

<b>Name of Faculty</b>		<b>Faculty of Physical Sciences</b>		<b>L: 2 T: 0</b>		
<b>Name of Course</b>		<b>Open elective Course</b>		<b>Credits: 2</b>		
<b>Subject/Paper</b>		<b>Radiation Physics</b>		<b>Paper Code</b>	<b>PS-1</b>	<b>Marks: 50</b>
<b>Course Coordinator Name: Contact:</b>		<b>Anjaneyulu.Bendi anjaneyulu.bendi@sgtuniversity.org .....</b>		<b>Class Time: 2:00-4:00 pm.</b>	<b>Days</b>	<b>Wednesday</b>
<b>Unit</b>	<b>Title</b>	<b>Time (hrs)</b>	<b>Topic</b>	<b>Teaching Methodology</b>	<b>Assessment Method</b>	<b>Teaching Faculty</b>
<b>Unit-I</b>	<b>Basics of Radiation Physics</b>	7 hours	1. Latent images formation and its processing. 2. Various units used for measuring radiation, 3. Half life, decay factor, details about radium, cobalt and cesium. 4. Doze and doze rate, exposure doze, exit doze, surface doze, depth doze, maximum permissible dose, 5. iso-dose charts and their uses.	1. Assignment 2. Seminar 3. SIS 4. Demonstration 5. Power point presentation	1. Assignment 2. Seminar/presentation 3. Class test 4. Sessional Examination 5. End Term Examination	

<b>UNIT – II</b>	<b>Radiation production and measurement Techniques</b>	7hrs	<p>1. X-rays–its production, properties and quality</p> <p>2. Ionization chambers, G.M. Counter</p> <p>3. Scintillation Counter</p> <p>4. Interaction of radiation with matter, linear absorption coefficient,</p> <p>4. Grid, Cones and Filters.</p> <p>5.Scattered radiations and appliances used to reduce it.</p>	<p>1.Assignment</p> <p>2.Seminar</p> <p>3.SIS</p> <p>4.Demonstration</p> <p>5.Experiment based learning</p> <p>6.Power point presentation</p>		
					<b>Assessment Method</b>	
					<p>1.Assignment</p> <p>2.Seminar/presentation</p> <p>3 Class test</p> <p>4 Sessional Examination</p> <p>5 End Term Examination</p>	
<b>UNIT - III</b>	<b>Radiation Protection</b>	6hrs	<p>1.Radiation Hazards,</p> <p>2. Protection against it, film badge, pocket</p> <p>3 Radiation protection of people; Radiation protection of the environment;</p> <p>4. Radioactive source security, particle physics</p> <p>5. Statistics related to</p>	<p>1.Assignment</p> <p>2.Seminar</p> <p>3.SIS</p> <p>4.Demonstration</p> <p>5.Experiment based learning</p> <p>6.Power point presentation</p>	<p>1.Assignment</p> <p>2.Seminar/presentation</p> <p>3 Class test</p> <p>4 Sessional Examination</p> <p>5 End Term Examination</p>	

			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.

**Assessment: Summative:**

**Formative:**

<b>Name of Faculty</b>		<b>Faculty of Physical Sciences</b>					<b>L: 2 T: 0</b>
<b>Name of Course</b>		<b>Open Elective Course</b>					<b>Credits: 2</b>
<b>Subject/Paper</b>		<b>Green Chemistry and Technology</b>			<b>Course Code</b>	<b>PS-2</b>	<b>Marks: 50</b>
<b>Course Coordinator Name: Contact:</b>		<b>Anjaneyulu.Bendi</b> anjaneyulu.bendi@sgtuniversity.org .....			<b>Class Time:</b> <b>2:00-4:00 pm.</b>	<b>Days</b>	<b>Wednesday</b>
<b>Unit</b>	<b>Title</b>	<b>Time (hrs)</b>	<b>Topic</b>	<b>Teaching Methodology</b>	<b>Assessment Method</b>	<b>Teaching Faculty</b>	
<b>Unit-I</b>	<b>Green Chemistry</b>	7 hours	<ol style="list-style-type: none"> <li>1. Introduction- Definition, Scope and need of green Chemistry</li> <li>2. Basic principles of green chemistry.</li> <li>3. Limitations /Obstacles in the pursuit the goals of the Green Chemistry and technology.</li> <li>4. Reasons for Green Chemistry (resource minimization, waste minimization concepts),</li> <li>5. Green synthesis: Evaluation of the type of the reaction i) Rearrangements (100% atom economic), ii) Addition reaction (100% atom economic).</li> </ol>	<ol style="list-style-type: none"> <li>1. Assignment</li> <li>2. Seminar</li> <li>3. SIS</li> <li>4. Demonstration</li> <li>5. Power point presentation</li> </ol>	<ol style="list-style-type: none"> <li>1. Assignment</li> <li>2. Seminar/presentation</li> <li>3. Class test</li> <li>4. Sessional Examination</li> <li>5. End Term Examination</li> </ol>		
<b>UNIT-II</b>	<b>Fundamentals of Catalytic Science and Engineering</b>	6hrs	<ol style="list-style-type: none"> <li>1. Homogenous and heterogeneous catalysis.</li> <li>2. Fundamentals of homogeneous catalysis mechanisms and kinetics.</li> <li>3. Acid--base catalysis, Transition metal catalysis.</li> <li>4. Green catalysts (Natural and Modified Clays, Zeolites, Ionic Liquids)</li> <li>5. Bio catalysts (Enzymes).</li> </ol>	<ol style="list-style-type: none"> <li>1. Assignment</li> <li>2. Seminar</li> <li>3. SIS</li> <li>4. Demonstrations</li> </ol>	<ol style="list-style-type: none"> <li>Assignment</li> <li>2. Seminar/presentation</li> <li>3. Class test</li> <li>4. Sessional Examination</li> <li>5. End Term Examination</li> </ol>		

				5.Power point presentation		
<b>UNIT -III</b>	<b>Green Technology in Day to Day life &amp; Industries</b>	7hrs	<ol style="list-style-type: none"> <li>1. Implications of Green Technology in day to day life.</li> <li>2. Some of the case studies (including Dry Cleaning of cloths, Hydrogen peroxide as a bleaching agent, Green solution to turn turbid water clear)</li> <li>3. Different fields including Pharma &amp; Polymer science (Paracetamol, Irubfen, polylactic acid, etc.),</li> <li>4. Organic electronics (such as OLED, Organic sensors, Green mobile phones, conductive paper), IT, Civil and Mechanical Engineering.</li> </ol>	<ol style="list-style-type: none"> <li>1.Assignment</li> <li>2.Seminar</li> <li>3.SIS</li> <li>4.Demonstration</li> <li>5Experiment based learning</li> <li>5.Power point presentation</li> </ol>	<ol style="list-style-type: none"> <li>1.Assignment</li> <li>2.Seminar/pre presentation</li> <li>3 Class test</li> <li>4 Sessional Examination</li> <li>5 End Term Examination</li> </ol>	

**Reference books:**

1. Green Chemistry Theory and Practice. P.T.Anatas and J.C. Warner
2. Green Chemistry V.K. Ahluwalia Narosa, New Delhi.
3. Real world cases in Green Chemistry M.C. Cann and M.E. Connelly
4. Green Chemistry: Introductory Text M.Lancaster: Royal Society of Chemistry(London)
5. Green Chemistry: Introductory Text, M.Lancaster

**Assessment: Summative:**

**Formative:**

<b>Name of Faculty</b>		<b>Faculty of Physical Sciences</b>					<b>L: 2 T: 0</b>
<b>Name of Course</b>		<b>Open Elective Course</b>					<b>Credits: 2</b>
<b>Subject/Paper</b>		<b>Introduction to Forensic Science</b>			<b>Paper Code</b>	<b>PS-3</b>	<b>Marks: 50</b>
<b>Course Coordinator Name: Contact:</b>		<b>Anjaneyulu.Bendi</b> anjaneyulu.bendi@sgtuniversity.org .....			<b>Class Time:</b> <b>2:00-4:00 pm.</b>	<b>Days</b>	<b>Wednesday</b>
<b>Unit</b>	<b>Title</b>	<b>Time (hrs)</b>	<b>Topic</b>	<b>Teaching Methodology</b>		<b>Assessment Method</b>	<b>Teaching Faculty</b>
<b>UNIT-I</b>	<b>Forensic Science</b>	8 hrs	Definition, Introduction, Basic Principles & Significance, History & Development of Forensic Science in India and World, Organizational Structure of Forensic Science laboratory, Different divisions and units of Forensic Science Laboratory, Organizational Structure of Forensic Science teaching Institution.	1.Assignment 2.Seminar 3.SIS 4. Power point presentation		1.Assignment 2.Seminar/presentation 3 Class test 4 Sessional Examination 5 End Term Examination	
<b>UNIT-II</b>	<b>Criminalistics</b>	6 hrs	Definition, Introduction, Scope, Significance and use, Coordination of Forensic Science activities and its use for court of Law.	1.Assignment 2.Seminar 3.SIS 4.Power point presentation		1.Assignment 2.Seminar/presentation 3 Class test 4 Sessional Examination 5 End Term Examination	
	<b>Forensic Ethics</b>		Introduction, Definition, Scope, Ethics in Forensic Science, Professionalism and ethics: Importance of professional ethics, the importance of professional	1.Assignment 2.Seminar 3.SIS 4.Power point		1.Assignment 2.Seminar/presentation 3 Class test	

<b>UNIT -III</b>		8 hrs	ethics to science practitioners, development of code of conduct and code of ethics for Forensic Science; Application of codes and ethics, How ethical requirements impact the daily work of a forensic scientist; Ethical dilemmas and their resolution.	presentation	4 Sessional Examination 5 End Term Examination	
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**Assessment: Summative: 60%marks – 30 marks (15 Subjective+15 Objective)**

**Formative: 40% Marks – 20 marks**

**Reference Books:**

1. Houck, M.M. & Siegel, JA; Fundamentals of Forensic Science, Academic Press, London, 2006.
2. Sharma, B.R., Forensic Science in Criminal Investigation & Trials, Universal Publishing Co., New Delhi, 2003
3. Nanda B.B and Tewari, R.k. Forensic Science in India- A vision for the Twenty First Century, Select publisher, N. Delhi, 2001.
4. James, SH and Nordby, J.J., Forensic Science- An Introduction to Scientific and investigative Techniques, CRC Press, USA (2003)
5. Saferstein; Criminalistics- An Introduction of Forensic Science, Prentice Hall Inc, USA,2007.
6. Sharma, B.R. (1974) Forensic Science in Criminal Investigation and Trials, Central Law Agency, Allahabad, 1974.

<b>Name of Faculty</b>		<b>Faculty of Physical Sciences</b>					<b>L: 2 T: 0</b>
<b>Name of Course</b>		<b>Open Elective Course</b>					<b>Credits: 2</b>
<b>Subject/Paper</b>		<b>SOCIAL ISSUES AND ENVIRONMENT</b>			<b>Paper Code</b>	<b>PS-4</b>	<b>Marks: 50</b>
<b>Course Coordinator Name: Contact:</b>		<b>Anjaneyulu.Bendi anjaneyulu.bendi@sgtuniversity.org .....</b>			<b>Class Time:</b>	<b>Days</b>	
<b>Unit</b>	<b>Title</b>	<b>Time (hrs)</b>	<b>Topic</b>	<b>Teaching Methodology</b>	<b>Assessment Method</b>	<b>Teaching Faculty</b>	
<b>UNIT-I</b>	<b>Environment and Culture</b>	7 hrs	<ol style="list-style-type: none"> <li>1. Ancient civilizations and their environmentalism</li> <li>2. Consumerism and advertising in environmental degradation, Land Acquisition and Resettlement, Compensation and benefits for displaced persons</li> <li>3. Social impact assessment, resettlement planning and implementation</li> <li>4. Government-managed resettlement, Indigenous People, their relocation and their rights</li> <li>5. Impacts on traditional or customary lands, Cultural Heritage and its protection.</li> </ol>	<ol style="list-style-type: none"> <li>1. Assignment</li> <li>2. Seminar</li> <li>3. SIS</li> <li>4. Demonstration</li> <li>5. Power point presentation</li> </ol>	<ol style="list-style-type: none"> <li>1. Assignment</li> <li>2. Seminar/presentation</li> <li>3. Class test</li> <li>4. Sessional Examination</li> <li>5. End Term Examination</li> </ol>		
<b>UNIT-II</b>	<b>Environment and Pollution</b>	6 hrs	<ol style="list-style-type: none"> <li>1. Sources of different pollutions: Air, Water, Soil, Noise, Radiation, Thermal and Biological;</li> <li>2. Case studies: Fe-Al use, Use of cleaners in domestic sector and their harms, Overuse of fertilizers and pesticides in agriculture, Silent</li> </ol>	<ol style="list-style-type: none"> <li>1. Assignment</li> <li>2. Seminar</li> <li>3. SIS</li> <li>4. Demonstrations</li> <li>5. Power point presentation</li> </ol>	<ol style="list-style-type: none"> <li>1. Assignment</li> <li>2. Seminar/presentation</li> <li>3. Class test</li> <li>4. Sessional Examination</li> <li>5. End Term</li> </ol>		



			Spring 3. Lack of urban planning in pollution, Common toxins introduced in environment such as Pb, Hg, VOCs etc. 4. Point sources, Mobile sources and Fugitive sources of Air pollution.		Examination	
<b>UNIT -III</b>	<b>Energy and Water Conservation</b>	7 hrs	1. Energy use and conservation: in process heating (including heating for fluids, calcining, drying, heat treating, metal heating, melting, melting agglomeration, curing and forming) and process cooling (in refrigeration and cooling). 2. Water Use and Conservation: In industrial process heating and cooling, operations, in agriculture, in domestic sector 3. Wastewater disposal standards and cautions for different sectors.	1. Assignment 2. Seminar 3. SIS 4. Demonstration 5. Experiment based learning 5. Power point presentation	1. Assignment 2. Seminar/presentation 3. Class test 4. Sessional Examination 5. End Term Examination	

**Reference Books:**

1. Environmental Chemistry by A K De by NEW AGE Publishers
2. Energy Conservation Guidebook by Dale R. Patrick, Stephen W. Fardo, Ray E. Richardson, Brian W. Fardo. CRC Press
3. Elixir: A History of Water and Humankind by Brian Fagan, Bloomsbury Press
4. Hazardous Waste Management by Michael D. Lagrega, Waveland Pr Inc
5. This Sacred Earth: Religion, Nature and Environment by Roger S Gottlieb, Psychology Press
6. Worldviews, Religion, and the Environment: A Global Anthology by Richard C. Foltz., Wadsworth Publishing.

**Assessment: Summative:**  
**Formative:**