Faculty of Physical Sciences

For Undergraduate Programme

Course Structure under Choice Based Credit System (CBCS): 2019-20

The University Grants Commission (UGC) has initiated several measures to bring equity, efficiency and excellence in the Higher Education System of country. The important measures taken to enhance academic standards and quality in higher education include innovation and improvements in curriculum, teaching-learning process, examination and evaluation systems under Choice Based Credit System. Choice Based Credit System opens pathways for learning opportunities and follows a credit system which is attached to course components offered to students. A credit system for higher education measures various parameters like student performance, outcomes, entrepreneurship skills, contact hours, innovation and creativity talents, etc. With this initiative The Faculty of Science, Shree Guru Gobind Singh Tricentenary University, Gurugram introduced six Generic Elective (GE) Courses for the UG students of SGT University except students of Faculty of Science.

Selection of students to the GECs:

The Departmental Committee shall follow a selection procedure on a first come first served basis, fixing the maximum number of students, giving counseling to the students etc. to avoid overcrowding to particular course(s) at the expense of some other courses.

Course Structure of OECs

S. No.	COURSENAME	CODE	L	T	P	Contact hours/ week	Credits	Max. Marks	Formative Assessment	Summative Assessment
1.	Radiation Physics	PS-1	4	0	0	4	4	100	40	60
2.	Green Chemistry and Technology	PS-2	4	0	0	4	4	100	40	60
3.	Basic Forensic Sciences	PS-3	4	0	0	4	4	100	40	60
4.	Environmental History & Contemporary Policies	PS-4	4	0	0	4	4	100	40	60
5.	Environmental Toxicity and Human Health	PS-5	4	0	0	4	4	100	40	60
6.	Instrumentation and Analytics	PS-6	4	0	0	4	4	100	40	60
	Total		**24**	**0**	**0**	**24**	**24**	**600**	**240**	**360**

Syllabus

Radiation Physics

UNIT- I

Basics of Radiation Physics

Introduction to Medical Imaging, Latent images formation and its processing. Image Quality: Resolution, contrast. Radiation and the Atom. Ionizing and non-ionizing radiation.Various units used for measuring radiation-Roentgen, rad and rem, Doses: dose and dose rate, exposure dose, exit dose, surface dose, depth dose, maximum permissible dose, iso-dose charts and their uses.

UNIT – II

Radiation production and measurement Techniques

X–rays–its production, properties and quality, Power Ratings, Factors affecting X-ray emissions. Interaction of radiation with matter, linear absorption coefficient, Grid, Cones and Filters, scattered radiations and appliances used to reduce it.

UNIT – III

Nuclear Medicine

Radioactivity and Nuclear transformation: Curie, Half life, decay factor, Details about radium, cobalt and cesium, Radionuclide production, Radiation detection: Types of Detectors and Basic principles, Ionization chambers, G.M. Counter and Scintillation Counter, Counting Statistics. Basic concepts of Nuclear Imaging: Scintillation Camera and Emission Tomography.

UNIT – IV

Radiation Protection

Interaction of Radiation with tissue, Radiation Hazards, Sources of exposure to ionizing radiation, Protection against it, Personnel Dosimetry, film badge, pocket ionization chamber, Radiation protection of people; Radiation protection of the environment; radioactive source security; particle physics and statistics related to radiation protection.

References:

1. Radiation physics for medical physicists by Ervin B. Podgorsak, Second Edition, Springer.
2. Physics for radiation protection; A hand book, Second edition by J.E.Martin
3. A Primer in applied radiation physics by Frederic Alan smith.
4. Fundamentals of nuclear physics by Jagdesh Verma, Roop Chand Bhandari and D.R.S.Somayajulu.
5. The Essential Physics of Medical Imaging by Av Jerrold T. Bushberg, J. Anthony Seibert, Edwin M. Leidholdt, John M. Boone.