



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

**Four years Full time
Undergraduate Program**

**Bachelor of Science in
Medical Imaging Technology
(B.Sc. MIT)**

With effect from July 2020

- Assisting in Ultrasonography and Ultrasound guided procedures.
- Performing and assisting all the routine, emergency and special cases in CT scan.
- Performing and assisting all routine, emergency and special cases of MRI scans.
- Assisting in Image guided procedures.

2. PROGRAM EDUCATION OBJECTIVES (PEOs)

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

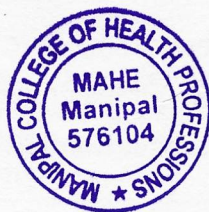
PEO No.	Education Objective
PEO 1	Students will be able to use their fundamental knowledge and technical competence in Radiology and Imaging field as and when required to achieve professional excellence.
PEO 2	Students will demonstrate strong and well defined practical skills in equipment's available in the field of radio-diagnosis and imaging
PEO 3	Students will be able to practice the profession with a highly professional and ethical attitude, strong communication skills, and effective professional skills to work in a inter-disciplinary team.
PEO 4	Students will be able to use interpersonal and collaborative skills in providing imaging services to the patient
PEO 5	Students will be able to imbibe the culture of research, innovation, entrepreneurship and incubation.
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 radiation physics and Imaging science towards serving the cause of the society.



5. PROGRAM OUTCOMES (POs)

After successful completion of Bachelor / BSc Medical Imaging Technology program, students will be able to:

PO No.	Attribute	Competency
PO 1	Professional knowledge	Possess and acquire scientific knowledge to work as a health care professional
PO 2	Clinical/ Technical skills	Demonstrate and possess clinical 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/learning	Demonstrate high quality evidence based practice/learning 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



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

SEMESTER - I

Course code	Course title	Credit distribution (L, T, P are hours/week)					Marks Distribution		
		L	T	P	CL	CR	IAC	ESE	TOTAL
ANA1101	Anatomy - I	3	-	-	-	3	30	70	100
PHY1101	Physiology - I	2	-	-	-	2	30	70	100
EIC1001	Environmental Science and Indian Constitution	2	-	-	-	2	100	-	100
CSK1001	Communication Skills	2	-	-	-	2	100	-	100
MIT1101	Radiation Physics	2	1	-	-	3	50	50	100
MIT1102	Radiographic Positioning and Techniques - I	2	1	-	-	3	50	50	100
MIT1103	Image evaluation and interpretation of Radiographs- I	2	-	-	-	2	100	-	100
MIT1131	Clinical aspect of Radiographic Positioning and Techniques - I	-	-	-	9	3	50	50	100
TOTAL		15	2	-	9	20	510	290	800

Note:

- ESE for ANA1101, PHY1101 will be conducted for 50 marks and normalized to 70 marks
- ESE for MIT1101, MIT1102 will be conducted for 100 marks and normalized to 50 marks



SEMESTER- II

Course code	Course title	Credit distribution (L,T,P are hours/week)					Marks Distribution		
		L	T	P	CL	CR	IAC	ESE	TOTAL
ANA1201	Anatomy - II	2	-	-	-	2	30	70	100
PHY1201	Physiology - II	2	-	-	-	2	30	70	100
BIC1201	Biochemistry	3	-	-	-	3	30	70	100
MIT1201	Radiographic Positioning and Techniques - II	2	1	-	-	3	50	50	100
MIT1202	Digital Imaging & Image processing methods in Radiography	2	1	-	-	3	50	50	100
MIT1203	Image evaluation and Interpretation of Radiographs - II	2	-	-	-	2	100	-	100
MIT1231	Clinical aspect of Radiographic Positioning and Techniques - II	-	-	-	15	5	50	50	100
TOTAL		13	2	-	15	20	340	360	700

Note:

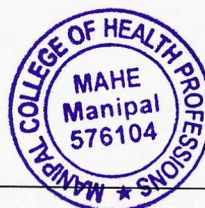
- ESE for ANA1201, PHY1201 and BIC1201 will be conducted for 50 marks and normalized to 70 marks.
- ESE for MIT1201, MIT1202, MIT1231 will be conducted for 100 marks and normalized to 50 marks.

SEMESTER- III

Course code	Course title	Credit distribution (L,T,P are hours/week)					Marks Distribution		
		L	T	P	CL	CR	IAC	ESE	TOTAL
PAT2103	Pathology	3	-	-	-	3	30	70	100
MCB2101	Microbiology	2	-	-	-	2	30	70	100
SUR4101	General Surgery	3	-	-	-	3	30	70	100
MIT2101	Orthopaedics in Radiology	2	-	-	-	2	100	-	100
MIT2102	Radiographic Special Procedures	3	1	-	-	4	50	50	100
MIT2131	Clinical aspect of Radiographic special procedures	-	-	-	9	3	50	50	100
*** **	Open Elective - I	3	-	-	-	3	S/NS		
TOTAL		16	1	-	9	20	290	310	600

Note:

- ESE for PAT2103, MCB2101 and SUR4101 will be conducted for 50 marks and normalized to 70 marks
- ESE for MIT2102 and MIT2131 will be conducted for 100 marks and normalized to 50 marks



SEMESTER- IV

Course code	Course title	Credit distribution (L,T,P are hours/week)					Marks Distribution		
		L	T	P	CL	CR	IAC	ESE	TOTAL
PHC2203	Pharmacology	3	-	-		3	30	70	100
GPY2201	General Psychology	2	-	-		2	30	70	100
MED3201	General Medicine	3	-	-	-	3	30	70	100
MIT2201	Radiation Safety in Radio diagnosis	3	1	-	-	4	50	50	100
MIT2231	Clinical aspect of Radiography and Fluoroscopy	-	-	-	15	5	50	50	100
MIT****	Program Elective - I	3	-	-	-	3	50	50	100
TOTAL		14	1	-	15	20	240	360	600

Note:

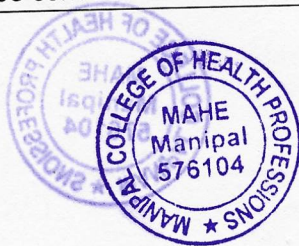
- ESE for PHC2203, GPY2201, MED3201 will be conducted for 50 marks and normalized to 70
- ESE for MIT2201, MIT2231 will be conducted for 100 marks and normalized to 50 marks

SEMESTER - V

Course code	Course title	Credit distribution (L,T,P are hours/week)					Marks Distribution		
		L	T	P	CL	CR	IAC	ESE	TOTAL
MIT3101	Physics of Ultrasound	2	1	-	-	3	50	50	100
MIT3102	Computed Tomography - I	2	-	-	-	2	50	50	100
MIT3103	Magnetic Resonance Imaging - I	1	1	-	-	2	50	50	100
MIT3104	Specialized Imaging Modalities	2	1	-	-	3	50	50	100
MIT3105	Patient care and Ethics in Radio-diagnosis	2	-	-	-	2	100	-	100
MIT3131	Clinical aspect of Specialized Imaging Modalities	-	-	-	15	5	50	50	100
*** ****	Open Elective - II	3	-	-	-	3	S/NS		
TOTAL		12	3	-	15	20	350	250	600

Note:

- ESE for MIT3101, MIT3103, MIT3131 will be conducted for 100 marks and normalized to 50 marks
ESE FOR MIT3102, MIT3103 will be conducted out of 50 marks only



SEMESTER - VI

Course code	Course title	Credit distribution (L,T,P are hours/week)					Marks Distribution		
		L	T	P	CL	CR	IAC	ESE	TOTAL
BST3201	Biostatistics and Research Methodology	3	-	-	-	3	30	70	100
MIT3201	Computed Tomography II	2	1	-	-	3	50	50	100
MIT3202	Magnetic Resonance Imaging II	2	1	-	-	3	50	50	100
MIT3203	Cross sectional anatomy in CT and MRI	2	-	-	-	2	100	-	100
MIT3231	Clinical aspect of CT & MRI	-	-	-	18	6	50	50	100
MIT****	Program Elective -II	2	1	-	-	3	50	50	100
TOTAL		11	3	-	18	20	330	270	600

Note:

- ESE for MIT3201, MIT3202 and MIT3231 will be conducted for 100 marks and normalized to 50.
- ESE for BST3201 will be conducted for 100 marks and normalized to 70 marks

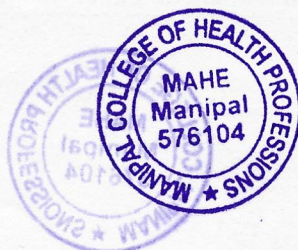
Open Electives

Open elective is credited, choice-based and is graded as satisfactory / not satisfactory (S/NS). Students make a choice from pool of electives offered by MAHE institution / Online courses as approved by the department

Program Electives

Program elective is credited and choice-based. The students make a choice from pool of electives offered by the department. The ESE is conducted for 50 marks.

Semester	Course Code	Course Title	Credit (s) Distribution (L,T,P,CL are hours/ week)				
			L	T	P	CL	CR
IV Semester	MIT2241	Advanced Image guided procedures	3	-	-	-	3
	MIT2242	Imaging Informatics	2	1	-	-	3
VI Semester	MIT3241	Quality Assurances in Diagnostic Equipment's	2	1	-	-	3
	MIT3242	Basic in Nuclear medicine Technology	2	1	-	-	3



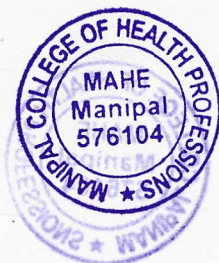
SEMESTER - VII and VIII

Internship

Semester VII	Internship - I	Duration 6 months 48 hours in a week / 8 hours in a day
Semester VIII	Internship - II	Duration 6 months 48 hours in a week / 8 hours in a day

OVERALL CREDIT DISTRIBUTION

Semester	Hours per week				Total Credits	Marks		
	L	T	P	CL		IAC	ESE	Total
Semester - I	15	2	-	9	20	510	290	800
Semester - II	13	2	-	15	20	340	360	700
Semester - III	16	1	-	9	20	290	310	600
Semester - IV	14	1	-	15	20	240	360	600
Semester - V	12	3	-	15	20	350	250	600
Semester - VI	11	3	-	18	20	330	270	600
Semester - VII	-	-	-	48	Na	-	-	-
Semester - VIII	-	-	-	48	Na	-	-	-
Total					120	2060	1840	3900



3. GRADUATE ATTRIBUTES

S No.	Attribute	Description
1	Professional Knowledge	Demonstrate scientific knowledge and understanding to work as a health care professional
2	Clinical / technical /skills	Demonstrate Clinical / technical skills in order to implement the preventive, assessment and management plans for quality health care services
3.	Communication	Ability to communicate effectively and appropriately in writing and orally to patients/clients, care-givers, other health professionals and other members of the community
4.	Cooperation/Team work	Ability to work effectively and respectfully with interdisciplinary team members to achieve coordinated, high quality health care
5.	Professional ethics	Ability to identify ethical issues and apply the ethical values in the 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	Ability to think critically and apply once learning to real-life situations
8.	Reflective thinking	Ability to employ reflective thinking along with the ability to create the a sense of awareness of one self and society
9.	Information/digital literacy	Ability to use ICT in a variety of learning situations
10.	Multi-cultural competence	Ability to effectively engage in a multicultural society and interact respectfully
11.	Leadership readiness/qualities	Ability to respond in an autonomous and confident manner to planned and uncertain situations, and should be able to manage themselves and others effectively
12.	Lifelong Learning	Every graduate to be converted into lifelong learner and consistently update himself or herself with current knowledge, skills and technologies. Acquiring Knowledge and creating an understanding in learners that learning will continue throughout life.