

**DELHI TECHNOLOGICAL UNIVERSITY**

**SCHEME OF EXAMINATION**

**for**

**M.Sc. (Physics) 2019-2021**

The University in tune with the Post Graduate attributes devised by the UGC developed a framework for instructional structure. The Proposed version is the minimum requirement for a Master's Degree within the limitations of CBCS norms stipulated by the UGC. The CBCS provides for inbuilt flexibilities in which the students have a choice of pursuing courses of their choice in the form of electives. This not only broadens their horizons but also intends to make students well rounded in all spheres of development. Thus, CBCS is an effective process of 'Academic Reforms' to sustain the Quality Education that focuses on the learner centric education.

### **SALIENT FEATURES OF CBCS GUIDELINES ISSUED BY UGC**

1. The main feature of the CBCS is to make postgraduate education student centric rather than system centric or teacher centric. For achieving these objectives, the CBCS strives to create a holistic syllabus. Thus, in addition to dedicated focus on a discipline through core papers in a regular curriculum, elective papers have been added which will give students the freedom to choose the allied/applied/broad areas of their discipline and also the areas of other disciplines of their interest.
2. Further in keeping with the vision of the Government, special emphasis has been given to ability enhancement and skill development of students through elective courses under these domains which every student is required to study. However, in keeping with the spirit of CBCS here also the students will have complete freedom to choose these courses from a pool suggested by the University.
3. All papers except core papers offer complete freedom to the University in designing and reviewing the syllabi and enable them to offer their own distinct flavor and maintain their unique character. These elective papers provide them with the opportunity to develop competencies of students in their areas of strength, expertise and specialization.
4. Even in the core papers under the proposed guidelines 30% flexibility is proposed in adopting the syllabus as per the template advised by the UGC. It is pertinent to point out that as per the existing education policy different institutions and universities are required to maintain 70% equivalence in the syllabi and the same is being maintained under the proposed system of CBCS.
5. The Departments / Schools must ensure the reasonable and manageable number of credits within the stipulated hours of Instruction not exceeding 30 Hours per Week and also stipulation of an exclusive 10 Hours per Week must be available for active participation of Student in MOOC's, Co and Extra-curricular Activities for achieving Student's Holistic Development.
6. The Department can have the option of 4 Core papers or 3 Core + 1 DSE or mix of two across the semesters. For example, in Semester-I there could be 4 core papers. In Semester II there could be 3 Core and 1 DSE or like. Core courses may have seminar, industrial training and projects. One among the pool of papers offered by the

Department in each semester may be treated as **Discipline Specific Elective (DSE)** across the University. Each of the Core courses and DSE shall be of 4 credits. Credits under DSE may vary (16/12/8) depending upon the number of DSE offered across the semesters. However, the combination of Core (48/52/56) and DSE (16/12/8) shall be of a minimum 64 credits.

7. The interested Students may opt for Project Work, against the Discipline Specific Elective (DSE) offered in IV Semester; however, it may carry 6 Credits for any of the General Education programs. In case of specifics of any discipline, Project work / Dissertation could constitute Core and Mandatory also carry 6 credits and an additional 2 credits of total credits.
8. Each **Generic Elective paper (GE)** will be of 4 Credits and Students has the choice of taking 2 GE's across the 4 semesters. Each student has to take Generic Electives from Department other than the parent Department. Core / DS Electives will not be offered as Generic Electives.
9. Additional Credits may be permitted to accrue under Mandatory Non-CGPA Credit Courses, which classified into two groups one is Compulsory Specified Courses and another is Elective Courses or Activities.
  - a) Compulsory Specified Courses: These are compulsory courses will be of 2 / 4 credits each to be opted by the students of all PG Programs under **Ability Enhancement Courses(AEC)** (4) and **Skill Enhancement Courses** (SEC) (2/4).
    - i. Ability Enhancement Courses (AEC): Communicative English is the Mandatory Course for all except for those who opts English as Language Optional and who shall need to opt for Urdu Language under AEC and will be offered in I and III Semesters amounting to a total of minimum 4 credits. Each AEC shall be of 2 credits.
    - ii. Skill Enhancement Courses (SEC): Fundamentals of Information Technology (FIT) is another Mandatory course for all and those with Computers as a Core/Elective course may choose any other enlisted course under SEC in place of FIT and will be offered in II/IV -Semester. Each SEC shall be of 2 credits.

## Structure of Postgraduate programs

The two-year M.Sc. programs comprise of courses divided in six distinct areas, namely: Departmental Core (DCC), Departmental Specific Elective (DSE), Ability Enhancement Courses (AEC), Skill Enhancement Courses (SEC) and Generic Electives (GE). Credits assigned to various components of the M.Sc. curriculum are given in subsequent Tables2.

### **Course Coding**

A course is identified by a course code designated by a string of alpha-numeric characters and a course title. In a course code, first two letters of the string indicate the Academic Program & next two letters indicate the department offering the course and the last three numbers designate particular course.

### **Course Number**

For all the courses, the first digit corresponds to the level (year) at which a course is normally offered. The last two digits denote the number of the course, which will usually be odd for courses offered in the Odd Semester and even for courses in the Even Semester.

### **Abbreviations and Notations**

#### **Credits: Cr**

#### **Teaching Engagements**

Every course maintains a teaching schedule for which weekly contact hours are decided for delivering lectures (L), engaging tutorials (T) and/or performing practicals(P) to make learning in a course more effective. In the syllabi, the information regarding number of course credits and contact hours per week is denoted as: Credits (L – T – P); 4 (3 – 1–0) and options are tabulated below:

<b>Credits</b>	<b>L</b>	<b>T</b>	<b>P</b>
4	3	1	0
4	4	0	0
4	3	0	2
4	2	1	2
4	2	0	4
4	0	0	8

## Weights for Course Evaluation

Evaluation in every course is based on the weights assigned to various components of the course curriculum. These components are designated as under:

S. No.	Course Type			Examination		Relative Weights				
	L	T	P	Theory	Practical	CWS	PRS	MTE	ETE	PRE
1.	3	1	0	Yes	-	25	-	25	50	-
2.	4	0	0	Yes	0	25	-	25	50	-
3.	3	0	2	Yes	Yes	15	25	20	40	-
4.	2	1	2	Yes	Yes	15	25	20	40	-
5.	2	0	4	Yes	Yes	15	25	20	40	-
6.	0	0	8	-	Yes	-	50	-	-	50

In general, the relative weights assigned to different components of the entire course are as given in subsequent tables.

## 1<sup>st</sup> YEAR

### PROPOSED SCHEME FOR M.Sc.(Physics) FIRST SEMESTER

Teaching Scheme					Contact Hours/ Week			Exam Duration		Relative Weightage %				
S. No.	Subject Code	Course Title	Course Type	Credit	L	T	P	Theory	Practical	CWS	PRS	MTE	ETE	PRE
1.	MSPH 101	Mathematical Physics	C	4	3	1	0	3	0	25	-	25	50	-
2.	MSPH 103	Classical Mechanics	C	4	3	1	0	3	0	25	-	25	50	-
3.	MSPH 105	Quantum Mechanics	C	4	3	1	0	3	0	25	-	25	50	-
4.	MSPH 107	Applied Optics	C	4	3	1	0	3	0	25	-	25	50	-
5.	MSPH 109	Electronics	C	4	3	1	0	3	0	25	-	25	50	-
6.	MSPH 111	Physics Lab-I	C	2	0	0	4	0	2	-	50	-	-	50
		Total		<b>22</b>	15	5	4							
7.	MSHU 113*	AEC (Communicative English)	E	4	3	1	0	3	0	25	-	25	50	-

\*Non CGPA Mandatory Course

#### Credits

Total	Core	Generic Electives (GE)	Department Specific Electives (DEC)	Ability Enhancement Courses (AEC)	Skill Enhancement Courses (SEC)
<b>22</b>	<b>22</b>	-	-	<b>4</b>	-

**1<sup>st</sup> YEAR**

**PROPOSED SCHEME FOR M.Sc.(Physics) SECOND SEMESTER**

S. No.	Subject Code	Teaching Scheme			Contact Hours/ Week			Exam Duration		Relative Weightage %				
		Course Title	Course Type	Credit	L	T	P	Theory	Practical	CWS	PRS	MTE	ETE	PRE
1.	MSPH 102	Advanced Quantum Mechanics	C	4	3	1	0	3	0	25	-	25	50	-
2.	MSPH 104	Statistical Mechanics	C	4	3	1	0	3	0	25	-	25	50	-
3.	MSPH 106	Computational Methods	C	4	3	1	0	3	0	25	-	25	50	-
4.	MSPH 108	Electrodynamics	C	4	3	1	0	3	0	25	-	25	50	-
5.	MSPH 110	Solid State Physics	C	4	3	1	0	3	0	25	-	25	50	-
6.	MSPH 112	Physics Lab-II	C	2	0	0	4	0	2	-	50	-	-	50
		Total			22	15	5	4						
7.	MSCT 114*	SEC (IT related Course)	E	4	3	1	0	3	0	25	-	25	50	-

*\*Non CGPA Mandatory Course*

**Credits**

Total	Core	Generic Electives (GE)	Department Specific Electives (DEC)	Ability Enhancement Courses (AEC)	Skill Enhancement Courses (SEC)
22	22	-	-	-	4

**2<sup>nd</sup>YEAR****PROPOSED SCHEME FOR M.Sc.(Physics) THIRD SEMESTER**

Teaching Scheme					Contact Hours/ Week			Exam Duration		Relative Weightage %				
S. No.	Subject Code	Course Title	Course Type	Credit	L	T	P	Theory	Practical	CWS	PRS	MTE	ETE	PRE
1.	MSPH 201	Atomic and Molecular Physics	C	4	3	1	0	3	0	25	-	25	50	-
2.	MSPH 203	Nuclear and Particle Physics	C	4	3	1	0	3	0	25	-	25	50	-
3.	MSPH 205	Dissertation-I	C	2	-	-	-	-	-	-	40	-	-	60
4.	MSPH207	Elective-I/ Track-1	E	4	3	1	0	3	0	25	-	25	50	-
5.	MSXX XXX	GE-1	E	4	3	1	0	3	0	25	-	25	50	-
6.	MSPH211	Advanced Physics Lab -I	E	4	0	1	6	0	3	0	50	0	0	50
		Total		22	12	7	6							

**Credits**

Total	Core	Generic Electives (GE)	Department Specific Electives (DSE)	Ability Enhancement Courses (AEC)	Skill Enhancement Courses (SEC)
22	10	4	8	-	-



## 2<sup>nd</sup> YEAR

### PROPOSED SCHEME FOR M.Sc.(Physics) FOURTH SEMESTER

Teaching Scheme					Contact Hours/ Week			Exam Duration		Relative Weightage %				
S. No.	Subject Code	Course Title	Course Type	Credit	L	T	P	Theory	Practical	CWS	PRS	MTE	ETE	PRE
1.	MSPH 202	Advanced Semiconductor Devices	C	4	3	1	0	3	0	25	-	25	50	-
2.	MSPH 204	Elective-II/ Track -I	E	4	3	1	0	3	0	25	-	25	50	-
3.	MSXX XXX	GE-2	E	4	3	1	0	3	0	25	-	25	50	-
4.	MSPH 208	Advanced Physics Lab -II	E	4	0	1	6	0	3	0	50	0	0	50
5.	MSPH 210	Dissertation-II	C	8	-	-	-	-	-	-	40	-	-	60
Total				24	9	12	6							

#### Credits

Total	Core	Generic Electives (GE)	Department Specific Electives (DSE)	Ability Enhancement Courses (AEC)	Skill Enhancement Courses (SEC)
24	12	4	8	-	-

<b>Subject Code</b>	<b>Elective-I</b>	<b>Subject Code</b>	<b>Elective-II</b>
MSPH 207	Fibre and Integrated Optics	MSPH 204	Space and Atmospheric Science
MSPH 209	Advanced Condensed Matter Physics	MSPH 206	Lasers and Spectroscopy
MSPH 213	Advanced Numerical Physics	MSPH 212	Spintronics
MSPH 215	Plasma Physics	MSPH 214	Advanced Electronics
MSPH 217	Characterization Techniques	MSPH 216	Advanced Functional Materials

### Credits in Four Semesters

<b>Total</b>	<b>Core</b>	<b>Generic Electives (GE)</b>	<b>Department Specific Electives (DSE)</b>	<b>Ability Enhancement Courses (AEC)</b>	<b>Skill Enhancement Courses (SEC)</b>
<b>90</b>	<b>66</b>	<b>8</b>	<b>16</b>	<b>4</b>	<b>4</b>

### In addition to the above scheme

**Elective Courses / Activities:** These are part of Co and Extra-curricular Activities and must opt for a minimum of 2 to 6 Credits in entire duration of the program.

The Identified MOOC's subjects or any other On-line Courses offered by the Recognized Accredited University enlisted by the University.

OR

The Approved Co and Extra-curricular Activities as defined by the University.