

UNIVERSITY OF CALICUT

B.Sc. PHYSICS HONOURS

(MAJOR, MINOR AND GENERAL FOUNDATION COURSES)

SYLLABUS & MODEL QUESTION PAPERS

w.e.f. 2024 admission onwards

(CUFYUGP Regulations 2024)

B.Sc. PHYSICS HONOURS
(MAJOR, MINOR AND GENERAL FOUNDATION COURSES)

SYLLABUS

PROGRAMME OUTCOMES (PO):

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

PO1	Knowledge Acquisition: Demonstrate a profound understanding of knowledge trends and their impact on the chosen discipline of study.
PO2	Communication, Collaboration, Inclusiveness, and Leadership: Become a team player who drives positive change through effective communication, collaborative acumen, transformative leadership, and a dedication to inclusivity.
PO3	Professional Skills: Demonstrate professional skills to navigate diverse career paths with confidence and adaptability.
PO4	Digital Intelligence: Demonstrate proficiency in varied digital and technological tools to understand and interact with the digital world, thus effectively processing complex information.
PO5	Scientific Awareness and Critical Thinking: Emerge as an innovative problem-solver and impactful mediator, applying scientific understanding and critical thinking to address challenges and advance sustainable solutions.
PO6	Human Values, Professional Ethics, and Societal and Environmental Responsibility: 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.
PO7	Research, Innovation, and Entrepreneurship: 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 Physics Honours programme at Calicut University, a student would:

PSO1	Understand concepts and applications in the field of Physics viz. Mechanics, Electrodynamics, Thermodynamics, Optics, Quantum Mechanics, Electronics etc.
PSO2	Develop the skills for experimentation to measure, analyse and interpret empirical data, and present the results in a methodical and accessible way.
PSO3	Evaluate complex real-world problems by applying principles of theoretical and applied physics, and mathematical and computational models.
PSO4	Design and execute a Project to solve real-world problems in accordance to the need of the industry and academic research, in a stipulated time frame.
PSO5	Develop understanding of the fundamental concepts of Physics needed for a deeper study of related fields of knowledge viz. Mathematics, Chemistry, Electronics, Computer Science, Geology etc.

PSO6	Develop the experimental and analytical skills in Physics that can be of useful applications in allied areas of knowledge.
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**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: Physics + 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: Physics + Mathematics and Chemistry
3	Major (A) with Minor (B)	68 (17 courses)	24 (6 courses)	39 (13 courses)	2	133	Major: Physics Minor: Mathematics
4	Major (A) with Vocational Minor (B)	68 (17 courses)	24 (6 courses)	39 (13 courses)	2	133	Major: Physics Minor: Data Analysis
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	Physics and Mathematics double major
Exit with UG Degree / Proceed to Fourth Year with 133 Credits							

B.Sc. PHYSICS 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

Seme ster	Course Code	Course Title	Total Hours	Hours/ Week	Credits	Marks		
						Inter nal	Exter nal	Total
1	PHY1CJ 101/ PHY1MN 100	Core Course 1 in Major – Fundamentals of Physics	75	5	4	30	70	100
		Minor Course 1	60/ 75	4/ 5	4	30	70	100
		Minor Course 2	60/ 75	4/ 5	4	30	70	100
	ENG1FA 101(2)	Ability Enhancement Course 1– English	60	4	3	25	50	75
		Ability Enhancement Course 2 – Additional Language	45	3	3	25	50	75
		Multi-Disciplinary Course 1 – Other than Major	45	3	3	25	50	75
		Total		23/ 25	21			525
2	PHY2CJ 101/ PHY2MN 100	Core Course 2 in Major –Electronics – I	75	5	4	30	70	100
		Minor Course 3	60/ 75	4/ 5	4	30	70	100
		Minor Course 4	60/ 75	4/ 5	4	30	70	100
	ENG2FA 103(2)	Ability Enhancement Course 3– English	60	4	3	25	50	75
		Ability Enhancement Course 4 – Additional Language	45	3	3	25	50	75
		Multi-Disciplinary Course 2 – Other than Major	45	3	3	25	50	75
		Total		23/ 25	21			525
3	PHY3CJ 201	Core Course 3 in Major – Mechanics – I	60	4	4	30	70	100
	PHY3CJ 202/ PHY3MN 200	Core Course 4 in Major – Computational Physics	75	5	4	30	70	100

		Minor Course 5	60/ 75	4/ 5	4	30	70	100
		Minor Course 6	60/ 75	4/ 5	4	30	70	100
		Multi-Disciplinary Course 3 – Kerala Knowledge System	45	3	3	25	50	75
	ENG3FV 108(2)	Value-Added Course 1 – English	45	3	3	25	50	75
		Total		23/ 25	22			550
4	PHY4CJ 203	Core Course 5 in Major – Electrodynamics–I	75	5	4	30	70	100
	PHY4CJ 204	Core Course 6 in Major – Mechanics– II	75	5	4	30	70	100
	PHY4CJ 205	Core Course 7 in Major – Modern Physics	75	5	4	30	70	100
	ENG4FV 109(2)	Value-Added Course 2 – English	45	3	3	25	50	75
		Value-Added Course 3 – Additional Language	45	3	3	25	50	75
	ENG4FS 111(2)	Skill Enhancement Course 1 – English	60	4	3	25	50	75
		Total		25	21			525
5	PHY5CJ 301	Core Course 8 in Major – Electrodynamics – II	75	5	4	30	70	100
	PHY5CJ 302	Core Course 9 in Major – Optics	75	5	4	30	70	100
	PHY5CJ 303	Core Course 10 in Major – Quantum Mechanics – I	60	4	4	30	70	100
		Elective Course 1 in Major*	60	4	4	30	70	100
		Elective Course 2 in Major*	60	4	4	30	70	100
		Skill Enhancement Course 2	45	3	3	25	50	75
		Total		25	23			575
6	PHY6CJ 304/ PHY8MN 304	Core Course 11 in Major – Thermodynamics	75	5	4	30	70	100
	PHY6CJ 305/ PHY8MN 305	Core Course 12 in Major–Electronics–II	75	5	4	30	70	100

	PHY6CJ 306/ PHY8MN 306	Core Course 13 in Major – Nuclear and Particle Physics	60	4	4	30	70	100
		Elective Course 3 in Major*	60	4	4	30	70	100
		Elective Course 4 in Major*	60	4	4	30	70	100
	PHY6FS 113	Skill Enhancement Course 3 – Data Analysis in Physics	45	3	3	25	50	75
	PHY6CJ 349	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	PHY7CJ 401	Core Course 14 in Major – Mathematical Physics	75	5	4	30	70	100
	PHY7CJ 402	Core Course 15 in Major – Classical Mechanics	75	5	4	30	70	100
	PHY7CJ 403	Core Course 16 in Major – Quantum Mechanics – II	75	5	4	30	70	100
	PHY7CJ 404	Core Course 17 in Major – Statistical Mechanics	75	5	4	30	70	100
	PHY7CJ 405	Core Course 18 in Major – Electronics – III	75	5	4	30	70	100
		Total		25	20			500
8	PHY8CJ 406 / PHY8MN 406	Core Course 19 in Major – Solid State Physics	75	5	4	30	70	100
	PHY8CJ 407 / PHY8MN 407	Core Course 20 in Major – Spectroscopy	60	4	4	30	70	100
	PHY8CJ 408 / PHY8MN 408	Core Course 21 in Major – Electrodynamics – III	60	4	4	30	70	100
	OR (instead of Core Courses 19 – 21 in Major)							
	PHY8CJ 449	Project (in Honours programme)	360**	13**	12	90	210	300
	PHY8CJ 499	Project (in Honours with Research programme)	360**	13**	12	90	210	300

		Elective Course 5 in Major*** / Minor Course 7	60	4	4	30	70	100
		Elective Course 6 in Major*** / Minor Course 8	60	4	4	30	70	100
		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)							
	PHY8CJ 489	Principles of Research Methodology	60	4	4	30	70	100
		Total		25	24			600
Total Credits for Four Years					177			4425

* Choose any two elective courses each from the course basket of seven elective courses in semester 5 and six elective courses in semester 6, as listed below in the two tables of elective courses with specialisation and elective courses with no specialisation.

** The teacher should have 13 hrs/week of engagement (the hours corresponding to the three core courses) in the guidance of the Project(s) in Honours programme and Honours with Research programme, while each student should have 24 hrs/week of engagement in the Project work. Total hours are given based on the student's engagement.

*** Choose any three elective courses from the course basket of nine elective courses in semester 8, as listed below in the table of elective courses with no specialisation.

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
* Instead of three Major courses					
Total for Four Years	88 + 12 = 100	36	39	2	177

DISTRIBUTION OF MAJOR COURSES IN PHYSICS 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	PHY1CJ 101 / PHY1MN 100	Core Course 1 in Major – Fundamentals of Physics	5	4
2	PHY2CJ 101 / PHY2MN 100	Core Course 2 in Major – Electronics – I	5	4
3	PHY3CJ 201	Core Course 3 in Major – Mechanics – I	4	4
	PHY3CJ 202 / PHY3MN 200	Core Course 4 in Major – Computational Physics	5	4
4	PHY4CJ 203	Core Course 5 in Major – Electrodynamics – I	5	4
	PHY4CJ 204	Core Course 6 in Major – Mechanics –II	5	4
	PHY4CJ 205	Core Course 7 in Major – Modern Physics	5	4
5	PHY5CJ 301	Core Course 8 in Major – Electrodynamics –II	5	4
	PHY5CJ 302	Core Course 9 in Major – Optics	5	4
	PHY5CJ 303	Core Course 10 in Major – Quantum Mechanics– I	4	4
		Elective Course 1 in Major*	4	4

		Elective Course 2 in Major*	4	4
6	PHY6CJ 304 / PHY8MN 304	Core Course 11 in Major – Thermodynamics	5	4
	PHY6CJ 305 / PHY8MN 305	Core Course 12 in Major – Electronics – II	5	4
	PHY6CJ 306 / PHY8MN 306	Core Course 13 in Major – Nuclear and Particle Physics	4	4
		Elective Course 3 in Major*	4	4
		Elective Course 4 in Major*	4	4
	PHY6CJ 349	Internship in Major	-	2
Total for the Three Years				70
7	PHY7CJ 401	Core Course 14 in Major – Mathematical Physics	5	4
	PHY7CJ 402	Core Course 15 in Major – Classical Mechanics	5	4
	PHY7CJ 403	Core Course 16 in Major – Quantum Mechanics–II	5	4
	PHY7CJ 404	Core Course 17 in Major – Statistical Mechanics	5	4
	PHY7CJ 405	Core Course 18 in Major – Electronics – III	5	4
8	PHY8CJ 406 / PHY8MN 406	Core Course 19 in Major – Solid State Physics	5	4
	PHY8CJ 407 / PHY8MN 407	Core Course 20 in Major – Spectroscopy	4	4
	PHY8CJ 408 / PHY8MN 408	Core Course 21 in Major –Electrodynamics–III	4	4
	OR (instead of Core Courses 19 – 21 in Major)			

	PHY8CJ 449	Project (in Honours programme)	13	12
	PHY8CJ 499	Project (in Honours with Research programme)	13	12
		Elective Course 5 in Major**	4	4
		Elective Course 6 in Major**	4	4
		Elective Course 7 in Major**	4	4
	OR (instead of Elective course 7 in Major, in Honours with Research programme)			
	PHY8CJ 489	Principles of Research Methodology	4	4
Total for the Four Years				114

* Choose any two elective courses each from the course basket of seven elective courses in semester 5 and six elective courses in semester 6, as listed below in the two tables of elective courses with specialisation and elective courses with no specialisation.

** Choose any three elective courses from the course basket of nine elective courses in semester 8, as listed below in the table of elective courses with no specialisation.

ELECTIVE COURSES IN PHYSICS WITH SPECIALISATION

Group No.	Sl. No.	Course Code	Title	Seme ster	Total Hrs	Hrs/ Week	Cre dits	Marks		
								Inte rnal	Exte rnal	Total
1		MATERIALS SCIENCE								
	1	PHY5EJ 301(1)	Properties of Solids	5	60	4	4	30	70	100
	2	PHY5EJ 302(1)	Materials Science	5	60	4	4	30	70	100
	3	PHY6EJ 301(1)	Nano Science and Technology	6	60	4	4	30	70	100
	4	PHY6EJ 302(1)/ PHY6EJ 304(2)	Optoelectronic and Semiconductor Devices	6	60	4	4	30	70	100
2		PHOTONICS								
	1	PHY5EJ 303(2)	Photonics	5	60	4	4	30	70	100
	2	PHY5EJ 304(2)	Introductory Molecular Spectroscopy	5	60	4	4	30	70	100

	3	PHY6EJ 303(2)/ PHY6EJ 306(3)	Biophotonics	6	60	4	4	30	70	100
	4	PHY6EJ 304(2)/ PHY6EJ 302(1)	Optoelectronic and Solid State Devices	6	60	4	4	30	70	100
3	PHYSICS IN BIOLOGY									
	1	PHY5EJ 305(3)	Physics of Human Body	5	60	4	4	30	70	100
	2	PHY5EJ 306(3)	Introductory Medical Physics	5	60	4	4	30	70	100
	3	PHY6EJ 305(3)	Introductory Biophysics	6	60	4	4	30	70	100
	4	PHY6EJ 306(3)/ PHY6EJ 303(2)	Biophotonics	6	60	4	4	30	70	100

ELECTIVE COURSES IN PHYSICS WITH NO SPECIALISATION

Sl. No.	Course Code	Title	Seme ster	Total Hrs	Hrs/ Week	Cre dits	Marks		
							Inte rnal	Exte rnal	Total
1	PHY5EJ 307	Astrophysics	5	60	4	4	30	70	100
2	PHY6EJ 307	Space Physics	6	60	4	4	30	70	100
3	PHY6EJ 308	Atmospheric Physics	6	60	4	4	30	70	100
4	PHY8EJ 401	Quantum Computation and Quantum Information	8	60	4	4	30	70	100
5	PHY8EJ 402	Artificial Intelligence and Machine Learning in Physics	8	60	4	4	30	70	100
6	PHY8EJ 403	Digital Signal Processing	8	60	4	4	30	70	100
7	PHY8EJ 404	Digital Electronics	8	60	4	4	30	70	100

8	PHY8EJ 405	Communication Electronics	8	60	4	4	30	70	100
9	PHY8EJ 406	Plasma Physics	8	60	4	4	30	70	100
10	PHY8EJ 407	Nonlinear Dynamics and Chaos	8	60	4	4	30	70	100
11	PHY8EJ 408	Introductory General Relativity	8	60	4	4	30	70	100
12	PHY8EJ 409	Introductory Quantum Field Theory	8	60	4	4	30	70	100

GROUPING OF MINOR COURSES IN PHYSICS

Note: The Minor courses given below should not be offered to students who have taken Physics as the Major discipline. They should be offered to students from other Major disciplines only.

Group No.	Sl. No.	Course Code	Title	Seme ster	Total Hrs	Hrs/ Week	Cre dits	Marks		
								Inte rnal	Exte rnal	Total
1		MATHEMATICS FOR PHYSICAL SYSTEMS (preferable for students from Mathematics and other Major disciplines)								
	1	PHY1MN 101	Mechanics and Optics	1	75	5	4	30	70	100
	2	PHY2MN 101	Electromagnetism and Network Theorems	2	75	5	4	30	70	100
	3	PHY3MN 201	Mathematical Methods for Physics	3	75	5	4	30	70	100
2		MATERIALS PHYSICS (preferable for students from Chemistry and other Major disciplines)								
	1	PHY1MN 102	Properties of Matter and Thermodynamics	1	75	5	4	30	70	100
	2	PHY2MN 102	Modern Physics and Nuclear Physics	2	75	5	4	30	70	100
	3	PHY3MN 202	Solid State Physics and Spectroscopy	3	75	5	4	30	70	100
3		SEMICONDUCTOR PHYSICS (preferable for students from Electronics, Computer Science, Instrumentation and other Major disciplines)								
	1	PHY1MN 103	Semiconductor Physics and Electronics	1	75	5	4	30	70	100

	2	PHY2MN 103	Fundamentals of Optics	2	75	5	4	30	70	100
	3	PHY3MN 203	Electronic Communication	3	75	5	4	30	70	100
4		OPTICAL PHYSICS (preferable for students from Geology and other Major disciplines)								
	1	PHY1MN 104	Electricity and Magnetism	1	75	5	4	30	70	100
	2	PHY2MN 104	Optics and Lasers	2	75	5	4	30	70	100
	3	PHY3MN 204	Atomic Structure and Spectroscopy	3	75	5	4	30	70	100
5		ENERGY PHYSICS (preferable for students from Food Technology and other Major disciplines)								
	1	PHY1MN 105	Non-Conventional Energy Sources	1	75	5	4	30	70	100
	2	PHY2MN 105	Fluid Mechanics and Thermodynamics	2	75	5	4	30	70	100
	3	PHY3MN 205	Optics and Spectroscopy	3	75	5	4	30	70	100

GROUPING OF VOCATIONAL MINOR COURSES IN PHYSICS

Note: The Vocational Minor courses given below should not be offered to students who have taken Physics as the Major discipline. They should be offered to students from other Major disciplines only.

Group No.	Sl. No.	Course Code	Title	Seme ster	Total Hrs	Hrs/ Week	Cre dits	Marks		
								Inte rnal	Exte rnal	Total
1		TECHNIQUES IN MATERIALS PHYSICS								
	1	PHY1VN 101	Introductory Materials Science	1	75	5	4	30	70	100
	2	PHY2VN 101	Synthesis of Nanomaterials	2	75	5	4	30	70	100
	3	PHY3VN 201	Characterizations and Applications of Nanomaterials	3	75	5	4	30	70	100
	4	PHY8VN 301	Scientific Documentation	8	60	4	4	30	70	100

2										
DATA ANALYSIS IN PHYSICS										
1	PHY1VN 102	Python Basics	1	75	5	4	30	70	100	
2	PHY2VN 102	Data Analysis in Physics Using Python	2	75	5	4	30	70	100	
3	PHY3VN 202	Data Analysis in Physics Using Machine Learning	3	75	5	4	30	70	100	
4	PHY8VN 302	Applications of Advanced Machine Learning and Artificial Intelligence in Physics	8	60	4	4	30	70	100	

- (i). Students in Single Major pathway 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 a discipline other than their Major discipline.
- (iii). Students in Major with Minor pathway can choose all the courses from any two Minor groups offered by a discipline other than their Major discipline. If the students from other Major disciplines choose any two Minor groups in Physics as given above, then the title of the Minor will be **Physics**.
- (iv). Students in Major with Vocational Minor pathway can choose all the courses from any two Vocational Minor groups offered by a discipline other than their Major discipline. If the students from other Major disciplines choose any two Vocational Minor groups in Physics as given above, then the title of the Vocational Minor will be **Physics**.

DISTRIBUTION OF GENERAL FOUNDATION COURSES IN PHYSICS

Sem ester	Course Code	Course Title	Total Hours	Hours/ Week	Credits	Marks		
						Inter nal	Exter nal	Total
1	PHY1FM 105	Multi-Disciplinary Course 1 – Physics in Everyday Life	45	3	3	25	50	75
2	PHY2FM 106	Multi-Disciplinary Course 2 – Astronomy and Stargazing	45	3	3	25	50	75

3	PHY3FV 108	Value-Added Course 1 – Renewable Energy Sources	45	3	3	25	50	75
4	PHY4FV 110	Value-Added Course 2 – Science Communication	45	3	3	25	50	75
5	PHY5FS 112	Skill Enhancement Course 2 – Electrical and Photovoltaic Circuits	45	3	3	25	50	75
6	PHY6FS 113	Skill Enhancement Course 3 – Data Analysis in Physical Sciences	45	3	3	25	50	75

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

A1: 68 credits in Physics (Major A)

B1: 68 credits in Major B

A2: 53 credits in Physics (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

Seme ster	Course Code	Course Title	Total Hours	Hours/ Week	Credits	Marks		
						Inter nal	Exter nal	Total
1	PHY1CJ 101 / PHY1MN 100	Core Course 1 in Major Physics – Fundamentals of Physics	75	5	4	30	70	100
	BBB1CJ 101	Core Course 1 in Major B –	60/ 75	4/ 5	4	30	70	100
	PHY1CJ 102 / PHY2CJ 102 / PHY4CJ 205*	Core Course 2 in Major Physics – Modern Physics (for batch A1 only)	75	5	4	30	70	100
	ENG1FA 101(2)	Ability Enhancement Course 1 – English	60	4	3	25	50	75
		Ability Enhancement Course 2 – Additional Language	45	3	3	25	50	75
	PHY1FM 105	Multi-Disciplinary Course 1 in Physics – Physics in Everyday Life (for batch A1 only)	45	3	3	25	50	75

		Total		24/ 25	21			525
2	PHY2CJ 101 / PHY2MN 100	Core Course 3 in Major Physics – Electronics – I	75	5	4	30	70	100
	BBB2CJ 101	Core Course 2 in Major B –	60/ 75	4/ 5	4	30	70	100
	BBB2CJ 102 / BBB1CJ 102	Core Course 3 in Major B – (for batch B2 only)	60/ 75	4/ 5	4	30	70	100
	ENG2FA 103(2)	Ability Enhancement Course 3 – English	60	4	3	25	50	75
		Ability Enhancement Course 4 – Additional Language	45	3	3	25	50	75
	PHY2FM 106 / PHY3FM 106	Multi-Disciplinary Course 2 in Physics – Astronomy and Stargazing	45	3	3	25	50	75
		Total		23 – 25	21			525
3	PHY3CJ 201	Core Course 4 in Major Physics – Mechanics – I	60	4	4	30	70	100
	PHY3CJ 202 / PHY3MN 200	Core Course 5 in Major Physics – Computational Physics	75	5	4	30	70	100
	BBB3CJ 201	Core Course 4 in Major B	60/ 75	4/ 5	4	30	70	100
	BBB3CJ 202	Core Course 5 in Major B	60/ 75	4/ 5	4	30	70	100
	BBB3FM 106 / BBB2FM 106	Multi-Disciplinary Course 1 in B –	45	3	3	25	50	75
	PHY3FV 108	Value-Added Course 1 in Physics – Renewable Energy Sources (for batch A1 only)	45	3	3	25	50	75
		Total		23 – 25	22			550
4	PHY4CJ 203	Core Course 6 in Major Physics – Electrodynamics –I	75	5	4	30	70	100

		Core Course 6 in Major B	60/ 75	4/ 5	4	30	70	100
	PHY4CJ 204	Core Course 7 in Major Physics – Mechanics – II (for batch A1 only)	75	5	4	30	70	100
	PHY4FV 110	Value-Added Course 2 in Physics – Science Communications	45	3	3	25	50	75
	BBB4FV 110	Value-Added Course 1 in B –	45	3	3	25	50	75
	PHY4FS 112 / PHY5FS 112	Skill Enhancement Course 1 in Physics – Electrical and Photovoltaic Circuits	45	3	3	25	50	75
		Total		23/ 24	21			525
5	PHY5CJ 302	Core Course 8 in Major Physics – Optics	75	5	4	30	70	100
		Core Course 7 in Major B –	60/ 75	4/ 5	4	30	70	100
	PHY5CJ 303	Core Course 9 in Major Physics – Quantum Mechanics –I (for batch A1 only)	60	4	4	30	70	100
		Elective Course 1 in Major Physics**	60	4	4	30	70	100
		Elective Course 1 in Major B**	60	4	4	30	70	100
	BBB5FS 112 / BBB4FS 112	Skill Enhancement Course 1 in B	45	3	3	25	50	75
		Total		24/ 25	23			575
6	PHY6CJ 305/ PHY8MN 305	Core Course 10 in Major Physics – Electronics – II	75	5	4	30	70	100
		Core Course 8 in Major B –	60/ 75	4/ 5	4	30	70	100
	BBB6CJ 305	Core Course 9 in Major B – (for batch B2 only)	60	4	4	30	70	100
		Elective Course 2 in Major Physics**	60	4	4	30	70	100
		Elective Course 2 in Major B**	60	4	4	30	70	100

	PHY6FS 113	Skill Enhancement Course 2 in Physics – Data Analysis in Physics (for batch A1 only)	45	3	3	25	50	75
	PHY6CJ 349	Internship in Major Physics (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

** Choose any one elective course each in Major Physics from the course basket of seven elective courses in physics in semester 5 and six elective courses in physics in semester 6, as listed above in the two tables of elective courses with specialisation and elective courses with no specialisation. Choose any one elective course each in Major B from the course basket of elective courses in Major B in semester 5 and semester 6.

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

Semester	Major Courses in Physics	General Foundation Courses in Physics	Internship/ Project in Physics	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 Physics	Minor Courses					

7	4 + 4 + 4 + 4 + 4	-			-	-	20
8	4 + 4 + 4	4 + 4 + 4	12*		-	-	24
* Instead of three Major courses							
Total for Four Years	88 + 12 = 100	12					177

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

A1: 68 credits in Physics (Major A)

B1: 68 credits in Major B

A2: 53 credits in Physics (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

Seme ster	Course Code	Course Title	Total Hours	Hours/ Week	Credits	Marks		
						Inter nal	Exter nal	Total
1	PHY1CJ 101 / PHY1MN 100	Core Course 1 in Major Physics – Fundamentals of Physics	75	5	4	30	70	100
	BBB1CJ 101	Core Course 1 in Major B –	60/ 75	4/ 5	4	30	70	100
	BBB1CJ 102 / BBB2CJ 102	Core Course 2 in Major B – (for batch B1 only)	60/ 75	4/ 5	4	30	70	100
	ENG1FA 101(2)	Ability Enhancement Course 1 – English	60	4	3	25	50	75
		Ability Enhancement Course 2 – Additional Language	45	3	3	25	50	75
	BBB1FM 105	Multi-Disciplinary Course 1 in B – (for batch B1 only)	45	3	3	25	50	75
		Total		23 – 25	21			525
2	PHY2CJ 101 / PHY2MN 100	Core Course 2 in Major Physics – Electronics – I	75	5	4	30	70	100

	BBB2CJ 101	Core Course 3 in Major B –	60/ 75	4/ 5	4	30	70	100
	PHY2CJ 102 / PHY1CJ 102 / PHY4CJ 205*	Core Course 3 in Major Physics – Modern Physics (for batch A2 only)	75	5	4	30	70	100
	ENG2FA 103(2)	Ability Enhancement Course 3 – English	60	4	3	25	50	75
		Ability Enhancement Course 4 – Additional Language	45	3	3	25	50	75
	PHY2FM 106 / PHY3FM 106	Multi-Disciplinary Course 1 in Physics – Astronomy and Stargazing	45	3	3	25	50	75
		Total		24/ 25	21			525
3	PHY3CJ 201	Core Course 4 in Major Physics – Mechanics – I	60	4	4	30	70	100
	PHY3CJ 202 / PHY3MN 200	Core Course 5 in Major Physics – Computational Physics	75	5	4	30	70	100
	BBB3CJ 201	Core Course 4 in Major B	60/ 75	4/ 5	4	30	70	100
	BBB3CJ 202	Core Course 5 in Major B	60/ 75	4/ 5	4	30	70	100
	BBB3FM 106 / BBB2FM 106	Multi-Disciplinary Course 2 in B –	45	3	3	25	50	75
	BBB3FV 108	Value-Added Course 1 in B – (for batch B1 only)	45	3	3	25	50	75
		Total		23 – 25	22			550
4	PHY4CJ 203	Core Course 6 in Major Physics –Electrodynamics –I	75	5	4	30	70	100
		Core Course 6 in Major B	60/ 75	4/ 5	4	30	70	100
		Core Course 7 in Major B – (for batch B1 only)	60/ 75	4/ 5	4	30	70	100

	PHY4FV 110	Value-Added Course 1 in Physics – Science Communications	45	3	3	25	50	75
	BBB4FV 110	Value-Added Course 2 in B –	45	3	3	25	50	75
	PHY4FS 112 / PHY5FS 112	Skill Enhancement Course 1 in Physics – Electrical and Photovoltaic Circuits	45	3	3	25	50	75
		Total		22 – 24	21			525
5	PHY5CJ 302	Core Course 7 in Major Physics – Optics	75	5	4	30	70	100
		Core Course 8 in Major B –	60/ 75	4/ 5	4	30	70	100
		Core Course 9 in Major B – (for batch B1 only)	60	4	4	30	70	100
		Elective Course 1 in Major Physics**	60	4	4	30	70	100
		Elective Course 1 in Major B**	60	4	4	30	70	100
	BBB5FS 112 / BBB4FS 112	Skill Enhancement Course 1 in B	45	3	3	25	50	75
		Total		24/ 25	23			575
6	PHY6CJ 305/ PHY8MN 305	Core Course 8 in Major Physics – Electronics – II	75	5	4	30	70	100
		Core Course 10 in Major B –	60/ 75	4/ 5	4	30	70	100
	PHY6CJ 306/ PHY8MN 306	Core Course 9 in Major Physics – Nuclear and Particle Physics (for batch A2 only)	60	4	4	30	70	100
		Elective Course 2 in Major Physics**	60	4	4	30	70	100
		Elective Course 2 in Major B**	60	4	4	30	70	100
	BBB6FS 113	Skill Enhancement Course 2 in B – (for batch B1 only)	45	3	3	25	50	75

	BBB6CJ 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 Physics in semesters 7 and 8, batch B1(A2) needs to earn additional 15 credits in Physics to make the total credits of 68. If this condition is achieved, and the student of batch B1(A2) proceeds to the next semesters to study Physics, then 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 Physics taken online to earn the additional 15 credits.								

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

** Choose any one elective course each in Major Physics from the course basket of seven elective courses in physics in semester 5 and six elective courses in physics in semester 6, as listed above in the two tables of elective courses with specialisation and elective courses with no specialisation. Choose any one elective course each in Major B from the course basket of elective courses in Major B in semester 5 and semester 6.

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 Physics	General Foundation Courses in Physics	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
* Instead of three Major courses							
Total for Four Years	88 + 12 = 100	12					177

EVALUATION SCHEME

- 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.
- 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.
- All the 3-credit courses (General Foundational Courses) in Physics, except SEC3, 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. Considering the nature of the SEC3 course, the internal evaluation for the 25 marks, including the 5 marks in the open-ended module, will be entirely based on the practical examination and viva.

4. The students can write the external examinations in physics in both English and Malayalam languages.

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	-
Total		20	10	10	20*
		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
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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 Physics 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. Physics 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. PROJECT

3.1. 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/ any other higher educational institution (HEI)/ research centre/ training centre.
- The Project in Honours programme can be a short research work or an extended internship or a skill-based training programme.
- A faculty member of the respective institution, where the student does the Project, should be the supervisor of the Project.

3.2. 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.
- A relaxation of 5% in marks (equivalently, a relaxation of 0.5 grade in CGPA) is allowed for those belonging to SC/ ST/ OBC (non-creamy layer)/ Differently-Abled/ Economically Weaker Section (EWS)/ other categories of candidates as per the decision of the UGC from time to time.
- In Honours with Research programme, the student has to do a mandatory Research Project of 12-credits instead of three Core Courses in Major 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 two faculty members 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 five students in Honours with Research stream.
- The maximum intake of the department for Honours with Research programme is fixed by the department based on the number of faculty members eligible for project supervision, and other academic, research, and infrastructural facilities available.

- If a greater number of eligible students are opting for the Honours with Research programme than the number of available seats, then the allotment shall be based on the existing rules of reservations and merits.

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

1. Project can be in Physics 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 360 hrs. of engagement from the student in the Project work in Honours programme as well as in Honours with Research programme.
5. There should be minimum 13 hrs./week of engagement (the hours corresponding to the three core courses in Major in semester 8) from the teacher in the guidance of the Project(s) in Honours programme and 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.

3.4. 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 as well as that in 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 Project (Honours/ Honours with Research)	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 Project (Honours/ Honours with Research)
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 Project (Honours/ Honours with Research) 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

4. GENERAL FOUNDATION COURSES

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

4.1. INTERNAL EVALUATION

Sl. No.	Components of Internal Evaluation of a General Foundation Course in Physics	Internal Marks of a General Foundation Course of 3-credits in Physics	
		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
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4.2. 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

5. 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	

5	55% to below 65%	Above Average	B	6	5.50 – 6.49	First Class
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.

5.1. 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 (C_i) with the grade points (G_i) 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,

$$\text{i.e. SGPA } (S_i) = \sum_i (C_i \times G_i) / \sum_i (C_i)$$

where C_i is the number of credits of the i^{th} course and G_i 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 (C_i) of the course by the grade point (G_i) 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.