UNIVERSITY OF KERALA

Revised Syllabus for
Msc Degree Programme in Physics

(with effect from 2014 admissions)

UNIVERSITY OF KERALA

M.Sc Degree Programme (effective from 2014 - 15)

Branch II PHYSICS

A: COURSE STRUCTURE & MARK DISTRIBUTIC

Semester	Paper Code	Title of Paper	Contact hours per week			UE duration (h)	Maximum mark		
			L	T	P		IA	UE	Total
I	PH 211	Classical Mechanics	6	1	…	3	25	75	100
	PH 212	Mathematical Physics	6	1	…	3	25	75	100
	PH 213	Basic Electronics	6	1	…	3	25	75	100
	PH 251	General Physics Practicals	…	1	3	…	…	…	…
	PH 252	Electronics & Computer Science Practicals	…	1	4	…	…	…	…
		Total for Semester I (S1)	18	5	7	…	75	225	300
II	PH 221	Modern Optics & Electromagnetic theory	6	1	…	3	25	75	100
	PH 222	Thermodynamics, Statistical Physics & Basic Quantum Mechanics	6	1	…	3	25	75	100
	PH 223	Computer Science & Numerical Techniques	6	1	…	3	25	75	100
	PH 251	General Physics Practicals	…	1	3	6	25	75*	100
	PH 252	Electronics & Computer Science Practicals	…	1	4	6	25	75*	100
		Total for Semester II (S2)	18	5	7	…	125	375	500
III	PH 231	Advanced Quantum Mechanics	6	1	…	3	25	75	100
	PH 232	Advanced Spectroscopy	6	1	…	3	25	75	100
	PH 233 X	Special Paper I	6	1	…	3	25	75	100
	PH 261	Advanced Physics Practicals	…	1	4	…	…	…	…
	PH 262	Advanced Electronics Practicals	…	1	3	…	…	…	…
		Total for Semester III (S3)	18	5	7	…	75	225	300
	PH 241	Condesed Matter Physics	6	1	…	3	25	75	100
	PH 242	Nuclear & Particle Physics	6	1	…	3	25	75	100
	PH 243 X	Special Paper II	6	1	…	3	25	75	100
	PH 261	Advanced Physics Practicals	…	1	3	6	25	75*	100

IV	PH 262	Advanced Electronics Practicals	…	…	4	6	25	75*	100
	PH 201	Project	…	…	…	…	25	75	100
	PH 202	Viva Voce	…	…	…	…	…	100	100
		Total for Semester IV (S4)	18	5	7	…	150	550	700
		Grand Total	**72**	**20**	**28**	…	**425**	**1375**	**1800**

* 10 marks for records

L- Lecture IA - Internal Assesment

T - Tutorial UE - University Exam

P - Practical

X: E (Electronics),M(Materials Science)
N (Nuclear Physics) ,S (Space Physics)
T (Theoretical Physics)

B: SPECIAL PAPERS FOR THIRD AND FOURTH SEMESTERS

Special paper Category	Code Nos of Special Papers	Name of Special Papers
1 ELECTRONICS	PH 233 E PH 243 E	Advanced Electronics-I Advanced Electronics-II
2 MATERIALS SCIENCE	PH 233 M PH 243 M	Materials Science-I Materials Science-II
3 NUCLEAR PHYSICS	PH 233 N PH 243 N	Advanced Nuclear Physics Radiation Physics
4. SPACE PHYSICS	PH 233 S PH 243 S	Space Physics and Plasma Physics Advanced Astrophysics
5.THEORETICAL PHYSICS .	PH 233 T PH 243 T	Theoretical Physics-1 Theoretical Physics-2

C: GENERAL GUIDELINES

C-1 Theory papers

Books of study and corresponding chapters are given for most of the theory papers in the syllabus to define the scope of the syllabus.

For internal evaluation of theory papers at least one Viva must be conducted for each paper

For assignments and seminars current developments in the areas of the syllabus may be chosen for improving the general awareness of the student

In tutorial sessions of theory papers problem solving in different topics of the syllabus may be discussed.

C-2 Lab Courses

Rough records may be properly maintained for each practical paper and should be produced during the University Practical Examinations along with original record book.

Each student is encouraged to include critical comments on each experiments done in the original records including sources and estimates of errors,limitations in the experiments done and scope for improvements/additions in the experimental work.

In performing Electronics Practicals: Bread Board Practice is recommended in addition to soldering of electronic circuits.

UNIVERSITY OF KERALA

Revised Syllabus for

M.Sc Degree Programme in Physics

(With effect from 2018 admissions)

UNIVERSITY OF KERALA

M.Sc Degree Programme (effective from 2018 - 19)

Branch II PHYSICS

A: COURSE STRUCTURE & MARK DISTRIBUTION

Semester	Paper Code	Title of Paper	Contact hours per week			UE duration (h)	Maximum mark		
			L	T	P		IA	UE	Total
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	PH 213	Basic Electronics	6	1	…	3	25	75	100
	PH 251	General Physics Practicals	…	1	3	…	…	…	…
	PH 252	Electronics & Computer Science Practicals	…	1	4	…	…	…	…
		Total for Semester I (S1)	18	5	7	…	75	225	300
II	PH 221	Modern Optics & Electromagnetic theory	6	1	…	3	25	75	100
	PH 222	Thermodynamics, Statistical Physics & Basic Quantum Mechanics	6	1	…	3	25	75	100
	PH 223	Computer Science & Numerical Techniques	6	1	…	3	25	75	100
	PH 251	General Physics Practicals	…	1	3	6	25	75*	100
	PH 252	Electronics & Computer Science Practicals	…	1	4	6	25	75*	100
		Total for Semester II (S2)	18	5	7	…	125	375	500

	PH 231	Advanced Quantum Mechanics	6	1	…	3	25	75	100
	PH 232	~~Advanced Spectroscopy~~	6	1	…	3	25	75	100
	PH 233 X	Special Paper I	6	1	…	3	25	75	100
III	PH 261	Advanced Physics Practicals	…	1	4	…	…	…	…
	PH 262	Advanced Electronics Practicals	…	1	3	…	…	…	…
		Total for Semester III (S3)	18	5	7	…	75	225	300
	PH 241	Condesed Matter Physics	6	1	…	3	25	75	100
	PH 242	Nuclear & Particle Physics	6	1	…	3	25	75	100
	PH 243 X	Special Paper II	6	1	…	3	25	75	100
	PH 261	Advanced Physics Practicals	…	1	3	6	25	75*	100

IV	PH 262	Advanced Electronics Practicals	…	…	4	6	25	75*	100
	PH 201	Project	…	…	…	…	25	75	100
	PH 202	Viva Voce	…	…	…	…	…	100	100
		Total for Semester IV (S4)	18	5	7	…	150	550	700
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C-2 Lab Courses

Rough records may be properly maintained for each practical paper and should be produced during the University Practical Examinations along with original record book.

Each student is encouraged to include critical comments on each experiment done in the original records including sources and estimates of errors, limitations in the experiments done and scope for improvements/additions in the experimental work.

In performing Electronics Practicals: Bread Board Practice is recommended in addition to soldering of electronic circuits.

C-3 Special papers

Depending on the expertise and facilities available in a College (with approval of the University and Government as per rules) one of the five Specialisations (Special paper Category) may be chosen by a student for the third and fourth semesters of the M.Sc Programme in Physics. At present for all specialisations, practical courses are common.

C4-Project work and Project Evaluation

The Project may be started during the second semester of the M.Sc programme.

25 marks of the project are to be awarded on the basis of internal assessment carried out in the College for each student concerned. A Project rough record may be maintained by each student to help to evaluate the progress of the project. Each student is required to present the completed project along with experimental demonstration if any in the college before the final University examinations in the Fourth Semester of the MSc (Physics) Programme.

For University Examinations for the Project: 50 marks is allotted for Project report evaluation and 25 marks allotted for Project based Viva Voce to be conducted along with General Viva Voce examination by the University.

D Pattern of University Question papers

D-1 Theory Papers

Each question Paper has three parts: Part A, Part B and Part C

Part A: Eight short answer questions covering the entire syllabus. *One of the questions from this section may be used to test the CURRENT AWARENESS (general knowledge) of the student in the areas of syllabus covered for this paper.* Each question carries 3 marks.

Part B: contains three compulsory questions with internal choice. Questions cover all the three units in the syllabus. Each question carries 15 marks.

Part C: contains six problems covering the entire syllabus. The student needs to answer any three. Each question carries five marks.

The question paper pattern for the theory papers is given separately.

D-2 PRACTICALS

Each practical paper carries a total of 75 marks. 10 marks are allotted for practical records.

PH 252: Electronics and Computer Science: Unit A-Electronics practical (4h, 45 marks)

Unit B- Computer Science (2h, 20 marks)

PH261: Advanced Physics has two parts: Physics Experiment (5h, 45 marks)
Data Analysis of given scientific data (1 h, 20 marks)
PH 262: Advanced Electronics has two parts: (i) Electronics Practicals (4h, 45 marks)

(ii) Microprocessor Practicals (2h, 20 marks)

PH 201 Project: Internal Evaluation for project is 25 marks

For University Examinations: 50 marks for Project Dissertation/report evaluation and 25 marks for Project based Viva Voce

PH 202 General Viva Voce: For General Viva Voce covering the entire MSc Syllabus,

University Examinations: 100 marks

(University Question Paper pattern given separately)

Question paper pattern

MSc Degree Examination

Branch II PHYSICS

PH 2xy……

Duration: 3 hours **Maximum marks: 75**

Instructions to question paper setter

1. Each question paper has three parts - Part A, Part B and Part C

2. Part A contains eight short answer questions spanning the entire syllabus, of which the candidate has to answer any *five* question carries *three* marks.
3. Part B contains *three* compulsory questions with internal choice. Each question shall be drawn from each unit of the syllabus. Each question carries 15 marks
4. Part C contains six problems spanning the entire syllabus. The candidate has to answer any *three*. Each question carries *five* marks

PART A

(Answer any five questions. Each question carries three marks)

I (a)

(b)

(c)

(d)

(e)

(f)

(g)

(h)

UNIVERSITY OF KERALA

Revised Syllabus for

M.Sc Degree Program in Physics

(With effect from 2020 admissions)

UNIVERSITY OF KERALA

M. Sc Degree Program in Physics

Objectives: Major objective of the M. Sc Physics program of University of Kerala is to equip the students for pursuing higher studies and employment in any branches of Physics and related areas. The program also envisages developing thorough and in-depth knowledge in Mathematical Physics, Classical Mechanics, Quantum Mechanics, Statistical Physics, Electromagnetic Theory, Nuclear Physics, Atomic and Molecular Spectroscopy and Electronics. The program also aims to enhance problem solving skills of students so that they will be well equipped to tackle national level competitive exams. The program also acts as a bridge between theoretical knowhow and its implementation in experimental scenario. The program also introduces the students to the scientific research approach in defining problems, execution through analytical methods, systematic presentation of results keeping in line with the research ethics through M. Sc dissertations.

Program Outcome

(i) Define and explain fundamental ideas and mathematical formalism of theoretical and applied physics.

(ii) Identify, classify and extrapolate the physical concepts and related mathematical methods to formulate and solve real physical problems.

(iii) Identify and solve interdisciplinary problems that require simultaneous implementation of concepts from different branches of physics and other related areas.

(iv) To define a research problem, translate ideas into working models, interpret the data collected draw the conclusions and report scientific data in the form of dissertation.

(v) To disseminate scientific knowledge and scientific temper in the society to contribute towards greater human cause.

UNIVERSITY OF KERALA

M.Sc Degree Program (effective from 2018 - 19) Branch

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