

PERIYAR MANIAMMAI INSTITUTE OF SCIENCE & TECHNOLOGY

FACULTY OF SCIENCE AND HUMANITIES

DEPARTMENT OF PHYSICS

B.Sc. Physics

CURRICULUM - REGULATIONS 2024

Category of courses and minimum credit requirement as per new guidelines of UGC for B.Sc. Physics programme are outlined below:

Sl. No.	Category of Courses	Credits	
		UG 3-Years	UG 4-Years
1.	Major (Core)	60	80
2.	Minor Stream	24	32
3.	Multidisciplinary	09	09
4.	Ability Enhancement Courses	08	08
5.	Skill Enhancement Courses	09	09
6.	Value Added Courses	06 - 08	06 - 08
7.	Internship	02 - 04	02 - 04
8.	Research Project / Dissertation	-	12
Total		120	160

SEMESTER I

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
Theory						
1	U24TA101	பொதுத்தமிழ் (General Tamil)	3	0	0	3
	U24TA102	□□□□□□□□□□□□□□□□ (Foundational Tamil)				
2	U24EN102	English for Communication - I	3	0	0	3
3	U24MA101	Matrices and Differential Calculus	3	1	0	4
4	U24CH101	Chemical Bonding and Energy Dynamics	3	0	0	3
5	U24JM101	Basics of Media Culture and Society	3	0	0	3
6	U24EM101	Coding Techniques	3	0	0	3
Practical						
7	U24CH102	Quantitative and Qualitative Analysis Laboratory	0	0	4	2
8	U24EM102	Coding Techniques Laboratory	0	0	2	1
Total			18	1	6	22

SEMESTER II

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
Theory						
1	U24TA151	அறிவியல் தமிழ் (Scientific Tamil)	3	0	0	3
	U24TA152	□□□□ □□□□□ (Beginners Tamil)				
2	U24EN152	English for Communication - II	3	0	0	3
3	U24PH151	Fundamentals of Physics	3	0	0	3
4	U24MA152	Vector Calculus	3	1	0	4
5	U24EM151	Programming in Practice	3	0	0	3
6	U24VA002	Universal Human Values	2	1	0	3
Practical						
7	U24PH152	Physics Laboratory	0	0	2	1
8	U24EM152	Programming in Practice Laboratory	0	0	2	1
9	U24EM103	Speech Communication Laboratory	0	0	2	1
Total			17	2	6	22

SEMESTER III

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
Theory						
1	U24TA201	கணிணித்தமிழ் (Computing Tamil)	3	0	0	3
2	U24EN201	English for Communication - III	3	0	0	3
3	U24PH201	Properties of Matter and Sound	3	0	0	3
4	U24PH202	Heat and Thermodynamics	3	0	0	3
5	U24PH203	Optics	3	0	0	3
6	U24MA206	Fourier Series and Laplace Transforms	3	1	0	4
7	U24VA001	Environmental Studies	2	0	0	2
Practical						
8	U24PH204	Properties of Matter and Sound Laboratory	0	0	2	1
9	U24PH205	Thermodynamics and Optics Laboratory	0	0	2	1
Total			20	1	4	23

SEMESTER IV

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
Theory						
1	U24TA251	தொழில்நுட்பத்தமிழ் (Technical Tamil)	3	0	0	3
2	U24EN251	English for Communication - IV	3	0	0	3
3	U24PH251	Laser and Fibre Optics	3	0	0	3
4	U24PH252	Electricity and Magnetism	3	0	0	3
5	U24PH253	Energy Physics	3	0	0	3
6	U24ED257	Emotional Intelligence	3	0	0	3
7	U24PH751	Indian Astrophysics (Open Elective - I)	3	0	0	3
Practical						
8	U24PH254	Advanced Optics Laboratory	0	0	2	1
9	U24PH255	Electricity and Magnetism Laboratory	0	0	2	1
10	U24EM256	Internship	0	0	0	2
Total			21	0	4	25

SEMESTER V

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
Theory						
1	U24PH301	Atomic Physics	3	0	0	3
2	U24PH302	Solid State Physics	3	1	0	4
3	U24PH303	Analog Electronics	3	0	0	3
4	U24PH304	Biophysics	3	0	0	3
5	U24PH7XX	Open Elective - II	3	0	0	3
6	U24PH9XX	Programme Elective - I	3	0	0	3
Practical						
7	U24PH305	Analog Electronics Laboratory	0	0	4	2
8	U24EM301	Community Engagement and Social Responsibility	1	0	2	2
Audit Course						
9	U24AUXXX	Audit Course - I	2	0	0	--
Total			21	1	6	23

SEMESTER VI

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
Theory						
1	U24PH351	Nuclear and Particle Physics	3	0	0	3
2	U24PH352	Quantum Physics	3	1	0	4
3	U24PH353	Material Science Fundamentals	3	0	0	3
4	U24PH354	Digital Electronics	3	0	0	3
5	U24PH8XX	Online Course	3	0	0	3
6	U24PH9XX	Programme Elective - II	3	0	0	3
Practical						
7	U24PH355	Digital Electronics Laboratory	0	0	4	2
8	U24PH356	Capstone Project	0	0	8	4
Audit Course						
9	U24AUXXX	Audit Course - II	2	0	0	--
Total			20	1	12	25

SEMESTER VII

B.Sc. (Honours) Physics

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
Theory						
1	U24PH401	Mathematical Physics	3	1	0	4
2	U24PH402	Classical Mechanics	3	1	0	4
3	U24PH403	Theory of Relativity	3	1	0	4
4	U24PH404	Data Science for Physicist	3	0	2	4
5	U24PH405	Optoelectronics	3	0	2	4
Total			15	3	4	20

SEMESTER VIII

B.Sc. (Honours) Physics

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
Theory						
1	U24PH451	Atomic and Molecular Spectroscopy	3	0	2	4
2	U24PH452	Statistical Mechanics	3	1	0	4
Practical						
3	U24PH453	Project / Dissertation	0	0	24	12
Total			6	1	26	20

SEMESTER VII**B.Sc. (Honours with Research) Physics**

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
Theory						
1	U24PH401	Mathematical Physics	3	1	0	4
2	U24PH402	Classical Mechanics	3	1	0	4
3	U24PH404	Data Science for Physicist	3	0	2	4
4	U24PH406	IPR and Research Methodology	3	1	0	4
Research Project						
5	U24PH407	Applicative Research	0	0	8	4
Total			12	3	10	20

SEMESTER VIII**B.Sc. (Honours with Research) Physics**

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
1	U24PH454	Research / Dissertation (with SCOPUS / SCI Publication)	0	0	40	20
Total			0	0	40	20

Actual Credit allotment as per the guidelines of UGC / TANSICHE for the B.Sc. Physics programme are given below:

Sl. No.	Category of Courses	Credits		
		3 Years	4 Years (Honours)	4 Years (Honours with Research)
1.	Major (Core)	62	82	74
2.	Minor Stream	24	32	32
3.	Multidisciplinary	09	09	09
4.	Ability Enhancement Courses	24	24	24
5.	Skill Enhancement Courses	09	09	09
6.	Value Added Courses	08	08	08
7.	Internship	04	04	04
8.	Project / Dissertation	-	12	20
Total		140	180	180

Semester wise Credit Distribution (In all Categories of Courses)**B.Sc. Physics - 3 Years**

Sl. No.	Category of Courses	Credits	I	II	III	IV	V	VI
1.	Major (Core)	62	-	-	11	11	15	25
2.	Minor Stream	24	9	8	4	-	3	-
3.	Multidisciplinary	09	3	-	-	3	3	-
4.	Ability Enhancement Courses	24	6	6	6	6	-	-
5.	Skill Enhancement Courses	09	4	5	-	-	-	-
6.	Value Added Courses	08	-	3	2	3	-	-
7.	Internship	04	-	-	-	2	2	-
8.	Project / Dissertation	-	-	-	-	-	-	-
Total		140	22	22	23	25	23	25

Semester wise Credit Distribution (In all Categories of Courses)

B.Sc. (Honours) Physics - 4 Years

Sl. No.	Category of Courses	Credits	I	II	III	IV	V	VI	VII	VIII
1.	Major (Core)	82	-	-	11	11	15	25	12	8
2.	Minor Stream	32	9	8	4	-	3	-	8	-
3.	Multidisciplinary	09	3	-	-	3	3	-	-	-
4.	Ability Enhancement Courses	24	6	6	6	6	-	-	-	-
5.	Skill Enhancement Courses	09	4	5	-	-	-	-	-	-
6.	Value Added Courses	08	-	3	2	3	-	-	-	-
7.	Internship	04	-	-	-	2	2	-	-	-
8.	Project / Dissertation	12	-	-	-	-	-	-	-	12
Total		180	22	22	23	25	23	25	20	20

Semester wise Credit Distribution (In all Categories of Courses)

B.Sc. (Honours with Research) Physics - 4 Years

Sl. No.	Category of Courses	Credits	I	II	III	IV	V	VI	VII	VIII
1.	Major (Core)	74	-	-	11	11	15	25	12	-
2.	Minor Stream	32	9	8	4	-	3	-	8	-
3.	Multidisciplinary	09	3	-	-	3	3	-	-	-
4.	Ability Enhancement Courses	24	6	6	6	6	-	-	-	-
5.	Skill Enhancement Courses	09	4	5	-	-	-	-	-	-
6.	Value Added Courses	08	-	3	2	3	-	-	-	-
7.	Internship	04	-	-	-	2	2	-	-	-
8.	Project / Dissertation	20	-	-	-	-	-	-	-	20
Total		180	22	22	23	25	23	25	20	20

The number of credits in each semester is summarized as follows:

Programme	I	II	III	IV	V	VI	VII	VIII
B.Sc. Physics	22	22	23	25	23	25	20	20

Suggested List of Courses for Programme Elective – I

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
1	U24PH901	Renewable Energy	3	0	0	3
2	U24PH902	Laser and its Applications	3	0	0	3
3	U24PH903	Numerical Methods	3	0	0	3
4	U24PH904	Astronomy and Astrophysics	3	0	0	3
5	U24PH905	Elements of Modern Physics	3	0	0	3

Suggested List of Courses for Programme Elective – II

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
1	U24PH951	Micro Processor and Microcontroller	3	0	0	3
2	U24PH952	Nanoscience and Technology	3	0	0	3
3	U24PH953	Artificial Intelligence in Physics	3	0	0	3
4	U24PH954	Instrumentation Techniques	3	0	0	3
5	U24PH955	Physics for IOT Devices	3	0	0	3

List of Courses under each Category

Major (Core)

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
1.	U24PH201	Properties of Matter and Sound	3	0	0	3
2.	U24PH202	Heat and Thermodynamics	3	0	0	3
3.	U24PH203	Optics	3	0	0	3
4.	U24PH204	Properties of Matter and Sound Laboratory	0	0	2	1
5.	U24PH205	Thermodynamics and Optics Laboratory	0	0	2	1
6.	U24PH251	Laser and Fibre Optics	3	0	0	3
7.	U24PH252	Electricity and Magnetism	3	0	0	3
8.	U24PH253	Energy Physics	3	0	0	3
9.	U24PH254	Heat and Thermodynamics Laboratory	0	0	2	1
10.	U24PH255	Electricity and Magnetism Laboratory	0	0	2	1
11.	U24PH301	Atomic Physics	3	0	0	3
12.	U24PH302	Solid State Physics	3	1	0	4
13.	U24PH303	Analog Electronics	3	0	0	3
14.	U24PH9XX	Programme Elective - I	3	0	0	3
15.	U24PH305	Analog Electronics Laboratory	0	0	4	2
16.	U24PH351	Nuclear and Particle Physics	3	0	0	3
17.	U24PH352	Quantum Physics	3	1	0	4
18.	U24PH353	Material Science Fundamentals	3	0	0	3
19.	U24PH354	Digital Electronics	3	0	0	3
20.	U24PH8XX	Online Course	3	0	0	3
21.	U24PH9XX	Programme Elective - II	3	0	0	3

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
22.	U24PH355	Digital Electronics Laboratory	0	0	4	2
23.	U24PH356	Capstone Project	0	0	8	4
Total			48	2	24	62

Additional Major (Core) for 4 years B.Sc. (Honours) Physics						
24.	U24PH401	Mathematical Physics	3	1	0	4
25.	U24PH402	Classical Mechanics	3	1	0	4
26.	U24PH403	Theory of Relativity	3	1	0	4
27.	U24PH451	Atomic and Molecular Spectroscopy	3	0	2	4
28.	U24PH452	Statistical Mechanics	3	1	0	4
Total			15	4	2	20

Additional Major (Core) for 4 years B.Sc. (Honours with Research)						
29.	U24PH401	Mathematical Physics	3	1	0	4
30.	U24PH402	Classical Mechanics	3	1	0	4
31.	U24PH407	Applicative Research	0	0	8	4
Total			6	2	8	12

Minor (Core)

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
1	U24MA101	Matrices and Differential Calculus	3	1	0	4
2	U24CH101	Chemical Bonding and Energy Dynamics	3	0	0	3
3	U24CH102	Quantitative and Qualitative Analysis Laboratory	0	0	4	2
4	U24PH151	Fundamentals of Physics	3	0	0	3
5	U24MA152	Vector Calculus	3	1	0	4
6	U24PH152	Physics Laboratory	0	0	2	1
7	U24MA206	Fourier Series and Laplace Transforms	3	1	0	4
8	U24PH304	Biophysics	3	0	0	3
Total			18	3	6	24

Additional Minor (Core) for 4 years B.Sc. (Honours) Physics

9	U24PH404	Data Science for Physicist	3	0	2	4
10	U24PH405	Optoelectronics	3	0	2	4
Total			6	0	4	8

Additional Minor (Core) for 4 years B.Sc. (Honours with Research) Physics

11	U24PH404	Data Science for Physicist	3	0	2	4
12	U24PH406	IPR and Research Methodology	3	1	0	4
Total			6	1	2	8

Multidisciplinary

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
1	U24JM101	Basics of Media Culture and Society	3	0	0	3
2	U24ED257	Emotional Intelligence	3	0	0	3
3	U24PH7XX	Open Elective - II	3	0	0	3
Total			9	0	0	9

Ability Enhancement Courses

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
1	U24TA101	பொதுத்தமிழ் (General Tamil)	3	0	0	3
	U24TA102	□□□□□□□□□□□□□□□□ (Foundational Tamil)				
2	U24EN102	English for Communication - I	3	0	0	3
3	U24TA151	அறிவியல் தமிழ் (Scientific Tamil)	3	0	0	3
	U24TA152	வளர் தமிழ் (Beginners Tamil)				
4	U24EN152	English for Communication - II	3	0	0	3
5	U24TA201	கணினித்தமிழ் (Computing Tamil)	3	0	0	3
6	U24EN201	English for Communication - III	3	0	0	3
7	U24TA251	தொழில்நுட்பத்தமிழ் (Technical Tamil)	3	0	0	3
8	U24EN251	English for Communication - IV	3	0	0	3
Total			24	0	0	24

Skill Enhancement Courses

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
1	U24EM101	Coding Techniques	3	0	0	3
2	U24EM102	Coding Techniques Laboratory	0	0	2	1
3	U24EM151	Programming in Practice	3	0	0	3
4	U24EM152	Programming in Practice Laboratory	0	0	2	1
5	U24EM103	Speech Communication Laboratory	0	0	2	1
Total			6	0	6	9

Value Added Courses

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
1	U24VA001	Environmental Studies	2	0	0	2
2	U24VA002	Universal Human Values	2	1	0	3
Total			7	1	0	8

Internship

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
1	U24EM252	Internship	0	0	0	2
2	U24EM301	Community Engagement and Social Responsibility	1	0	2	2
Total			1	0	2	4

Research Project / Dissertation (Honors)

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
1	U24PH453	Project / Dissertation	0	0	24	12

Research Project / Dissertation (Honors with Research)

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
1	U24PH454	Research / Dissertation (with SCOPUS / SCI Publication)	0	0	40	20

Audit Courses

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
1	U24AU003	Cyber Security	2	0	0	--
2	U24AU008	Entrepreneurship Development	2	0	0	--
Total			4	0	0	--