

3D Digital Medical device Designing

Sponsored by: Department of Health Research, Human Resource Development Grant

Eligibility Criteria: MBBS, BDS, MDS / MD/ MS, PhD Students

Learning Objectives

- *Recognize importance of 3D designing*
- *Compare traditional techniques with 3D designing*
- *Appraise advantages of 3D designing of prosthesis*
- *Design a facial prosthesis with 3D design software*
- *Correlate designs with material science requirements*
- *Fabricate facial prosthesis with choice of material*

Length of Course: 4 Weeks (1 week in a month starting August-November 2021), evening online classes

Effort: 2–4 hours per week

Credits: 3 per week

Price: FREE

Institution: KGMU, Lucknow

Level: Introductory, Self-paced on your time

Language: English

Important highlights of the course:

- Online lectures by National & International speakers
- Exhaustive offline Hands on exercises
- Extensive learning from realistic experiences
- Focus on individual learning
- Team works and assignments

Resource Faculty

Er Pradeep K Yadav, MTech, 3D printing technologies

Prof Divya Mehrotra, Oral & Maxillofacial Surgeon

Prof Dominic Eggbeer, Cardiff Wales, UK

Mr Peter Evans, Swansea UK

Dr Richa Khanna, Paedodontist

Dr Sumit Kumar, Research Scientist Department of Health Research MRU

Dr Ashutosh

Dr Kanenika Tandon

Dr Ruby Dwivedi

Sponsored by: Department of Health Research, Human Resource Development Grant

Modules

1. Extraoral and intraoral 3D scan
2. 3 D printing and bioprinting
3. Surgical planning
4. Medical device designing

Module 1: 3D scanning

Understand the role of digital technology in 3D scanning

- Examine commonly used digital techniques to scan
- Know the face scanner and 3D camera
- Know the intraoral scanners
- Lab scanner
- Demonstration of the workflow
- Application of Extraoral scanning eye, ear, nose, breast
- Application of Intraoral scanning for teeth, caries, crown, bridge
- Exporting the scanned file for further processing

Assignment: Scan any two

Module 2: 3D printing

- How 3D printing is disrupting medical and dental Industry. Stratasys
- Clinical applications
- Types of 3D printers
- Bioprinter
- 3D printing process, Building support structures, Post processing

Assignment: Print 1 model

Module 3: Surgical planning

- Examine the commonly used digital techniques in radiography
- Mimics in suit software overview, MCQ
- Proplan software overview, MCQ
- Segmentation, MCQ
- Volume measurements, MCQ
- Application in virtual Surgical planning, MCQ
- Surgical simulation: trauma, tumour , deformity
- FEA & Ansys
- Air flow

Assignment: One case planning

Module 4: Device designing

- Clinical Applications: Surgical guides , splints, implant guides, osteotomy guides, PSI, eye, ear, nose, TMJ
- Haptic device with Geomagic freeform software overview

- 3matic software, MCQ
- Workflow, MCQ

Assignment: designing a surgical guide

Assessment: MCQ, PROJECT assignment