SETHU INSTITUTE OF TECHNOLOGY

(An Autonomous Institution | Accredited with 'A++' Grade by NAAC)

Pulloor, Kariapatti – 626 115.

B.E. COMPUTER SCIENCE AND DESIGN

REGULATIONS 2021

CHOICE BASED CREDIT SYSTEM

CURRICULUM & SYLLABUS

(1st SEMESTER To 8th SEMESTER)

BATCH 2021-25

CHAIRPERSON
BOARD OF STUDIES

CHAIRMAN
ACADEMIC COUNCIL

DEPARTMENT OF COMPUTER SCIENCE AND DESIGN

REGULATIONS 2021 [Batch 2021-2025]

OVERALL COURSE STRUCTURE

Code	Category	Total No. of Courses	Credits	Percentage
BS	Basic Sciences	**10**	**28**	**17.28**
ES	Engineering Sciences	**7**	**20.5**	**12.65**
HSS	Humanities and Social Sciences	**5**	**9**	**5.55**
PC	Professional Core	**26**	**59.5**	**36.73**
PE	Professional Elective	**6**	**18**	**11.11**
OE	Open Elective	**4**	**12**	**7.41**
PW	Project Work, Seminar & Internship	**4**	**14**	**8.64**
MC	Mandatory Courses	**9**	**1**	**0.62**
	TOTAL	**72**	**162**	**100**

COURSE CREDITS – SEMESTERWISE

Branch	I	II	III	IV	V	VI	VII	VIII	TOTAL
CSD	**20**	**17**	**22**	**22**	**21**	**25**	**21**	**14**	**162**

SEMESTER I

Course Code	Course Title	L	T	P	C	Type of Course
THEORY						
21UEN101	English for Technical Communication (Common to ALL Branches except CSBS)	2	0	0	2	HSS
21UMA102	Matrix and Calculus (Common to ALL Branches except CSBS)	3	1	0	4	BS
21UPH103	Engineering Physics (Common to ALL Branches except CSBS)	3	0	0	3	BS
21UCY105	Applied Chemistry (Common to CSE, ECE, EEE IT, BME, BT, AIDS, CSD)	3	0	0	3	BS
21UCS108	Problem Solving and Python Programming (Common to All Branches Except CSBS)	3	0	0	3	ES
OTHER THEORY COURSES						
21UCD107	Aesthetics Design	3	0	0	3	ES
PRACTICAL						
21UCS110	Problem-Solving and Python Programming Laboratory (Common to All Branches Except CSBS)	0	0	2	1	ES
21UGS113	Basic Sciences Laboratory I (Common to All Branches Except CSBS)	0	0	2	1	BS
MANDATORY						
21UGM131	Induction Programme (Common to All Branches)	0	3	0	P/F	MC
	TOTAL	**17**	**4**	**4**	**20**	
Total No of Credits – 20						

SEMESTER II

Course Code	Course Title	L	T	P	C	Type of Course
THEORY						
21UEN201	Communication Skills for Professionals(Integrated) (Common to All Branches except CSBS)	1	0	1	1.5	HSS
21UMA210	Differential Equations, Fourier series and Transforms (Common to AI&DS,CSD)	3	1	0	4	BS
21UPH205	Physics for Information Science (Common to CSE, IT , EEE ,AIDS,CSD)	3	0	0	3	BS
OTHER THEORY COURSES						
21UCS204	Programming Using C (common to CSE,CSD)	3	0	0	3	ES
21UCD205	Digital and Computer Organization	3	0	0	3	ES
PRACTICAL						
21UGS210	Basic Sciences Laboratory II (Common to All Branches Except CSBS)	0	0	2	1	BS
OTHER PRACTICALS						
21UCS211	C Programming Laboratory (common to CSE, CSD)	0	0	3	1.5	ES
MANDATORY						
21UGM231	Environmental Science (Common to All Branches)	3	0	0	P/F	MC
	TOTAL	**16**	**1**	**6**	**17**	
Total No of Credits – 17						

SEMESTER III

Course Code	Course Title	L	T	P	C	Type of Course
THEORY						
21UMA328	Discrete Mathematics (Common To AIDS, CSD)	3	1	0	4	BS
21UIT302	Data Structures (Common to CSE, IT, AI&DS, CSD)	3	0	0	3	PC
21UCS303	Object Oriented Programming using C++ (Integrated) (Common to CSE, IT, CSBS, CSD)	3	0	2	4	PC
21UIT304	Principles of Operating Systems (Common to CSE, IT, AI&DS, CSD)	3	0	0	3	PC
21UCD305	Design Thinking	3	0	0	3	PC
21UCD306	Database System Design (Common to CSE, IT, AI&DS, CSD)	3	0	0	3	PC
PRACTICAL						
21UIT307	Data Structures Laboratory (Common to CSE, IT, AI&DS, CSD)	0	0	2	1	PC
21UCD308	Database System Design Laboratory (Common to CSE, IT, AI&DS, CSD)	0	0	2	1	PC
MANDATORY						
21UGM331	Biology for Engineers (Common to All except BME & BT)	2	0	0	P/F	MC
	TOTAL	**20**	**1**	**6**	**22**	
Total No of Credits - 22						

SEMESTER IV

Course Code	Course Title	L	T	P	C	Type of Course
THEORY						
21UMA426	Probability And Statistical Techniques (Common To AIDS & CSD)	3	1	0	4	BS
21UCS402	Computer Networks (Common to CSE, IT, CSD)	3	0	0	3	PC
21UCS403	Algorithm Analysis (Common to CSE, IT, AI&DS, CSD)	3	0	0	3	PC
21UIT404	Java Programming (Integrated) (Common to CSE, IT, CSD)	3	0	2	4	PC
21UCD405	Computer Graphics	3	0	0	3	PC
21UCD406	Agile Methodologies	3	0	0	3	ES
PRACTICAL						
21UCS407	Computer Networks Laboratory (Common to CSE, IT, CSD)	0	0	2	1	PC
21UCD408	Computer Graphics Laboratory	0	0	2	1	PC
MANDATORY						
21UGM431	Gender Equality (Common to All)	1	0	0	P/F	MC
		19	**1**	**6**	**22**	
Total No of Credits –22						

SEMESTER V

Course Code	Course Title	L	T	P	C	Type of Course
THEORY						
21UGS531	Reasoning and Aptitude (Common to CSE, IT, CSBS, AIDS, CSD, ECE)	1	0	0	1	BS
21UCD501	Visual Design and Communication	3	0	0	3	PC
21UCD502	Foundations of Machine Learning	3	0	0	3	PC
21UCD503	Multimedia Technologies	3	0	0	3	PC
PE1	Professional Elective–I	3	0	0	3	PE
OE1	Open Elective–I	3	0	0	3	OE
PRACTICAL						
21UCD507	Creative Thinking and Innovation	0	0	2	1	PW
21UCD508	Visual Design and Communication Laboratory	0	0	2	1	PC
21UCD509	Interactive Design Laboratory	0	0	2	1	PC
21UGS532	Soft Skills Laboratory (Common to CSE,IT,CSBS, AIDS,EEE, CSD,AGRI)	0	0	2	1	HSS
MANDATORY						
21UGT140	Heritage of Tamils (Common to all)	1	0	0	1	MC
	TOTAL	**17**	**0**	**8**	**21**	
Total No of Credits – 21						

SEMESTER VI

Course Code	Course Title	L	T	P	C	Type of Course
THEORY						
21UCD601	Game Design and Development	3	0	0	3	PC
21UCD602	IoT Design (Common to CSE, CSD)	2	0	0	2	PC
21UCD603	Distributed Computing	3	0	0	3	PC
PE-II	Professional Elective–II	3	0	0	3	PE
PE-III	Professional Elective–III	3	0	0	3	PE
OE-II	Open Elective–II	3	0	0	3	OE
PRACTICAL						
21UCD607	Product Development Project	0	0	8	4	PW
21UCD608	Game Design and Development Laboratory	0	0	2	1	PC
21UCD609	IoT Design Laboratory(Common to CSE, CSD)	0	0	3	1.5	PC
21UGS633	Interpersonal Skills Development Lab (Common to CSE, EEE, IT, AGRI, CSBS, AIDS,CSD)	0	0	3	1.5	HSS
MANDATORY						
21UGM631	Indian Constitution (Common to all)	1	0	0	P/F	MC
	TOTAL	**20**	**0**	**12**	**25**	
Total No of Credits - 25						

SEMESTER VII

Course Code	Course Title	L	T	P	C	Type of Course
THEORY						
21UME701	Project Management and Finance (Common to All Branches Except CSBS, AGRI)	3	0	0	3	HSS
21UCD702	Virtual Reality and Augmented Reality	3	0	0	3	PC
21UCD703	3D Modeling and Animation	3	0	0	3	PC
PE-IV	Professional Elective–IV	3	0	0	3	PE
PE-V	Professional Elective –V	3	0	0	3	PE
OE-III	Open Elective–III	3	0	0	3	OE
PRACTICAL						
21UCD707	Virtual Reality and Augmented Reality Laboratory	0	0	2	1	PC
21UCD708	3D Modeling and Animation Laboratory	0	0	2	1	PC
21UCD785	Internship	-	-	-	1	PW
21UGE710	Multi-Disciplinary Project - I	0	0	6	3	PW
MANDATORY						
21UGM731	Sports and Social Development (Common to All)	-	-	-	P/F	MC
21UGM732	Skill Development	-	-	-	P/F	MC
	TOTAL	**18**	**0**	**4**	**21**	
Total No of Credits - 21						

SEMESTER VIII

Course Code	Course Title	L	T	P	C	Type of Course
THEORY						
PE-VI	Professional Elective–VI	3	0	0	3	PE
OE-IV	Open Elective–IV	3	0	0	3	OE
PRACTICAL						
21UCD801	Project Work	0	0	16	8	PW
21UGE810	Multi-Disciplinary Project - II	0	0	16	8	PW
MANDATORY						
21UGM831	Professional Ethics and Human Values (Common to all branches)	2	0	0	P/F	MC
	TOTAL	**8**	**0**	**16**	**14**	
Total No of Credits – 14						

LIST OF PROFESSIONAL ELECTIVES

CourseCode	Course Title	L	T	P	C
21CSV505	Digital Marketing	3	0	0	3
21ITV305	Storage Technologies	3	0	0	3
21ITV205	Software Testing and Automation	3	0	0	3
21IT V108	Big Data Analytics	3	0	0	3
21ITV304	Data Warehousing	3	0	0	3
21CSV604	Cyber security	3	0	0	3
21ITV105	Business Analytics	3	0	0	3
21CSV306	Software Defined Networks	3	0	0	3
21CSV407	Network Security	3	0	0	3
21ITV401	Ethical Hacking	3	0	0	3
21CSV708	Ethics and AI	3	0	0	3
21ITV105	Business Analytics	3	0	0	3
21ITV701	Knowledge Engineering	3	0	0	3
21ITV402	Digital And Mobile Forensics	3	0	0	3

LIST OF OPEN ELECTIVES

OPEN ELECTIVES – I

Course Code	Course Title	L	T	P	C
21UME971	Introduction to Industry4.0	3	0	0	3
21UME972	Product Life Cycle Management	3	0	0	3
21UEE971	Drone Technologies	3	0	0	3
21UEE972	Renewable Energy and Technology	3	0	0	3
21UCE971	Developments of Smart cities	3	0	0	3
21UCE972	Remote sensing and GIS Application	3	0	0	3
21UAG971	ICT in Agriculture	3	0	0	3
21UAG972	Integrated Farming System	3	0	0	3
21UCH971	Fire Safety Engineering	3	0	0	3
21UBT971	Bio Nanotechnology	3	0	0	3
21UBT972	Herbal Medicines	3	0	0	3

21UEN972	Speak better write better	3	0	0	3
21UJN975	Japanese for engineers	3	0	0	3
21UFR973	French for engineers	3	0	0	3

OPEN ELECTIVES – II

CourseCode	CourseTitle	L	T	P	C
21UAG973	Business Management in Agriculture	3	0	0	3
21UAG974	Agriculture Automation	3	0	0	3
21UCE973	Disaster Management and Mitigation	3	0	0	3
21UCE974	Air Pollution and Control Engineering	3	0	0	3
21UCH972	Food Safety and Regulations	3	0	0	3
21UME976	Renewable Energy Technologies	3	0	0	3
21UEN971	English ForCompetitiveExam	3	0	0	3
21UGR974	GermanForEngineers	3	0	0	3

OPEN ELECTIVES – III

CourseCode	CourseTitle	L	T	P	C
21UME973	IntroductiontoAdditiveManufacturing	3	0	0	3
21UME974	Basics of Industrial Layout design and Safety	3	0	0	3
21UEE973	Principles of Embedded Computing Sysytem	3	0	0	3
21UEE976	Industrial Automation and Control	3	0	0	3
21UCE975	Environmental and Social Impact Assessment	3	0	0	3
21UCE976	Road Safety	3	0	0	3
21UAG975	Organic Farming Technology	3	0	0	3
21UAG977	Agriculture Water Management	3	0	0	3
21UCH974	Industrial Waste Management	3	0	0	3
21UCH976	Plastic Materials for Engineers	3	0	0	3
21UBT976	Bio Entrepreneurship	3	0	0	3
21UBT977	Food and Diary Technology	3	0	0	3

OPEN ELECTIVES – IV

Course Code	Course Name	L	T	P	C
21UAI972	Integrated Farming System	3	0	0	3
21UBM973	Computer Applications in Medicine	3	0	0	3
21UBM975	Robotics in Health Care	3	0	0	3
21UCE973	Developments of Smart Cities	3	0	0	3
21UCB973	Strategic Management and Leadership	3	0	0	3
21UEC973	Design thinking for innovations	3	0	0	3
21UEC981	Wearable Devices	3	0	0	3
21UEE972	Design of Embedded Systems	3	0	0	3
21UEE974	Drone Technologies	3	0	0	3
21UEE976	Foundation of Robotics	3	0	0	3
21UEE980	Non-Conventional Energy Resources and Applications	3	0	0	3
21UIT973	Cyber Forensics and Malware	3	0	0	3
21UME971	Hydraulics and Pneumatics	3	0	0	3
21UME974	Industry 4.0	3	0	0	3
21UME976	Lean Concepts, Tools and Practices	3	0	0	3
21UME978	Operations Research	3	0	0	3
21UME980	Production Planning and Control	3	0	0	3
21UME982	Reverse Engineering	3	0	0	3

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B.E COMPUTER SCIENCE AND DESIGN

PROFESSIONAL ELECTIVE COURSES: VERTICALS

Vertical I Data Science	**Vertical II Full Stack Development**	**Vertical III Cloud Computing and Data Center Technologies**	**Vertical IV Marketing andManagement**	**VerticalVCreative Mediaand Design**	**Vertical VI Emerging Technologies**	**Vertical VII Media Processing**
Exploratory DataAnalysis	WebTechnologies	CloudComputing	HumanResource Management forEntrepreneurs	VisualEffects	CloudComputing	Image and VideoAnalytics
Recommender Systems	AppDevelopment	Virtualization	RecommenderSystems	Metaverse	Robotic ProcessAutomation	Metaverse
Neural NetworksandDeep Learning	Cloud Essentials	Cloud Essentials	SupplyChainManagement	Multimedia andAnimation	Neural NetworksandDeep Learning	MultimediaDataCompressionand Storage
Textand SpeechAnalysis	UIandUX Design	DataWarehousing	Marketing and SocialMediaWebAnalytics	Video CreationandEditing	Cybersecurity	UIandUXDesign
BusinessAnalytics	SoftwareTesting andAutomation	StorageTechnologies	SocialDataMining	Digital Audio &VideoProduction Workflow	QuantumComputing	Streaming MediaToolsandTechnologies
ImageandVideo Analytics	Web ApplicationSecurity	Software DefinedNetworks	FinancialManagement	Digital Audio andVideoDesign	Crypto Currency andBlock chainTechnologies	Digital Audio andVideoDesign
Computer Vision	DevOps	Stream Processing	DigitalMarketing	DigitalMarketing	DevOps	Wearable DevicesApplications
BigDataAnalytics	Principles ofProgramming Languages	SecurityandPrivacyinCloud	MarketingResearchand MarketingManagement	ShortFilmDevelopment	3D Printing and Design	3D PrintingandDesign

PROFESSIONAL ELECTIVE COURSES: VERTICALS

VERTICAL 1: DATA SCIENCE

Course Code	Course Title	L	T	P	C
21CSV 101	Exploratory DataAnalysis	3	0	0	3
21CSV 102	Recommender Systems	3	0	0	3
21ITV 103	Neural NetworksandDeepLearning	3	0	0	3
21CSV 104	Textand SpeechAnalysis	3	0	0	3
21ITV 105	BusinessAnalytics	3	0	0	3
21ITV 106	ImageandVideoAnalytics	3	0	0	3
21CSV 107	ComputerVision	3	0	0	3
21IT V 108	BigDataAnalytics	3	0	0	3

VERTICAL 2: FULL STACK DEVELOPMENT

Course Code	Course Title	L	T	P	C
21ITV 201	WebTechnologies	3	0	0	3
21ITV 202	AppDevelopment	3	0	0	3
21CSV 203	Cloud Essentials	3	0	0	3
21CSV 204	UIandUX Design	3	0	0	3
21ITV 205	SoftwareTesting andAutomation	3	0	0	3
21CSV 206	Web ApplicationSecurity	3	0	0	3
21ITV207	DevOps	3	0	0	3
21CSV 208	Principles ofProgramming Languages	3	0	0	3

VERTICAL 3: CLOUD COMPUTING AND DATA CENTER TECHNOLOGIES

Course Code	Course Title	L	T	P	C
21CSV 301	CloudComputing	3	0	0	3
21CSV 302	Virtualization	3	0	0	3
21CSV 203	Cloud Essentials	3	0	0	3
21ITV 304	DataWarehousing	3	0	0	3
21ITV 305	StorageTechnologies	3	0	0	3
21CSV 306	Software defined networks	3	0	0	3
21ITV 307	StreamProcessing	3	0	0	3
21ITV 308	SecurityandPrivacyinCloud	3	0	0	3

VERTICAL 4: MARKETING AND MANAGEMENT

Course Code	Course Title	L	T	P	C
21CBV 401	Human Resource Management for Entrepreneurs	3	0	0	3
21CSV 102	Recommender Systems	3	0	0	3
21CBV 403	Financial Management	3	0	0	3
21CSV 404	Supply Chain Management	3	0	0	3
21CSV 505	Digital Marketing	3	0	0	3
21CBV 406	Marketing Research and Marketing Management	3	0	0	3
21CDV 407	Social Data Mining	3	0	0	3
21CDV 408	Marketing and Social Media Web Analytics	3	0	0	3

VERTICAL 5: CREATIVEMEDIA AND DESIGN

Course Code	Course Title	L	T	P	C
21CSV 501	Visual Effects	3	0	0	3
21ITV 502	Multimedia and Animation	3	0	0	3
21ITV 503	Video Creation and Editing	3	0	0	3
21ITV 504	Digital Audio & Video Production Workflow	3	0	0	3
21CSV 505	Digital Marketing	3	0	0	3
21ADV 706	Metaverse	3	0	0	3
21ITV 507	Digital Audio and Video Design	3	0	0	3
21ITV 508	Short Film Development	3	0	0	3

VERTICAL 6: EMERGING TECHNOLOGIES

Course Code	Course Title	L	T	P	C
21CSV 301	CloudComputing	3	0	0	3
21CSV 602	RoboticProcess Automation	3	0	0	3
21ITV 103	Neural NetworksandDeepLearning	3	0	0	3
21CSV 604	Cybersecurity	3	0	0	3
21CSV 605	Quantum Computing	3	0	0	3
21ITV 406	Crypto currency andBlock chain Technologies	3	0	0	3
21ITV 207	DevOps	3	0	0	3
21ITV 608	3DPrintingandDesign	3	0	0	3

VERTICAL 7:MEDIA PROCESSING

Course Code	Course Title	L	T	P	C
21ITV 501	Metaverse	3	0	0	3
21CDV 702	Streaming Media Tools and Technologies	3	0	0	3
21CSV204	UI and UX Design	3	0	0	3
21CDV705	Wearable DevicesApplications	3	0	0	3
21ITV106	Image and VideoAnalytics	3	0	0	3
21ITV 507	Digital Audio andVideoDesign	3	0	0	3
21CSV508	MultimediaDataCompressionandStorage	3	0	0	3
21ITV608	3DPrintingandDesign	3	0	0	3

ENROLLMENT FOR B.E. / B. TECH. (HONOURS) / MINOR DEGREE (OPTIONAL)

A student can also optionally register for additional courses (18 credits) and become eligible for the award of B.E. / B. Tech. (Honours) or Minor Degree. For B.E. / B. Tech. (Honours), a student shall register for the additional courses (18 credits) from semester V onwards. These courses shall be from the same vertical or a combination of different verticals of the same programme of study only. For minor degree, a student shall register for the additional courses (18 credits) from semester V onwards. All these courses have to be in a particular vertical from any one of the other programmes, Moreover, for minor degree the student can register for courses from any one of the following verticals also.

VERTICALS FOR MINOR DEGREE

(In addition to all the verticals of other programmes)

Vertical I Fintech and Block Chain	**Vertical II Entrepreneurship**	**Vertical III Public Administration**	**Vertical IV Business Data Analytics**	**Vertical V Environment and Sustainability**	**Vertical VI Computer Technology**	**Vertical VII Artificial Intelligence and Data Science**
Financial Management	Foundations of Entrepreneurship	Principles of Public Administration	Statistics for Management	Sustainable Infrastructure Development	Object oriented programming using C++	Fundamentals of Data Science
Fundamentals of Investment	Team Building & Leadership Management for Business	Constitution of India	Data mining for Business Intelligence	Sustainable Agriculture and Environmental Management	Algorithms and data structures	Foundation of Artificial Intelligence
Banking, Financial Services and	Creativity & Innovation in Entrepreneurship	Public Personnel Administration	Human Resource Analytics	Sustainable Bio Materials	Java fundamentals	Data Analytics

Insurance						
Introduction to Block chain and its Applications	Principles of Marketing Management for Business	Administrative Theories	Marketing and Social Media Web Analytics	Materials for Energy Sustainability	Agile Software development	Data and Information Security
Fintech Personal Finance and Payments	Human Resource Management for Entrepreneurs	Indian Administrative System	Operation and Supply Chain Analytics	Green Technology	Database and data analytics	Information Storage and Management
Introduction to Fintech	Financing New Business Ventures	Public Policy Administration	Financial Analytics	Environmental Quality Monitoring and Analysis	Networking and data Communication	Statistical Machine Learning
-	-	-	-	Integrated Energy Planning for Sustainable Development	Applications development (Full Stack)	Human Computer Interaction
-	-	-	-	Energy Efficiency for Sustainable Development	Machine learning	AI in Speech Processing
-	-	-	-	-	Cyber Security	-

(choice of courses for Minor degree is to be made from any one vertical of other programmes or from anyone of the following verticals)

VERTICAL I: FINTECH AND BLOCKCHAIN

Course Code	Course Title	L	T	P	C
21CBVG11	Financial Management	3	0	0	3
21CBVG12	Fundamentals of Investment	3	0	0	3
21CBVG13	Banking, Financial Services and Insurance	3	0	0	3
21CBVG14	Introduction to Blockchain and its Applications	3	0	0	3
21CBVG15	Fintech Personal Finance and Payments	3	0	0	3
21CBVG16	Introduction to Fintech	3	0	0	3

VERTICAL II: ENTREPRENEURSHIP

Course Code	Course Title	L	T	P	C
21MEVG21	Foundations of Entrepreneurship	3	0	0	3
21MEVG22	Team Building & Leadership Management for Business	3	0	0	3
21MEVG23	Creativity & Innovation in Entrepreneurship	3	0	0	3
21MEVG24	Principles of Marketing Management for Business	3	0	0	3
21MEVG25	Human Resource Management for Entrepreneurs	3	0	0	3
21MEVG26	Financing New Business Ventures	3	0	0	3

VERTICAL III : PUBLIC ADMINISTRATION

CourseCode	Course Title	L	T	P	C
21EEVG31	Principles of Public Administration	3	0	0	3
21EEVG32	Constitution of India	3	0	0	3
21EEVG33	Public Personnel Administration	3	0	0	3
21EEVG34	Administrative Theories	3	0	0	3
21EEVG35	Indian Administrative System	3	0	0	3
21EEVG36	Public Policy Administration	3	0	0	3

VERTICAL IV: BUSINESS DATA ANALYTICS

CourseCode	Course Title	L	T	P	C
21CSVG41	Statistics for Management	3	0	0	3
21CSVG42	Datamining for Business Intelligence	3	0	0	3
21CSVG43	Human Resource Analytics	3	0	0	3
21CSVG44	Marketing and Social Media Web Analytics	3	0	0	3
21CSVG45	Operation and Supply Chain Analytics	3	0	0	3
21CSVG46	Financial Analytics	3	0	0	3

VERTICAL V :ENVIRONMENT AND SUSTAINABILITY

CourseCode	Course Title	L	T	P	C
21CEVG51	Sustainable Infrastructure Development	3	0	0	3
21CEVG52	Sustainable Agriculture and Environmental Managemen	3	0	0	3
21CEVG53	Sustainable Bio Materials	3	0	0	3
21CEVG54	Materials for Energy Sustainability	3	0	0	3
21CEVG55	Green Technology	3	0	0	3
21CEVG56	Environmental Quality Monitoring and Analysis	3	0	0	3
21CEVG57	Integrated Energy Planning for Sustainable Development	3	0	0	3
21CEVG58	Energy Efficiency for Sustainable Development	3	0	0	3

VERTICAL VI :COMPUTER TECHNOLOGY

Course Code	Course Title	L	T	P	C
21UITVG61	Object oriented programming using C++	2	0	2	3
21UITVG62	Algorithms and data structures	3	0	0	3
21UITVG63	Java fundamentals	2	0	2	3
21UITVG64	Agile Software development	3	0	0	3
21UITVG65	Database and data analytics	3	0	0	3
21UITVG66	Networking and Data Communication	3	0	0	3
21UITVG67	Applications development (Full Stack)	2	0	2	3
21UITVG68	Machine learning	3	0	0	3
21UITVG69	Cyber Security Essentials	3	0	0	3

VERTICAL VII ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

Course Code	Course Title	L	T	P	C
21ADVG71	Fundamentals of Data Science	3	0	0	3
21ADVG72	Foundation of Artificial Intelligence	3	0	0	3
21ADVG73	Data Analytics	3	0	0	3
21ADVG74	Data and Information Security	3	0	0	3
21ADVG75	Information Storage and Management	3	0	0	3
21ADVG76	Statistical Machine Learning	3	0	0	3
21ADVG77	Human Computer Interaction	3	0	0	3
21ADVG78	AI in Speech Processing	3	0	0	3