Lab	B.Sc ECS	P	3	25	25	50	2
III / IV	21EDE07	Python Programming	B.Sc ECS	T	4	50	50	100	3
	21EDE08	Python Programming Lab	B.Sc ECS	P	3	25	25	50	2
V	21EDE10	Introduction to Data Science	B.Sc ECS	T	4	25	25	100	3

The Course Offered to B.Sc. (Computer Science with Cognitive Systems)

Semester	Course Code	Course Name	Programme	T/ P	Ins. hrs	CIA	ES	Total Marks	Credit
III	21TGE02	Physics for Computer Science	B.SC Computer Science with CG	T	5	50	50	100	4
	21CDE09	Robotics and Applications		T	5	50	50	100	3

List of Courses Offered to B.Sc. (IT), B.Sc. (CT), B.Sc. (CS), B.Sc. (CSA), B.Sc. (SS), B.Sc. (Data Sci.)& BCA

Semester	Course Code	Course Name	Programme	T/ P	Ins. hrs	CIA	ES	Total Marks	Credit
IV	21CDE08	Embedded Systems	B.Sc. (IT) B.Sc. (CT) B.Sc. (CS) B.Sc. (CSA) B.Sc. (SS) BCA B.Sc. (Data Sci.)	T	5	50	50	100	3
	21CDE09	Robotics and Applications		T	5	50	50	100	3
	21CDE10	PC Hardware		T	5	50	50	100	3