

(Abstract)

M.Sc. Physics (Advanced Materials) Programme (CBCSS) - Open Elective Courses Modified in the Scheme and Syllabus - implemented in the University Department - w.e.f. 2021 Admission - Orders issued.

ACADEMIC C SECTION

Acad/C4/12614/2020

Dated: 06.12.2022

- Read:-1. U.O. No. Acad/C4/12614/2020 dated 06.01.2021
2. U.O. No. ACAD C/ACAD C3/4236/2021 dated 03.10.2022
3. The Minutes of the meeting of the Department Council, Dept of Physics dated 06.10.2022
4. Syllabus submitted by the HoD, Dept of Physics dated 29.11.2022

ORDER

1. As per paper read (1) above, the Revised Scheme, Syllabus and Model question papers of M.Sc. Physics (Advanced Materials) Programme (CBCSS) implemented in the University Department - w.e.f 2020 admission
2. As per paper read (3) above, the Department Council, Department of Physics resolved to incorporate the following modifications in the Syllabus for implementation from 2021 admission onwards and as requested as per paper read (2) above.
 - To include Open Elective Course- MSPHY03O01-Energy Physics in the third semester
 - To shift MSPHY04C14 Study Tour Report from third semester to fourth semester
3. As per paper read (4) above, HoD, Dept of Physics submitted the modified Scheme, Syllabus of M.Sc. Physics (Advanced Materials) Programme (CBCSS) for implementation with effect from 2021 admission.
4. The Vice Chancellor after considering the matter in detail and in exercise of the powers of the Academic Council conferred under section 11 (1) Chapter III of Kannur University Act 1996 accorded sanction to implement the modified Scheme and Syllabus of M.Sc. Physics (Advanced Materials) Programme (CBCSS) in the Department of Physics, Swami Anandatheertha Campus, Payyannur as detailed in para (2) above, with effect from 2021 admission, and to report to the Academic Council.
5. The modified Scheme & Syllabus of M.Sc. Physics (Advanced Materials) Programme (CBCSS) implemented with effect from 2021 admission are appended and uploaded in the University Website.(www.kannuruniversity.ac.in).
6. The UO read (1) above stand modified to this effect
Orders are issued accordingly.

Sd/-

BALACHANDRAN V K
DEPUTY REGISTRAR (ACAD)
For REGISTRAR

To: 1. The Head, Dept. Physics
Swami Anandatheertha Campus, Payyannur

Copy To: 1. The Examination Branch (through PA to CE).
2. PS to VC / PA to PVC / PA to R
3. DR / AR 1/ AR II (Acad), EXCI, EPIV
4. The Web Manager (for uploading in the Website), Computer Programmer
5. SF / DF /FC

Forwarded/ By Order


SECTION OFFICER

KANNUR UNIVERSITY

Regulation, Scheme and Syllabus

for

M.Sc. PROGRAMME

in

PHYSICS

(Advanced Materials)

Choice Based Credit Semester System

For 2021 Admission only

KANNUR UNIVERSITY

School of Pure and Applied Physics

KANNUR UNIVERSITY

**REGULATIONS FOR POST GRADUATE PROGRAMMES UNDER CHOICE
BASED CREDIT SEMESTER SYSTEM
IN THE DEPARTMENTS/SCHOOLS EFFECTIVE
FROM 2021 ADMISSION**

1. SCOPE

- 1.1 These Regulations shall apply to all the Post Graduate programmes, including P.G. Diploma and Certificate Courses conducted by the Departments/Schools of Kannur University
- 1.2 Choice based Credit Semester System presupposes academic autonomy, cafeteria approach in academic environment, semester system, course credits, alphabetical grading and interdepartmental academic collaboration. There shall be a Department Council consisting of all the Permanent/Contract teachers of the Department. The Head of the Department shall be responsible for admission to all the programmes offered by the Department including conduct of entrance tests, verification of records, admission and evaluation. The Department Council will deliberate on courses and specify the distribution of credits semester wise and course wise. For each course, it will specify the number of credits for lectures, tutorials, practicals etc.
- 1.3 These regulations shall come into effect from 2020 admission onwards and supersede all other Regulations unless otherwise prescribed.

2. DEFINITIONS

- 2.1 Curriculum Committee means the Committee constituted by the Vice-Chancellor under these Regulations to monitor the running of Choice based Credit Semester System. One of the Senior Professors shall be the Convener of the Curriculum Committee coordinating the various academic activities
- 2.2 Department/Centre/School means Department/Centre/School instituted in the University as per Kannur University Statutes.
- 2.3 '**Academic Programme**' means an entire course of study comprising its programme structure, course details, evaluation schemes etc. designed to be taught and evaluated in a teaching Department.
- 2.4 '**Course**' means a segment of a Programme limited to one semester in a subject.
- 2.5 '**Programme Structure**' means a list of courses (Core, Elective, and Open Elective) that makes up an Academic Programme, specifying the syllabus, credits, hours of teaching, evaluation and examination schemes, minimum number of credits required

for successful completion of the programme etc. prepared in conformity with University Rules

2.6 '**Core Course**' means a course that a student admitted to a particular programme must successfully complete to receive the degree, and which cannot be substituted by any other course.

2.7 '**Elective Course**' means an optional course to be selected by a student out of such courses offered in the same or any other Department/Centre.

2.8 '**Open Elective**' means an elective course which is available for students of all programmes, including students of same department. Students of other Departments may opt these courses subject to fulfilling of eligibility of criteria as laid down by the Department offering the course.

2.9 '**Credit**' means the value assigned to a course which indicates the level of instruction. Normally, one hour lecture per week equals 1 Credit; 2/3 hours practical class per week equals 1 credit. Credit for a practical could be proposed as part of a course or as a separate practical course

2.10 '**SGPA**' means Semester Grade Point Average calculated for individual semester.

2.11 '**CGPA**' is Cumulative Grade Points Average calculated for all courses completed by the students in the last year of the course by clubbing together SGPA of four semesters

3. **ELIGIBILITY FOR ADMISSION**

3.1 BSc Physics with Mathematics as complementary course with minimum 50% marks or equivalent grade in core course.

3.2 Candidates who have passed their qualifying examination from Universities outside Kerala and candidates, who have passed their degrees with different nomenclature from the Universities within Kerala, should submit Recognition/Equivalency Certificate while seeking admission.

4. **ADMISSION**

4.1. As per the regulations prescribed by the University Departments for each Programme from time to time. However, blind/deaf candidates are not eligible for admission to the course.

4.2 Admission to the PG programme of the University departments shall be made purely on the basis of Entrance Examination. Newspaper notification in this regard has to be made in the month of May itself. Entrance Examination is mandatory for all the

departments even if the numbers of applicants are less than the sanctioned strength. If the number of candidates admitted based on the Entrance Exam is less than the sanctioned strength, the concerned department can fill the vacancy by making necessary press release by fulfilling the reservation norms on the basis of the marks obtained in the qualifying examination.

4.3 There should be uniformity in the date of starting the courses and conducting the End Semester Examination of different PG programmes of the University.

5. **REGISTRATION**

5.1 Every Department/School shall have Permanent / Contract faculty members as Student Advisors. Each student at the time of admission will be assigned to an advisor by the Department Council. He/she will advise the student about the academic Programme and counsel on the choice of courses depending on the student's academic background and objective. The student will then register for the courses she/he plans to take for the semester before the classes begin.

5.2 The Department offering any course shall prescribe the maximum number of students that can be admitted taking into consideration the facilities available. The Department Council will be the authority to fix the optionals that can be offered for a Programme while ensuring that sufficient choice is given to each student in all semesters other than Semester 01. Elective courses for the next semester will be announced within 10 days of the end of the previous semester.

5.3 The student has to complete the prescribed prerequisites for the course before registration. The student within a maximum of 10 working days after the commencement of the classes can change the Optional Course with the consent of Head of the Department in consultation with the Advisor.

5.4 The Department shall make available to all students a bulletin listing all the courses offered in every Semester specifying the Credits, list of topics the course intends to cover, the name of the instructor, the timetable and examination schedule. This will be made available in the last week of each semester after it is approved by the Department Council, the Dean and the Vice Chancellor.

6. **COURSE STRUCTURE**

6.1 Three kinds of Courses are offered - Core, Elective and Open Elective Courses (including MOOC courses). Core Courses are offered by the Department conducting

the Programme. Elective / Open Elective Courses are offered either by the Department conducting the Programme or by any other Department of the University or via MOOC.

- 6.2 Elective Courses are offered by the Department concerned. Open Elective Courses will be offered by other Departments/Centres/Institutions as options. Open Elective Courses can be opted in any of the Semesters during the entire Programme other than the first semester. The maximum students that can be admitted to an Open Elective Course is limited to forty (40) except for MOOC courses. If the student intake in a department is more than 40, then the maximum number of students that can be admitted to an Open Elective Course is equal to the student intake.
- 6.3 Every Course offered by the University Department is identified by a unique course code. Where first two letters denote Programme name (MS for Master of Science). Next three letters denote subject. This is followed by semester number such as 01, 02, 03,04. After semester number single alphabet stands for Core (C). Elective (E) and Open Elective course (O). The last two digits denote the serial number of the course in that category (C, E or O) in that programme. MSPHY01C02 MS – Master of Science, PHY – Physics 01 – First Semester C – Core 02– Serial number of the Core course of the programme
- 6.4 Any course including a core course of one Department can be offered as an Open Elective Course to students of other Departments
- 6.5 The minimum duration for completion of a two-year PG Programme is four (4) Semesters and the maximum period for completion is eight (8) Semesters from the date of registration. The minimum duration for completion of a one year PG programme in any subject is two (2) semesters and the maximum period for completion is four (4 semesters) four years from the date of registration.
- 6.6 No regular student shall register for more than 24 credits and less than 16 credits per Semester, subject to the provisions of the Programme concerned.
- 6.7 The total credits required for the successful completion of a four semester Programme will be between 72 to 80. For science subjects core credits should not exceed 70 per cent.
- 6.8 The Department Council shall design the Core, Elective and Open Courses including the detailed syllabus for each Programme offered by the Department. The Department Council shall have the freedom to introduce new courses and/or to modify/redesign existing Courses and replace any existing Course with a new

Course to facilitate better exposure and training for the students, with the approval of the Faculty Council and the Academic Council.

7. EVALUATION

- 7.1 Evaluation of the students shall be done by the Faculty member who teaches the Course on the basis of Continuous Evaluation and an End Semester Examination. The proportion of the distribution of marks among End Semester Examination and Continuous Evaluation shall be 60:40. 10 percent of the scripts, subject to a minimum of 5 scripts per course will be valued by an External Examiner. If there is an average difference of more than 15 per cent in the marks awarded by the Internal and External Examiner, the scripts will be valued by one internal and External examiner, the scripts will be valued by one Internal and one External examiner together.
- 7.2 Continuous Evaluation includes Assignments, Seminars, periodic written examinations etc.
- 7.3 The allocation of marks for each component under Continuous Evaluation shall be in the following proportions:

Theory		Practical	
Components	% of marks	Components	% of marks
Test papers	40% (16 marks)	Tests	75% (30 marks)
Tutorial with viva, Seminar presentations, Discussion, Debate etc	40% (16 marks)	Record	25% (10 marks)
Assignment	20% (8 marks)		
Total Internal marks	40	Total internal marks	40

- 7.4 Mode of assessment i.e., administering of Test or Tutorial will be decided by individual departments

7.5 A copy of all records of Continuous Evaluation shall be maintained in electronic format in the Department and shall be made available for verification by the University.

7.5 Performance of each student in an assessment shall be intimated to him/her within two weeks of the conduct of test/ submission of assignment/ report.

8. CONDUCT OF THE END SEMESTER EXAMINATION

8.1 The End Semester Examinations of each semester will be conducted by the Controller of Examinations. It will be the responsibility of the Department to maintain a sufficient balance of different levels of questions in the Question Bank. The tabulation registers of each Semester shall be prepared and maintained by the Examination Branch. There shall be a minimum of one external examiner to ensure transparency in the conduct of examinations. The external examiners will be faculty members appointed from other Colleges/Departments of this University or from other Universities. The duration of End Semester Examination shall be specified in the curriculum.

8.2 The Board of Examiners will function as the Pass Board and will be called the Subject Examination Board with the Head of the Department/or a nominee of the Vice Chancellor when there is no University Department offering that Programme as its Chair

9. ATTENDANCE

9.1. The minimum attendance required for each Course shall be 60% of the total number of classes conducted for that semester. Those who secure the minimum attendance in a semester alone will be allowed to register for the End Semester Examination. Condonation of attendance to a maximum of 10 days in a Semester subject to a maximum of two spells within a Programme will be granted by the Vice-Chancellor. Benefit of Condonation of attendance will be granted to the students on health grounds, for participating in University Union activities, meetings of the University Bodies and participation in extracurricular activities on production of genuine supporting documents with the recommendation of the Head of the Department concerned. A student who is not eligible for Condonation shall repeat the Course along with the subsequent batch.

10. GRADING

10.1 An alphabetical Grading System shall be adopted for the assessment of a student's performance in a Course. The grade is based on a 6 point scale. The following table gives the range of marks %, grade points and alphabetical grade.

Range of Marks %	Grade Points	Alphabetical Grade
90-100	9	A+
80-89	8	A
70-79	7	B+
60-69	6	B
50-59	5	C
Below 50	0	F

10.2 A minimum of grade point 5 (Grade C) is needed for the successful completion of a Course. A student who has failed in a Course can reappear for the End Semester Examination of the same Course along with the next batch without taking re-admission or choose another Course in the subsequent Semesters of the same programme to acquire the minimum credits needed for the completion of the Programme. There shall not be provision for improvement of CE and ESE. A student can sit the ESE again if she/he has successfully completed the CE requirements in a subsequent semester subject to the maximum durations permitted.

10.3 Performance of a student at the end of each Semester is indicated by the Semester Grade Point Average (SGPA) and is calculated by taking the weighted average of grade points of the Courses successfully completed. Following formula is used for the calculation. The average will be rounded off to two decimal places.

$$\text{CGPA} = \frac{\text{Sum of (grade points in a course multiplied by its credit)}}{\text{Sum of Credits of Courses}}$$

10.4 At the end of the Programme, the overall performance of a student is indicated by the Cumulative Grade Point Average (CGPA) and is calculated using the same formula given above.

10.5. Empirical formula for calculating the percentage of marks will be

$$\% \text{ Marks} = (\text{CGPA} \times 10) + 5.$$

10.6 Based on the CGPA overall letter grade of the student and classification shall be in the following way.

CGPA	Overall Letter Grade	Classification
8.5 and above	A+	First Class with Distinction
7.5 and above but less than 8.5	A	
6.5 and above but less than 7.5	B+	First Class
5.5 and above but less than 6.5	B	
5 and above but less than 5.5	C	Second Class

10.7 Appearance for Continuous Evaluation (CE) and End Semester Evaluation (ESE) are compulsory and no Grade shall be awarded to a candidate if he/she is absent for CE/ESE or both.

10.8 A student who fails to complete the Programme/Semester can repeat the full Programme / Semester once, if the Department Council permits to do so. Absence in an examination will be marked zero.

10.9 No student shall be allowed to take more than eight/twelve consecutive Semesters for completing a four/six Semester Programme from the date of enrolment.

11. **GRADE CARD**

11.1. The Controller of Examinations shall issue the grade cards of all semesters and the consolidated grade card and certificates on completion of the programme, based on the details submitted by the Heads of the Departments concerned. This will be in digital form only.

11.2. The Grade Card shall contain the following

- a) Title of the Courses taken as Core, Elective & Open Elective.
- b) The credits associated with and grades awarded for each Course.
- c) The number of credits (Core /Elective / Open) separately earned by the student and the SGPA.
- d) The total credits (Core / Elective / Open) separately earned by a student till that Semester.

11.3. The consolidated grade statement issued on completion of the Programme shall contain the name of the Programme, the Department/School offering the

Programme, the title of the Courses taken, the credits associated with each Course, grades awarded, the total credits (Core /Elective/Open) separately earned by the student, the CGPA and the class in which the student is placed. Rank Certificates will be issued based on CGPA calculated at the end of the last semester of that Programmes.

12. DEPARTMENT COUNCIL

- 12.1 All the Permanent and Contract teachers of the Department shall be the members of the Department Council.
- 12.2 The Department Council subject to these Regulations shall monitor every academic programme conducted in the Department.
- 12.3 Department Council shall prescribe the mode of conduct of courses, conduct of examinations and evaluation of the students.
- 12.4 An elected student representative also may attend the department council meeting where agenda related to academic matters / research activities of students are discussed

13. CURRICULUM COMMITTEE

- 13.1 There shall be a Curriculum Committee constituted by the Vice Chancellor to monitor and co-ordinate the working of the Choice based Credit Semester System.
- 13.2 A senior professor nominated by the Vice Chancellor shall be the convener of the Curriculum Committee.
- 13.3 The Committee shall consist of:
 - a) Vice-Chancellor or person nominated by VC (Chairperson)
 - b) The Convener of the Curriculum Committee (A professor of the University nominated by the Vice-Chancellor)
 - c) The Registrar -Secretary
 - d) The Controller of Examinations
 - e) Deans
 - f) The Heads of the Departments

- 13.4 The term of office of the Committee shall be two years, but the Committee once constituted shall continue in office until a reconstituted committee assumes office.

14. ACADEMIC GRIEVANCE REDRESSAL MECHANISM

- 14.1 Committees will be constituted at the Department and University levels to look into the written complaints regarding Continuous Evaluation (CE). Department Level Committee (DLC) will consist of the Department Council, and elected student representatives who is currently a student of that Programme of study. There will be one student representative for the post graduate programmes and one student representative for the doctoral programme.
- 14.2 University Level Committee (ULC) will consist of the Convenor of the Curriculum Committee, the concerned Dean, the concerned Head of the Department and a nominee of the Students' Union
- 14.3 Department Level Committee will be presided over by the HoD. Complaints should be submitted to the Department concerned within two weeks of publication of results of Continuous Evaluation (CE) and disposed of within two weeks of receipt of complaint. Appeals to University Level Committee should be made within two weeks of the decisions taken by Department Level Committee and disposed of within two weeks of the receipt of the complaint.
- 14.4 Complaints unsolved by the University Level Grievance Committee shall be placed before the Vice Chancellor.

15. TRANSITORY PROVISION

- 15.1 Notwithstanding anything contained in these regulations, the shall for a period of one year (may be revised) from the date of coming into force of these regulations, the Vice Chancellor have the power to provide by order that these regulations shall be applied to any Programme with such modifications as may be necessary.

16. REPEAL

- 16.1 The Regulations now in force so far as they are applicable to programmes offered in the University Departments and to the extent they are inconsistent with these regulations are hereby repealed. In the case of any inconsistency between the implemented regulations of Choice based Credit Semester System and its application to any independent programme offered in a University Department, the former shall prevail.

Scheme and Syllabus for

M. Sc. Physics (Advanced Materials) Programme (CCSS)

For the University Physics Department w.e.f. **2021** admission onwards

I. About the Department

The Post Graduate Department of Physics of the Kannur University was established in 2003 at Edat, about two kilometres far from Payyanur town heading towards the south. The campus is calm and beautiful, away from the bustle and pollution of the city where modern buildings with all high-tech infrastructure facilities for the smooth functioning of the Post Graduate & Research programmes in Physics have been established with an intake of 20 students.

The aim of the Department is to impart up to date information and new knowledge materials as evolved from time to time to our students so as to meet the requirements of trained manpower in Physics towards the areas of teaching, research, engineering and other vocations. It is meant mainly to benefit the aspiring students of the northern part of Kerala. The University takes all efforts to develop this campus as a centre of excellence with well-qualified faculty and provides most modern techniques in teaching, with the well-equipped, enhanced computer and research laboratories. The Department has plans to introduce innovative programs in research leading to M. Phil and Ph.D. in the forthcoming years. The thrust area of teaching is chosen as Material Science which includes areas such as Thin Film Technology, Semiconductor Materials, Nanomaterials, Lasers and Optoelectronics, Polymer Materials, Composite Materials, Photovoltaic Energy Conversion, Ceramic Materials etc. The main thrust areas of research are Materials Science and Nuclear Physics.

The Post Graduate course has been designed with specialization in Materials Science and is equivalent to the other M.Sc. courses in Physics of the Kannur University and all the other universities at Kerala State.

II. Introduction to CBCS (Choice Based Credit System) Choice Based Credit System:

The CBCS provides an opportunity for the students to choose courses from the prescribed courses comprising core, elective/minor or skill-based courses. The courses can be evaluated following the grading system, which is considered to be better than the conventional marks system. Grading system provides uniformity in the evaluation and computation of the Cumulative Grade Point Average (CGPA) based on student's performance in examinations which enables the student to move across institutions of higher learning. The uniformity in evaluation system also enables the potential employers in assessing the performance of the candidates. Definitions: (i) 'Academic Programme' means an entire course of study comprising its programme structure, course details, evaluation schemes etc. designed to be taught and evaluated in a teaching Department/Centre or jointly

under more than one such Department/ centre. (ii) 'Course' means a segment of a subject that is part of an Academic Programme. (iii) 'Programme Structure' means a list of courses (Core, Elective, Open Elective) that makes up an Academic Programme, specifying the syllabus, credits, hours of teaching, evaluation and examination schemes, minimum number of credits required for successful completion of the programme etc. prepared in conformity to University rules, eligibility criteria for admission. (iv) 'Core Course' means a course that a student admitted to a particular programme must successfully complete to receive the degree and which cannot be substituted by any other course. (v) 'Elective Course' means an optional course to be selected by a student out of such courses offered in the same or any other Department/Centre. (vi) 'Open Elective' means an elective course which is available for students of all programmes, including students of the same department. Students of other Department will opt these courses subject to fulfilling the eligibility of criteria as laid down by the Department offering the course. (vii) 'Credit' means the value assigned to a course which indicates the level of instruction; One-hour lecture per week equals 1 Credit, 2 hours practical class per week equals 1 credit. Credit for a practical could be proposed as part of a course or as a separate practical course.

'SGPA' means Semester Grade Point Average calculated for individual semesters. (ix) 'CGPA' is Cumulative Grade Points Average calculated for all courses completed by the students at any point of time. CGPA is calculated each year for both the semesters clubbed together. (x) 'Grand CGPA' is calculated in the last year of the course by clubbing together a CGPA of two years, i.e., four semesters. Grand CGPA is being given in Transcript form. To benefit the student a formula for conversation of Grand CGPA into percentage marks is given in the Transcript.

III. Programme Objectives (PSOs):

- To develop strong student competencies in Physics and its applications in a technology-rich, interactive environment.
- To develop strong student skills in research, analysis and interpretation of complex information.