

B.Sc. Honors Physics syllabus 2020-23**Under****CHOICE BASED CREDIT SYSTEM****School of Studies in Physics
Jiwaji University, Gwalior****Detailed structure of the course**

Course Structure Physics-Major (Details of courses under B.Sc. Honors)

Courses	No. of Papers	Theory +Practical I	Theory + Tutorial
I. Core Course 14courses			
Theory	14Papers	14X4=56	14X5=70
Practical or	14Papers	14X2=28	
Tutorial*			14X1=14
II. Elective Course 8courses			
1. Discipline Specific Elective(DSE)			
Theory	4 Papers	4X4=16	4X5=20
Practical or	4 Papers	4 X 2=08	
Tutorial*			4X1=04
2. Generic Elective(GE)/ Interdisciplinary			
Theory	4 Papers	4X4=16	4X5=20
Practical or	4 Papers	4 X 2=08	
Tutorial*			4X1=04
III. Ability Enhancement Courses			
1. Ability Enhancement Compulsory course(AECC) Environmental Science /English/Media and Information literacy(MIL)Communication(any two)	2 Papers	2 X 2=04	2 X 2=04
2. Ability Enhancement Elective course (AEEC) Minimum two papers Skill Based	2 Papers	2 X 2=04	2 X 2=04
Total credit		140	140

* Wherever there is a practical there will be no tutorial and vice-versa.

Along with practical each theory paper will be of 4 credits and each practical will be of 2 credits.

Along with tutorial each theory paper will be of 5 credits and each tutorial will be of 1 credits.

- Optional Dissertation or project work in place of one Discipline Specific Elective paper 6 credits in 6th Semester

PROPOSED SCHEME FOR CHOICE BASED CREDIT SYSTEM IN (B. Sc. Honours Physics)

Sem-ester	Courses for Theory/Practical/Tutorial	AECC 2 courses (Compulsory)	AECC 2 courses (Skill Based)	Elective	
				DSE 4 courses	GE 4 courses
I	Mathematical Physics-I	AECC – 1 (Environ.Science)			GE-1 (Comp. Sc.)
	Mechanics				
II	Electricity & Magnetism	AECC – 2 (English)			GE-2 (Chemistry)
	Waves and Optics				
III	Mathematical Physics–II		AECC -1		GE-3
	Thermal Physics				
	Digital Systems and Applications				
IV	Mathematical Physics–III		AECC -2		GE-4
	Elements of Modern Physics				
	Analog Systems & Applications				
V	Quantum Mechanics & applications			DSE-1	
	Solid State Physics			DSE -2	
VI	Electromagnetic Theory			DSE -3	
	Statistical Mechanics			DSE -4	



SEMESTER	COURSE OPTED	COURSE NAME	Credits
I 20	Core course-I Theory	Mathematical Physics-I	4
	Core course-I Practical/Tutorial	Mathematical Physics-I Lab	2
	Core course-II Theory	Mechanics	4
	Core course-II Practical/Tutorial	Mechanics Lab	2
	Generic Elective -1 Theory	GE-1	4/5
	Generic Elective -1 Practical/Tutorial	GE-1 practical/ tutorial	2/1
	Ability Enhancement Compulsory Course-I	English/MIL communications/ Environmental Science (any one)	2
II 20	Core course-III	Electricity and Magnetism	4
	Core course-III Practical/Tutorial	Electricity and Magnetism Lab	2
	Core course-IV	Waves and Optics	4
	Core course-IV Practical/Tutorial	Waves and Optics Lab	2
	Generic Elective -2	GE-2	4/5
	Generic Elective -2 Practical/Tutorial	GE-2 practical/ tutorial	2/1
	Ability Enhancement Compulsory Course-II	English/MIL communications/ Environmental Science	2
III 26	Core course-V theory	Mathematical Physics-II	4
	Core course-V Practical/Tutorial	Mathematical Physics-II Lab	2
	Core course-VI theory	Thermal Physics	4
	Core course-VI Practical/Tutorial	Thermal Physics Lab	2
	Core course-VII theory	Digital Systems and Applications	4
	Core course-VII Practical/Tutorial	Digital Systems & Applications Lab	2
	Skill Enhancement Course -1	SEC-1	2
	Generic Elective -3 theory	GE-3	4/5
	Generic Elective -3 Practical/Tutorial	GE-3 practical/ tutorial	2/1
IV 26	Core course-VIII theory	Mathematical Physics III	4
	Core course-VIII Practical/Tutorial	Mathematical Physics-III Lab	2
	Core course-IX theory	Elements of Modern Physics	4
	Course-IX Practical/Tutorial	Elements of Modern Physics Lab	2
	Core course-X theory	Analog Systems and Applications	4
	Course- X Practical/Tutorial	Analog Systems & Applications Lab	2
	Skill Enhancement Course -2	SEC -2	2
	Generic Elective -4 theory	GE-4	4/5
	Generic Elective -4 Practical/ tutorial	GE-4 practical/ tutorial	2/1
V 24	Core course-XI theory	Quantum Mechanics & Applications	4
	Core course-XI Practical/Tutorial	Quantum Mechanics Lab	2
	Core course-XII theory	Solid State Physics	4
	Core course-XII Practical	Solid State Physics Lab	2
	Discipline Specific Elective -1 theory	DSE-1	4
	Discipline Specific Elective -1Practical	DSE-1 Lab	2
	Discipline Specific Elective -2	DSE-2	4
	Discipline Specific Elective- 2Practical	DSE-2 Lab	2

VI 24	Core course-XIII theory	Electro-magnetic Theory	4
	Core Course-XIII Practical	Electro-magnetic Theory Lab	2
	Core course-XIV theory	Statistical Mechanics	4
	Core Course-XIV Practical	Statistical Mechanics Lab	2
	Discipline Specific Elective -3	DSE-3	4
	Discipline Specific Elective -3Practical	DSE-3 Lab	2
	Discipline Specific Elective-4	DSE-4	4
	Discipline Specific Elective -4Practical	DSE-4 Lab	2
TotalCredits			140

Core Papers C: Credit: 06 each 1 period/week for tutorials or 4 periods/week for practical

S. No.	Course Name	Credit	
		Theory	Lab.
1	Mathematical Physics-I	4	2
2	Mechanics	4	2
3	Electricity and Magnetism	4	2
4	Waves and Optics	4	2
5	Mathematical Physics-II	4	2
6	Thermal Physics	4	2
7	Digital Systems and Applications	4	2
8	Mathematical Physics III	4	2
9	Elements of Modern Physics	4	2
10	Analog Systems and Applications	4	2
11	Quantum Mechanics and Applications	4	2
12	Solid State Physics	4	2
13	Electromagnetic Theory	4	2
14	Statistical Mechanics	4	2

Discipline Specific Elective (DSE) Papers: 4 papers to be selected- DSE 1-4

S.No.	Course Name	Credit		
		Theory	Lab.	Tutorials
1	Experimental Techniques	4	2	
2	Embedded systems- Introduction to Microcontroller	4	2	
3	Physics of Devices and Instrumentation	4	2	
4	Nuclear and Particle Physics	5		1
5	Astronomy and Astrophysics	5		1
9	Atmospheric Physics	4	2	
6	Nano Materials and Applications	4	2	
7	Medical Physics	4	2	
8	Biophysics	5		1

Note: Universities may include more options or delete some from this list

Other Discipline Four papers of any one discipline- GE 1 to GE 4 (Four courses)

S.No.	Course Name	Credit		
		Theory	Lab.	Tutorials
1	Mathematics	5		1
2	Economics	5		1
3	Chemistry	4	2	
4	Computer Science	4	2	

Any other discipline of importance

Ability (Skill) Enhancement Elective Courses (AEEC) (Any two)

S.No.	Course Name	Credit		
1	Physics Workshop Skills		2	
2	Computational Physics Skills		2	
3	Electrical circuit network Skills		2	
4	Basic Instrumentation Skills		2	
5	Renewable Energy and Energy harvesting		2	
6	Radiation Safety		2	
7	Weather Forecasting		2	

Note: Universities may include more options or delete some from this list

**Generic Elective Papers (GE) Minor-Physics any four
(for other Departments/Disciplines: Credit: 06 each)**

S.No.	Course Name	Credit		
		Theory	Lab.	Tutorials
1	Mechanics	4	2	
2	Electricity and Magnetism	4	2	
3	Thermal Physics	4	2	
4	Digital, Analog and Instrumentation	4	2	
5	Elements of Modern Physics	4	2	
6	Mathematical Physics	4	2	
7	Solid State Physics	4	2	
8	Quantum Mechanics	4	2	
9	Nuclear and Particle Physics	5		1

Note: Universities may include more options or delete some from this list

Important:

1. Each University/Institute should provide a brief write-up about each paper outlining the salient features, utility, learning objectives and prerequisites.
2. University can add/delete some experiments of similar nature in the Laboratory papers.
3. The size of the practical group for practical papers is recommended to be 12-15 students.
4. University/Institute can add to the list of reference books given at the end of each paper.

- Institute would evolve a system/policy about ECA/ General Interest/ Hobby/ Sports/ NCC/NSS/ related courses on its own.

