

**One Year Post Graduate Diploma In Medical
Diagnostic Ultrasound
(ECHO Track)
Semester 2
Weekly Planner**



Semester 2

Course Name: Echocardiography I

Course Director: Associate Prof. Dr. Raham Bacha (PhD)

Course Code: PGDE-7106

Teaching Faculty

1: Prof. Dr. Syed Amir Gilani (PhD)

2: Associate Prof. Dr. Raham Bacha (PhD)

Weeks	Course Content
Week 1	Introduction to Echocardiography-(1)-(1)
Week 2	Echocardiographic Views and Imaging Planes(I)-(1)
Week 3	Echocardiographic Views and Imaging Planes(II)-(1)
Week 4	Quiz & Assignments
Week 5	Left ventricular systolic function-(2)
Week 6	Mitral and aortic valve assessment-(2)
Week 7	Tricuspid and pulmonic valve assessment-(2)
Week 8	Quiz & Assignments
Week 9	Pericardial effusion and tamponade-(1)
Week 10	Stress Echocardiography(I)-(2)
Week 11	Stress Echocardiography(II)-(2)
Week 12	Echocardiography in pediatrics-(2)
Week 13	Quiz & Assignments
Week 14	Intraoperative echocardiography-(2)
Week 15	Echocardiography during interventional procedures-(2)
Week 16	

Semester 2

Course Name: Medical Ethics & Patient Safety

Course Director: Prof. Dr. Syed Amir Gilani

Course Code: PGDE-7107

Teaching Faculty

1:Prof. Dr. Syed Amir Gilani (PhD)

Weeks	Course Content
Week 1	Introduction to Medical Ethics-(1)
Week 2	Informed Consent-(1)
Week 3	Confidentiality and Privacy-(1)
Week 4	Quiz & Assignment
Week 5	Allocation of scarce resources-(1)
Week 6	Human subjects and research ethics-(1)
Week 7	Contemporary Ethical Challenges-(1)
Week 8	Quiz & Assignment
Week 9	Definition and importance of patient safety-(1)
Week 10	Role of organizational culture in patient safety-(1)
Week 11	Patient Safety Reporting and Analysis-(1)
Week 12	Medication Safety-(1)
Week 13	Quiz & Assignment
Week 14	Quality Improvement in Healthcare-(1)
Week 15	Simulation and Team Training-(1)
Week 16	Final Exam



Semester 2

Course Name: Echocardiography II

Course Director: Associate Prof. Dr. Raham Bacha (PhD)

Course Code: PGDE-7108

Teaching Faculty

1: Prof. Dr. Syed Amir Gilani (PhD)

2: Associate Prof. Dr. Raham Bacha (PhD)

Weeks	Topics Covered
Week 1	Techniques for optimizing image quality-(2)
Week 2	Cardiac chamber dimensions and volumes-(2)
Week 3	Basics of congenital heart conditions(1)
Week 4	Quiz & Assignment
Week 5	Echocardiographic evaluation of congenital heart defects-(1)
Week 6	Contrast echocardiography(2)
Week 7	Three-dimensional echocardiography(2)
Week 8	Quiz & Assignment
Week 9	Speckle tracking and strain imaging-(2)
Week 10	3D printing and virtual reality applications-(2)
Week 11	Comprehensive echocardiography reporting(1)
Week 12	Quality control and accreditation(2)
Week 13	Quiz & Assignment
Week 14	Continuing education and staying updated
Week 15	Quality Assurance and Continuing Education(II)-(2)
Week 16	Final Exam

Semester 2

Course Name: Image Analysis and Reporting

Course Director: Associate Prof. Dr. Raham Bacha (PhD)

Course Code: PGDE-7109

Teaching Faculty

1: Prof. Dr. Syed Amir Gilani (PhD)

2: Associate Prof. Dr. Raham Bacha (PhD)

Weeks	Topics
Week 1	Introduction to Image Analysis and Reporting-(1)
Week 2	Fundamentals of Image Processing-(1)
Week 3	Medical Image Analysis Techniques(I)-(2)
Week 4	Quiz & Assignment
Week 5	Image smoothing and sharpening-(2)
Week 6	Corner detection and Harris corner detector-(2)
Week 7	Thresholding methods: global and adaptive-(2)
Week 8	Quiz & Assignment
Week 9	Clustering-based segmentation: k-means clustering-(2)
Week 10	Introduction to data visualization principles-(2)
Week 11	Visualizing image-related data: heat maps, contour plots-(2)
Week 12	Structuring an image analysis report-(2)
Week 13	Quiz & Assignment
Week 14	Case Studies and Practical Applications-(2)
Week 15	Image analysis and reporting project incorporating various techniques learned throughout the course-(2)
Week 16	Final Exam

Semester 2

Course Name: Interventional Echocardiography

Course Director: Associate Prof. Dr. Raham Bacha (PhD)

Course Code: PGDE-7110

Teaching Faculty

1:Prof. Dr. Syed Amir Gilani (PhD)

2:Associate Prof. Dr. Raham Bacha (PhD)

Weeks	Course Content
Week 1	Overview of interventional cardiology and its evolution-(2)
Week 2	Integration of echocardiography with other imaging modalities-(1)
Week 3	Echocardiography equipment and transducers-(1)
Week 4	Quiz & Assignment
Week 5	Standard echocardiographic views and measurements-(1)
Week 6	Three-dimensional (3D) echocardiography-(2)
Week 7	Strain imaging and tissue Doppler techniques-(2)
Week 8	Quiz & Assignment
Week 9	Assessment of hemodynamics and monitoring during interventions-(2)
Week 10	Image Integration and Fusion(I)-(2)
Week 11	Real-time image guidance during complex procedures-(2)
Week 12	Reviewing real interventional echocardiography cases-(1)
Week 13	Quiz & Assignment
Week 14	Recognizing and managing complications during procedures-(2)
Week 15	Research advancements and clinical trials-(2)
Week 16	Final Exam

Semester 2

Course Name: Emerging Technologies in Echocardiography

Course Director: Associate Prof. Dr. Raham Bacha (PhD)

Course Code: PGDE-7111

Teaching Faculty

1:Prof. Dr. Syed Amir Gilani (PhD)

2:Associate Prof. Dr. Raham Bacha (PhD)

Weeks	Course Content
Week 1	Overview of the course objectives and structure-(2)
Week 2	Principles and physics of 3D/4D echocardiography-(2)
Week 3	Introduction to strain imaging and myocardial deformation analysis-(2)
Week 4	Quiz & Assignment
Week 5	Contrast-Enhanced Echocardiography(I)-(2)
Week 6	Contrast-Enhanced Echocardiography(II)-(2)
Week 7	Artificial Intelligence (AI) in Echocardiography(I)-(2)
Week 8	Quiz & Assignment
Week 9	Artificial Intelligence (AI) in Echocardiography(II)-(2)
Week 10	Handheld and Portable Echocardiography Devices-(2)
Week 11	Fusion Imaging and Hybrid Techniques(I)-(2)
Week 12	Fusion Imaging and Hybrid Techniques(II)-(2)
Week 13	Quiz & Assignment
Week 14	Virtual Reality (VR) and Augmented Reality (AR)-(2)
Week 15	Future Directions and Ethical Considerations-(2)
Week 16	Final Exam