DEPARTMENT OF PHYSICS

SCHOOL OF PHYSICAL SCIENCES

CENTRAL UNIVERSITY OF RAJASTHAN

FYUG - NEP2020

The Four Year Undergraduate Program (FYUG) in Physics offered by the Central University of Rajasthan is designed to give students a strong foundation in the subject and keep them updated with the latest advancements as per NEP 2020. The program's multidisciplinary structure allows students to explore the intersections of physics with other fields of study, cultivating a broader perspective and enhancing their understanding of interconnected knowledge areas. Designed to promote critical thinking, problem-solving abilities, and creativity, the syllabus includes laboratory work and practical exercises that enable students to apply theoretical concepts to real-world problems and enhance their scientific skills. As the students transitioning from senior secondary education face crucial decisions regarding their career paths, the program equips students with the skills and knowledge necessary for success in a rapidly changing world.

The FYUG program in Physics comprises Core courses, Minor courses, Elective courses, Ability enhancement courses, Value added courses, and Skill enhancement courses etc. As per NEP's recommendations, the FYUG program in Physics also offers multiple exit options:

1. A certificate after completing 1 year of study
2. A diploma after completing 2 years of study
3. A Bachelor's degree after completion of 3-years
4. A Bachelor's degree with Research after completing 4 years

PROGRAM OUTCOMES (PO)

- Appreciation for all natural science subjects (PO-1)
- Learn to carry out experiments in basic as well as in certain advanced areas of physics and to gain hands-on experience to work in applied fields (PO-2)
- Able to communicate topics of physics to peers, experts from other disciplines and the general public essential for collaborative work with a diverse team (PO-3)
- Building foundation for higher studies as well as enhancing capabilities to get science jobs (PO-4)
- Development of scientific attitude, analytical and rational thinking, positive attitudes to realize the importance of hard work, commitment, ethics and excellence (PO-5)
- Unafraid of taking challenging tasks, responsibilities, flexible in dealing with conflicting issues obligatory to become future entrepreneurs and innovators (PO-6)

Credit framework of FYUG Academic Program at CURAJ as per NEP-2020											
Qualification	**Credits**	**Semester wise credit break up**									**VSC**
		Semesters	**Major**	**Minor**	**IDC**	**SEC**	**AEC**	**VAC**	**RP**	**Semester Credits**	
UG Certificate	**44**	I	4	4	3	3	2	4	—	20	**4**
		II	4	4	3	3	2	4	—	20	
UG Diploma	**84**	III	8	4	3	3	2	—	—	20	**4**
		IV	12	4	—	—	2	—	2	20	
B.Sc.	**120**	V	16	4	—	—	—	—	—	20	
		VI	16	4	—	—	—	—	—	20	
B.Sc. (Hons) / B. Sc. (Hons with Res)	**160**	VII	12	8	—	—	—	—	—	20	
		VIII	8	—	—	—	—	—	12	20	

IDC: Inter-Disciplinary Course	**AEC**: Ability Enhancement Course	**RP**: Research Project / Internship
SEC: Skill Enhancement Course	**VAC**: Value Added Course	**VSC**: Vocational Skill Course

A student opting for exit after first year will be awarded UG Certificate, if, in addition to 40C, s/he complete one vocational course of 4C during summer.
A student opting for exit after second year will be awarded UG Diploma, if, in addition to 80C, s/he complete one vocational course of 4C during summer.
A student can opt for B.Sc. (Hons with Res) if they have secured a minimum of 75% marks in the first six semesters (B.Sc.).
A student opting for B.Sc. (Hons.) will have to take Elective courses of 12 credits instead of Research Project.

Semester I (20 Credits)	Semester II (20 Credits)	Semester III (20 Credits)	Semester IV (20 Credits)
Mechanics PHY 111 (4C, LTP: 301) (Major 1)	**Basic Electronics** PHY 121 (4C, LTP: 301) (Major 2)	**Modern Physics** PHY 211 (4C, LTP: 310) (Major 3)	**Optics** PHY 221 (4C, LTP: 301) (Major 5)
Minor (4C, LTP: xxx) (Minor 1)	**Minor** (4C, LTP: xxx) (Minor 2)	**Electricity and Magnetism** PHY 212 (4C, LTP: 301) (Major 4)	**Heat and Thermodynamics** PHY 222 (4C, LTP: 310) (Major 6)
IDC (3C, LTP: xxx) (IDC 1)	**IDC** (3C, LTP: xxx) (IDC 2)	**Minor** (4C, LTP: xxx) (Minor 3)	**Mathematical Physics I** PHY 223 (4C, LTP: 310) (Major 7)
SEC (3C, LTP: xxx) (SEC 1)	**SEC** (3C, LTP: xxx) (SEC 2)	**SEC** (3C, LTP: xxx) (SEC 3)	**Minor** (4C, LTP: xxx) (Minor 4)
AEC (2C, LTP: xxx) (AEC 1)	**AEC** (2C, LTP: xxx) (AEC 2)	**AEC** (2C, LTP: xxx) (AEC 3)	**AEC** (2C, LTP: xxx) (AEC 4)
VAC (4C, LTP: xxx) (VAC 1)	**VAC** (4C, LTP: xxx) (VAC 2)	**IDC** (3C, LTP: xxx) (IDC 3)	**Project/Internship** PHY 224 (2C) (Research Project)

Semester V (20 Credits)	Semester VI (20 Credits)	Semester VII (20 Credits)	Semester VIII (20 Credits)
Classical Mechanics PHY 311 (4C, LTP: 310) (Major 8)	**Solid State Physics** PHY 321 (4C, LTP: 310) (Major 12)	**Classical Electrodynamics** PHY 411 (4C, LTP: 310) (Major 16)	**Nuclear and Particle Physics** PHY 421 (4C, LTP: 310) (Major 19)
Quantum Mechanics PHY 312 (4C, LTP: 310) (Major 9)	**Atomic and Molecular Physics** PHY 322 (4C, LTP: 310) (Major 13)	**Statistical Mechanics** PHY 412 (4C, LTP: 310) (Major 17)	**Condensed Matter Physics** PHY 422 (4C, LTP: 310) (Major 20)
Mathematical Physics II PHY 313 (4C, LTP: 310) (Major 10)	**Computational Physics** PHY 323 (4C, LTP: 004) (Major 14)	**Physics Lab III** PHY 413 (4C, LTP: 004) (Major 18)	**Project / Electives** PHY 423 (12C) (Research Project)
Physics Lab I PHY 314 (4C, LTP: 004) (Major 11)	**Physics Lab II** PHY 324 (4C, LTP: 004) (Major 15)	**Minor** (4C, LTP: xxx) (Minor 7)	
Minor (4C, LTP: xxx) (Minor 5)	**Minor** (4C, LTP: xxx) (Minor 6)	**Minor (Elective)** (4C, LTP: xxx) (Minor 8)	