

**Department of Radiology  
& Imaging Techniques  
Era University, Lucknow  
Course Outline  
Effective From 2023-24**

Name of the Program	BRIT		Year/ Semester:	1 <sup>st</sup> Semester
Course Name	General Anatomy -I	Course Code: BRP 101	Type:	Practical
Credits	02		Total Sessions Hours:	40
Evaluation Spread	Internal Continuous Assessment:	30 Marks	End Term Exam:	70 Marks
Type of Course	<input type="radio"/> Compulsory	<input checked="" type="radio"/> Core	<input type="radio"/> Creative	<input type="radio"/> Life Skill
Course Objectives	1. Comprehend the normal disposition, inter-relationships, gross, functional, and applied anatomy of various structures in the human body. 2. Identify the microscopic structures of various tissues, and organs in the human body and correlate the structure with the functions. 3. Comprehend the basic structure and connections between the various parts of the central nervous system to analyze the integrative and regulative functions of the organs and systems.			
<b>Course Outcomes (CO):</b> After the successful course completion, learners will develop the following attributes:				
Course Outcome (CO)	<b>Attributes</b>			
CO1	Understand the various organ structures with a backdrop of general anatomy (Remember & Understand)			
CO2	Compare the differences between the similar structures in the body and their relevance (Analyze)			
CO3	Learn to apply the knowledge of various structures to clinical aspects of diseases (Apply & Analyze).			
CO4	Augment their learning by making model charts and learning on simulators.			
Pedagogy	Explanations by the Instructor, Group/Pair Work, Discussion, Assignment, Practical, Presentations.			

<b>Internal Evaluation Mode</b>	Terminal Exam, Attendance, Project/Assignment, Class participation, Class presentation, Bedside behavior or Interaction in class.		
<b>Session Details</b>	<b>Practical</b>	<b>Hours</b>	<b>Mapped CO</b>
<b>Unit 1</b>	<p><b>1. Introduction to Anatomical terms of the human body</b> - Basic anatomical terminology, anatomical position, anatomical planes, levels of organization in the body, organ systems, skeleton, and cavities of the body.</p> <p><b>2. Organization of the human body at the cellular level</b> - Structure of the cell comprising of the cell membrane, cytoplasm, cell organelles, nucleus, cell extensions etc.</p> <p><b>3. Organization of the human body at the tissue level</b> - Epithelial, Connective, Muscular&amp; and Nervous tissue.</p>	10	CO1
<b>Unit 2</b>	<p><b>1. Blood</b> - Composition of the blood, Features of red blood cells, white blood cells, and platelets.</p> <p><b>2. Lymphatic system</b> - Features of lymph vessels, lymphatic tissue and organs, lymphatics, spleen, tonsil, and thymus.</p> <p><b>3. Nervous system</b> - Central nervous system, brain, cerebellum, spinal cord, cranial nerves, autonomic nervous system.</p> <p><b>4. Muscular system</b> - Skeletal muscle, cardiac muscle, smooth muscle, muscles of the body.</p> <p><b>5. Skeletal system</b> - Features of bones, axial skeleton, appendicular skeleton.</p> <p><b>6. Musculoskeletal system</b> - Joints of upper &amp; lower limb.</p>	10	CO1 , CO2 , CO3

<b>Unit 3</b>	<p><b>1. Respiratory system</b> - Nose &amp; paranasal sinuses, pharynx, larynx, trachea, lungs.</p> <p><b>2. Cardiovascular system</b> - Heart &amp; blood vessels.</p> <p><b>3. Digestive system</b> - Oral cavity, pharynx, salivary glands, oesophagus, stomach, small intestine, large intestine, liver, gallbladder, pancreas.</p> <p><b>4. Urinary system</b> - Kidneys, juxtaglomerular apparatus, ureters, urinary bladder, urethra.</p>	10	CO3
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<b>Unit 4</b>	<p><b>1. Introduction to genetics</b> - Features of chromosomes, DNA.</p> <p><b>2. Reproductive system in females</b> - External &amp; internal genital organs, breast.</p> <p><b>3. Reproductive system in males</b> - Penis, scrotum, testes, prostate gland.</p> <p><b>4. Endocrine system</b> -Hormones, pituitary gland, thyroid gland, parathyroid glands, adrenal glands, endocrine pancreas.</p> <p><b>5. Special senses</b> - Olfactory system, taste apparatus, external middle &amp; internal ear, eye.</p> <p><b>6. Skin</b> - Features of skin, hair, sebaceous glands, sweat glands, nails. The classes will be two theories and two practicals including the tutorials in a week</p>	10	CO1, CO4, CO3
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#### CO-PO and PSO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	2	1	2	1	2	1	1	1	1	3	1	2	2	3
CO2	1	1	1	2	2	2	1	1	2	3	2	2	2	2
CO3	1	1	1	2	3	2	1	2	2	3	2	2	2	2
CO4	2	2	1	1	2	1	1	1	1	2	1	2	1	3

*Strong contribution-3, Average contribution-2, Low contribution-1,*

#### Suggested Readings:

<b>Text- Books</b>	<p>1. P.R Ashalatha &amp; G Deepa 's Textbook of anatomy &amp; physiology by</p> <p>2. B.D.Chaurasia's human anatomy</p> <p>1.</p>
<b>Reference Books</b>	<p>1. Sampath Madhyastha's Manipal manual of anatomy for allied health sciences</p> <p>2. Krishna Garg &amp; Madhu Joshi's Practical anatomy workbook</p> <p>3. Dixit's Atlas of Histology for Medical Students</p> <p>4. Basic Histology: A Color Atlas &amp; Text</p> <p>5. Jana's Exam Oriented Practical Anatomy</p> <p>6. Krishan's Anatomy Mnemonics</p>

#### Recapitulation & Examination Pattern

#### Internal Continuous Assessment:

<b>Component</b>	<b>Marks</b>	<b>Pattern</b>
Terminal Exam	12	<ol style="list-style-type: none"> <li>1. Contains a descriptive question of 4 marks</li> <li>2. Contains 4 MCQs</li> <li>3. Contains 2 short answer questions. Each question carries 2 marks</li> </ol>
Attendance	04	
Project/Assignments	04	
Class participation or any other	04	
Class Presentation	04	
Bed Side Behavior or Interaction in Class	02	
<b>Total Marks</b>	30	

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Effective From: 2023-24**

<b>Name of the Program</b>	<b>BRIT</b>			<b>Year/ Semester:</b>	<b>1<sup>st</sup> Semester</b>
<b>Course Name</b>	<b>General Anatomy -I</b>	<b>Course Code:</b>	<b>BRT 101</b>	<b>Type:</b>	<b>Theory</b>
<b>Credits</b>	<b>03</b>			<b>Total Sessions Hours:</b>	<b>40</b>
<b>Evaluation Spread</b>	<b>Internal Continuous Assessment:</b>	<b>30</b>		<b>End Term Exam:</b>	<b>70</b>
<b>Type of Course</b>	<input type="radio"/> Compulsory	<input checked="" type="radio"/> Core	<input type="radio"/> Creative	<input type="radio"/> Life Skill	
<b>Course Objectives</b>	<p>1. Comprehend the normal disposition, inter-relationships, gross, functional and applied anatomy of various structures in the human body.</p> <p>2. Identify the microscopic structures of various tissues, and organs in the human body &amp; correlate the structure with the functions.</p> <p>3. Comprehend the basic structure and connections between the various parts of the central nervous system so as to analyze the integrative and regulative functions on the organs and systems.</p>				
<b>Course Outcomes (CO):</b> <i>After the successful course completion, learners will develop following attributes:</i>					
<b>Course Outcome (CO)</b>	<b>Attributes</b>				
<b>CO1</b>	Understand the various organ structures with a backdrop of general anatomy (Remember & Understand)				
<b>CO2</b>	Compare the differences between the similar structures in the body and their relevance (Analyze)				
<b>CO3</b>	Learn to apply the knowledge of various structures to clinical aspects of diseases (Apply & Analyze).				
<b>CO4</b>	Augment their learning by making models, charts and learning on simulators.				
<b>Pedagogy</b>	Explanations by the Instructor, Group/Pair Work, Discussion, Assignment, Practical, Presentations.				

<b>Internal Evaluation Mode</b>	Terminal Exam, Attendance, Project/Assignment, Class participation, Class presentation, Bedside behavior or Interaction in class.		
<b>Session Details</b>	<b>Topic</b>	<b>Hours</b>	<b>Mapped CO</b>
<b>Unit 1</b>	<p><b>1. Introduction to Anatomical terms of the human body</b> - Basic anatomical terminology, anatomical position, anatomical planes, and levels of organization in the body, organ systems, skeleton, and cavities of the body.</p> <p><b>2. Organization of the human body at the cellular level</b> - Structure of the cell comprising of cell membrane, cytoplasm, cell organelles, nucleus, cell extensions etc.</p> <p><b>3. Organization of the human body at the tissue level</b> - Epithelial, Connective, Muscular&amp; Nervous tissue.</p>	5	CO1
<b>Unit 2</b>	<p><b>1. Blood</b> - Composition of blood, Features of red blood cells, white blood cells, platelets.</p> <p><b>2. Lymphatic system</b> - Features of lymph vessels, lymphatic tissue &amp; organs, lymphatics, spleen, tonsil, thymus.</p> <p><b>3. Nervous system</b> - Central nervous system, brain, cerebellum, spinal cord, cranial nerves, autonomic nervous system.</p> <p><b>4. Muscular system</b> - Skeletal muscle, cardiac muscle, smooth muscle, muscles of the body.</p> <p><b>5. Skeletal system</b> - Features of bones, axial skeleton, appendicular skeleton.</p> <p><b>6. Musculoskeletal system</b> - Joints of upper &amp; lower limb.</p>	9	CO1 , CO2 , CO3

<b>Unit 3</b>	<p><b>1. Respiratory system</b> - Nose &amp; paranasal sinuses, pharynx, larynx, trachea, lungs.</p> <p><b>2. Cardiovascular system</b> - Heart &amp; blood vessels.</p> <p><b>3. Digestive system</b> - Oral cavity, pharynx, salivary glands, oesophagus, stomach, small intestine, large intestine, liver, gallbladder, pancreas.</p> <p><b>4. Urinary system</b> - Kidneys, juxtaglomerular apparatus, ureters, urinary bladder, urethra.</p>	8	CO3,CO4
<b>Unit 4</b>	<p><b>1. Introduction to genetics</b> - Features of chromosomes, DNA.</p> <p><b>2. Reproductive system in females</b> - External &amp; internal genital organs, breast.</p> <p><b>3. Reproductive system in males</b> - Penis, scrotum, testes, prostate gland.</p> <p><b>4. Endocrine system</b> -Hormones, pituitary gland, thyroid gland, parathyroid glands, adrenal glands, endocrine pancreas.</p> <p><b>5. Special senses</b> - Olfactory system, taste apparatus, external middle &amp; internal ear, eye.</p> <p><b>6. Skin</b> - Features of skin, hair, sebaceous glands, sweat glands, nails. The classes will be two theories and two practical including the tutorials in a week</p>	8	CO1, CO4, CO3

#### CO-PO and PSO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	2	1	2	1	2	1	1	1	1	3	1	2	2	3
CO2	1	1	1	2	2	2	1	1	2	3	2	2	2	2
CO3	1	1	1	2	3	2	1	2	2	3	2	2	2	2
CO4	2	2	1	1	2	1	1	1	1	2	1	2	1	3

*Strong contribution-3, Average contribution-2, Low contribution-1,*

#### Suggested Readings:

<b>Text- Books</b>	<p>1. P.R Ashalatha &amp; G Deepa 's Textbook of anatomy &amp; physiology by</p> <p>2. B.D.Chaurasia's human anatomy</p> <p>2.</p>
<b>Reference Books</b>	<p>7. Sampath Madhyastha's Manipal manual of anatomy for allied health sciences</p> <p>8. Krishna Garg &amp; Madhu Joshi's Practical anatomy workbook</p> <p>9. Dixit's Atlas of Histology for Medical Students</p> <p>10. Basic Histology: A Color Atlas &amp; Text</p> <p>11. Jana's Exam Oriented Practical Anatomy</p> <p>12. Krishan's Anatomy Mnemonics</p>

#### Recapitulation & Examination Pattern

#### Internal Continuous Assessment:

Component	Marks	Pattern
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Terminal Exam	12	4. Contains a descriptive question of 4 marks 5. Contains 4 MCQs 6. Contains 2 short answer questions. Each question carries 2 marks
Attendance	04	
Project/Assignments	04	
Class participation or any other	04	
Class Presentation	04	
Bed Side Behavior or Interaction in Class	02	
<b>Total Marks</b>	30	



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<b>Name of the Program</b>	<b>BRIT</b>			<b>Year/ Semester:</b>	<b>1<sup>st</sup> Semester</b>
<b>Course Name</b>	<b>General Physiology- I</b>	<b>Course Code:</b>	<b>BRT 102</b>	<b>Type:</b>	<b>Theory</b>
<b>Credits</b>	<b>03</b>			<b>Total Sessions Hours:</b>	<b>40</b>
<b>Evaluation Spread</b>	<b>Internal Continuous Assessment:</b>	<b>30</b>		<b>End Term Exam:</b>	<b>70</b>
<b>Type of Course</b>	<input type="radio"/> Compulsory	<input checked="" type="radio"/> Core	<input type="radio"/> Creative	<input type="radio"/> Life Skill	
<b>Course Objectives</b>	1. Explain the normal functioning of various organ systems of the body and their interactions. 2. Elucidate the physiological aspects of normal growth and development. 3. Describe the physiological response and adaptations to environmental stresses. 4. Know the physiological principles underlying pathogenesis of disease.				
<b>Course Outcomes (CO):</b> <i>After the successful course completion, learners will develop following attributes:</i>					
<b>Course Outcome (CO)</b>	<b>Attributes</b>				
<b>CO1</b>	Understand the various organ functions with a backdrop of general physiology (Remember & Understand)				
<b>CO2</b>	Compare the differences between the similar functions in the body and their relevance (Analyze)				
<b>CO3</b>	Learn to apply the knowledge of various physiological process to clinical aspect of diseases (Apply & Analyze)				
<b>CO4</b>	Augment their learning by making models, charts and learning on simulators (Synthesize, evaluate & create)				
<b>Pedagogy</b>	Explanations by the Instructor, Group/Pair Work, Discussion, Assignment, Practical, Presentations.				

<b>Internal Evaluation Mode</b>	Terminal Exam, Attendance, Project/Assignment, Class participation, Class presentation, Bedside behavior or Interaction in class.		
<b>Session Details</b>	<b>Topic</b>	<b>Hours</b>	<b>Mapped CO</b>
<b>Unit 1</b>	<p><b>1. Introduction to physiology of the human body</b> - Composition of body, Homeostasis, Introduction to chemistry of life.</p> <p><b>2. Organization of the human body at the cellular level</b> - Function of lipids, carbohydrates, proteins &amp; cell organelles.</p> <p><b>3. Organization of the human body at the tissue level</b> - Function of Epithelial, Connective, Muscular &amp; Nervous tissues.</p>	05	CO1

<b>Unit 2</b>	<p>1. <b>Blood</b> - Haemopoiesis, haemostasis, coagulation of blood, blood transfusion.</p> <p>2. <b>Lymphatic system</b> - Function of lymph vessels, lymphatic tissue &amp; organs, lymphatics, spleen, tonsil, thymus.</p> <p>3. <b>Resistance &amp; immunity</b> - Innate immunity, acquired immunity, humoral &amp; cell mediated immunity.</p>	08	CO2 , CO3
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<p><b>Unit 3</b></p>	<p><b>1. Nervous system</b> -Properties of nerve fibres, function of neuroglia, synapse, CNS, CSF, brain, cranial nerves, demonstration of reflexes.</p> <p><b>2. Muscular system</b> - Properties of skeletal muscle, cardiac muscle, smooth muscle, muscles of the body.</p> <p><b>3. Skeletal system</b> - Functions of bones, axial skeleton, appendicular skeleton.</p> <p><b>4. Musculoskeletal system</b> - Movement in the joints of upper &amp; lower limb.</p>	<p>05</p>	<p>CO3</p>
<p><b>Unit 4</b></p>	<p><b>1. Respiratory system</b> - Physiology of respiration, pulmonary function tests, gas exchange in lungs, transport of gases between lungs &amp; tissues, regulation of respiration.</p> <p><b>2. Cardiovascular system</b> - Heart &amp; blood vessels: Systemic circulation, pulmonary circulation, ECG, cardiac output, blood pressure.</p> <p><b>3. Digestive system</b> ..... Process of digestion, function of oral cavity, pharynx, salivary glands, oesophagus, stomach, small intestine, large intestine, liver, gallbladder, pancreas.</p> <p><b>4. Urinary system</b> - Function of kidneys, juxtaglomerular apparatus, ureters, urinary bladder, urethra, physiology of urine formation, glomerular filtration, tubular reabsorption, water balance, micturition.</p> <p><b>5. Introduction to genetics</b> - Features of chromosomes, DNA, protein synthesis, dominant inheritance, recessive inheritance, and sex linked inheritance.</p> <p><b>6. Reproductive system- female:</b> Physiology of female reproductive system.</p> <p><b>7. Reproductive system - male:</b> Physiology of male reproductive system.</p> <p><b>8. Endocrine system</b> - Mechanism of action of hormones, function of pituitary gland, thyroid gland, parathyroid glands, adrenal glands, endocrine pancreas.</p> <p><b>9. Special senses</b> - Physiology of olfaction, taste, hearing, balance &amp; vision.</p> <p><b>9. Skin</b> - Function of skin, hair, sebaceous glands, sweat glands, nails, temperature regulation.</p>	<p>12</p>	<p>CO3, CO4</p>

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### CO-PO and PSO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	1	1	1	1	2	1	1	1	1	3	2	1	1	3
CO2	2	1	2	1	2	1	1	1	1	3	2	2	2	3
CO3	1	1	2	2	2	2	1	2	1	3	2	2	1	3
CO4	1	2	1	1	2	2	1	1	1	3	2	1	1	3

*Strong contribution-3, Average contribution-2, Low contribution-1,*

### Suggested Readings:

<b>Text- Books</b>	<ol style="list-style-type: none"> <li>3. PR Ashalatha &amp; G Deepa's Textbook of anatomy &amp; physiology</li> <li>4. N Geetha 's Textbook of physiology</li> </ol>
<b>Reference Books</b>	<ol style="list-style-type: none"> <li>1. CC Chatterjee's Human Physiology</li> <li>2. CC Chatterjee's Practical Physiology for Paramedical Courses</li> <li>3. CN Chandra Shekhar's Manipal Manual of Medical Physiology</li> <li>4. RK Maurya's Medical Physiology</li> </ol>

### Recapitulation & Examination Pattern

#### Internal Continuous Assessment:

Component	Marks	Pattern
Terminal Exam	12	<ol style="list-style-type: none"> <li>7. Contains a descriptive question of 4 marks</li> <li>8. Contains 4 MCQs</li> <li>9. Contains 2 short answer questions. Each question carries 2 marks</li> </ol>
Attendance	04	
Project/Assignments	04	
Class participation or any other	04	
Class Presentation	04	
Bed Side Behavior or Interaction in Class	02	
<b>Total Marks</b>	<b>30</b>	

**Department of Radiology &  
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**Era University, Lucknow**  
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**Effective From 2023-24**

<b>Name of the Program</b>	<b>BRIT</b>			<b>Year/ Semester:</b>	<b>1<sup>st</sup> Semester</b>
<b>Course Name</b>	<b>GENERAL PHYSIOLOGY-I</b>	<b>Course Code:</b>	BRP 112	<b>Type:</b>	<b>Practical</b>
<b>Credits</b>	<b>03</b>			<b>Total Sessions Hours:</b>	<b>40</b>
<b>Evaluation Spread</b>	<b>Internal Continuous Assessment:</b>	<b>30</b>		<b>End Term Exam:</b>	<b>70</b>
<b>Type of Course</b>	<input type="radio"/> Compulsory	<input checked="" type="radio"/> Core	<input type="radio"/> Creative	<input type="radio"/> Life Skill	
<b>Course Objectives</b>	1. Explain the normal functioning of various organ systems of the body and their interactions. 2. Elucidate the physiological aspects of normal growth and development. 3. Describe the physiological response and adaptations to environmental stresses. 4. Know the physiological principles underlying pathogenesis of disease.				
<b>Course Outcomes (CO):</b> <i>After the successful course completion, learners will develop the following attributes:</i>					
<b>Course Outcome (CO)</b>	<b>Attributes</b>				
<b>CO1</b>	Enumerate the Physiology of blood & various body systems				
<b>CO2</b>	Explain the Physiology of the respiration				
<b>CO3</b>	Explain the various physiology of cell				
<b>CO4</b>	Enumerate the Physiology of the cardiovascular system.				
<b>Pedagogy</b>	Explanations by the Instructor, Group/Pair Work, Discussion, Assignment, Practical, Presentations.				
<b>Internal Evaluation Mode</b>	Terminal Exam, Attendance, Project/Assignment, Class participation, Class presentation, Bedside behavior or Interaction in class.				

Session Details	Practical	Hours	Mapped CO
<b>Unit 1</b>	<ol style="list-style-type: none"> <li>1. Microscope</li> <li>2. Hemocytometer</li> <li>3. Blood</li> <li>4. RBC count</li> <li>5. Hb</li> <li>6. WBC count</li> <li>7. Differential Count</li> <li>8. Hematocrit</li> <li>9. Blood group &amp; Rh. Type Bleeding time and clotting time</li> </ol>	18	CO1
<b>Unit 2</b>	<ol style="list-style-type: none"> <li>1. Digestion</li> <li>2. Test salivary digestions Excretion</li> <li>3. Examination of Urine</li> <li>4. Specific gravity</li> <li>5. Albumin</li> <li>6. Sugar</li> <li>7. Microscopic examination for cells</li> </ol>	14	CO3

<b>Unit 3</b>	1. Respiratory System: 2. Clinical examination of respiratory system 3. Spirometry 4. Breath holding test.	4	CO2
<b>Unit 4</b>	Cardio Vascular System: 1. Measurement of blood pressure and pulse rate 2. Effect of exercise on blood pressure and pulse rate.	4	CO4

### CO-PO and PSO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	1	1	1	1	2	1	1	1	1	3	2	1	1	3
CO2	2	1	2	1	2	1	1	1	1	3	2	2	2	3
CO3	1	1	2	2	2	2	1	2	1	3	2	2	1	3
CO4	1	2	1	1	2	2	1	1	1	3	2	1	1	3

*Strong contribution-3, Average contribution-2, Low contribution-1,*

### Suggested Readings:

<b>Text- Books</b>	5. PR Ashalatha & G Deepa's Textbook of ANATOMY & PHYSIOLOGY 6. N Geetha's sTextbook of physiology
<b>Reference Books</b>	1. C C Chatterjee's Human Physiology 2. C C Chatterjee's Practical Physiology for Paramedical Courses 3. CN Chandrashekhar's Manipal Manual of Medical Physiology 4. RK Maurya's Medical Physiology

### Recapitulation & Examination Pattern

#### Internal Continuous Assessment:

Component	Marks	Pattern
Terminal Exam	12	10. Contains a descriptive question of 4 marks 11. Contains 4 MCQs 12. Contains 2 short answer questions. Each question carries 2 marks
Attendance	04	
Project/Assignments	04	
Class participation or any other	04	
Class Presentation	04	
Bed Side Behavior or Interaction in Class	02	
<b>Total Marks</b>	30	



**Department of Radiology &  
Imaging Techniques**

**Era University, Lucknow**

**Course Outline**

**Effective From: 2023-24**

<b>Name of the Program</b>	<b>BRIT</b>			<b>Year/ Semester:</b>	<b>1<sup>st</sup> Semester</b>
<b>Course Name</b>	<b>Introduction To Quality and Patient Safety</b>	<b>Course Code:</b>	<b>BRT 103</b>	<b>Type:</b>	<b>Theory</b>
<b>Credits</b>	<b>03</b>			<b>Total Sessions Hours:</b>	<b>40</b>
<b>Evaluation Spread</b>	<b>Internal Continuous Assessment:</b>			<b>End Term Exam:</b>	
<b>Type of Course</b>	<input type="radio"/> Compulsory	<input checked="" type="radio"/> Core		<input type="radio"/> Creative	<input type="radio"/> Life Skill
<b>Course Objectives</b>	<p>1. The main objective of this course is to teach students quality measures to provide patients with effective methods of treatment with more focus on proper handling of infected specimens and proper treatment with best sterilized and disinfected means to reduce the cross-infection scenario and nosocomial infections, which occurs due to poor handling of infected specimens and improper disposal means polluting environment too. Students are made to learn basic concepts of quality in health care and develop skills to implement sustainable quality assurance program. Introducing students to basic emergency care, infection prevention &amp; control with knowledge of biomedical waste management and antibiotic resistance.</p>				
<b>Course Outcomes (CO):</b> <i>After the successful course completion, learners will develop following attributes:</i>					
<b>Course Outcome (CO)</b>	<b>Attributes</b>				
<b>CO1</b>	Understood quality improvement approaches, NABH, NABL, JCI guidelines which purely focuses on the quality measures and proper handling of disposals providing quality facility to patients. (Understanding Based)				
<b>CO2</b>	Understood basic life support skills which can save many lives in urgent cases. (Applying Based)				
<b>CO3</b>	Understood proper disposals of biomedical waste, reducing risk of infection to waste handling personnel and cross infection which can occur due to improper handling of infected waste polluting surroundings too. (Applying Based)				
<b>CO4</b>	Understood effective hand hygiene, prevention and control of common health care associated infections. (Remembering Based).				

<b>CO5</b>	Understood fundamentals of emergency management, disaster preparedness. (Remembering Based).		
<b>Pedagogy</b>	Explanations by the Instructor, Group/Pair Work, Discussion, Assignment, Practical, Presentations.		
<b>Internal Evaluation Mode</b>	Terminal Exam, Attendance, Project/Assignment, Class participation, Class presentation, Bedside behavior or Interaction in class.		
<b>Session Details</b>	<b>Topic</b>	<b>Hours</b>	<b>Mapped CO</b>
<b>Unit 1</b>	Introduction, Quality improvement approaches, standards and norms, quality improvement tools, introduction to NABH guidelines.	03	CO1
<b>Unit 2</b>	Basic life support (BLS) following cardiac arrest, recognition of sudden cardiac arrest and activation of emergency response system, early cardiopulmonary resuscitation (CPR) and rapid defibrillation with an automated external defibrillator (AED)	06	CO2

<b>Unit 3</b>	First aid, choking, rescue breathing methods, ventilation including use of bag valve master (BVMs)	06	CO2
<b>Unit 4</b>	Definition, waste minimization, BMW-segregation, collection, transportation, treatment and disposal (Including color coding); Liquid BMW, Radioactive waste, metals/chemicals/drug waste, BMW management and methods of disinfection, use of Personal protective equipment (PPE)	05	CO3
<b>Unit 5</b>	Sterilization, Disinfection, Effective hand hygiene, use of PPE, Prevention and control of common health care associated infections, Guidelines(NABH) and JCI for hospital infection control.	06	CO4
<b>Unit 6</b>	Fundamentals of emergency management	04	CO5

#### CO-PO and PSO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	1	1	1	1	1	1	1	1	2	1	2	1	2	2
CO2	2	1	1	1	2	2	3	1	1	1	2	1	2	2
CO3	2	1	1	1	2	2	2	2	3	1	2	2	2	2
CO4	1	2	1	1	1	2	2	1	1	1	2	2	1	2
CO5	2	1	1	1	1	1	2	1	1	2	2	1	2	2

*Strong contribution-3, Average contribution-2, Low contribution-1,*

#### Suggested Readings:

<b>Text- Books</b>	1. Turgeon, Mary Louise. (2015). Clinical Laboratory Science, 7th ed. Maryland Heights, MO: Mosby. ISBN 9780323225458
<b>Reference Books</b>	1. Turgeon, Mary Louise. (2015). Clinical Laboratory Science, 7th ed. Maryland Heights, MO: Mosby. ISBN 9780323225458
<b>Para Text</b>	1. disaster management set up in india - opcw.org  www.opcw.org/sites/default/files/documents/event photos/2010/tabletop exercise poland nov201.  2. natural disasters: hospital management I 2015-10-22 I ahc ...

	<p><a href="http://www.reliasmedia.com/articles/136571-natural-disasters-hospital-management">www.reliasmedia.com/articles/136571-natural-disasters-hospital-management</a></p> <p>3. Biomedical waste management in India: Critical appraisal - NCBI - NIH  <a href="http://www.ncbi.nlm.nih.gov/pmc/articles/PMC5784295">www.ncbi.nlm.nih.gov/pmc/articles/PMC5784295</a></p> <p>4. Vital signs: Understanding what the body is telling us  <a href="https://www.coursera.org/learn/vital-signs/">https://www.coursera.org/learn/vital-signs/</a></p> <p>5. Patient Safety and Quality Improvement  <a href="https://www.coursera.org/learn/patient-safety">https://www.coursera.org/learn/patient-safety</a></p>
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**Recapitulation & Examination Pattern**

**Internal Continuous Assessment:**

<b>Component</b>	<b>Marks</b>	<b>Pattern</b>
Terminal Exam	12	13. Contains a descriptive question of 4 marks 14. Contains 4 MCQs 15. Contains 2 short answer questions. Each question carries 2 marks
Attendance	04	
Project/Assignments	04	
Class participation or any other	04	
Class Presentation	04	
Bed Side Behavior or Interaction in Class	02	
<b>Total Marks</b>	<b>30</b>	



**Department of Radiology &  
Imaging Techniques  
Era University, Lucknow  
Course Outline  
Effective From: 2023-24**

Name of the Program	BRIT		Year/ Semester:	1 <sup>st</sup> Semester
Course Name	Image Acquisition, Processing & Archiving	Course Code:	BRT 104	Type: Theory
Credits	04		Total Sessions Hours:	40
Evaluation Spread	Internal Continuous Assessment:	30	End Term Exam:	70
Type of Course	<input type="radio"/> Compulsory	<input checked="" type="radio"/> Core	<input type="radio"/> Creative	<input type="radio"/> Life Skill
Course Objectives	Demonstrate composition of film, screens, cassette, processing solution, the usage and effect of light. Perform best storage guidelines for film storage and handling. Select cassette size, Demonstrate Loading & unloading of films			
<b>Course Outcomes (CO):</b> After the successful course completion, learners will develop following attributes:				
Course Outcome (CO)	<b>Attributes</b>			
CO1	Understood the basic concepts, fundamental principles, and the scientific theories related to films, screens			
CO2	Acquired the skills in handling films screens and planning of dark-room and performing in laboratory experiments			
CO3	Realized how developments in any radio-graphic image quality. how interdisciplinary approach helps in providing better solutions and new ideas for the sustainable developments			
Pedagogy	Explanations by the Instructor, Group/Pair Work, Discussion, Assignment, Practical, Presentations.			
Internal Evaluation Mode	Terminal Exam, Attendance, Project/Assignment, Class participation, Class presentation, Bedside behavior or Interaction in class.			

Session Details	Topic	Hours	Mapped CO
<b>Unit 1</b>	Composition of single and double coated radiographic films, Screen & Non Screen films, structure of film, characteristic curve, characteristics (speed, base + fog, gamma, latitude), effect of grain size on film response to exposure, interpretation of characteristic curve, latent image formation, process of film developing (composition of developer, Fixer and other processing solution), common errors and faults while processing (densitometry), automatic processing unit (processing cycle), developer & Fixer replenishment and silver recovery.	10	CO1
<b>Unit 2</b>	Film storage rules and guidelines, film handling and care (size, construction and function), types of intensifying screens and relative advantage, loading and unloading of cassettes and their care/maintenance, effects of kV and mA on variation of emitted radiation intensity, determination of relative speeds, film contrast, film screen contact.	10	CO2 ,CO 3

<b>Unit 3</b>	Image formation, latent image, processing: manual processing, automatic processing. Developer, fixer, rinser components, replenisher. Manual technique of developing film, Automatic film processor, common errors in processing.	08	CO3
<b>Unit 4</b>	Meaning of radiographic image contrast, density, resolution, magnification and distortion of image, noise and blur, radiographic illuminators and viewing conditions, visual acuity and resolution, quality assurance of the related equipment and its benefits with respect to visual assessment	07	CO1,CO3
<b>Unit 5</b>	Purpose and location of dark room, layout of dark room, entrance, pass box, hatch, hangers, safe light, criteria of safe light, safe light test.	05	CO3

#### CO-PO and PSO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	2	1	1	3	1	2	2	2	3	1	2	3	3	2
CO2	3	1	1	3	1	2	3	2	3	2	3	3	3	2
CO3	2	2	1	3	1	2	3	3	3	1	3	3	3	2

*Strong contribution-3, Average contribution-2, Low contribution-1,*

#### Suggested Readings:

<b>Text- Books</b>	<b>1. Text book of radiology for residents and technician- S K Bhargava.</b>
<b>Reference Books</b>	<b>1. Dark room procedure- MO and Chesney</b>

#### Recapitulation & Examination Pattern

##### Internal Continuous Assessment:

Component	Marks	Pattern
Terminal Exam	12	16. Contains a descriptive question of 4 marks 17. Contains 4 MCQs 18. Contains 2 short answer questions. Each question carries 2 marks
Attendance	04	
Project/Assignments	04	
Class participation or any other	04	
Class Presentation	04	
Bed Side Behavior or Interaction in Class	02	
<b>Total Marks</b>	<b>30</b>	

**Department of Radiology &  
Imaging Techniques**  
**Era University, Lucknow**  
**Course Outline**  
**Effective From 2023-24**

<b>Name of the Program</b>	<b>BRIT</b>			<b>Year/ Semester:</b>	<b>1<sup>st</sup> Semester</b>
<b>Course Name</b>	<b>Applied Physics</b>	<b>Course Code:</b>	<b>BRP 105</b>	<b>Type:</b>	<b>Practical</b>
<b>Credits</b>	<b>03</b>			<b>Total Sessions Hours:</b>	<b>60</b>
<b>Evaluation Spread</b>	<b>Internal Continuous Assessment:</b>	<b>30</b>		<b>End Term Exam:</b>	<b>70</b>
<b>Type of Course</b>	<input type="radio"/> Compulsory	<input checked="" type="radio"/> Core	<input type="radio"/> Creative	<input type="radio"/> Life Skill	
<b>Course Objectives</b>	<p>The purpose of this course is to provide an understanding of physical concepts and underlying various technological applications. This course also provides fundamental ideas about circuit analysis and the working principles of machines. In addition, the course is expected to develop scientific temperament and analytical skills in students, to enable them to logically tackle complex engineering problems in their chosen area of application. The main objectives are:</p> <ol style="list-style-type: none"> <li>1. To understand the general scientific concepts required for technology</li> <li>2. Understand the basic concepts of magnetic circuits, and AC &amp; DC circuits.</li> <li>3. To gain knowledge about the fundamentals of electronic components and devices</li> </ol>				
<b>Course Outcomes (CO):</b> <i>After the successful course completion, learners will develop the following attributes:</i>					
<b>Course Outcome (CO)</b>	<b>Attributes</b>				
<b>CO1</b>	Understood the basic concepts, fundamental principles, and scientific theories related to various scientific phenomena and their relevancies in day-to-day life				
<b>CO2</b>	Acquired skills in handling scientific instruments, planning, and performing laboratory experiments.				
<b>CO3</b>	: Realized how developments in any science subject help in the development of other science subjects and vice-versa and how interdisciplinary approach helps in providing better solutions and new ideas for sustainable developments				
<b>Pedagogy</b>	Explanations by the Instructor, Group/Pair Work, Discussion, Assignment, Practical, Presentations.				
<b>Internal Evaluation Mode</b>	Terminal Exam, Attendance, Project/Assignment, Class participation, Class presentation, Bedside behavior or Interaction in class.				



Session Details	Topic	Hours	Mapped CO
<b>Unit 1</b>	<p>BASIC PHYSICS: Sound -The nature and propagation of sound waves (the characteristics of sound, wave theory), speed of sound in a material medium, intensity of sound, the decibel, Interference of sound waves, beats, diffraction, Doppler's effect</p> <p>HEAT: Definition of heat, temperature, Heat capacity, specific heat capacity, Heat transfer conduction, convection, radiation, thermal conductivity, equation for thermal conductivity (k), the value of k of various materials of interest in radiology, and thermal expansion.</p>	10	CO1
<b>Unit 2</b>	<p>FUNDAMENTALS OF DC CIRCUITS: Introduction to DC and AC circuits, Active and passive two terminal elements, Ohms law, resistivity, series, and parallel combination, Voltage- Current relations for resistor, inductor, capacitor, Kirchhoff's laws, EMF.</p> <p>AC CIRCUITS: AC. and D.C. power supply with examples, single phase and polyphase power supply, Sinusoids, Introduction to three-phase systems - types of connections, relationship between line and phase values.</p>	15	CO2 , CO3

<b>Unit 3</b>	MAGNETIC CIRCUITS: Introduction to magnetic Circuits-Simple magnetic circuits- Faraday's laws, induced EMFs and inductances, Galvanometer. Magnets and magnetic field, force on an electric current in a magnetic field, force on an electric charge moving in a magnetic field, magnetic field due to straight wire; force between two parallel wires, Ampere's law, electromagnet, and solenoids	15	CO2,CO3
<b>Unit 4</b>	RECTIFICATION: Wave form of half wave and full wave current/voltage waveform; Rectifiers: Introduction, energy bands in solids, the semiconductor, p-type and n-type semiconductors, p-n junction, p-n junction diode, p-n junction diode as rectifier (half-wave and full-wave rectifier), rectifiers relative merits and demerits; silicon, germanium diodes.	20	CO,CO3

### CO-PO and PSO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	1	1	1	3	1	1	2	1	3	1	2	2	2	1
CO2	2	1	1	3	1	2	1	1	3	1	2	3	2	1
CO3	2	1	1	3	1	2	2	1	3	1	3	3	3	1

*Strong contribution-3,*

*Average contribution-2,*

*Low contribution-1,*

### Suggested Readings:

#### Text- Books

1. R.F.Coughlin and F.F.Driscoll,'Operational amplifiers and linear integrated circuits', (6 th edition), Pearson Education Inc., New Delhi, 2001.
2. T. L. Floyd, Digital Fundamentals, (8 th deition), Pearson education Inc., New Delhi, 2003.
3. S.Brown and Z.Vranesic,'Fundamentals of digital logic with Verilog design', TataMcGraw Hill Publ Co.Ltd., New Delhi, 2003.
4. H.Skalsi, "Electronic instrumentation (2 nd edition), Tata McGraw Hill Publ. Co. Ltd., New Delhi,2004
5. J. P. Woodcock, Ultrasonic, Medical Physics Handbook series 1, Adam Hilger, Bristol,2002.
6. J. R. Greening, Medical Physics, North Holland Publishing Co., New York, 1999.
7. R. Pratesi and C. A. Sacchi, Lasers in Photomedicine and Photobiology, Springer Verlag,West Germany, 1980.
8. Harry Moseley, Hospital Physicists&#39; Association, Non-ionising radiation: microwaves, ultraviolet, and laser radiation, A. Hilger, in collaboration with the Hospital Physicists&#39; Association, 1988
9. H. E. Jones, J. R. Cunningham, The Physics of Radiology, Charles C. Thomas, New York, 2002.
10. W. J. Meredith and J. B. Massey, Fundamental Physics of Radiology, John Wright and Sons,U. K., 2000.
11. W. R. Handee, Medical Radiation Physics, Year Book Medical Publishers Inc., London, 2003.
12. Donald T. Graham, Paul J. Cloke, Principles of Radiological Physics, Churchill Livingstone, 2003

<b>Reference Books</b>	<ol style="list-style-type: none"> <li>1. H. E. Jones, J. R. Cunningham, The Physics of Radiology, Charles C. Thomas, New York, 2002.</li> <li>2. W. J. Meredith and J. B. Massey, Fundamental Physics of Radiology, John Wright and Sons, U. K., 2000.</li> <li>3. W. R. Handee, Medical Radiation Physics, Year Book Medical Publishers Inc., London, 2003.</li> <li>4. Donald T. Graham, Paul J. Cloke, Principles of Radiological Physics, Churchill Livingstone, 2003</li> </ol>
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<b>Recapitulation &amp; Examination Pattern</b>		
<b>Internal Continuous Assessment:</b>		
<b>Component</b>	<b>Marks</b>	<b>Pattern</b>
Terminal Exam	12	<ol style="list-style-type: none"> <li>19. Contains a descriptive question of 4 marks</li> <li>20. Contains 4 MCQs</li> <li>21. Contains 2 short answer questions. Each question carries 2 marks</li> </ol>
Attendance	04	
Project/Assignments	04	
Class participation or any other	04	
Class Presentation	04	
Bed Side Behavior or Interaction in Class	02	
<b>Total Marks</b>	<b>30</b>	

**Department of Radiology &  
Imaging Techniques**  
**Era University, Lucknow**  
**Course Outline**  
**Effective From: 2023-24**

<b>Name of the Program</b>	<b>BRIT</b>			<b>Year/ Semester:</b>	<b>1<sup>st</sup> Semester</b>
<b>Course Name</b>	<b>Applied Physics</b>	<b>Course Code:</b>	<b>BRT 105</b>	<b>Type:</b>	<b>Theory</b>
<b>Credits</b>	<b>03</b>			<b>Total Sessions Hours:</b>	<b>30</b>
<b>Evaluation Spread</b>	<b>Internal Continuous Assessment:</b>	<b>30</b>		<b>End Term Exam:</b>	<b>70</b>
<b>Type of Course</b>	<input type="radio"/> Compulsory	<input checked="" type="radio"/> Core	<input type="radio"/> Creative	<input type="radio"/> Life Skill	
<b>Course Objectives</b>	<p>The purpose of this course is to provide an understanding of physical concepts and underlying various technological applications. This course also provides fundamental idea about circuit analysis, working principles of machines. In addition, the course is expected to develop scientific temperament and analytical skill in students, to enable them logically tackle complex engineering problems in their chosen area of application. The main objectives are:</p> <ol style="list-style-type: none"> <li>1. To understand the general scientific concepts required for technology</li> <li>2. Understand the basic concepts of magnetic circuits, AC &amp; DC circuits.</li> <li>3. To gain knowledge about fundamentals of electronic components and devices</li> </ol>				
<b>Course Outcomes (CO):</b> <i>After the successful course completion, learners will develop following attributes:</i>					
<b>Course Outcome (CO)</b>	<b>Attributes</b>				
<b>CO1</b>	Understood the basic concepts, fundamental principles, and the scientific theories related to various scientific phenomena and their relevancies in the day-to-day life				
<b>CO2</b>	Acquired the skills in handling scientific instruments, planning and performing in laboratory experiments.				
<b>CO3</b>	: Realized how developments in any science subject helps in the development of other science subjects and vice-versa and how interdisciplinary approach helps in providing better solutions and new ideas for the sustainable developments				
<b>Pedagogy</b>	Explanations by the Instructor, Group/Pair Work, Discussion, Assignment, Practical, Presentations.				
<b>Internal Evaluation Mode</b>	Terminal Exam, Attendance, Project/Assignment, Class participation, Class presentation, Bedside behavior or Interaction in class.				

Session Details	Topic	Hours	Mapped CO
<b>Unit 1</b>	<p>BASIC PHYSICS: Sound -The nature and propagation of sound wave (the characteristics of sound, wave theory), speed of sound in a material medium, intensity of sound, the decibel, Interference of sound waves, beats, diffraction, Doppler's effect</p> <p>HEAT: Definition of heat, temperature, Heat capacity, specific heat capacity, Heat transfer- conduction, convection, radiation, thermal conductivity, equation for thermal conductivity (k), the value of k of various material of interest in radiology, thermal expansion.</p>	05	CO1
<b>Unit 2</b>	<p>FUNDAMENTALS OF DC CIRCUITS: Introduction to DC and AC circuits, Active and passive two terminal elements, Ohms law, resistivity, series and parallel combination, Voltage- Current relations for resistor, inductor, capacitor, Kirchhoffs laws, EMF.</p> <p>AC CIRCUITS: AC. and D.C. power supply with examples, single phase and poly phase power supply, Sinusoids, Introduction to three phase systems - types of connections, relationship between line and phase values.</p>	10	CO2 , CO3

<b>Unit 3</b>	MAGNETIC CIRCUITS: Introduction to magnetic Circuits-Simple magnetic Circuits-Faraday's laws, induced emfs and inductances, Galvanometer. Magnets and magnetic field, force on an electric current in a magnetic field, force on electric charge moving in a magnetic field, magnetic field due to straight wire; force between two parallel wires, Ampere's law, electromagnet and solenoids	06	CO2, CO3
<b>Unit 4</b>	RECTIFICATION: Wave form of half wave and full wave current/voltage wave form; Rectifiers: Introduction, energy bands in solids, the semiconductor, p-type and n-type semiconductors, p-n junction, p-n junction diode, p-n junction diode as rectifier (half- wave and full-wave rectifier), rectifiers relative merits and demerits; silicon, germanium diodes.	09	CO2, CO3

### CO-PO and PSO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	1	1	1	3	1	1	2	1	3	1	2	2	2	1
CO2	2	1	1	3	1	2	1	1	3	1	2	3	2	1
CO3	2	1	1	3	1	2	2	1	3	1	3	3	3	1

*Strong contribution-3, Average contribution-2, Low contribution-1,*

### Suggested Readings:

<b>Text- Books</b>	<ol style="list-style-type: none"> <li>1. R.F.Coughlin and F.F.Driscoll,'Operational amplifiers and linear integrated circuits', (6 th edition), Pearson Education Inc., New Delhi, 2001.</li> <li>2. T. L. Floyd, Digital Fundamentals, (8 th deition), Pearson education Inc., New Delhi, 2003.</li> <li>3. S.Brown and Z.Vranesic,'Fundamentals of digital logic with Verilog design', TataMcGraw Hill Publ Co.Ltd., New Delhi, 2003.</li> <li>4. H.Skalsi, "Electronic instrumentation (2 nd edition), Tata McGraw Hill Publ. Co. Ltd., New Delhi,2004</li> <li>5. J. P. Woodcock, Ultrasonic, Medical Physics Handbook series 1, Adam Hilger, Bristol,2002.</li> <li>6. J. R. Greening, Medical Physics, North Holland Publishing Co., New York, 1999.</li> <li>7. R. Pratesi and C. A. Sacchi, Lasers in Photomedicine and Photobiology, Springer Verlag,West Germany, 1980.</li> <li>8. Harry Moseley, Hospital Physicists&amp;#39; Association, Non-ionising radiation: microwaves, ultraviolet, and laser radiation, A. Hilger, in collaboration with the Hospital Physicists&amp;#39; Association, 1988</li> <li>9. H. E. Jones, J. R. Cunningham, The Physics of Radiology, Charles C. Thomas, New York, 2002.</li> <li>10. W. J. Meredith and J. B. Massey, Fundamental Physics of Radiology, John Wright and Sons,U. K., 2000.</li> <li>11. W. R. Handee, Medical Radiation Physics, Year Book Medical Publishers Inc., London, 2003.</li> <li>12. Donald T. Graham, Paul J. Cloke, Principles of Radiological Physics, Churchill Livingstone, 2003</li> </ol>
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<b>Reference Books</b>	<ol style="list-style-type: none"> <li>1. H. E. Jones, J. R. Cunningham, The Physics of Radiology, Charles C. Thomas, New York, 2002.</li> <li>2. W. J. Meredith and J. B. Massey, Fundamental Physics of Radiology, John Wright and Sons, U. K., 2000.</li> <li>3. W. R. Handee, Medical Radiation Physics, Year Book Medical Publishers Inc., London, 2003.</li> <li>4. Donald T. Graham, Paul J. Cloke, Principles of Radiological Physics, Churchill Livingstone, 2003</li> </ol>
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**Recapitulation & Examination Pattern**

**Internal Continuous Assessment:**

<b>Component</b>	<b>Marks</b>	<b>Pattern</b>
Terminal Exam	12	<ol style="list-style-type: none"> <li>22. Contains a descriptive question of 4 marks</li> <li>23. Contains 4 MCQs</li> <li>24. Contains 2 short answer questions. Each question carries 2 marks</li> </ol>
Attendance	04	
Project/Assignments	04	
Class participation or any other	04	
Class Presentation	04	
Bed Side Behavior or Interaction in Class	02	
<b>Total Marks</b>	<b>30</b>	

**Department of Radiology &  
Imaging Techniques**  
**Era University, Lucknow**  
**Course Outline**  
**Effective From 2023-24**

<b>Name of the Program</b>	<b>BRIT</b>			<b>Year/ Semester:</b>	<b>1<sup>st</sup> Semester</b>
<b>Course Name</b>	<b>Basic in Computer &amp; Information Science</b>	<b>Course Code:</b>	<b>CSP 101</b>	<b>Type: Semester</b>	<b>Practical</b>
<b>Credits</b>	<b>02</b>			<b>Total Sessions Hours:</b>	<b>40</b>
<b>Evaluation Spread</b>	<b>Internal Continuous Assessment:</b>	<b>30</b>		<b>End Term Exam:</b>	<b>70</b>
<b>Type of Course</b>	<input type="radio"/> Compulsory	<input checked="" type="radio"/> Core	<input type="radio"/> Creative	<input type="radio"/> Life Skill	
<b>Course Objectives</b>	<p>1. The course has a focus on computer organization, computer operating systems and software, MS Windows, Word processing, Excel data worksheets, and PowerPoint presentations.</p> <p>2. The students will be able to appreciate the role of computer technology and some extent able to gain hands-on experience in using computers.</p>				
<b>Course Outcomes (CO):</b> <i>After the successful course completion, learners will develop the following attributes:</i>					
<b>Course Outcome (CO)</b>	<b>Attributes</b>				
<b>CO1</b>	Understand the various hardware and software of the computer system,				
<b>CO2</b>	Compare the differences between the various functions of the same (Analyze)				
<b>CO3</b>	Learn to apply the knowledge of various fields of the course (Apply & Analyze)				
<b>CO4</b>	Augment their learning by making various presentations and graphics (Synthesize, evaluate & create)				
<b>Pedagogy</b>	Explanations by the Instructor, Group/Pair Work, Discussion, Assignment, Practical, Presentations.				
<b>Internal Evaluation Mode</b>	Terminal Exam, Attendance, Project/Assignment, Class participation, Class presentation, Bedside behavior or Interaction in class.				



Session Details	Topic	Hours	Mapped CO
<b>Unit 1</b>	<p>1. Input output devices: Input devices(keyboard, point and draw devices, data scanning devices, digitizer, electronic card reader, voice recognition devices, vision-input devices), output devices(monitors, pointers, plotters, screen image projector, voice response systems).</p> <p>3. Processor and memory: The Central Processing Unit (CPU) is, the main memory.</p> <p>4. Storage Devices: Sequential and direct access devices, magnetic tape, magnetic disk, optical disk, and mass storage devices.</p>	10	CO1 ,CO 2
<b>Unit 2</b>	<p>1. Introduction to MS Word: introduction, components of a word window, creating, opening, and inserting files, editing a document file, page setting and formatting the text, saving the document, spell checking, printing the document file, creating and editing of table, mail merge.</p> <p>3. Introduction to Excel: introduction, about worksheet, entering information, saving workbooks and formatting, printing the worksheet, creating graphs</p>	15	CO2 , CO4

<b>Unit 3</b>	<p>1. Computer networks: introduction, types of network (LAN, MAN, WAN, Internet, Intranet), network topologies (star, ring, bus, mesh, tree, hybrid), components of the network.</p> <p>2. Internet and its Applications: definition, brief history, basic services (E-Mail, File Transfer Protocol, telnet, the World Wide Web (WWW)), www browsers, use of the internet.</p> <p>3. Application of Computers in clinical settings.</p>	15	CO3, CO4
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### CO-PO and PSO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	2	2	1	3	1	2	1	1	2	1	1	1	1	1
CO2	1	2	1	3	1	2	1	2	2	1	1	1	1	1
CO3	2	3	1	3	1	2	1	1	2	1	2	1	1	1
CO4	3	3	1	3	2	3	1	2	3	2	2	1	1	1

*Strong contribution-3, Average contribution-2, Low contribution-1,*

### Suggested Readings:

<b>Text- Books</b>	<p>7. Rajaraman, &amp;quot;Fundamentals of Computers&amp;quot;, PHI</p> <p>8. Peter Norton&amp;#39;s, &amp;quot;Introduction to Computers&amp;quot;, TMH</p> <p>9. Hahn, &amp;quot;The Internet complete reference&amp;quot;, TMH</p> <p>10. D.S. Yadav, &amp;quot;Foundation of Information Technology&amp;quot;, New Age International.</p> <p>11. T. M. Ramachandran, &amp;quot;Principles and Techniques of Programming&amp;quot;, Galgotia Publications.</p>
<b>Reference Books</b>	<p>13. T. M. Ramachandran, &amp;quot;Principles and Techniques of Programming&amp;quot;, Galgotia Publications.</p>

### Recapitulation & Examination Pattern

#### Internal Continuous Assessment:

Component	Marks	Pattern
Terminal Exam	12	25. Contains a descriptive question of 4 marks 26. Contains 4 MCQs 27. Contains 2 short answer questions. Each question carries 2 marks
Attendance	04	
Project/Assignments	04	
Class participation or any other	04	
Class Presentation	04	
Bed Side Behavior or Interaction in Class	02	
<b>Total Marks</b>	30	

**Department of Radiology &  
Imaging Techniques**  
**Era University, Lucknow**  
**Course Outline**  
**Effective From: 2023-24**

Name of the Program	BRIT			Year/ Semester:	1 <sup>st</sup> Semester
Course Name	Basic in Computer & Information Science	Course Code:	CST 101	Type:	Theory
Credits	03			Total Sessions Hours:	30
Evaluation Spread	Internal Continuous Assessment:	30		End Term Exam:	70
Type of Course	<input type="radio"/> Compulsory	<input checked="" type="radio"/> Core		<input type="radio"/> Creative	<input type="radio"/> Life Skill
Course Objectives	1. The course has focus on computer organization, computer operating system and software, and MS windows, Word processing, Excel data worksheet and PowerPoint presentation. 2. The students will be able to appreciate the role of computer technology and some extent able to gain hand-on experience in using computers.				
<b>Course Outcomes (CO):</b> After the successful course completion, learners will develop following attributes:					
Course Outcome (CO)	<b>Attributes</b>				
CO1	Understand the various hardware and software of the computer system,				
CO2	Compare the differences between the various functions of the same (Analyze)				
CO3	Learn to apply the knowledge of various fields of the course (Apply & Analyze)				
CO4	Augment their learning by making various presentations and graphics (Synthesize, evaluate & create)				
Pedagogy	Explanations by the Instructor, Group/Pair Work, Discussion, Assignment, Practical, Presentations.				
Internal Evaluation Mode	Terminal Exam, Attendance, Project/Assignment, Class participation, Class presentation, Bedside behavior or Interaction in class.				

Session Details	Topic	Hours	Mapped CO
<b>Unit 1</b>	<p>1. Introduction to computer: Introduction, characteristics of computer, block diagram of computer, generations of computer, computer languages.</p> <p>2. Input output devices: Input devices (keyboard, point and draw devices, data scanning devices, digitizer, electronic card reader, voice recognition devices, vision-input devices), output devices (monitors, pointers, plotters, screen image projector, voice response systems).</p> <p>3. Processor and memory: The Central Processing Unit (CPU), main memory.</p> <p>4. Storage Devices: Sequential and direct access devices, magnetic tape, magnetic disk, optical disk, mass storage devices.</p>	06	CO1
<b>Unit 2</b>	<p>1. Introduction of windows: History, features, desktop, taskbar, icons on the desktop, operation with folder, creating shortcuts, operation with windows (opening, closing, moving, resizing, minimizing and maximizing, etc.).</p> <p>2. Introduction to MS-Word: introduction, components of a word window, creating, opening and inserting files, editing a document file, page setting and formatting the text, saving the document, spell checking, printing the document file, creating and editing of table, mail merge.</p> <p>3. Introduction to Excel: introduction, about worksheet, entering information, saving workbooks and formatting, printing the worksheet, creating graphs</p>	12	CO3 ,CO 4

<b>Unit 3</b>	<p>1. Introduction to power-point: introduction, creating and manipulating presentation, views, formatting and enhancing text, slide with graphs.</p> <p>2. Introduction of Operating System: introduction, operating system concepts, types of operating system.</p> <p>3. Computer networks: introduction, types of network (LAN, MAN, WAN, Internet, Intranet), network topologies (star, ring, bus, mesh, tree, hybrid), components of network.</p> <p>4. Internet and its Applications: definition, brief history, basic services (E-Mail, File Transfer Protocol, telnet, the World Wide Web (WWW)), www browsers, use of the internet.</p> <p>5. Application of Computers in clinical settings.</p>	12	CO2,CO4
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### CO-PO and PSO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	2	2	1	3	1	2	1	1	2	1	1	1	1	1
CO2	1	2	1	3	1	2	1	2	2	1	1	1	1	1
CO3	2	3	1	3	1	2	1	1	2	1	2	1	1	1
CO4	3	3	1	3	2	3	1	2	3	2	2	1	1	1

*Strong contribution-3, Average contribution-2, Low contribution-1,*

### Suggested Readings:

<b>Text- Books</b>	<p>12. Rajaraman, &amp;quot;Fundamentals of Computers&amp;quot;, PHI</p> <p>13. Peter Norton&amp;#39;s, &amp;quot;Introduction to Computers&amp;quot;, TMH</p> <p>14. Hahn, &amp;quot;The Internet complete reference&amp;quot;, TMH</p> <p>15. D.S. Yadav, &amp;quot;Foundation of Information Technology&amp;quot;, New Age International.</p> <p>16. T. M. Ramachandran, &amp;quot;Principles and Techniques of Programming&amp;quot;, Galgotia Publications.</p>
<b>Reference Books</b>	<p>14. T. M. Ramachandran, &amp;quot;Principles and Techniques of Programming&amp;quot;, Galgotia Publications.</p>

### Recapitulation & Examination Pattern

#### Internal Continuous Assessment:

Component	Marks	Pattern
Terminal Exam	12	28. Contains a descriptive question of 4 marks 29. Contains 4 MCQs 30. Contains 2 short answer questions. Each question carries 2 marks
Attendance	04	
Project/Assignments	04	
Class participation or any other	04	
Class Presentation	04	

Bed Side Behavior or Interaction in Class	02	
<b>Total Marks</b>	30	

**Department of Radiology &  
Imaging Techniques**  
**Era University, Lucknow**  
**Course Outline**  
**Effective From: 2023-24**

<b>Name of the Program</b>	<b>BRIT</b>			<b>Year/ Semester:</b>	<b>1<sup>st</sup> Semester</b>
<b>Course Name</b>	<b>English &amp; Communication Skill</b>	<b>Course Code:</b>	<b>ENG-101</b>	<b>Type:</b>	<b>Theory</b>
<b>Credits</b>	<b>03</b>			<b>Total Sessions Hours:</b>	<b>30</b>
<b>Evaluation Spread</b>	<b>Internal Continuous Assessment:</b>	<b>30</b>		<b>End Term Exam:</b>	<b>70</b>
<b>Type of Course</b>	<input type="radio"/> Compulsory	<input checked="" type="radio"/> Core	<input type="radio"/> Creative	<input type="radio"/> Life Skill	
<b>Course Objectives</b>	<p>1. This course trains the students in oral presentations, expository writing, logical organization and structural support.</p> <p>2. By acquiring skills in the use of communication techniques the students will be able to express better, grow personally and professionally, develop poise and confidence and achieve success.</p>				
<b>Course Outcomes (CO):</b> <i>After the successful course completion, learners will develop following attributes:</i>					
<b>Course Outcome (CO)</b>	<b>Attributes</b>				
<b>CO1</b>	Understood the role of radiographer in personal and professional ethics.				
<b>CO2</b>	Understood the handling of patient with good language.				
<b>CO3</b>	Understood the importance of good communication with patient as a health care professional.				
<b>Pedagogy</b>	Explanations by the Instructor, Group/Pair Work, Discussion, Assignment, Practical, Presentations.				
<b>Internal Evaluation Mode</b>	Terminal Exam, Attendance, Project/Assignment, Class participation, Class presentation, Bedside behavior or Interaction in class.				
<b>Session Details</b>	<b>Topic</b>			<b>Hours</b>	<b>Mapped CO</b>
<b>Unit 1</b>	Vocabulary, Synonyms, Antonyms, Prefix and Suffix, Homonyms, Analogies and Portmanteau words.			2	CO3
<b>Unit 2</b>	Active, Passive, Direct and Indirect speech, Prepositions, Conjunctions and Euphemisms			2	CO3

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<b>Unit 3</b>	Letter writing, E mail, and Essay, Articles, and Memos, one word substitutes, note making and Comprehension	2	CO3
<b>Unit 4</b>	Summary writing, Creative writing, newspaper reading	2	CO3
<b>Unit 5</b>	Formal speech, Phonetics, semantics and pronunciation	3	CO2,CO 3
<b>Unit 6</b>	<b>Introduction:</b> Communication process elements of communication, Barriers of communication and how to overcome them, Nuances for communicating with patients and their attenders in hospitals.	3	CO1
<b>Unit 7</b>	<b>Speaking:</b> importance of speaking efficiently Voice culture, Preparation of speech. Secrets of good delivery, Audience psychology, handling, Presentation skills, Individual feedback for each student, Conference/Interview technique.	4	CO2,CO 3
<b>Unit 8</b>	Importance of listening, Self-assessment, Action plan execution, Barriers in listening, Good and persuasive listening.	4	CO2
<b>Unit 9</b>	What is efficient and fast reading, Awareness of existing reading habits, tested techniques for improving speed, Improving concentration and comprehension through systematic study.	4	CO3
<b>Unit 10</b>	<b>Non Verbal Communication:</b> Basics of non-verbal communication, Rapport building skills using neuro- linguistic programming (NLP).	4	CO2,CO 3

#### CO-PO and PSO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	1	1	2	1	1	3	2	2	2	2	3	2	2	2
CO2	1	2	1	1	1	1	1	1	1	1	1	1	1	2
CO3	2	2	1	1	1	1	1	1	1	1	1	2	1	2

*Strong contribution-3, Average contribution-2, Low contribution-1,*

#### Suggested Readings:

<b>Text- Books</b>	With Good Reason : A Guide to Critical Thinking
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<b>Recapitulation &amp; Examination Pattern</b>		
<b>Internal Continuous Assessment:</b>		
<b>Component</b>	<b>Marks</b>	<b>Pattern</b>
Terminal Exam	12	31. Contains a descriptive question of 4 marks 32. Contains 4 MCQs 33. Contains 2 short answer questions. Each question carries 2 marks
Attendance	04	
Project/Assignments	04	
Class participation or any other	04	
Class Presentation	04	
Bed Side Behavior or Interaction in Class	02	
<b>Total Marks</b>	<b>30</b>	

