MANIPAL
ACADEMY of HIGHER EDUCATION
(Deemed to be University under Section 3 of the UGC Act, 1956)

Manipal College of Health Professions

Manipal Academy of Higher Education, Manipal

Outcome-Based Education (OBE) Framework

Two Years Full Time
Postgraduate Program
(Choice-Based Credit System)

Master of Science in Medical Imaging Technology (M.Sc. MIT)

With effect from July 2021

2. PROGRAM EDUCATION OBJECTIVES (PEOs)

The overall objective of the learning outcome-based curriculum framework (LOCF) for Master of Science in Medical Imaging Technology are as follows:

PEO No.	Education Objective
PEO 1	Students will be able to use their fundamental knowledge and clinical competence in various scientific aspects of Radiology and Imaging Field
PEO 2	Students will demonstrate strong and well defined clinical / practical skills in field of Radiodiagnosis and Imaging
PEO 3	Students will be able to practice the profession with highly professional and ethical attitude, strong communication skills, and to work in an inter-disciplinary team so as to provide Medical Imaging Services
PEO 4	Students will be able to use interpersonal and collaborative skills to identify, assess and formulate problems and execute the solution to assess Medical Imaging Services
PEO 5	Students will be able to imbibe the culture of research, innovation, entrepreneurship and incubation through evidence-based practice
PEO 6	Students will be able to participate in lifelong learning process for a highly productive career and will be able to relate the concepts of trends and issues in the discipline of Radiology and Imaging Sciences.

3. GRADUATE ATTRIBUTES

S No.	Attribute	Description
1	**Domain Knowledge**	Demonstrate comprehensive knowledge, competency and understanding of one or more disciplines that form a part of a professional domain
2	**Clinical / Hands-on skills**	Demonstrate clinical / hands-on skills in order to deliver and manage quality health care services
3	**Communication Skills**	Demonstrate the ability to listen carefully, read and write analytically, and present complex information in a clear and concise manner to different groups using appropriate media.
4	**Team work**	Demonstrate the ability to effectively and efficiently work and collaborate with diverse teams in the best interest of health care needs of the community
5.	**Professional ethics**	Demonstrate the ability to embrace moral/ethical values in conducting one's life, formulate a position/argument about an ethical issue from multiple perspectives, and use ethical practices in professional life.
6.	**Research / Innovation-related Skills**	A sense of inquiry and investigation for raising relevant and contemporary questions, synthesizing and articulating.
7.	**Critical thinking and problem solving**	Demonstrate capacity to think critically and extrapolate from what one has learned by applying their competencies and knowledge to solve different kinds of non-familiar problems in real life situations.

S No.	Attribute	Description
8	**Information/Digital Literacy**	Demonstrate capability to use ICT in a variety of learning situations, demonstrate ability to access, evaluate, and use a variety of relevant information sources and to use appropriate software for analysis of data.
9	**Multicultural Competence**	Demonstrate knowledge of the values and beliefs of multiple cultures and a global perspective, effectively engage in a multicultural society, interact respectfully with diverse groups.
11.	**Leadership qualities**	Demonstrate leadership capability to formulate an inspiring vision, build a team, motivate and inspire team members to attain organizational vision
12.	**Lifelong Learning**	Demonstrate the ability to acquire knowledge and skills, that are necessary for participating in learning activities throughout life, through self-paced and self-directed learning aimed at personal development, meeting economic, social and cultural objectives, and adapting to demands of work place through knowledge/skill development/reskilling.

5. PROGRAM OUTCOMES (POs):

After successful completion of Masters / MSc Medical Imaging Technology program students will be able to:

PO No.	Attribute	Competency
PO 1	**Domain knowledge**	Possess and acquire **scientific knowledge** to work as a health care professional
PO 2	**Clinical/ Hands-on skills**	Demonstrate and possess **clinical and hands-on skills** to provide quality health care services
PO 3	**Team work**	Demonstrate **team work skills** to support shared goals with the interdisciplinary health care team to improve societal health
PO 4	**Ethical value & professionalism**	Possess and demonstrate **ethical values and professionalism** within the legal framework of the society
PO 5	**Communication**	**Communicate effectively** and appropriately with the interdisciplinary health care team and the society
PO 6	**Evidence based practice**	Demonstrate high quality **evidence based practice** that leads to excellence in professional practice
PO 7	**Life-long learning**	Enhance knowledge and skills with the use of advancing technology for the **continual improvement** of professional practice
PO 8	**Entrepreneurship, leadership and mentorship**	Display **entrepreneurship, leadership and mentorship** skills to practice independently as well as in collaboration with the interdisciplinary health care team

MANIPAL COLLEGE
OF HEALTH PROFESSIONS
MANIPAL
(A constituent unit of MAHE, Manipal)

The subject code equivalence for subjects mentioned in syllabus copy of course **M.Sc. Medical Imaging Technology** from the academic year **2021-22** batch. These changes have been discussed in BOS meeting held on 13.12.2021 and subsequently approved in the 70th Academic Council meeting held on 14.01.2022.

SEMESTER - I

Course title	Old Course code	Revised Course code
Advanced Biostatistics and Research Methodology	ABS6101	ABS5101
Radiographic Equipment and Techniques	MIT6101	MIT5101
Radiographic Procedures	MIT6102	MIT5102
Advanced Instrumentation and techniques in CT- I	MIT6103	MIT5103
Clinical practice of Radiographic Procedures and CT	MIT6131	MIT5131

SEMESTER - II

Course title	Old Course code	Revised Course code
Ethics & Pedagogy	EPG6201	EPG5201
Advanced Instrumentation and Techniques in CT-II	MIT6201	MIT5201
Radiation Evaluation and Protection	MIT6202	MIT5202
Advanced Instrumentation and Techniques in MRI-I	MIT6203	MIT5203
Care of patients in diagnostic imaging	MIT6204	MIT5204
Clinical practice of CT and MRI	MIT6231	MIT5231

SEMESTER - III

Course title	Old Course code	Revised Course code
Advanced Instrumentation and Techniques in Ultrasonography	MIT7101	MIT6101
Nuclear Medicine Imaging Techniques	MIT7102	MIT6102
Advanced Instrumentation and Techniques in MRI-II	MIT7103	MIT6103
Image Interpretation and Analysis-I	MIT7104	MIT6104
Clinical practice of Ultrasonography, Nuclear Medicine and MRI	MIT7131	MIT6131
Research project-I	MIT7151	MIT6151

SEMESTER- IV

Course title	Old Course code	Revised Course code
Interventional radiology	MIT7201	MIT6201
Management of Healthcare Organization	MIT7202	MIT6202
Image Interpretation and Analysis-II	MIT7203	MIT6203
Clinical practice in Diagnostic Radiology	MIT7231	MIT6231
Research project - II	MIT7251	MIT6251

HOD

DEAN

Dean
Manipal College of Health Professions
MAHE, Manipal - 576104

Incharge Head
Dept. of Medical Imaging Technology
Manipal College of Health Professions
MAHE, Manipal - 576104

DEPUTY-REGISTRAR
ACADEMICS

Deputy Registrar - Academics
MANIPAL ACADEMY OF HIGHER EDUCATION
MANIPAL - 576 104

REGISTRAR

REGISTRAR
MANIPAL ACADEMY OF HIGHER EDUCATION
MANIPAL

6. COURSE STRUCTURE, COURSE WISE LEARNING OBJECTIVE, AND COURSE OUTCOMES (COs)

SEMESTER - I

Course code	Course title	Credit distribution (L,T,CL are hours/week)				Marks Distribution		
		L	T	CL	CR	IAC	ESE	Total
ABS6101	Advanced Biostatistics and Research Methodology	3	1	-	4	30	70	100
MIT6101	Radiographic Equipment and Techniques	3	1	-	4	50	50	100
MIT6102	Radiographic Procedures	3	1	-	4	50	50	100
MIT6103	Advanced Instrumentation and techniques in CT-I	2	1	-	3	50	50	100
MIT6131	Clinical practice of Radiographic Procedures and CT	-	-	15	5	50	50	100
	Total	11	4	15	20	230	270	500

Note: ESE for MIT6101, MIT 6102, MIT 6103 will be conducted for 100 marks and normalized to 50 marks
ESE for ABS6101 will be conducted for 50 marks and normalized to 70 marks
ESE for MIT 6131 will be conducted for 100 marks and normalized to 50 marks

SEMESTER - II

Course code	Course title	Credit distribution (L,T,CL are hours/week)				Marks Distribution		
		L	T	CL	CR	IAC	ESE	Total
EPG6201	Ethics & Pedagogy	1	1	-	2	100	-	100
MIT6201	Advanced Instrumentation and Techniques in CT-II	2	1	-	3	50	50	100
MIT6202	Radiation Evaluation and Protection	3	1	-	4	50	50	100
MIT6203	Advanced Instrumentation and Techniques in MRI-I	2	1	-	3	50	50	100
MIT6204	Care of patients in diagnostic imaging	2	1	-	3	50	50	100
MIT6231	Clinical practice of CT and MRI	-	-	15	5	50	50	100
	Total	10	5	15	20	350	250	600

Note: ESE for MIT6201, MIT6202, MIT6203, MIT6204, will be conducted for 100 marks and normalized to 50 marks
ESE for MIT6231 will be conducted for 100 marks and normalized to 50 marks

Note: At the end of first year the student will be completing the IRC and IEC Registration

SEMESTER - III

Course code	Course title	Credit distribution (L,T,PW,CL are hours/week)					Marks Distribution		
		L	T	PW	CL	CR	IAC	ESE	Total
MIT7101	Advanced Instrumentation and Techniques in Ultrasonography	3	1	-	-	4	50	50	100
MIT7102	Nuclear Medicine Imaging Techniques	2	1	-	-	3	50	50	100
MIT7103	Advanced Instrumentation and Techniques in MRI-II	2	1	-	-	3	50	50	100
MIT7104	Image Interpretation and Analysis-I	2	1	-	-	3	100	-	100
MIT7131	Clinical practice of Ultrasonography, Nuclear Medicine and MRI	-	-	-	12	4	50	50	100
MIT7151	Research project-I	-	-	9	-	3	100	-	100
	Total	9	4	9	12	20	400	200	600

Note:
ESE for MIT7101, MIT7102, MIT7103, will be conducted for 100 marks and normalized to 50 marks
ESE for MIT7131 will be conducted for 100 marks and normalized to 50 marks

SEMESTER- IV

Course code	Course title	Credit distribution (L,T,PW,CL are hours/week)					Marks Distribution		
		L	T	PW	CL	CR	IAC	ESE	Total
MIT7201	Interventional radiology	3	1	-	-	4	50	50	100
MIT7202	Management of Healthcare Organization	2	1	-	-	3	50	50	100
MIT7203	Image Interpretation and Analysis-II	2	1	-	-	3	100	-	100
MIT7231	Clinical practice in Diagnostic Radiology	-	-	-	12	4	50	50	100
MIT7251	Research project -II	-	-	18	-	6	50	50	100
	TOTAL	7	3	18	12	20	300	200	500

Note:
ESE for MIT7201, MIT7202, MIT7251 will be conducted for 100 marks and normalized to 50 marks
ESE for MIT7231 will be conducted for 100 marks and normalized to 50 marks

OVERALL CREDIT DISTRIBUTION

Semester	Hours per week				Total Credits	Marks		
	L	T	PW	CL		IAC	ESE	Total
Semester - I	11	4	-	15	20	230	270	500
Semester - II	10	5	-	15	20	350	250	600
Semester - III	9	4	9	12	20	400	200	600
Semester - IV	7	3	18	12	20	300	200	500
				Total	**80**	**1280**	**920**	**2200**