

Program Curriculum (Syllabus)

Program Name: - Diploma in X-Ray Diagnosis & Technology (Semester Pattern)

1	Name of the Program	Diploma in X -Ray Diagnosis & Techniques
2	Program Code	DXDT
3	Program Pattern (Semester/Annual)	Semester
4	Program Duration	One Year
5	Program Level	Diploma
6	Program Type	Full Time for regular students & Part time for In service candidates (with 6 Personal contact program each 10 days)
7	Program Total Credits	18 Credits
8	Program Total Marks	700
9	Program Passing Marks	315 (45% As per Table B)
10	Mode of Learning (Regular/ Distance Learning)	Regular / Part time for In service candidates
11	Medium of Instructions	English
12	Medium of Examination	English
13	Eligibility	The students with following educational qualification will be eligible for seeking admission to this course : MBBS, BAMS, BHMS, MD (Ayu - Rognidan)
14	Lecturer/Professor Qualification	The teaching faculties with following educational qualification will be eligible to teach this course : MD (Radiodiagnosis), MSc (Radiodiagnosis), DMRD, DMRE
15	Program Objectives	The Course aims to provide the advanced hands-on training related to X -ray techniques and Diagnosis of X-ray film, to the doctors, professors, students, working in the field of dignostics in health related streams such as allopathy, Ayurveda and Homeopathy
16	Program Outcome	Student will be up-skilled for each & every radiology related procedure and advanced diagnostic technology
17	No. of Days @ Week	3 Days
18	Internship Duration	One Month

Semester- 1 (6 months = 20 weeks Teaching & Practical + 2 weeks examination)

Sub Code	Subjects	Teaching hours per week (3 Days @ Week)	Tutorial (*T)/ Practical / Activity(*P/*A) per week		Theory		Practical		Subject Total		No. of Credits
							(Practical/ Diss. / Viva/ Oral/ Test/ Sessional etc.)		(in case of joint passing)		
					A		B		A + B		
			T	P/A	Max	Passing	Max	Passing	Max	Passing	
DXDT 101	Basic Roentgenology	3	1	2	100	45	100	45	200	90	2.6
DXDT 102	Respiratory & Cardiovascular Roentgenology	3	1	2	100	45	100	45	200	90	2.6
DXDT 103	Gastrointestinal & Hepato-Biliary-Pancreatic Roentgenology	3	1	2	100	45	100	45	200	90	2.6
DXDT 104	Radio Laboratory Management & Ethics (Viva only)	2	NA	2	NA	NA	100	45	100	45	1.3
Total		11	03	08	300	135	400	180	700	315	9.1

Semester- 2 (6 months = 20 weeks Teaching & Practical + 2 weeks examination)

Sub Code	Subjects	Teaching hours per week (3 Days @ Week)	Tutorial (*T)/ P3actical / Activity(*P/*A) per week		Theory		Practical		Subject Total		No. of Credits
							(Practical/ Diss. / Viva/ Oral/ Test/ Sessional etc.)		(in case of joint passing)		
					A		B		A + B		
			T	P/A	Max	Passing	Max	Passing	Max	Passing	
DXDT 105	Neuro & Spinal Roentgenology	3	1	2	100	45	100	45	200	90	2.6
DXDT 106	Genito-Urinary System Roentgenology	3	1	2	100	45	100	45	200	90	2.6
DXDT 107	Musculoskeletal And Osteo Roentgenology	3	1	2	100	45	100	45	200	90	2.6
DXDT 108 (Viva only)	Advanced Techniques & Future Trends In Roentgenology	2	NA	2	NA	NA	100	45	100	45	1.3
Total		11	12	08	300	135	400	180	700	315	9.1

The performance of the learners shall be evaluated into two components with 50% marks in the first component by conducting the Semester Examinations with 50% marks in the second component.

Syllabus & Course Content with Hourly Teaching Plan

Diploma in Advanced Pathology Training		
Semester- 1		
Sr. No.	SUBJECT CODE	SUBJECT TITLE
1	DXDT 101	Basic Roentgenology
2	DXDT 102	Respiratory & Cardiovascular Roentgenology
3	DXDT 103	Gastrointestinal & Hepato-Biliary-Pancreatic Roentgenology
4	DXDT 104	Radio Laboratory Management & Ethics (Viva only)
Semester- 2		
1	DXDT 105	Neuro & Spinal Roentgenology
2	DXDT 106	Genito-Urinary System Roentgenology
3	DXDT107	Musculoskeletal And Osteo Roentgenology
4	DXDT 108	Advanced Techniques & Future Trends In Roentgenology (Viva only)

Question Paper Pattern

EXAMINATION- Theory (Semester- 01)

PROGRAMME NAME- DIPLOMA IN X

RAY DIAGNOSIS & TECHNIQUES

SUBJECT TITLE _____ (Course Code- _____)

[TIME: 3 Hours] TOTAL: 100 Marks

Note- 1. Attempt Section A and Section B Only

2. Write answers to each question in proportion to the mark allotted

SECTION – A

Que-1 Explain: Attempt Any one out of 2 questions (20 Marks each)

Que-2 Explain: Attempt Any Two out of 3 questions (15 Marks each)

SECTION – B

Que-1 Explain: Attempt Any one out of 2 questions (20 Marks each)

Que-2 Explain: Attempt Any Two out of 3 questions (15 Marks each)

PRACTICAL

Practical - 1 (40 Marks)

Practical - 2 (40 Marks)

Viva Voce (20 Marks)

Semester - 1
Hourly Teaching Plan For DXDT Course
Paper – 1
Basic Radiology
(Theory – 100 Marks + Practical Viva – 100 Marks)

Module No.	Sub Topics	Hours	Credit
Module No. 1 (Theory)	Basic Radiology Radiation Physics and Radiation Biology Introduction to general properties of radiation Production of X-Ray Characteristic properties of X-Ray	1 hr	
	Interaction of X-Rays with matter and their effects Units of radiation, radiation measurement	1 hr	
	Radio image Image receptors. X-Ray film	1 hr	
	intensifying screen Formation of radiographic image	1 hr	
	X-Ray equipments Conventional X-Ray Units Advanced imaging equipments.	1 hr	
	Film procession dark room equipments and procedures-manual, automatic	1 hr	
	Contrast media Types (Conventional Non Conventional, Ionic, non ionic etc)	1 hr	
	Contrast media chemical composition, mechanism of action	1 hr	
	Contrast media dose schedule, route of administration	1 hr	
	Contrast media adverse reaction and their management	1 hr	
	Contrast media In GIT	1 hr	
	Contrast media – Barium Swallow Indications, Contraindications, Contrast, Technique, Complications	1 hr	
	Contrast media – Barium Meal Indications, Contraindications, Contrast, Technique, Complications	1 hr	
	Contrast media – Barium Meal Follow Through Indications, Contraindications, Contrast, Technique, Complications	1 hr	
Contrast media – Enteroclysis (Small Bowel Enema)	1 hr		

	Indications, Contraindications, Contrast, Technique, Complications		
	Contrast media – Barium Enema Indications, Contraindications, Contrast, Technique, Complications	1 hr	
	Fallopian Tube recanalization	1 hr	
	Sialography	1 hr	
	T Tube Cholangiography	1 hr	
	Percutaneous Transhepatic Cholangiography	1 hr	
	Portal Venography	1 hr	
	Bronchography	1 hr	
	Angiography	1 hr	
	Phlebography	1 hr	
	Myelogram	1 hr	
	Intravenous Urogram	1 hr	
	Micturating Cystourethrogram	1 hr	
	Retrograde Pyeloureterography	1 hr	
	Radiation Hazard and Management	1 hr	
	Automation and Digital X-Ray	1 hr	
A	Hours And Credit	30 hrs	2
Module No. 2 (Practical)	Technique of X – Ray filming & positioning Chest PA (Standing erect, sitting erect, trolley, bed), Chest AP (Standing erect, sitting erect, trolley, bed), Chest Lateral (right-left)	1 hr	
	Chest Lateral Decubitus (PA, AP, Lateral - right-left) Chest Apical (Lardotic) Ribs Oblique AP	1 hr	
	Chest X -ray for infants and Children	1 hr	
	X-Ray Abdomen (Adult) – AP, PA, Lateral decubitus	1 hr	
	Urinary Tract – AP	1 hr	
	Urinary Tract – IVP	1 hr	
	Gall Bladder – Cholecystography GB – Prone, Erect, Decubitus	1 hr	
	X-ray Pregnancy Before 37 weeks and After 37 Weeks Special Care	1 hr	

	X-Ray Abdomen (Infants and Children) – AP, PA, Lateral decubitus	1 hr	
	X-Ray (Skull) –PA, AP, Lateral	1 hr	
	X-Ray (Sinuses, Face, Nose) –PA, AP, Lateral	1 hr	
	X-Ray (Mandible) –PA, AP, Oblique, Lateral	1 hr	
	X-Ray (Cervical Spine) –PA, AP, Lateral, Oblique	1 hr	
	X-Ray (Thoracic Spine) –PA, AP, Lateral, Oblique	1 hr	
	X-Ray (Lumbosacral Spine) –PA, AP, Lateral, Oblique	1 hr	
	X-Ray (Arm) - Clavicle - AP Scapula – AP, Lateral Shoulder - AP, Lateral	1 hr	
	X-Ray (Arm) Humerus – AP, Lateral Elbow – AP, Lateral	1 hr	
	X-Ray (Arm) Forearm – AP, Lateral Wrist – AP, Lateral	1 hr	
	X-Ray (Leg) Pelvis & Hip Joints – AP, Lateral Femur – AP, Lateral	1 hr	
	Knee – AP, Lateral Lower leg – AP, Lateral Foot - AP, Lateral	1 hr	
	X - Ray Arm in Infants & Children	1 hr	
	X - Ray Leg in Infants & Children	1 hr	
	Development of the film in dark room	1 hr	
	Examination of X-Ray film- Over/ under exposure etc	1 hr	
	Catheters	1 hr	
	Contrast media preparation (Soluble)	1 hr	
	Contrast media preparation (Insoluble)	1 hr	
	Contrast media preparation (Miscellaneous)	1 hr	
	Digital X- Ray	1 hr	
	Safety Precautions	1 hr	
B	Hours And Credit	30 hrs	1
A + B	Total Hours And Credit	60 hrs	3

Paper – 2
Respiratory & Cardiovascular Roentgenology
(Theory – 100 Marks + Practical Viva – 100 Marks)

Module No.	Sub Topics	Hours	Credit
Module No. 1 (Theory)	Anatomical Landmarks Inspecting The Chest X-ray Lung fields & Pulmonary Vessels The heart & Mediastinum	1 hr	
	The diaphragm & subdiaphragmatic mass The bony thorax (ribs, clavicles, spine, shoulder) The soft tissues (muscles, breast)	1 hr	
	Localization of Intrathoracic lesions General Principles The Silhouette Sign	1 hr	
	Heart & Aorta Descending Aorta Pulmonary Arteries	1 hr	
	Hilum Overlay and Hilum convergence Cervicothoracic & Thoracoabdominal Signs	1 hr	
	Diaphragm	1 hr	
	Back of the heart	1 hr	
	The Air bronchogram	1 hr	
	Lobes Congenital anomalies	1 hr	
	Lobar Collapse	1 hr	
	Deviation of the trachea Shift of the heart Narrowing of the rib cage Hilar displacement	1 hr	
	Lobar Enlargement	1 hr	
	Lung Segments Segmental Anatomy Segmental Sequestration	1 hr	
	Segmental Collapse	1 hr	
	Hila & The Pulmonary Vessels	1 hr	
	Intrapulmonary Arteries and the Veins Bronchial Circulation	1 hr	
	Lymphatic Vessels	1 hr	
Lymph Nodes	1 hr		

	Pulmonary Airways	1 hr	
	Bronchoalveolar system	1 hr	
	Interstitium (Nodule, cavity, cyst, fibrosis, honeycombing)	1 hr	
	Pleura - Anatomic considerations Free fluid Encapsulated fluid	1 hr	
	Pleural thickening	1 hr	
	The Extrapleural Space	1 hr	
	Mediastinum	1 hr	
	Thoracic Wall	1 hr	
	Thoracic Calcification	1 hr	
	Pulmonary infections Tuberculosis Pneumonias ARDS	1 hr	
	Chest trauma post-operative and intensive care imaging.	1 hr	
	Cardiovascular Radiology Diseases and disorder of cardiovascular system (congenital and acquired conditions) and the role of imaging by conventional radiology (RVH, LVH, MS etc)	1 hr	
A	Total Hours And Credit	30 hrs	2 credits
Module No. 2 (Practical)	Technique of Filming the X- ray Chest (PA & Lateral)	1 hr x 5 Pract	
	Examining the Chest X-ray (Basic landmarks)	1 hr x 5 Pract	
	Detection of Lung Pathologies on given X-ray Film	1 hr x 5 Pract	
	Detection of Heart Pathologies on given X-ray Film	1 hr x 5 Pract	
	Pre-filmed lung pathologies And Diagnosis	1 hr x 5 Pract	
	Pre-filmed cardiac pathologies And Diagnosis	1 hr x 5 Pract	
B	Total Hours And Credit	30 hrs	1 credit
A + B	Total Hours And Credit	60 hrs	3 credits

Paper – 3
Gastrointestinal & Hepato-Biliary-Pancreatic Roentgenology
(Theory – 100 Marks + Practical Viva – 100 Marks)

Module No.	Sub Topics	Hours	Credit
Module No. 1 (Theory)	Gastrointestinal Roentgenology	1 hr	
	Anatomical Landmarks		
	Diseases and disorders of mouth	1 hr	
	Diseases and disorders of pharynx, salivary glands,	1 hr	
	Diseases and disorders of esophagus (CA, Stricture)	1 hr	
	Diseases and disorders of stomach (Barium Meal)	1 hr	
	Diseases and disorders of small intestine (contrast studies – small bowel follow through)	1 hr	
	Diseases and disorders of large intestine, (contrast studies – Barium enema)	1 hr	
	Inflammatory Bowel diseases – Crohn’s and Ulcerative colitis	1 hr	
	Diseases of omentum, peritoneum and mesentery	1 hr	
	Acute abdomen	1 hr	
	Malignant Disorders	1 hr	
	Abdominal trauma	1 hr	
	Hepato-Biliary-Pancreatic System	1 hr	
Anatomical Landmarks			
Diseases and disorders of hepato-biliary-pancreatic system. (Hepatic/pancreatic Abscess, Tumours)	1 hr		
CBD stone, Gall stones	1 hr		
A	Total Hours And Credit	15 hrs	1 credit
Module No. 2 (Practical)	Technique of Filming the X- ray Abdomen	1 hr x 5 Pract	
	Examining the Abdominal X-ray (Basic landmarks)	1 hr x 5 Pract	
	Detection of GI Pathologies on given X-ray Film	1 hr x 5 Pract	
	Detection of Hepato-Pancreatic Pathologies on given X-ray Film	1 hr x 5 Pract	
	Pre-filmed GI pathologies And Diagnosis	1 hr x 5 Pract	
	Pre-filmed Hepatobiliary and Pancreatic pathologies And Diagnosis	1 hr x 5 Pract	
B	Total Hours And Credit	30 hrs	1 credit
A + B	Total Hours And Credit	45 hrs	2 credits

Paper - 4

Introduction To Radio Laboratory Management & Ethics

(Only Viva Voce – 100 Marks)

[oral Questioning only] *

Module No.	Sub Topics	Hours	Credit
Module No. 1	Care Of Radio Laboratory, Equipment And Instruments- General Principles, Care & Cleaning	1 hr	
	X-Ray Plates – Use, care, storage labelling	1 hr	
	Machinery handling- Using the Appropriate dose of radiation, Use of Protective gowns	1 hr	
	Method of collection of filming	1 hr	
	Laboratory Safety- First aid and safety measures for Radioactive hazards, Universal safety precautions	1 hr	
	Quality control and quality assurance	1 hr	
	Laboratory Planning - General principles, goals	1 hr	
	Market potential, Selection of area, Competition	1 hr	
	Space requirements & Designing of laboratory sections	1 hr	
	Staff and their duties, Work schedule and workload	1 hr	
	Application Of Computers In Practice	1 hr	
	Input and Output devices, Storage devices	1 hr	
	Introduction to operating systems Windows 2000 – Utilities and basic operations	1 hr	
	Future Trends	1 hr	
	Miscellaneous	1 hr	
A	Hours	15 hrs	
Module No. 2	First aid for Radioactive hazards	1 hr x 5 Pract	
	Digital X- Ray	1 hr x 5 Pract	
	Mobile X-ray Unit	1 hr x 5 Pract	
	Use of Windows Utilities – Explorer, Setting etc.	1 hr x 5 Pract	
	File operation – Copy, Move, Delete, Rename etc.	1 hr x 5 Pract	
	Document Creation, editing, printing using MS Word	1 hr x 5 Pract	
B	Hours	30 hrs	
A + B	Total Hours	45	1 credits

Paper – 5
Neuro & Spinal Roentgenology
(Theory – 100 Marks + Practical Viva – 100 Marks)

Module No.	Sub Topics	Hours	Credit
Module No. 1 (Theory)	Anatomical Landmarks of Skull	1 hr	1
	Degenerative diseases of Skull	1 hr	
	Infiltrative diseases of the Skull	1 hr	
	Traumatic diseases of the Skull	1 hr	
	Congenital Anomalies of the Skull	1 hr	
	Miscellaneous conditions of the Skull	1 hr	
	Anatomical Landmarks of Spine	1 hr	
	Degenerative diseases of Spine	1 hr	
	Infiltrative diseases of the Spine	1 hr	
	Traumatic diseases of the Spine	1 hr	
	Infectious diseases of the Spine	1 hr	
	Inflammatory diseases of the Spine	1 hr	
	Autoimmune diseases of the Spine	1 hr	
	Congenital Anomalies of the Spine	1 hr	
	Miscellaneous conditions of the Spine	1 hr	
A	Total Hours And Credit	15 hrs	
Module No. 2 (Practical)	Technique of Filming the X- ray Skull & Spine	1 hr x 5 Pract	
	Examining the X-ray Skull & Spine (Basic landmarks)	1 hr x 5 Pract	
	Detection of Skull Pathologies on given X-ray Film	1 hr x 5 Pract	
	Detection of Spine Pathologies on given X-ray Film	1 hr x 5 Pract	
	Pre-filmed Skull pathologies And Diagnosis	1 hr x 5 Pract	
	Pre-filmed Spine pathologies And Diagnosis	1 hr x 5 Pract	
B	Total Hours And Credit	30 hrs	1 credit
A + B	Total Hours And Credit	45 hrs	2 credits

Paper – 5
Genito-Urinary System Roentgenology
(Theory – 100 Marks + Practical Viva – 100 Marks)

Module No.	Sub Topics	Hours	Credit
Module No. 1 (Theory)	Anatomical Landmarks of the Genital System	1 hr	
	Anatomical Landmarks of the Urinary System	1 hr	
	Congenital disorders of Genital System	1 hr	
	Congenital disorders of Urinary System	1 hr	
	Inflammatory disorders of Genital System	1 hr	
	Inflammatory disorders of Urinary System	1 hr	
	Traumatic disorders of Genital System	1 hr	
	Traumatic disorders of Urinary System	1 hr	
	Neoplastic disorders of Genital System	1 hr	
	Neoplastic disorders of Urinary System	1 hr	
	Calculus diseases of Genital System	1 hr	
	Calculus diseases of Urinary System	1 hr	
	Infectious diseases of Urinary System	1 hr	
	Infectious diseases of Genital System	1 hr	
	Contrast media in Genital system (Hysterosalpingography)	1 hr	
	Contrast media in Urinary System (IVP)	1 hr	
miscellaneous conditions	1 hr		
A	Total Hours And Credit	15 hrs	1
Module No. 2 (Practical)	Technique of Filming the X- ray GUT	1 hr x 5 Pract	
	Examining the X-ray GUT (Basic landmarks)	1 hr x 5 Pract	
	Detection of Genito Pathologies on given X-ray Film	1 hr x 5 Pract	
	Detection of Urinary Pathologies on given X-ray Film	1 hr x 5 Pract	
	Pre-filmed Genito pathologies And Diagnosis	1 hr x 5 Pract	
	Pre-filmed Urinary pathologies And Diagnosis	1 hr x 5 Pract	
B	Total Hours And Credit	30 hrs	1
A + B	Total Hours And Credit	60 hrs	2 credits

Paper – 6
Musculoskeletal And Osteo Roentgenology
(Theory – 100 Marks + Practical Viva – 100 Marks)

Module No.	Sub Topics	Hours	Credit
Module No. 1 (Theory)	Anatomical landmarks related to bones, joints and Interpretation of disease of muscles, soft tissue	1 hr	
	Interpretation of congenital diseases of bones	1 hr	
	Interpretation of inflammatory diseases of muscles	1 hr	
	Interpretation of inflammatory diseases of bones	1 hr	
	Interpretation of endocrine diseases of muscles	1 hr	
	Interpretation of endocrine diseases of bones	1 hr	
	Interpretation of metabolic diseases of muscles	1 hr	
	Interpretation of metabolic diseases of bones	1 hr	
	Interpretation of neoplastic diseases of muscles	1 hr	
	Interpretation of neoplastic diseases of bones	1 hr	
	Interpretation of traumatic disease of bones	1 hr	
	Interpretation of traumatic disease of joints	1 hr	
	Interpretation of immunological diseases of bone	1 hr	
	Interpretation of immunological diseases of joints	1 hr	
miscellaneous conditions	1 hr		
A	Total Hours And Credit	15 hrs	1
Module No. 2 (Practical)	Technique of Filming the X- ray bones & joints	5 hrs	
	Examining the X-ray musculoskeletal and osteo system (Basic landmarks)	1 hr x 5 Pract	
	Detection of musculoskeletal Pathologies on given X-ray Film	1 hr x 5 Pract	
	Detection of osteo and joint Pathologies on given X-ray Film	1 hr x 5 Pract	
	Pre-filmed musculoskeletal pathologies And Diagnosis	1 hr x 5 Pract	
	Pre-filmed osteo and joint pathologies And Diagnosis	1 hr x 5 Pract	
B	Total Hours And Credit	30 hrs	1
A + B	Total Hours And Credit	45 hrs	2 credits

Paper - 8

Advanced Techniques & Future Trends In Roentgenology

(Only Viva Voce – 100 Marks)

[oral Questioning only] *

Module No.	Sub Topics	Hours	Credit
Module No. 1	Mammography and Breast Intervention Role of screen film mammography (conventional and digital) in screening of benign and malignant lesions of the breast.	1 x 2hr	
	Radiology Emergency Medicine understanding of the protocol of imaging in emergency situations of different organ systems	1 x2 hr	
	Tomography	1 hr	
	Video-radiography	1 hr	
	Miniature Radiography (Camera Photography)	1 hr	
	Xeroradiography	1 hr	
	Digital Vascular Imaging	1 hr	
	Interventional Radiology	1 hr	
A		10 hrs	
Module No. 2	Pre recorded video of Mamography for study	1 hr x 5 Pract	
	Pre recorded video of Tomography for study	1 hr x 5 Pract	
	Pre recorded video of Video-radiography	1 hr x 5 Pract	
	Pre recorded video of Xeroradiography	1 hr x 5 Pract	
	Pre recorded video of Digital Vascular Imaging	1 hr x 5 Pract	
	Pre recorded video of Interventional Radiology	1 hr x 5 Pract	
A	Total Hours	30	
A + B	Total Hours	40	1 credit

Hours And Credits Summary of The Course

Sr.	Course Details	Hours	Credits
1	Theory	120	8
2	Practical	265	8
3	Internship	125	2
	Total	510	18

Examination Pattern

Sr.	Course Details	Papers	Marks
1	Theory	6	100 (per paper) x 6 = 600
2	Practical	8	100 (per paper) x 8 = 800
	Total	14	1400

Passing Criteria

Sr.	Course Details	Total Marks	Minimum Passing Criteria
1	Theory	100 each paper	45
2	Practical	100 each paper	45
	Total	200	90