

**SRI KRISHNA ARTS AND SCIENCE COLLEGE**  
**An Autonomous College Affiliated to Bharathiar University**  
**Coimbatore-641008, Tamil Nadu, India.**

**LEARNING OUTCOMES BASED CURRICULUM FRAMEWORK**  
**(LOCF)**

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

**for 2022-23 Admitted Students**

**DEPARTMENT OF ELECTRONICS AND COMMUNICATION SYSTEMS**



**SRI KRISHNA ARTS AND SCIENCE COLLEGE  
COIMBATORE – 641008**

**DEPARTMENT OF ELECTRONICS AND COMMUNICATION SYSTEMS**

**(2022-2023)**

<b>I. PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)</b>	
Graduates from the B.Sc. Electronics and Communication Systems Programme are expected to achieve the following PEOs	
<b>PEO 1</b>	Graduates will be practitioners and leaders in the field of Electronics and Communication Systems with effective interpersonal skills.
<b>PEO 2</b>	Graduates with an ability to solve scientific or engineering problems by using critical thinking and problem-solving skills in a multi-disciplinary setting.
<b>PEO 3</b>	Graduates will be professionals or entrepreneurs and exhibit technical, social, and ethical responsibility in service or product-based companies.
<b>PEO 4</b>	Graduates are equipped with skills in recent technologies and be receptive to attain professional competence through life-long learning.
<b>PEO 5</b>	Graduates will be successful in pursuing higher education and choosing the right career path.

<b>II. PROGRAMME LEARNING OUTCOMES (PLOs)</b>	
The Graduates of B.Sc. Electronics and Communication Systems programme will be able to:	
<b>PLO1</b>	<b>Knowledge:</b> Apply knowledge of Mathematics and Science in solving Electronics related problems. <b>(Cognitive)</b>
<b>PLO2</b>	<b>Critical Thinking Skills:</b> Demonstrate critical thinking skills in understanding of complex problems and to develop fully reasoned opinions on such contemporary issues. <b>(Cognitive)</b>
<b>PLO3</b>	<b>Practical Skills:</b> Design and conduct electronics experiments, as well as to analyze and interpret data using scientific/engineering methods. <b>(Psychomotor)</b>
<b>PLO4</b>	<b>Teamwork Skills:</b> Function as a member of a multidisciplinary team with sense of ethics, integrity and social responsibility. <b>(Affective)</b>
<b>PLO5</b>	<b>Communication Skills:</b> Communicate effectively in both verbal and written forms. <b>(Affective)</b>
<b>PLO6</b>	<b>Digital Skills:</b> Design and manage electronic systems or processes that conforms digital skills within ethical and economic constraints. <b>(Affective)</b>
<b>PLO7</b>	<b>Numeracy Skills:</b> Identify, formulate, solve and analyze the problems in various disciplines of Electronics. <b>(Cognitive)</b>
<b>PLO8</b>	<b>Leadership Skills:</b> Become competent by applying their technical and managerial skills. <b>(Affective)</b>
<b>PLO9</b>	<b>Lifelong Learning Skills:</b> Recognize the need for, and be able to engage in higher studies, research and lifelong learning. <b>(Affective)</b>
<b>PLO10</b>	<b>Entrepreneurial Skills:</b> Pursue the opportunity to create value and wealth for the betterment of the individual and society at large. <b>(Affective)</b>

<b>PLO11</b>	<b>Ethics &amp; Professional Skills:</b> Apply ethical principles and commit to professional ethics and responsibilities, and norms of the scientific/ engineering practices. <i>(Affective)</i>
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III. PROGRAMME LEARNING OUTCOMES VS GRADUATE ATTRIBUTES VSTAXONOMY 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. PROGRAMME LEARNING OUTCOMES VS PROGRAMME EDUCATIONAL OBJECTIVES					
	PEO 1	PEO 2	PEO 3	PEO 4	PEO 5
PLO 1	3		2		3
PLO 2		3			
PLO 3	3				
PLO 4		3			
PLO 5	3				
PLO 6				3	
PLO 7		3			
PLO 8	3				
PLO 9				3	2
PLO 10			2		2
PLO 11			3		

V. ADDITIONAL PROGRAMME OUTCOMES (APOs)	
<b>APO 1</b>	Graduates will have ability with social intelligence with good Intelligent Quotient (IQ) and Emotional Quotient (EQ).

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

#### VI. PROGRAMME SPECIFIC OUTCOMES (PSO's)

<b>PSO 1</b>	Graduates will be able to design and develop applications for Information Technology, Communication Systems, Signal Processing, Embedded Systems, Instrumentation and Control Systems, Networking, IoT, Automotive, Industrial Automation and Robotics.
<b>PSO 2</b>	Graduates will be able to use modern tools and programming techniques to solve problems in the field of Electronics and Communication, and IT.
<b>PSO 3</b>	Graduates will be able to pursue post-graduate or research-based programmes.

#### VII. Mapping of PEOs with PSOs

	<b>PSO 1</b>	<b>PSO 2</b>	<b>PSO 3</b>
<b>PEO 1</b>	3		3
<b>PEO 2</b>	3	3	
<b>PEO 3</b>	3		
<b>PEO 4</b>		2	2
<b>PEO 5</b>			3

**VIII. Curriculum Structure for B.Sc. Electronics and Communication Systems**  
**Course Components, Credits & Marks Distribution**

Part No	Group	Basic Structure: Distribution of Courses	Number of Courses	Total Marks	Total Credits
I - IV	1	AEC – Ability Enhancement Courses	10	1000	31
III	2	DSC – Discipline Specific Courses	20	1500	56
	3	DSE – Discipline Specific Electives	12	1000	35
	4	GEC – Generic Elective Courses	7	500	18
IV	5	ANCC I & II – Audit Non-Credit Courses	2	Completed	
V		ANCC III – Audit Non-Credit Courses	1	Completed	
-	6	Drive Through Courses (DTCs) – (SWAYAM-NPTEL, Coursera, Any courses certified by statutory bodies, etc)	Any number	-	Additional Credits
<b>Total</b>				<b>4000</b>	<b>140</b>

**Group 1. Ability Enhancement Courses (AECs) (10 Courses)– Part (I–IV)**

AEC are the courses based upon the content that leads to knowledge enhancement. Ability Enhancement Courses (AEC) are the following:

S. No.	Course Code	Course Title	Semester	Ownership Department	Contact Hours	Marks	Credits
1	22AEC02/ 22AEC07/ 22AEC11/ 22AEC17/ 22AEC21	<b>AEC Part I:</b> Language – I: Tamil–I Tamizhum Ariviyalum/ Hindi – I/ French – I/ Malayalam – I/ Sanskrit – I	I	Language Department	6	100	3
2	22AEC26	<b>AEC Part II:</b> English-I: English for Professional Communication	I	English Department	6	100	3
3	22AEC04/ 22AEC08/ 22AEC12/ 22AEC18/ 22AEC22	<b>AEC Part I:</b> Language – II Tamil–II Panpattu Padhivugalum Ariviyalargalum/ Hindi – II/ French – II/ Malayalam – II/ Sanskrit – II	II	Language Department	6	100	3

4	22AEC28	<b>AEC Part II:</b> English – II: Campus to Corporate	II	English Department	6	100	3
5	22AEC34	<b>AEC Part III:</b> Academic Skills for Electronic Science	II	ECS	3	100	3
6	22AEC42	<b>AEC Part III:</b> Statistics for Science	III	Mathematics	5	100	3
7	22AEC71	<b>AEC Part IV:</b> Effective Communication	III	English Department	3	100	3
8	22AEC54	<b>AEC Part III:</b> Capstone Project for Electronics	IV	ECS	-	100	4
9	22AEC72	<b>AEC Part IV:</b> Talent Enhancement Course: Career Guidance	IV	Mathematics & English Department	3	100	3
10	22AEC62	<b>AEC Part IV:</b> Professional Ethics in Electronic Science	V	ECS	3	100	3
<b>Total</b>						<b>1000</b>	<b>31</b>

**Group 2. Discipline Specific Courses (DSCs) (20 Courses) – Part III**

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 Major project.

S. No.	Course Code	Course Title	Semester	Contact Hours	Marks	Credits
1	22ECU01	Basic Electronics and Network Analysis	I	4	100	3
2	22ECU02	Basic Electronics and Network Analysis Lab	I	3	50	2
3	22ECU03	Semiconductor Devices	I	4	100	3
4	22ECU04	Semiconductor Devices Lab	I	3	50	2
5	22ECU05	Electronic Circuits	II	5	100	4
6	22ECU06	Electronic Circuits Lab	II	3	50	2
7	22ECU07	Circuit Simulation Lab	II	3	50	2
8	22ECU08	Communication Electronics	III	5	100	4
9	22ECU09	Communication Electronics Lab	III	3	50	2
10	22ECU10	Digital Electronics and VHDL	III	5	100	4
11	22ECU11	Digital Electronics and VHDL Lab	III	3	50	2
12	22ECU12	Integrated Circuits and Instrumentation	IV	4	100	3
13	22ECU13	Linear Integrated Circuits Lab	IV	3	50	2

14	22ECU14	Embedded Systems	IV	4	100	3
15	22ECU15	Embedded Systems Lab	IV	3	50	2
16	22ECU16	Modern Communication Systems	V	4	100	4
17	22ECU17	Modern Communication Systems Lab	V	3	50	2
18	22ECU18	Industrial and Automotive Electronics	V	4	100	4
19	22ECU19	Industrial and Automotive Electronics Lab	V	3	50	2
20	22ECU20	Project Work	VI	4	100	4
<b>Total</b>					<b>1500</b>	<b>56</b>

### Project Work

During the Sixth semester each student should undertake a project work and submit the report. A guide will be allotted to each student by the Department. A student can select any research 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.

#### **Internal Evaluation:**

Reviews (3)	– 25 Marks
Work Dairy	– 10 Marks
Report	– 15 Marks
Total	– 50 Marks

**End Semester Viva-Voce** will be conducted for 50 Marks.  
(Dissertation - 30 Marks & Viva-voce - 20 Marks)

### Group 3. Discipline Specific Elective (DSEs) (12 Courses) – Part III

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 one course from two courses each in the list of following DSEs.

S. No.	Course Code	Course Title	Ownership Department	Contact Hours	Marks	Credits
1	22ECU21	Microwave and Fiber Optic Communication Systems	ECS	4	100	3
	22ECU22	Photonics	ECS			
2	22ECU23	Industrial Exposure Training	ECS	4 Weeks	100	4
	OR					

	22ECU24	Internet of Things	ECS	4		
	22ECU25	Introduction to Cloud Computing	ECS	4		
3	22ECU26	Robotics	ECS	4	100	4
	22ECU27	Digital Image Processing	ECS			
4	22ECU28	Robotics and IoT Lab	ECS	3	50	2
	22ECU29	Digital Image Processing Lab	ECS			
5	22ECU30	Python Programming	Computer Application	3	100	2
	22ECU31	R Programming	Computer Application			
6	22ECU32	Python Programming Lab	Computer Application	2	50	2
	22ECU33	R Programming Lab	Computer Application			
7	22ECU34	Computer Networks	ECS	4	100	3
	22ECU35	Mobile and Cellular Network Security	ECS			
8	22ECU36	Programmable Logic Controller	ECS	4	100	3
	22ECU37	Medical Electronics	ECS			
9	22ECU38	Programmable Logic Controller Lab	ECS	3	50	2
	22ECU39	Medical Electronics Lab	ECS			
10	22ECU40	Artificial Intelligence	ECS	4	100	4
	22ECU41	Soft Computing Techniques	ECS			
11	22ECU42	Artificial Intelligence Lab	ECS	3	50	2
	22ECU43	Soft Computing Lab	ECS			
12	22ECU44A/ 22ECU44B	Introduction to Data Science / Data Science Lab	Computer Science	5	100	4
	22ECU45A/ 22ECU45B	Mobile Application Development/ Mobile Application Development Lab				

#### 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
3 Reviews	Presentation	Phase by Phase	25
Work Diary	Written	Phase by Phase	10



Report	Submission	Entire Process	15
<b>Total</b>			<b>50</b>

The end semester viva-voce marks for the Industrial Exposure Training will be given based on the report and viva-voce examination, conducted by the Department.

Report : 30 Marks

Viva-voce: 20 Marks

#### **Group 4. Generic Elective Courses (GECs) (7 Courses)– Part III**

Generic Elective Courses are interdisciplinary in nature. They are additional courses based on expertise, specialization, requirements, scope, and need of the department. The student can learn the courses in the field of language, mathematics and computer science.

Sl. No.	Course Code	Course Title	Semester	Ownership Department	Contact Hours	Marks	Credits
1	22GEU10	Mathematics - I	I	Mathematics	4	100	4
2	22GEU15	Mathematics - II	II	Mathematics	4	100	4
3	22GEU42	C Programming and Data Structures	III	Computer Applications	4	50	2
	22GEU43	C++ Programming and Data Structures					
4	22GEU44	C Programming and Data Structures Lab	III	Computer Applications	3	50	2
	22GEU45	C++ Programming and Data Structures Lab					
5	22GEU50	Internet and Java Programming	IV	Computer Applications	4	50	2
	22GEU38	Relational Database Management System					
6	22GEU51	Internet and Java Programming Lab	IV	Computer Applications	3	50	2
	22GEU39	Relational Database Management System Lab					
7	22GEU01	Spoken Hindi	IV	Language	3	100	2
	22GEU02	Spoken Tamil					
	22GEU03	Spoken Telugu					
	22GEU04	Spoken Malayalam					
	22GEU05	Spoken French					
Total						500	18

#### **Group 5. Audit Non-Credit Courses (ANCC)– Part IV & V**

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- ANCC			
S. No.	Course Code	Course Name	Ownership Department
<b>ANCC 1 (Semester I)</b>			
1	22ANC01	Environmental Studies	Bioscience
<b>ANCC 2 - Values &amp; Ethics (Semester II)</b>			

2	22ANC02	Human Rights	ECS
3	22ANC03	Women's Rights	ECS
4	22ANC04	Yoga for Human Excellence	ECS
5	22ANC05	Indian Culture and Heritage	ECS
6	22ANC06	Introduction to Cyber Security	ECS
7	22ANC07	Consumer Protection	ECS
8	22ANC08	Constitution of India	ECS
9	22ANC09	Waste Management	ECS

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

Part V- ANCC		
ANCC 3 - Extension Activities		
S. No.	Course Code	Course Name
1	22ANC10	National Service Scheme
2	22ANC11	National Cadet Corps
3	22ANC12	Youth Red Cross
4	22ANC13	Red Ribbon Club
5	22ANC14	Rotaract Club
6	22ANC15	Sports
7	22ANC16	Association Activities
8	22ANC17	Club Activities

#### Group 6.

##### i) Drive-Through Courses (DTCs) I & II – Additional Credits

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 opportunities to the students 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.

##### ii) Drive-Through Course (DTC – III)

##### Internship Training/Mini Project/ Spoken Tutorial/etc.

Students individually or with the maximum of four members per batch should take up either Internship training or mini project for a period of fifteen days during IV Semester vacation. The report will be evaluated and viva-voce examination will be conducted during V semester. Otherwise, the students have to complete one spoken tutorial course or any certification course suggested by the department.

**VIII. Semester-wise Scheme**

Semester I										
Course Code	Course Title	T/P/E	Ins. Hrs/Week	ESE Dur. Hrs	CIA Marks	ES Marks	Total Marks	Credits	SD/EM/EN	L/ R/ N/ G
22AEC02/ 22AEC07/ 22AEC11/ 22AEC17/ 22AEC21	<b>AEC 1: Language I</b> Tamil-I Tamizhum Ariviyalum/ Hindi - I/ French - I/ Malayalam-I/ Sanskrit - I	T	6	3	50	50	100	3	SD	L/ N/ G/ R/ N
22AEC26	<b>AEC 2: English I</b> English for Professional Communication	T	6	3	50	50	100	3	SD	G
22ECU01	<b>DSC 1</b> Basic Electronics and Network Analysis	T	4	3	50	50	100	3	SD	G
22ECU02	<b>DSC 2</b> Basic Electronics and Network Analysis Lab	P	3	3	25	25	50	2	SD	G
22ECU03	<b>DSC 3</b> Semiconductor Devices	T	4	3	50	50	100	3	SD	G
22ECU04	<b>DSC 4</b> Semiconductor Devices Lab	P	3	3	25	25	50	2	SD	G
22GEU10	<b>GEC 1</b> Mathematics - I	T	4	3	50	50	100	4	SD	G
22ANC01	<b>ANCC1 (NF2F)</b> Environmental Studies	T	2	-	-	-	Completed		SD	G
Drive Through Course I: Additional Credit Courses (NPTEL/Coursera)							Completed			
<b>Total</b>			<b>30</b>				<b>600</b>	<b>20</b>		
Semester II										
Course Code	Course Title	T/P/E	Ins. Hrs/Week	ESE Dur. Hrs	CIA Marks	ES Marks	Total Marks	Credits	SD/EM/EN	L/ R/ N/ G
22AEC04/ 22AEC08/ 22AEC12/ 22AEC18/ 22AEC22	<b>AEC 3: Language II</b> Tamil-II Panpattu Padhivugalum Ariviyalalargalum/ Hindi - II/ French - II/ Malayalam - II/ Sanskrit - II	T	6	3	50	50	100	3	SD	L/ N/ G/ R/ N

22AEC28	<b>AEC 4: English II</b> Campus to Corporate	T	6	3	50	50	100	3	SD	G
22AEC34	<b>AEC 5</b> Academic Skills for Electronic Science	T	3	3	50	50	100	3	SD	G
22ECU05	<b>DSC 5</b> Electronic Circuits	T	5	3	50	50	100	4	SD	G
22ECU06	<b>DSC 6</b> Electronic Circuits Lab	P	3	3	25	25	50	2	SD	G
22ECU07	<b>DSC 7</b> Circuit Simulation Lab	P	3	3	25	25	50	2	EM	G
22GEU15	<b>GEC 2</b> Mathematics - II	T	4	3	50	50	100	4	SD	G
22ANC02/ 22ANC03/ 22ANC04/  22ANC05/  22ANC06/  22ANC07/ 22ANC08/ 22ANC09	<b>ANCC 2 (NF2F)</b> 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	SD	G	
Drive Through Course II: Additional Credit Courses (NPTEL/Coursera)							Completed			
Total			30				600	21		
Semester III										
Course Code	Course Title	T/P/E	Ins. Hrs/Week	ESE Dur. Hrs	CIA Marks	ES Marks	Total Marks	Credits	SD/EM/EN	L/ R/ N/ G
22AEC42	<b>AEC 6</b> Statistics for Science	T	5	3	50	50	100	3	SD	G
22AEC71	<b>AEC 7</b> Effective Communication	T	3	3	50	50	100	3	SD	G
22ECU08	<b>DSC 8</b> Communication Electronics	T	5	3	50	50	100	4	SD	G
22ECU09	<b>DSC 9</b> Communication Electronics Lab	P	3	3	25	25	50	2	SD	G
22ECU10	<b>DSC 10</b> Digital Electronics and VHDL	T	5	3	50	50	100	4	EM	G

22ECU11	<b>DSC 11</b> Digital Electronics and VHDL Lab	P	3	3	25	25	50	2	EM	G
22GEU42/ 22GEU43	<b>GEC 3</b> C Programming and Data Structures/ C++ Programming and Data Structures	T	4	3	25	25	50	2	EM	G
22GEU44/ 22GEU45	<b>GEC 4</b> C Programming and Data Structures Lab/ C++ Programming and Data Structures Lab	P	2	3	25	25	50	2	EM	G
<b>Total</b>			<b>30</b>				<b>600</b>	<b>22</b>		
<b>Semester IV</b>										
Course Code	Course Title	T/P/E	Ins. Hrs/Week	ESE Dur. Hrs	CIA Marks	ES Marks	Total Marks	Credits	SD/EM/EN	L/ R/ N/ G
22AEC54	<b>AEC 8</b> Capstone Project	-	-	-	50	50	100	4	SD	N
22AEC72	<b>AEC 9</b> Talent Enhancement Course: Career Guidance	T	3	3	50	50	100	3	EM	G
22ECU12	<b>DSC 12</b> Integrated Circuits and Instrumentation	T	4	3	50	50	100	3	SD	G
22ECU13	<b>DSC 13</b> Linear Integrated Circuits Lab	P	3	3	25	25	50	2	SD	G
22ECU14	<b>DSC 14</b> Embedded Systems	T	4	3	50	50	100	3	EN	G
22ECU15	<b>DSC 15</b> Embedded Systems Lab	P	3	3	25	25	50	2	EN	G
22ECU21/ 22ECU22	<b>DSE 1</b> Microwave and Fiber Optic Communication Systems / Photonics	T	4	3	50	50	100	3	EM	G
22GEU50/ 22GEU38	<b>GEC 5</b> Internet and Java Programming/ Relational Database Management System	T	4	3	25	25	50	2	EM	G
22GEU51/	<b>GEC 6</b> Internet and Java Programming Lab/	P	2	3	25	25	50	2	EM	G

22GEU39	Relational Database Management System Lab									
22GEU01 22GEU02 22GEU03 22GEU04 22GEU05	<b>GEC 7</b> Spoken Hindi / Spoken Tamil/ Spoken Telugu/ Spoken Malayalam/ Spoken French	T	3	3	50	50	100	2	SD	L/ N/ R/ R/ G
<b>Total</b>			<b>30</b>				<b>800</b>	<b>26</b>		
<b>Semester V</b>										
Course Code	Course Title	T/P/E	Ins. Hrs/Week	ESE Dur. Hrs	CIA Marks	ES Marks	Total Marks	Credits	SD/EM/EN	L/ R/ N/ G
22AEC62	<b>AEC 10</b> Professional Ethics in Electronic Science	T	3	3	50	50	100	3	SD	G
22ECU16	<b>DSC 16</b> Modern Communication Systems	T	4	3	50	50	100	4	SD	G
22ECU17	<b>DSC 17</b> Modern Communication Systems Lab	T	3	3	25	25	50	2	SD	G
22ECU23	<b>DSE 2</b> Industrial Exposure Training	-	4 Weeks	-	50	50	100	4	EM	G
<b>OR</b>										
22ECU24/ 22ECU25	<b>DSE 2</b> Internet of Things / Introduction to Cloud Computing	T	4	3	50	50	100	4	EM	G
<b>AND</b>										
22ECU26/ 22ECU27	<b>DSE 3</b> Robotics / Digital Image Processing	T	4	3	50	50	100	4	EN	G
22ECU28/ 22ECU29	<b>DSE 4</b> Robotics and IoT Lab / Digital Image Processing Lab	P	3	3	25	25	50	2	EN	G
22ECU30/ 22ECU31	<b>DSE 5</b> Python Programming / R Programming	T	3	3	50	50	100	2	EM	G
22ECU32/ 22ECU33	<b>DSE 6</b> Python Programming Lab/ R Programming Lab	P	2	3	25	25	50	2	EM	G
22ECU34/	<b>DSE 7</b>	T	4	3	50	50	100	3	EM	G

22ECU35	Computer Networks / Mobile and Cellular Network Security									
Drive Through Course III – Internship/Mini Project							Completed			
<b>Total</b>			<b>30</b>				<b>750</b>	<b>26</b>		
<b>Semester VI</b>										
Course Code	Course Title	T/P/E	Ins. Hrs/Week	ESE Dur. Hrs	CIA Marks	ES Marks	Total Marks	Credits	SD/EM/EN	L/ R/ N/ G
22ECU18	<b>DSC 18</b> Industrial and Automotive Electronics	T	4	3	50	50	100	4	EM	G
22ECU19	<b>DSC 19</b> Industrial and Automotive Electronics Lab	P	3	3	25	25	50	2	EM	G
22ECU20	<b>DSC 20</b> Major Project	-	4	-	50	50	100	4	EM	G
22ECU36/ 22ECU37	<b>DSE 8</b> Programmable Logic Controller/ Medical Electronics	T	4	3	50	50	100	3	EM	G
22ECU38/ 22ECU39	<b>DSE 9</b> Programmable Logic Controller Lab / Medical Electronics Lab	P	3	3	25	25	50	2	EM	G
22ECU40/ 22ECU41	<b>DSE 10</b> Artificial Intelligence / Soft Computing Techniques	T	4	3	50	50	100	4	EM	G
22ECU42/ 22ECU43	<b>DSE 11</b> Artificial Intelligence Lab / Soft Computing Lab	P	3	3	25	25	50	2	EM	G
22ECU44A/ 22ECU44B	<b>DSE 12A</b> Introduction to Data Science / Data Science Lab	E	3	3	25	25	50	2	EM	G
			2	3	25	25	50	2		
22ECU45A/ 22ECU45B	<b>DSE 12B</b> Mobile Application Development Mobile Application Development Lab	E	3	3	25	25	50	2	EM	G
			2	3	25	25	50	2		

22ANC10/ 22ANC11/ 22ANC12/ 22ANC13/ 22ANC14/ 22ANC15/ 22ANC16/ 22ANC17/ 22ANC17	<b>ANCC 3</b> Extension Activities / National Service Scheme / National Cadet Corps / Youth Red Cross / Red Ribbon Club / Rotract Club / Sports / Association Activities / Club Activities	-	-	-	-	-	Grade	-	SD	G
<b>Total</b>			<b>30</b>				<b>650</b>	<b>25</b>		
<b>Total</b>							<b>4000</b>	<b>140</b>		
<b>Drive-Through Courses (DTCs):</b> 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			

The courses focus on the following needs	
SD	Skill Development
EM	Employability
EN	Entrepreneurship
L	Local
R	Regional
N	National
G	Global

#### Semester-wise Distribution of Marks and Credits

Semester	Total Marks	Total Credits
I	600	20
II	600	21
III	600	22
IV	800	26
V	750	26
VI	650	25
<b>Total</b>	<b>4000</b>	<b>140</b>



**OFFERED BY**

**List of Courses Offered by Mathematics Department**

Semester	Course Code	Course Name	Programme	T/P/E	Ins. hrs	CIA	ES	Total Marks	Credit	SD/EM/EN	L/R/N/G
I	22GEU10	Mathematics - I	B.Sc ECS	T	4	50	50	100	4	SD	G
II	22GEU15	Mathematics - II	B.Sc ECS	T	4	50	50	100	4	SD	G

**List of Courses Offered by Computer Applications Department**

Semester	Course Code	Course Name	Programme	T/P/E	Ins. hrs	CIA	ES	Total Marks	Credit	SD/EM/EN	L/R/N/G
III	22GEU42/	C Programming and Data Structures /	B.Sc ECS	T	4	25	25	50	2	EM	G
	22GEU43	C++ Programming and Data Structures	B.Sc ECS	T	4	25	25	50	2	EM	G
III	22GEU44/	C Programming and Data Structures Lab /	B.Sc ECS	P	2	25	25	50	2	EM	G
	22GEU45	C++ Programming and Data Structures Lab	B.Sc ECS	P	2	25	25	50	2	EM	G
IV	22GEU50/	Internet and Java Programming /	B.Sc ECS	T	4	25	25	50	2	EM	G
	22GEU37	Relational Database Management System	B.Sc ECS	T	4	25	25	50	2	EM	G
IV	22GEU51/	Internet and Java Programming Lab /	B.Sc ECS	P	2	25	25	50	2	EM	G
	22GEU38	Relational Database Management System Lab	B.Sc ECS	P	2	25	25	50	2	EM	G
V	22ECU30/	<b>DSE</b> Python Programming /	B.Sc ECS	T	3	50	50	100	2	EM	G
	22ECU31	<b>DSE</b> R Programming	B.Sc ECS	T	3	50	50	100	2	EM	G
V	22ECU32/	<b>DSE</b> Python Programming Lab/	B.Sc ECS	P	2	25	25	50	2	EM	G
	22ECU33	<b>DSE</b> R Programming Lab	B.Sc ECS	P	2	25	25	50	2	EM	G

**List of Courses Offered by Computer Science Department**

Semester	Course Code	Course Name	Programme	T/P/E	Ins. hrs	CIA	ES	Total Marks	Credit	SD/EM/EN	L/R/N/G
VI	22ECU44A/	<b>DSE 12A</b> Introduction to Data Science	E	3	3	25	25	50	2	EM	G
	22ECU44B	Data Science Lab		2	3	25	25	50	2		
	22ECU45A/	<b>DSE 12B</b> Mobile Application Development	E	3	3	25	25	50	2	EM	G
	22ECU45B	Mobile Application Development Lab		2	3	25	25	50	2		

**OFFERED TO**

**List of Courses Offered to B.Sc. (IT), B.Sc. (CT), B.Sc. (CS), B.Sc. (CSA), B.Sc. (SS), B.Sc. (CS with CG), B.Sc. Data Science, B.Sc. (AI with ML) & BCA**

Semester	Course Code	Course Name	T/P/E	Ins. hrs	CIA	ES	Total Marks	Credit	SD/EM/EN	L/R/N/G
IV	22GEU59	Embedded Systems	T	5	50	50	100	3	EM	G
	22GEU60	Robotics and Applications	T	5	50	50	100	3	EM	G
	22GEU61	PC Hardware	T	5	50	50	100	3	EN	G

**List of Courses Offered to B.Sc. (CS with CG)**

Semester	Course Code	Course Name	T/P/E	Ins. hrs	CIA	ES	Total Marks	Credit	SD/EM/EN	L/R/N/G
III	22CGU12	<b>DSE</b> Physics for Computer Science	T	5	50	50	100	4	SD	G
V	22GEU62	Internet of Things	T	5	50	50	100	4	EM	G

**List of Courses Offered to B.Sc. Data Science**

Semester	Course Code	Course Name	T/P /E	Ins. hrs	CIA	ES	Total Marks	Credit	SD/ EM/ EN	L/ R/ N/ G
VI	20DSU14	Internet of Things	T	4	20	30	50	4	EM	G
VI	21CGE08	Internet of Things	T	5	50	50	100	4	EM	G
V	22GEU62	Internet of Things	T	5	50	50	100	4	EM	G

**List of Courses Offered to B.Sc. AI with ML**

Semester	Course Code	Course Name	T/P /E	Ins. hrs	CIA	ES	Total Marks	Credit	SD/ EM/ EN	L/ R/ N/ G
III	22AIU08A	<b>DSC 8A:</b> Internet of Things	E	3	25	25	50	2	EM	G
III	22AIU08B	<b>DSC 8B:</b> Practical: Internet of Things Lab		2	25	25	50	2	EM	G