UNIVERSITY OF CALICUT

THENHIPALAM, CALICUT UNIVERSITY P.O

DEGREE OF

BACHELOR OF SCIENCE (B.Sc.)

HONOURS IN

COMPUTER SCIENCE

(FOUR YEAR UNDERGRADUATE PROGRAMME CURRICULUM)

UNDER THE FACULTY OF SCIENCE

SYLLABUS

(FOR THE STUDENTS ADMITTED FROM THE ACADEMIC YEAR 2024 – '25 ONWARDS)

BOARD OF STUDIES IN COMPUTER SCIENCE (UG)

THENHIPALAM, CALICUT
UNIVERSITY P.O., KERALA,
673635, INDIA

APRIL 2024

UNIVERSITY OF CALICUT

B.Sc. COMPUTER SCIENCE HONOURS

(MAJOR, MINOR AND GENERAL FOUNDATION COURSES)

SYLLABUS & MODEL QUESTION PAPERS

(w.e.f. 2024 admission onwards)

(CUFYUGP Regulations 2024)

B.Sc. COMPUTER SCIENCE HONOURS

(MAJOR, MINOR AND GENERAL FOUNDATION COURSES)

SYLLABUS

PROGRAMME OUTCOMES (PO):

At the end of the graduate programme at Calicut University, a student would:

Knowledge Acquisition:	
PO1	Demonstrate a profound understanding of knowledge trends and their impact on the chosen discipline of study.
Communication, Collaboration, Inclusiveness, and Leadership:	
PO2	Become a team player who drives positive change through effective communication, collaborative acumen, transformative leadership, and a dedication to inclusivity.
Professional Skills:	
PO3	Demonstrate professional skills to navigate diverse career paths with confidence and adaptability.
Digital Intelligence	
PO4	Demonstrate proficiency in varied digital and technological tools to understand and interact with the digital world, thus effectively processing complex information.
Scientific Awareness and Critical Thinking:	
PO5	Emerge as an innovative problem-solver and impactful mediator, applying scientific understanding and critical thinking to address challenges and advance sustainable solutions.
Human Values, Professional Ethics, and Societal and Environmental Responsibility:	
PO6	Become a responsible leader, characterized by an unwavering commitment to human values, ethical conduct, and a fervent dedication to the well-being of society and the environment.
Research, Innovation, and Entrepreneurship:	
PO7	Emerge as a researcher and entrepreneurial leader, forging collaborative partnerships with industry, academia, and communities to contribute enduring solutions for local, regional, and global development.

PROGRAMME SPECIFIC OUTCOMES (PSO):

At the end of the BSc Computer Science Honours programme at Calicut University, a student would:

PSO1	Understand the theoretical and mathematical foundations of Computer Science
PSO2	Understand the concepts of system architecture, hardware, software and network configuration
PSO3	Acquire logical thinking and problem-solving skills to find solutions in the software domain
PSO4	Design, analyse and develop code-based solutions for the algorithms
PSO5	Address the industry demands and assimilate technical, logical and ethical skills needed for the industry
PSO6	Adapt to emerging trends and tackle the challenges in the software field.

MINIMUM CREDIT REQUIREMENTS OF THE DIFFERENT PATHWAYS IN THE THREE-YEAR PROGRAMME IN CUFYUGP

Sl. No.	Academic Pathway	Major	Minor/ Other Disciplines	Foundation Courses AEC: 4 MDC: 3 SEC: 3 VAC: 3	Intern -ship	Total Credits	Example
		Each course has 4 credits		Each course has 3 credits			
1	Single Major (A)	68 (17 courses)	24 (6 courses)	39 (13 courses)	2	133	Major: Computer Science + six courses in different disciplines in different combinations
2	Major (A) with Multiple Disciplines (B, C)	68 (17 courses)	12 + 12 (3 + 3 = 6 courses)	39 (13 courses)	2	133	Major: Computer Science + Mathematics and Physics
3	Major (A) with Minor (B)	68 (17 courses)	24 (6 courses)	39 (13 courses)	2	133	Major: Computer Science Minor: Electronics
4	Major (A) with Vocational Minor (B)	68 (17 courses)	24 (6 courses)	39 (13 courses)	2	133	Major: Computer Science Minor: Data Science/Web Technology
5	Double Major (A, B)	A: 48 (12 courses) B: 44 (11 courses)	- The 24 credits in the Minor stream are distributed between the two Majors. 2 MDC, 2 SEC, 2 VAC and the Internship should be in Major A. Total credits in Major A should be 48 + 20 = 68 (50% of 133) 1 MDC, 1 SEC and 1 VAC should be in Major B. Total credits in Major B should be 44 + 9 = 53 (40% of 133)	12 + 18 + 9	2	133	Computer Science and Statistics Double Major
Exit with UG degree / Proceed to fourth year with 133 credits							

B.Sc. COMPUTER SCIENCE HONOURS PROGRAMME

COURSE STRUCTURE FOR PATHWAYS 1 – 4

1. Single Major
2. Major with Multiple Disciplines
3. Major with Minor
4. Major with Vocational Minor

Semester	Course Code	Course Title	Total Hours	Hours/ Week	Credits	Marks		
						Internal	External	Total
1	CSC1CJ101/ CSC1MN100	Fundamentals of Computers & Computational Thinking	75	5	4	30	70	100
	XXX1MNXXX	Minor Course 1	75	5	4	30	70	100
	XXX1MNXXX	Minor Course 2	75	5	4	30	70	100
	ENG1FA101 (2)	Ability Enhancement Course 1	60	4	3	25	50	75
	XXX1FA102 (2)	Ability Enhancement Course 2	45	3	3	25	50	75
	XXX1FM105	Multi-Disciplinary Course 1	45	3	3	25	50	75
		Total		**25**	**21**			**525**
2	CSC2CJ101/ CSC2MN100	Fundamentals of Programming(C Language)	75	5	4	30	70	100
	XXX1MNXXX	Minor Course 3	75	5	4	30	70	100
	XXX1MNXXX	Minor Course 4	75	5	4	30	70	100
	ENG2FA103 (2)	Ability Enhancement Course 3	60	4	3	25	50	75
	XXX2FA104 (2)	Ability Enhancement Course 4	45	3	3	25	50	75
	XXX2FM106	Multi-Disciplinary Course 2	45	3	3	25	50	75
		Total		**25**	**21**			**525**
3	CSC3CJ201	Software Project Management	60	4	4	30	70	100
	CSC3CJ202/ CSC3MN200	Data Structures and Algorithm	75	5	4	30	70	100
	XXX1MNXXX	Minor Course 5	75	5	4	30	70	100
	XXX1MNXXX	Minor Course 6	75	5	4	30	70	100
	XXX3FM107 (2)	Multi-Disciplinary Course 3 – Kerala Knowledge System	45	3	3	25	50	75
	ENG3FV108 (2)	Value-Added Course 1	45	3	3	25	50	75
		Total		**25**	**22**			**550**
4	CSC4CJ203	Database Management System	75	5	4	30	70	100
	CSC4CJ204	Python Programming	75	5	4	30	70	100

	CSC4CJ205	Computer Networks	75	5	4	30	70	100
	ENG4FV109 (2)	Value-Added Course 2	45	3	3	25	50	75
	XXX4FV110(2)	Value-Added Course 3	45	3	3	25	50	75
	ENG4FS111 (2)	Skill Enhancement Course – 1 (P)	60	4	3	25	50	75
		Total		**25**	**21**			**525**
5	CSC5CJ301	Data Mining	60	4	4	30	70	100
	CSC5CJ302	Object Oriented Programming (Java)	75	5	4	30	70	100
	CSC5CJ303	Full Stack Web Development	75	5	4	30	70	100
	CSC5EJ305	Elective Course 1 in Major	60	4	4	30	70	100
	CSC5EJ306	Elective Course 2 in Major	60	4	4	30	70	100
	CSC5FS112	Skill Enhancement Course 2 - Introduction to Digital Marketing	45	3	3	25	50	75
		Total		**25**	**23**			**575**
6	CSC6CJ304/ CSC8MN304	Digital Electronics and Computer Architecture	60	4	4	30	70	100
	CSC6CJ305/ CSC8MN305	Principles of Operating Systems	75	5	4	30	70	100
	CSC6CJ306/ CSC8MN306	Introduction to Artificial Intelligence & Machine Learning	75	5	4	30	70	100
	CSC6CJ311	Elective Course 3 in Major	60	4	4	30	70	100
	CSC6CJ312	Elective Course 4 in Major	60	4	4	30	70	100
	CSC6FS113	Skill Enhancement Course 3 - Project Implementation	45	3	3	25	50	75
	CSC6CJ349	Internship in Major (Credit for internship to be awarded only at the end of Semester 6)	60		2	50	-	50
		Total		**25**	**25**			**625**
Total Credits for Three Years					**133**			**3325**
7	CSC7CJ401	Theory of Computation	60	4	4	30	70	100
	CSC7CJ402	System Security	60	4	4	30	70	100
	CSC7CJ403	Advanced Data Structures and Algorithms	75	5	4	30	70	100
	CSC7CJ404	Block Chain Technology	60	4	4	30	70	100
	CSC7CJ405	Internet of Things	75	5	4	30	70	100
		Total		**22**	**20**			**500**

8	CSC8CJ406	Compiler Design	60	4	4	30	70	100
	CSC8CJ407	Client-Server Architecture	60	4	4	30	70	100
	CSC8CJ408	Parallel Computing	60	4	4	30	70	100
	OR (instead of Core Courses CSC8CJ406, CSC8CJ407 and CSC8CJ408 in Major)							
	CSC8CJ449**	Project (in Honours programme)	360	13	12	90	210	300
	CSC8CJ499**	Research Project (in Honours with Research programme)	360	13	12	90	210	300
	CSC8EJXXX* /CSC8MN406	Elective Course 5 in Major / Minor Course 7	60	4	4	30	70	100
	CSC8EJXXX* /CSC8MN407	Elective Course 6 in Major / Minor Course 8	60	4	4	30	70	100
	CSCEJXXX* /CSC8MN408	Elective Course 7 in Major / Minor Course 9 / Major Course in any Other Discipline	60	4	4	30	70	100
	OR (instead of Elective Course 7 in Major, in the case of Honours with Research Programme)							
	CSC8CJ 489	Research Methodology	60	4	4	30	70	100
		Total		**25**	**24**			**600**
Total Credits for Four Years					**177**			**4425**

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Choose any four elective courses (two in fifth and two in sixth semester) from the basket of electives with specialization

Choose three elective courses in semester 8 from elective basket with no specialization

CREDIT DISTRIBUTION FOR PATHWAYS 1 – 4

1. Single Major
2. Major with Multiple Disciplines
3. Major with Minor
4. Major with Vocational Minor

Semester	Major Courses	Minor Courses	General Foundation Courses	Internship/ Project	Total
1	4	4 + 4	3 + 3 + 3	-	21
2	4	4 + 4	3 + 3 + 3	-	21
3	4 + 4	4 + 4	3 + 3	-	22
4	4 + 4 + 4	-	3 + 3 + 3	-	21
5	4 + 4 + 4 + 4 + 4	-	3	-	23
6	4 + 4 + 4 + 4 + 4	-	3	2	25
Total for Three Years	**68**	**24**	**39**	**2**	**133**
7	4 + 4 + 4 + 4 + 4	-	-	-	20
8	4 + 4 + 4	4 + 4 + 4	-	12	24
Total for Four Years	**88 + 12 = 100**	**36**	**39**	**2**	**177**

DISTRIBUTION OF MAJOR COURSES IN COMPUTER SCIENCE FOR PATHWAYS 1 – 4

1. Single Major
2. Major with Multiple Disciplines
3. Major with Minor
4. Major with Vocational Minor

Semester	Course Code	Course Title	Hours/ Week	Credits
1	CSC1CJ101 /CSC1MN100	Fundamentals of Computers & Computational Thinking	5	4
2	CSC2CJ101 /CSC2MN100	Fundamentals of Programming (C Language)	5	4
3	CSC3CJ201	Software Project Management	4	4
	CSC3CJ202 /CSC3MN200	Data Structures and Algorithms	5	4
4	CSC4CJ203	Database Management System	5	4
	CSC4CJ204	Python Programming	5	4

	CSC4CJ205	Computer Networks	5	4
5	CSC5CJ301	Data Mining	4	4
	CSC5CJ302	Object Oriented Programming(Java)	5	4
	CSC5CJ303	Full Stack Development	5	4
	CSC5EJ305	Elective Course 1	4	4
	CSC5EJ306	Elective Course 2	4	4
6	CSC6CJ304 /CSC8MN304	Digital Electronics and Computer Architectures	4	4
	CSC6CJ305 /CSC8MN305	Principles of Operating Systems	5	4
	CSC6CJ306 /CSC8MN306	Introduction to AI and ML	5	4
	CSC6CJ311	Elective Course 3	4	4
	CSC6CJ312	Elective Course 4	4	4
	CSC6CJ349	Internship in Major	-	2
Total for the Three Years				**70**
7	CSC7CJ401	Theory of Computation	4	4
	CSC7CJ402	System Security	4	4
	CSC7CJ403	Advanced Data Structures and Algorithms	5	4
	CSC7CJ404	Blockchain Technology	4	4
	CSC7CJ405	Internet of Things	5	4
8	CSC8CJ406	Compiler Design	4	4
	CSC8CJ407	Client-Server Architecture	4	4
	CSC8CJ408	Parallel Computing	4	4
	OR (instead of Core Courses CSC8CJ406, CSC8CJ407 and CSC8CJ408 in Major)			
	CSC8EJXXX* /CSC8MN406	Elective Course 5	4	4
	CSC8EJXXX * /CSC8MN407	Elective Course 6	4	4
	CSC8EJXXX * /CSC8MN408	Elective Course 7	4	4
	CSC8CJ449**	Project Work (in Honours Programme)/ Project with Research	12	12
	CSC8CJ499**	Research Project (in Honours with Research Programme)		
	OR (instead of Elective Course 7 in Major, in the case of Honours with Research Programme)			

	CSC8CJ 489	Research Methodology	4	4
Total for the Four Years				**114**

ELECTIVE COURSES IN COMPUTER SCIENCE WITH SPECIALISATION

Group No.	Sl. No.	Course Code	Title	Semester	Total Hrs	Hrs/ Week	Credits	Marks		
								Internal	External	Total
1		**DATA SCIENCE**								
	1	CSC5EJ305a	Mathematical and Statistical Foundation for Data Science	5	60	4	4	30	70	100
	2	CSC5EJ306a	Exploratory Data Analysis	5	60	4	4	30	70	100
	3	CSC6CJ311a	Introduction to Data Warehousing and Big Data	6	60	4	4	30	70	100
	4	CSC6CJ312a	Advanced Python for Data Science	6	60	4	4	30	70	100
2		**AI and ML**								
	1	CSC5EJ305b	Machine Learning Algorithms	5	60	4	4	30	70	100
	2	CSC5EJ306b	Knowledge Engineering	5	60	4	4	30	70	100
	3	CSC5EJ311b	Soft Computing	6	60	4	4	30	70	100
	4	CSC5EJ312b	Deep Learning	6	60	4	4	30	70	100
3	**Cloud Computing**									
	1	CSC5EJ305c	Cloud Computing	5	60	4	4	30	70	100
	2	CSC5EJ306c	Security and Privacy in Cloud	5	60	4	4	30	70	100
	3	CSC6CJ311c	Storage Technologies	6	60	4	4	30	70	100
	4	CSC6CJ312c	Virtualization	6	60	4	4	30	70	100

ELECTIVE COURSES IN COMPUTER SCIENCE WITH NO SPECIALISATION

Sl. No.	Course Code	Title	Semester	Total Hrs	Hrs/ Week	Credits	Marks		
							Internal	External	Total
1	CSC8EJ401	Microprocessor and its Applications	8	60	4	4	30	70	100
2	CSC8EJ402	System Software	8	60	4	4	30	70	100
3	CSC8EJ403	Social Network Analysis	8	60	4	4	30	70	100
4	CSC8EJ404	Advanced Distributed Computing	8	60	4	4	30	70	100
5	CSC8EJ405	Cyber Forensic	8	60	4	4	30	70	100
6	CSC8EJ406	Ethical Hacking	8	60	4	4	30	70	100
7	CSC8EJ407	Expert System and fuzzy logic	8	60	4	4	30	70	100

GROUPING OF MINOR COURSES IN COMPUTER SCIENCE

The Minor courses given below should not be offered to students who have taken Computer Science as the Major discipline. They should be offered to students from other major discipline

(Title of the Minor: **COMPUTER SCIENCE)**

Group No.	Sl. No.	Course Code	Title	Semester	Total Hrs	Hrs/ Week	Credits	Marks		
								Internal	External	Total
1	**Foundation of Computer Programming** (preferable for Physic and Electronics students)									
	1	CSC1MN 101	Exploring Computer Basics & Computational	1	75	5	4	30	70	100

			Thinking							
	2	CSC2MN 101	Foundations of C Programming	2	75	5	4	30	70	100
	3	CSC3MN 201	Python Programming	3	75	5	4	30	70	100
2	**Data Science and AI** (preferable for Mathematics and Data Science as complementary course)									
	1	CSC1MN 102	Python Programming	1	75	5	4	30	70	100
	2	CSC2MN 102	Introduction to Data Science	2	75	5	4	30	70	100
	3	CSC3MN 202	Introduction to AI and Machine Learning	3	75	5	4	30	70	100
3	**Data Analysis and Visualization** (preferable for Statistics, Econometrics, and Economics students)									
	1	CSC1MN 103	Data analysis using Spreadsheet	1	75	5	4	30	70	100
	2	CSC2MN 103	Fundamentals of SPSS and R programming	2	75	5	4	30	70	100
	3	CSC3MN 203	Data Visualisation using Python	3	75	5	4	30	70	100
4	**Computing Skills and Programming Fundamentals** (preferable for Chemistry, and Industrial Chemistry students)									

	1	CSC1MN 104	Computer Essentials with Word Processing & Presentation	1	75	5	4	30	70	100
	2	CSC2MN 104	Web Design Trends and Techniques	2	75	5	4	30	70	100
	3	CSC3MN 204	Programming fundamentals using C	3	75	5	4	30	70	100
5	**General Computing Principles** (preferable for Humanities, Commerce, Public Administration, and Travel and tourism students)									
	1	CSC1MN 105	Introduction to IT	1	75	5	4	30	70	100
	2	CSC2MN 105	Efficient Office Dynamics	2	75	5	4	30	70	100
	3	CSC3MN 205	Mastering Content Management Systems	3	75	5	4	30	70	100
6	**Fundamentals of Computer Science** (preferable for Microbiology students)									
	1	CSC1MN 106	Computer Fundamentals with MS Excel,_SPSS	1	75	5	4	30	70	100
	2	CSC2MN 106	Fundamentals of the System software, Networks and DBMS	2	75	5	4	30	70	100
	3	CSC3MN	Python	3	75	5	4	30	70	100

		206	Programming							
7	**General awareness in Computer** (for any sream)									
	1	CSC1MN 107	Computer Hardware Assembly	1	75	5	4	30	70	100
	2	CSC2MN 107	Exploring Cyber security in social media	2	75	5	4	30	70	100
	3	CSC3MN 207	Emerging Trends in Computer Science	3	75	5	4	30	70	100

GROUPING OF VOCATIONAL MINOR COURSES IN COMPUTER SCIENCE

(Title of the Vocational Minor: **DATA SCIENCE)**

Group No.	Sl. No.	Course Code	Title	Semester	Total Hrs	Hrs/ Week	Credits	Marks		
								Internal	External	Total
1		**DATA SCIENCE**								
	1	CSC1VN101	Computational Mathematics in Data Science	1	75	5	4	30	70	100
	2	CSC2VN101	Introduction to Data Science	2	75	5	4	30	70	100
	3	CSC3VN201	Data Analysis and Visualisation Using Spreadsheets	3	75	5	4	30	70	100
	4	CSC8VN401	Predictive Modelling	8	60	4	4	30	70	100

Group No.	Sl. No.	Course Code	Title	Semester	Total Hrs	Hrs/ Week	Credits	Marks		
								Internal	External	Total
2		**Artificial Intelligence**								
	1	CSC1VN102	Statistical Foundations for	1	75	5	4	30	70	100

			Artificial Intelligence							
	2	CSC2VN102	Foundations of Artificial Intelligence	2	75	5	4	30	70	100
	3	CSC3VN202	Automation and Robotics	3	75	5	4	30	70	100
	4	CSC8VN402	Expert Systems and Fuzzy Logic	8	60	4	4	30	70	100

i. Students in Single Major path way can choose course/courses from any of the Minor/ Vocational Minor groups offered by a discipline other than their Major discipline.

ii. Students in Major with Multiple Disciplines pathway can choose as one of the multiple disciplines, all the three courses from any one of the Minor/ Vocational Minor groups offered by any discipline, other than their Major discipline. If they choose one of the Minor/ Vocational Minor groups offered by their Major discipline as the first one of the multiple disciplines, then their choice as the second one of the multiple disciplines should be any one of the Minor/ Vocational Minor groups offered by a discipline other than the Major discipline. If the students choose any one of the Minor/ Vocational Minor groups in Computer Science as given above, then the title of the group will be the title of that multiple discipline.

(iii). Students in Major with Minor pathway can choose all the courses from any two Minor groups offered by any discipline. If the students choose two Minor groups in Computer Science (three courses from foundations of computing and three courses from foundations of data analytics) as given above, then the title of the Minor will be **Computer science.**

(iv). Students in Major with Vocational Minor pathway can choose all the courses from any two Vocational Minor groups offered by any discipline. If the students choose a Vocational Minor groups in Computer Science as given above, then the title of the Vocational Minor will be **Data Science and AI**

DISTRIBUTION OF GENERAL FOUNDATION COURSES IN COMPUTER SCIENCE

Semester	Course Code	Course Title	Total Hours	Hours/ Week	Credits	Marks		
						Internal	External	Total
1	CSC1FM105	Data Analysis and Visualization Through Spread Sheet	45	3	3	25	50	75
2	CSC2FM106	Digital Empowerment Through Ethical Standards	45	3	3	25	50	75
3	CSC3FV108(1)	Introduction to cyber laws	45	3	3	25	50	75
4	CSC4FV109(2)	Introduction to Content Management Systems	45	3	3	25	50	75
5	CSC5FS112	Introduction to Digital Marketing	45	3	3	25	50	75
6	CSC6FS113	Project Implementation	45	3	3	25	50	75

COURSE STRUCTURE FOR BATCH A1(B2)
IN PATHWAY 5: DOUBLE MAJOR

A1: 68 credits in COMPUTER SCIENCE (Major A) ***B1: 68 credits in Major B***

A2: 53 credits in COMPUTER SCIENCE (Major A) ***B2: 53 credits in Major B***

The combinations available to the students: (A1 & B2), (B1 & A2)

Note: Unless the batch is specified, the course is for all the students of the class

Semester	Course Code	Course Title	Total Hours	Hours/ Week	Credits	Marks		
						Internal	External	Total
1	CSC1CJ101 / CSC1MN100	Fundamentals of Computers & Computational Thinking/Minor in Computer Science	75	5	4	30	70	100
	XXX1CJ101	Core Course 1 in Major B –	60/ 75	4/ 5	4	30	70	100
	CSC1CJ102 / CSC2CJ102 / CSC4CJ203*	Database Management System (for batch A1 only)	75	5	4	30	70	100
	ENG1FA101 (2)	Ability Enhancement Course 1	60	4	3	25	50	75
	XXX1FA102(2)	Ability Enhancement Course 2	45	3	3	25	50	75

	CSC1FM105	Multi-Disciplinary Course 1 – Data Analysis and Visualisation Through Spreadsheets	45	3	3	25	50	75
		Total		**24/ 25**	**21**			**525**
2	CSC2CJ101 / CSC2MN100	Fundamentals of Programming Language/ Minor in Computer Science	75	5	4	30	70	100
	XXX2CJ101	Core Course 2 in Major B –	60/ 75	4/ 5	4	30	70	100
	XXX2CJ102 / XXX1CJ102	Core Course 3 in Major B – (for batch B2 only)	60/ 75	4/ 5	4	30	70	100
	ENG2FA103 (2)	Ability Enhancement Course 3	60	4	3	25	50	75
	XXX2FA108(2)	Ability Enhancement Course 4	45	3	3	25	50	75
	CSC2FM106	Multi-Disciplinary Course 2 – Digital Empowerment Through Ethical Standards	45	3	3	25	50	75
		Total		**23 – 25**	**21**			**525**
3	CSC3CJ201	Core Course 4 in Major – Software Project Management	60	4	4	30	70	100
	CSC3CJ202/ CSC3MN200	Core Course 5 in Major – Data Structures and Algorithms	75	5	4	30	70	100
	XXX3CJ201	Core Course 4 in Major B	60/ 75	4/ 5	4	30	70	100
	XXX3CJ202	Core Course 5 in Major B	60/ 75	4/ 5	4	30	70	100
	XXX3FM106	Multi-Disciplinary Course 1 in B –	45	3	3	25	50	75
	CSC3FV108(1)	Value-Added Course Introduction to cyber laws	45	3	3	25	50	75
		Total		**23 – 25**	**22**			**550**
4	CSC4CJ204	Core Course 6 in Major –Python Programming	75	5	4	30	70	100
	XXX4CJXXX	Core Course 6 in Major B	60/ 75	4/ 5	4	30	70	100
	CSC4CJ205	Core Course 7 in Major – Computer networks	75	5	4	30	70	100
	CSC4FV109(2)	Value-Added Course Introduction to content management system	45	3	3	25	50	75
	XXX4FV110	Value-Added Course 1 in B	45	3	3	25	50	75

	CSC4FS112	Skill Enhancement Course Introduction to Digital Marketing	45	3	3	25	50	75
		Total		**23/ 24**	**21**			**525**
5	CSC5CJ302	Core Course 8 in Major – Object Oriented Programming	75	5	4	30	70	100
	XXX5CJXXX	Core Course 7 in Major B –	60/ 75	4/ 5	4	30	70	100
	CSC5CJ303	Core Course 9 in Major – Full Stack Development	60	4	4	30	70	100
		Elective Course 1 in Major	60	4	4	30	70	100
	XXX5CJXXX	Elective Course 1 in Major B	60	4	4	30	70	100
	XXX5FSXXX	Skill Enhancement Course 1 in B	45	3	3	25	50	75
		Total		**24/ 25**	**23**			**575**
6	CSC6CJ305/ CSC8MN305	Core Course 10 in Major – Operating System/minor	75	5	4	30	70	100
	XXX6CJXXX	Core Course 8 in Major B –	60/ 75	4/ 5	4	30	70	100
	XXX6CJXXX	Core Course 9 in Major B – (for batch B2 only)	60	4	4	30	70	100
		Elective Course 2 in Major Computer Science	60	4	4	30	70	100
	XXX6EJXXX	Elective Course 2 in Major B	60	4	4	30	70	100
	CSC6FS113	Skill Enhancement Course 3 – Project Implementation	45	3	3	25	50	75
	CSC6CJ349	Internship in Major Computer Science (Credit for internship to be awarded only at the end of Semester 6)	60		2	50	-	50
		Total		**24/ 25**	**25**			**625**
Total Credits for Three Years					**133**			**3325**
For batch A1(B2), the course structure in semesters 7 and 8 is the same as for pathways 1 – 4, except that the number of the core and elective courses is in continuation of the number of courses in the two categories completed at the end of semester 6.								

* The course code of the same course as used for the pathways 1 – 4

CREDIT DISTRIBUTION FOR BATCH A1(B2)
IN PATHWAY 5: DOUBLE MAJOR

Semester	Major Courses in Computer Science	General Foundation Courses in Computer Science	Internship/ Project in Computer Science	Major Courses in B	General Foundation Courses in B	AEC	Total
1	4 + 4	3	-	4	-	3 + 3	21
2	4	3	-	4 + 4	-	3 + 3	21
3	4 + 4	3	-	4 + 4	3	-	22
4	4 + 4	3 + 3	-	4	3	-	21
5	4 + 4 + 4	-	-	4 + 4	3	-	23
6	4 + 4	3	2	4 + 4 + 4	-	-	25
Total for Three Years	**48**	**18**	**2**	**44**	**9**	**12**	**133**
	68			**53**		**12**	**133**
	Major Courses in Computer Science	Minor Courses					
7	4 + 4 + 4 + 4 + 4	-			-	-	20
8	4 + 4 + 4	4 + 4 + 4	12		-	-	24
Total for Four Years	**88 + 12 = 100**	**12**					**177**

COURSE STRUCTURE FOR BATCH B1(A2)
IN PATHWAY 5: DOUBLE MAJOR

A1: 68 credits in Computer Science (Major A) ***B1: 68 credits in Major B***

A2: 53 credits in Computer Science (Major A) ***B2: 53 credits in Major B***

The combinations available to the students: (A1 & B2), (B1 & A2)

Note: Unless the batch is specified, the course is for all the students of the class

Semester	Course Code	Course Title	Total Hours	Hours/ Week	Credits	Marks		
						Internal	External	Total
1	**XXX**1CJ101	Core Course 1 in Major B –	75	5	4	30	70	100

	CSC1CJ101	Fundamentals of Computers & Computational Thinking	60/ 75	4/ 5	4	30	70	100
	XXX1CJ 102 / XXX2CJ 102	Core Course 2 in Major B – (for batch B1 only)	60/ 75	4/ 5	4	30	70	100
	ENG1FA101(2)	Ability Enhancement Course – 1 (P) (E)	60	4	3	25	50	75
	XXX1FA102(2)	Ability Enhancement Course – 2 (AL)	45	3	3	25	50	75
	XXX1FM 105	Multi-Disciplinary Course 1 in B – (for batch B1 only)	45	3	3	25	50	75
		Total		**23 – 25**	**21**			**525**
2	XXX2CJ101	Core Course 2 in Major B –	75	5	4	30	70	100
	CSC2CJ101	Fundamentals of Programming (C Language)	75	5	4	30	70	100
	CSC2CJ 102 / CSC1CJ 102 / CSC4CJ 204*	Python Programming	75	5	4	30	70	100
	ENG2FA103(2)	Ability Enhancement Course – 3 (P) (E)	60	4	3	25	50	75
	XXX2FA108(2)	Ability Enhancement Course – 4 (AL)	45	3	3	25	50	75
	CSC2FM 106 / CSC3FM 106	Multi-Disciplinary Course -Digital Empowerment Through Ethical Standards	45	3	3	25	50	75
		Total		**24/ 25**	**21**			**525**
3	XXX3CJ203	Core Course 4 in Major B	60	4	4	30	70	100
	XXX3CJ202	Core Course 5 in Major B	75	5	4	30	70	100
	CSC3CJ203	Software Project Management	60/ 75	4/ 5	4	30	70	100

	CSC3CJ204	Data Structures and Algorithm	60/ 75	4/ 5	4	30	70	100
	XXX3FM 106 / XXX2FM 106	Multi-Disciplinary Course 2 in B –	45	3	3	25	50	75
	XXX3FV 108	Value-Added Course 1 in B – (for batch B1 only)	45	3	3	25	50	75
		Total		**23 – 25**	**22**			**550**
4	CSC4CJ203	Core Course 6 in Major A- Database management system	75	5	4	30	70	100
	XXX4CJXXX	Core Course 6 in Major B	60/ 75	4/ 5	4	30	70	100
	XXX4CJXXX	Core Course 7 in Major B – (for batch B1 only)	60/ 75	4/ 5	4	30	70	100
	CSC4FV 109(2)	Value-Added Course Introduction to Content management system	45	3	3	25	50	75
	XXX4FV 110	Value-Added Course 2 in B –	45	3	3	25	50	75
	CSC4FS 112	Skill Enhancement Course Introduction to Digital Marketing	45	3	3	25	50	75
		Total		**22 – 24**	**21**			**525**
5	CSC5CJ 302	Core Course 7 in Major A Object Oriented Programming	75	5	4	30	70	100
	XXX5CJXXX	Core Course 8 in Major B –	60/ 75	4/ 5	4	30	70	100
	XXX5CJXXX	Core Course 9 in Major B – (for batch B1 only)	60	4	4	30	70	100
		Elective Course 1 in Major A	60	4	4	30	70	100
	XXX5EJXXX	Elective Course 1 in Major B	60	4	4	30	70	100
	XXX5FS 112 / XXX4FS 112	Skill Enhancement Course 1 in B	45	3	3	25	50	75

		Total		**24/ 25**	**23**			**575**
6	CSC6CJ 305/ CSC8MN305	Core Course 8 in Major A Operating System	75	5	4	30	70	100
	XXX6CJXXX	Core Course 10 in Major B –	60/ 75	4/ 5	4	30	70	100
	CSC6CJ 306/ CSC8MN306	Core Course 9 in Major A (for batch A2 only) Introduction to AI and ML	60	4	4	30	70	100
		Elective Course 2 in Major A	60	4	4	30	70	100
	XXX6EJXXX	Elective Course 2 in Major B	60	4	4	30	70	100
	XXX6FS 113	Skill Enhancement Course 2 in B (for batch B1 only)	45	3	3	25	50	75
	XXX6CJ 349	Internship in Major B (Credit for internship to be awarded only at the end of Semester 6)	60		2	50	-	50
		Total		**24/ 25**	**25**			**625**
Total Credits for Three Years					**133**			**3325**

To continue to study Computer Science in semesters 7 and 8, batch B1(A2) needs to earn additional 15 credits in Computer Science to make the total credits of 68. Suppose this condition is achieved, and the student of batch B1(A2) proceeds to the next semesters to study Computer Science. The course structure in semesters 7 and 8 is the same as for pathways 1 – 4, except that the number of the core and elective courses is in continuation of the number of courses in the two categories completed at the end of semester 6, taking into account the number of courses in Computer Science taken online to earn the additional 15 credits.

* The course code of the same course as used for the pathways 1 – 4

CREDIT DISTRIBUTION FOR BATCH B1(A2) IN PATHWAY 5: DOUBLE MAJOR

Semester	Major Courses in B	General Foundation Courses in B	Internship/ Project in B	Major Courses in Computer Science	General Foundation Courses in Computer Science	AEC	Total
1	4 + 4	3	-	4	-	3 + 3	21
2	4	-	-	4 + 4	3	3 + 3	21

3	4 + 4	3 + 3	-	4 + 4	-	-	22
4	4 + 4	3	-	4	3 + 3	-	21
5	4 + 4 + 4	3	-	4 + 4	-	-	23
6	4 + 4	3	2	4 + 4 + 4	-	-	25
Total for Three Years	**48**	**18**	**2**	**44**	**9**	**12**	**133**
	68			**53**		**12**	**133**
	Major Courses in B	Minor Courses					
7	4 + 4 + 4 + 4 + 4	-			-	-	20
8	4 + 4 + 4	4 + 4 + 4	12		-	-	24
Total for Four Years	**88 + 12 = 100**	**12**					**177**

EVALUATION SCHEME

1. The evaluation scheme for each course contains two parts: internal evaluation (about 30%) and external evaluation (about 70%). Each of the Major and Minor courses is of 4-credits. It is evaluated for 100 marks, out of which 30 marks is from internal evaluation and 70 marks, from external evaluation. Each of the General Foundation course is of 3-credits. It is evaluated for 75 marks, out of which 25 marks is from internal evaluation and 50 marks, from external evaluation.
2. The 4-credit courses (Major and Minor courses) are of two types: (i) courses with only theory and (ii) courses with 3-credit theory and 1-credit practical.
    - In 4-credit courses with only theory component, out of the total 5 modules of the syllabus, one open-ended module with 20% content is designed by the faculty member teaching that course, and it is internally evaluated for 10 marks. The internal evaluation of the remaining 4 theory modules is for 20 marks.
    - In 4-credit courses with 3-credit theory and 1-credit practical components, out of the total 5 modules of the syllabus, 4 modules are for theory and the fifth module is for practical. The practical component is internally evaluated for 20 marks. The internal evaluation of the 4 theory modules is for 10 marks.

3. All the 3-credit courses (General Foundational Courses) in Computer Science are with only theory component. Out of the total 5 modules of the syllabus, one open-ended module with 20% content is designed by the faculty member teaching that course, and it is internally evaluated for 5 marks. The internal evaluation of the remaining 4 theory modules is for 20 marks.

Sl. No.	Nature of the Course		Internal Evaluation in Marks (about 30% of the total)		External Exam on 4 modules (Marks)	Total Marks
			Open-ended module / Practical	On the other 4 modules		
1	4-credit course	only theory (5 modules)	10	20	70	100
2	4-credit course	Theory (4 modules) + Practical	20	10	70	100
3	3-credit course	only theory (5 modules)	5	20	50	75

1. MAJOR AND MINOR COURSES

1.1. INTERNAL EVALUATION OF THEORY COMPONENT

Sl. No.	Components of Internal Evaluation of Theory Part of a Major / Minor Course	Internal Marks for the Theory Part of a Major / Minor Course of 4-credits			
		Theory Only		Theory + Practical	
		4 Theory Modules	Open-ended Module	4 Theory Modules	Practical
1	Test paper/ Mid-semester Exam	10	4	5	-
2	Seminar/ Viva/ Quiz	6	4	3	-
3	Assignment	4	2	2	-
		20	10	10	20*
	Total	30		30	

* Refer the table in section 1.2 for the evaluation of practical component

1.2. EVALUATION OF PRACTICAL COMPONENT

The evaluation of practical component in Major and Minor courses is completely by internal evaluation.

- Continuous evaluation of practical by the teacher-in-charge shall carry a weightage of 50%.
- The end-semester practical examination and viva-voce, and the evaluation of practical records shall be conducted by the teacher in-charge and an internal examiner appointed by the Department Council.
- The process of continuous evaluation of practical courses shall be completed before 10 days from the commencement of the end-semester examination.
- Those who passed in continuous evaluation alone will be permitted to appear for the end-semester examination and viva-voce.

The scheme of continuous evaluation and the end-semester examination and viva-voce of practical component shall be as given below:

Sl. No.	Evaluation of Practical Component of Credit-1 in a Major / Minor Course	Marks for Practical	Weightage
1	Continuous evaluation of practical/ exercise performed in practical classes by the students	10	50%
2	End-semester examination and viva-voce to be conducted by teacher-in-charge along with an additional examiner arranged internally by the Department Council	7	35%
3	Evaluation of the Practical records submitted for the end semester viva–voce examination by the teacher-in-charge and additional examiner	3	15%
	Total Marks	20	

1.3. EXTERNAL EVALUATION OF THEORY COMPONENT

External evaluation carries 70% marks. Examinations will be conducted at the end of each semester. Individual questions are evaluated in marks and the total marks are converted into grades by the University based on 10-point grading system (refer section 5).

PATTERN OF QUESTION PAPER FOR MAJOR AND MINOR COURSES

Duration	Type	Total No. of Questions	No. of Questions to be Answered	Marks for Each Question	Ceiling of Marks
2 Hours	Short Answer	10	8 – 10	3	24

	Paragraph/ Problem	8	6 – 8	6	36
	Essay	2	1	10	10
				Total Marks	70

2. INTERNSHIP

- All students should undergo Internship of 2-credits during the first six semesters in a firm, industry or organization, or training in labs with faculty and researchers of their own institution or other Higher Educational Institutions (HEIs) or research institutions.
- Internship can be for enhancing the employability of the student or for developing the research aptitude.
- Internship can involve hands-on training on a particular skill/ equipment/ software. It can be a short project on a specific problem or area. Attending seminars or workshops related to an area of learning or skill can be a component of Internship.
- A faculty member/ scientist/ instructor of the respective institution, where the student does the Internship, should be the supervisor of the Internship.

2.1. GUIDELINES FOR INTERNSHIP

1. Internship can be in Computer Science or allied disciplines.
2. There should be minimum 60 hrs. of engagement from the student in the Internship.
3. Summer vacations and other holidays can be used for completing the Internship.
4. In BSc. Computer Science Honours programme, institute/ industry visit or study tour is a requirement for the completion of Internship. Visit to minimum one national research institute, research laboratory and place of scientific importance should be part of the study tour. A brief report of the study tour has to be submitted with photos and analysis.
5. The students should make regular and detailed entries in to a personal log book through the period of Internship. The log book will be a record of the progress of the Internship and the time spent on the work, and it will be useful in writing the final report. It may contain experimental conditions and results, ideas, mathematical expressions, rough work and calculation, computer file names etc. All entries should be dated. The Internship supervisor should periodically examine and countersign the log book.
6. The log book and the typed report must be submitted at the end of the Internship.

7. The institution at which the Internship will be carried out should be prior-approved by the Department Council of the college where the student has enrolled for the UG (Honours) programme.

2.2. EVALUATION OF INTERNSHIP

- The evaluation of Internship shall be done internally through continuous assessment mode by a committee internally constituted by the Department Council of the college where the student has enrolled for the UG (Honours) programme.
- The credits and marks for the Internship will be awarded only at the end of semester 6.
- The scheme of continuous evaluation and the end-semester viva-voce examination based on the submitted report shall be as given below:

Sl. No.	Components of Evaluation of Internship		Marks for Internship 2 Credits	Weightage
1	Continuous evaluation of internship through interim presentations and reports by the committee internally constituted by the Department Council	Acquisition of skill set	10	40%
2		Interim Presentation and Viva-voce	5	
3		Punctuality and Log Book	5	
4	Report of Institute Visit/ Study Tour		5	10%
5	End-semester viva-voce examination to be conducted by the committee internally constituted by the Department Council	Quality of the work	6	35%
6		Presentation of the work	5	
7		Viva-voce	6	
8	Evaluation of the day-to-day records, the report of internship supervisor, and final report submitted for the end semester viva–voce examination before the committee internally constituted by the Department Council		8	15%
	Total Marks		50	

3 MINI PROJECT WORK (Skill Enhancement Course 3 - CSC6FS307

A mandatory mini-project (SEC 3) is scheduled in the VI Semester of the BSc (Honours) Computer Science program. It is designed to cultivate students' research and software development skills. It will serve as a capstone experience, allowing students to bridge the gap between theoretical knowledge acquired in the classroom and its practical application to real-world problems.

3.1 Project Selection and Approval:

- Student groups (at most four members) can propose projects in computer science or related disciplines.
- Projects can be experimental (building a prototype), theoretical (a research paper), or computational (implementing an algorithm).
- Project proposals must be submitted for **prior approval** from the Department Council.
- Each project team will be assigned a project supervisor for guidance.

Project Duration:

- The mini-project duration is one semester.
- **Minimum engagement:** 90 hours per student.

Project Deliverables**:**

- Two hard copies and one softcopy of a well-structured typed report outlining:
    - Project objectives and requirements analysis
    - System design and architecture
    - Implementation details (including sample code snippets)
    - Test cases and results
    - Conclusion and future work
- A signed undertaking by the student declaring the originality of the work and the absence of plagiarism.
- A certificate from the project supervisor confirming the same.

3.2 Evaluation Criteria and Rubrics:

1. **Internal Evaluation (25 Marks)** - Conducted by the project supervisor throughout the semester. This could involve:
    - **Project Proposal and Planning**
        - Clarity of project goals and objectives.
        - Feasibility of the chosen approach.
        - Quality of system study/literature review and proposed methodology.
        - Clarity of project schedule and division of tasks within the team.
    - **Project Progress and Implementation**
        - Regular code reviews and adoption of feedback provided by the supervisor.
        - Attendance and active participation in project meetings.
        - Completion of project milestones as planned.
        - Quality of code documentation and adherence to coding standards.
    - **Interim Presentations**
        - Effectiveness of communication and presentation skills.
        - Clarity of technical details and progress made.
        - Ability to answer questions about the project effectively.

Sl. No	Components of Evaluation of Project	Marks for the Internal Evaluation of Mini project
1	Project Proposal and Planning	5
2	Project Progress and Implementation	10
3	Interim Presentations	10
	Total Marks	25

2. **External Evaluation (50 Marks)** - Conducted by an internal examiner appointed by the Department Council and the project supervisor. This will take place at the end of the VIth semester:
    - **Project Report:**
        - **Content:** Completeness, organisation, clarity, and technical accuracy.
        - **Structure:** Introduction, System Design/literature review, methodology, implementation details, results, discussion, conclusion, future work, and references.
        - **Presentation:** Quality of writing, grammar, and formatting.
    - **Project Demonstration**
        - **Demonstration:** Ability to showcase the functionality of the project or present the research findings effectively.
    - **Viva-voce**
        - **Viva-voce:** Understanding of project concepts, ability to answer questions confidently, and critical thinking skills.

Sl. No	**Components of Evaluation of Project**	**Marks for the End Semester Evaluation of Mini project**
1	**Project Report**	**15**
2	**Project Demonstration**	**20**
3	**Viva-voce**	**15**
Total Marks		**50**

4. PROJECT

4.1. PROJECT IN HONOURS PROGRAMME

- In Honours programme, the student has the option to do a Project of 12-credits instead of three Core Courses in Major in semester 8.
- The Project can be done in the same institution or any other higher educational institution (HEI) or research centre.

- A faculty member of the respective institution, where the student does the Project, should be the supervisor of the Project.

4.2. PROJECT IN HONOURS WITH RESEARCH PROGRAMME

- Students who secure 75% marks and above (equivalently, CGPA 7.5 and above) cumulatively in the first six semesters are eligible to get selected to Honours with Research stream in the fourth year.
- In Honours with Research programme, the student has to do a mandatory Research Project of 12-credits in semester 8.
- The approved research centres of University of Calicut or any other university/ HEI can offer the Honours with Research programme. The departments in the affiliated colleges under University of Calicut, which are not the approved research centres of the University, should get prior approval from the University to offer the Honours with Research programme. Such departments should have minimum one faculty member with Ph.D., and they should also have the necessary infrastructure to offer Honours with Research programme.
- A faculty member of the University/ College with a Ph.D. degree can supervise the research project of the students who have enrolled for Honours with Research. One such faculty member can supervise maximum four students in Honours with Research stream.

4.3. GUIDELINES FOR THE PROJECT IN HONOURS PROGRAMME AND HONOURS WITH RESEARCH PROGRAMME

1. Project can be in Computer Science or allied disciplines.
2. Project should be done individually.
3. Project work can be of experimental/ theoretical/ computational in nature.
4. There should be minimum 240 hrs. of engagement from the student in the Project work in Honours programme.
5. There should be minimum 360 hrs. of engagement from the student in the Project work in Honours with Research programme.
6. The various steps in project works are the following:
    - Wide review of a topic.
    - Investigation on a problem in systematic way using appropriate techniques.
    - Systematic recording of the work.
    - Reporting the results with interpretation in a standard documented form.
    - Presenting the results before the examiners.

7. During the Project the students should make regular and detailed entries in to a personal log book through the period of investigation. The log book will be a record of the progress of the Project and the time spent on the work, and it will be useful in writing the final report. It may contain experimental conditions and results, ideas, mathematical expressions, rough work and calculation, computer file names etc. All entries should be dated. The Project supervisor should periodically examine and countersign the log book.
8. The log book and the typed report must be submitted at the end of the Project. A copy of the report should be kept for reference at the department. A soft copy of the report too should be submitted, to be sent to the external examiner in advance.
9. It is desirable, but not mandatory, to publish the results of the Project in a peer reviewed journal.
10. The project report shall have an undertaking from the student and a certificate from the research supervisor for originality of the work, stating that there is no plagiarism, and that the work has not been submitted for the award of any other degree/ diploma in the same institution or any other institution.
11. The project proposal, institution at which the project is being carried out, and the project supervisor should be prior-approved by the Department Council of the college where the student has enrolled for the UG (Honours) programme.

4.4. EVALUATION OF PROJECT

- The evaluation of Project will be conducted at the end of the eighth semester by both internal and external modes.
- The Project in Honours programme/ Honours with Research programme will be evaluated for 300 marks. Out of this, 90 marks is from internal evaluation and 210 marks, from external evaluation.
- The internal evaluation of the Project work shall be done through continuous assessment mode by a committee internally constituted by the Department Council of the college where the student has enrolled for the UG (Honours) programme. 30% of the weightage shall be given through this mode.
- The remaining 70% shall be awarded by the external examiner appointed by the University.
- The scheme of continuous evaluation and the end-semester viva-voce of the Project shall be as given below:

Components of Evaluation of Project	Marks for the Research Project(Honours)/ (Honours with Research) 12 Credits	Weightage
Continuous evaluation of project work through interim presentations and reports by the committee internally constituted by the Department Council	90	30%
End-semester viva-voce examination to be conducted by the external examiner appointed by the university	150	50%
Evaluation of the day-to-day records and project report submitted for the end-semester viva–voce examination conducted by the external examiner	60	20%
Total Marks	300	

INTERNAL EVALUATION OF PROJECT

Sl. No	Components of Evaluation of Project	Marks for the Research Project (Honours programme) /(Honours with Research programme) 12 credits
1	Skill in doing project work	30
2	Interim Presentation and Viva-Voce	20
3	Punctuality and Log book	20
4	Scheme/ Organization of Project Report	20
	Total Marks	90

EXTERNAL EVALUATION OF PROJECT

Sl. No	Components of Evaluation of Project	Marks for the Research Project (Honours programme) / (Honours with Research programme) 12 credits
1	Content and relevance of the Project, Methodology, Quality of analysis, and Innovations of Research	50

2	Presentation of the Project	50
3	Project Report (typed copy), Log Book and References	60
4	Viva-Voce	50
	Total Marks	210

5. GENERAL FOUNDATION COURSES

- All the General Foundation Courses (3-credits) in Computer Science are with only theory component.

5.1. INTERNAL EVALUATION

Sl. No.	Components of Internal Evaluation of a General Foundation Course in Computer Science	Internal Marks of a General Foundation Course of 3-credits in Computer Science	
		4 Theory Modules	Open-ended Module
1	Test paper/ Mid-semester Exam	10	2
2	Seminar/ Viva/ Quiz	6	2
3	Assignment	4	1
		20	5
	Total	25	

5.2. EXTERNAL EVALUATION

External evaluation carries about 70% marks. Examinations will be conducted at the end of each semester. Individual questions are evaluated in marks and the total marks are converted into grades by the University based on 10-point grading system (refer section 5).

PATTERN OF QUESTION PAPER FOR GENERAL FOUNDATION COURSES

Duration	Type	Total No. of Questions	No. of Questions to be Answered	Marks for Each Question	Ceiling of Marks
1.5 Hours	Short Answer	10	8 – 10	2	16
	Paragraph/ Problem	5	4 – 5	6	24
	Essay	2	1	10	10
				Total Marks	50

6. LETTER GRADES AND GRADE POINTS

- Mark system is followed for evaluating each question.

- For each course in the semester letter grade and grade point are introduced in 10-point indirect grading system as per guidelines given below.
- The Semester Grade Point Average (SGPA) is computed from the grades as a measure of the student's performance in a given semester.
- The Cumulative GPA (CGPA) is based on the grades in all courses taken after joining the programme of study.
- Only the weighted grade point based on marks obtained shall be displayed on the grade card issued to the students.

LETTER GRADES AND GRADE POINTS

Sl. No.	Percentage of Marks (Internal & External Put Together)	Description	Letter Grade	Grade Point	Range of Grade Points	Class
1	95% and above	Outstanding	O	10	9.50 – 10	First Class with Distinction
2	Above 85% and below 95%	Excellent	A+	9	8.50 – 9. 49	
3	75% to below 85%	Very Good	A	8	7.50 – 8.49	
4	65% to below 75%	Good	B+	7	6.50 – 7.49	First Class
5	55% to below 65%	Above Average	B	6	5.50 – 6.49	
6	45% to below 55%	Average	C	5	4.50 – 5.49	Second Class
7	35% to below 45% aggregate (internal and external put together) with a minimum of 30% in external valuation	Pass	P	4	3.50 – 4.49	Third Class
8	Below an aggregate of 35% or below 30% in external evaluation	Fail	F	0	0 – 3.49	Fail
9	Not attending the examination	Absent	Ab	0	0	Fail

- When students take audit courses, they will be given Pass (P) or Fail (F) grade without any credits.
- The successful completion of all the courses and capstone components prescribed for the three-year or four-year programme with 'P' grade shall be the minimum requirement for the award of UG Degree or UG Degree Honours or UG Degree Honours with Research, as the case may be.

6.1. COMPUTATION OF SGPA AND CGPA

- The following method shall be used to compute the Semester Grade Point Average (SGPA):

The SGPA equals the product of the number of credits (Ci) with the grade points (Gi) scored by a student in each course in a semester, summed over all the courses taken by a student in the semester, and then divided by the total number of credits of all the courses taken by the student in the semester,

$$\text{i.e. SGPA (Si)} = \Sigma i\ (Ci \times Gi) \,/\, \Sigma i\ (Ci)$$

where Ci is the number of credits of the i^{th} course and Gi is the grade point scored by the student in the i^{th} course in the given semester. Credit Point of a course is the value obtained by multiplying the credit (Ci) of the course by the grade point (Gi) of the course.

$$\text{SGPA} = \frac{\text{Sum of the credit points of all the courses in a semester}}{\text{Total credits in that semester}}$$

ILLUSTRATION – COMPUTATION OF SGPA

Semester	**Course**	**Credit**	**Letter Grade**	**Grade point**	**Credit Point** (Credit x Grade)
I	Course 1	3	A	8	3 x 8 = 24
I	Course 2	4	B+	7	4 x 7 = 28
I	Course 3	3	B	6	3 x 6 = 18
I	Course 4	3	O	10	3 x 10 = 30
I	Course 5	3	C	5	3 x 5 = 15
I	Course 6	4	B	6	4 x 6 = 24
	Total	20			139
	SGPA				139/20 = 6.950

- The Cumulative Grade Point Average (CGPA) of the student shall be calculated at the end of a programme. The CGPA of a student determines the overall academic level of the student in a programme and is the criterion for ranking the students.

  CGPA for the three-year programme in CUFYUGP shall be calculated by the following formula.

$$\text{CGPA} = \frac{\text{Sum of the credit points of all the courses in six semesters}}{\text{Total credits in six semesters (133)}}$$

  CGPA for the four-year programme in CUFYUGP shall be calculated by the following formula.

$$\text{CGPA} = \frac{\text{Sum of the credit points of all the courses in eight semesters}}{\text{Total credits in eight semesters (177)}}$$

- The SGPA and CGPA shall be rounded off to three decimal points and reported in the transcripts.
- Based on the above letter grades, grade points, SGPA and CGPA, the University shall issue the transcript for each semester and a consolidated transcript indicating the performance in all semesters.

Syllabus of Major Courses