Entry level qualification

An applicant for admission to the course is required to obtain 50% marks taken together in Physics, Chemistry and Biology in the higher secondary examination that is equivalent to 10+2**.** Candidates who are appearing for the final qualifying examinations may also apply.

Scope of the program (career opportunities)

On completion of the course Perfusionist Technology graduate can work as a Perfusionist in any cardiac center, as an ECMO specialist, as an organ retriever in heart transplantation and also can work in industry as clinical specialist

2. PROGRAM EDUCATION OBJECTIVES (PEOs)

The overall objective of the learning outcome-based curriculum framework (LOCF) for Perfusion Technology Program are as follows:

PEO No.	Education Objective
PEO 1	Students will be able to use their fundamental knowledge and clinical & technical competence in Cardiopulmonary Bypass as and when required to achieve professional excellence.
PEO 2	Students will demonstrate strong and well defined clinical & practical skills in Perfusion related to Cardiopulmonary Bypass
PEO 3	Students will be able to practice the profession with highly professional and ethical attitude, strong communication skills, and effective professional skills to work in an inter-disciplinary team.
PEO 4	Students will be able to use interpersonal and collaborative skills to identify, assess and formulate problems and execute the solution related to Extracorporeal Circulation
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 Perfusion technology towards serving the cause of the society.

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 / practical skills**	Demonstrate Clinical, technical & practical 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 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 the understanding in learners that learning will continue throughout life.

4. QUALIFICATION DESCRIPTORS:

a) Demonstrate (i) a fundamental and systematic knowledge and understanding of an academic field of study as a whole and its applications, and links to related disciplinary areas/subjects of study; including a critical understanding of the established theories, principles and concepts, and of a number of advanced and emerging issues in the field of Perfusion Technology; (ii) Procedural knowledge that creates different types of professionals related to the Perfusion Technology, including research and development, teaching and in government and public service; (iii) Professional and communication skills in the domain of Cardiopulmonary Bypass, including a critical understanding of the latest developments, and an ability to use established techniques in the domain of cardiopulmonary Bypass.

b) Demonstrate comprehensive knowledge about Cardiopulmonary Bypass including current research, scholarly, and/or professional literature, relating to essential and advanced learning areas pertaining to the Cardiopulmonary Bypass, and techniques and skills required for identifying problems and issues.

c) Demonstrate skills in i) identifying the issues in Cardiopulmonary Bypass; ii) collection of quantitative and/or qualitative data relevant to client's needs and professional practice; iii) analysis and interpretation of data using methodologies as appropriate for formulating evidence based hypotheses and solutions

d) Use knowledge, understanding and skills for critical assessment of a wide range of ideas and complex problems and issues relating to the Perfusion Technology

e) Communicate appropriately with all stakeholders, and provide relevant information to the members of the healthcare team

f) Address one's own learning needs relating to current and emerging areas of study, making use of research, development and professional materials as appropriate, including those related to new frontiers of knowledge

g) Apply one's disciplinary knowledge and transferable skills to new/unfamiliar contexts and to identify and analyze problems and issues and seek solutions to real-life problems

5. PROGRAM OUTCOMES (POs):

After successful completion of BSc Perfusion technology program, students will be able to:

PO No.	Attribute	Competency
PO1	**Professional knowledge**	Possess and acquire scientific knowledge to work as a health care professional
PO2	**Clinical/ Technical skills**	Demonstrate and possess clinical skills to provide quality health care services
PO3	**Team work**	Demonstrate teamwork skills to support shared goals with the interdisciplinary health care team to improve societal health
PO4	**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
PO6	**Evidence based practice**	Demonstrate high quality evidence-based practice that leads to excellence in professional practice
PO7	**Life-long learning**	Enhance knowledge and skills with the use of advancing technology for the continual improvement of professional practice
PO8	**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)

SCHEME OF CURRICULUM

SEMESTER - I

CODE	COURSE TITLE	Credit Distribution					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 & Indian Constitution	2	-	-	-	2	100	-	100
PFT1101	Applied Anatomy	1	1		-	2	100	-	100
PFT1102	Medical Ethics & legal aspects	2	-	-	-	2	50	50	100
PFT1121	Equipment's in cardiac surgery and their application	1	1	6	-	5	100	-	100
PFT1131	Clinical Perfusion - I	-	-	-	12	4	100	-	100
	Total	**11**	**2**	**6**	**12**	**20**	**510**	**190**	**700**
Note: ESE for ANA1101 and PHY1101 will be conducted for 50 marks and normalized to 70 marks for Grading									

SEMESTER - II

CODE	COURSE TITLE	Credit Distribution					Marks Distribution		
		L	T	P	CL	CR	IAC	ESE	Total
BIC1201	Biochemistry	3	-	-	-	3	30	70	100
PHY1201	Physiology - II	2	-	-	-	2	30	70	100
CSK1001	Communication skills	2	-	-	-	2	100	-	100
PFT1201	Applied Physiology	1	1	-	-	2	100	-	100
PFT1221	Cardiac surgical operating room	1	1	6	-	5	100	-	100
PFT1231	Clinical Perfusion - II	-	-	-	18	6	50	50	100
Total		**9**	**2**	**6**	**18**	**20**	**410**	**190**	**600**
Note: ESE for BIC1201 and PHY1201 will be conducted for 50 marks and normalized to 70 marks for Grading									

SEMESTER - III

CODE	COURSE TITLE	Credit Distribution					Marks distribution		
		L	T	P	CL	CR	IAC	ESE	Total
MCB2103	Microbiology	3	-	-	-	3	30	70	100
PAT2103	Pathology	3	-	-	-	3	30	70	100
PFT2101	Introduction to perfusion technology	2	-	-	-	2	50	50	100
PFT2121	Cardiac surgical procedures	-	3	4	-	5	100	-	100
PFT2131	Clinical Perfusion - III	-	-	-	12	4	100	-	100
*******	Open Elective - I	-	-	-	-	3	S/NS		
Total		8	3	4	12	20	310	190	500
Note: ESE for MCB2103 and PAT2103 will be conducted for 50 marks and normalized to 70 marks for Grading									

SEMESTER - IV

CODE	COURSE TITLE	Credit Distribution					Marks distribution		
		L	T	P	CL	CR	IAC	ESE	Total
PHC2203	Pharmacology	3	-	-	-	3	30	70	100
BST3201	Biostatistics and research methodology	3	-	-	-	3	30	70	100
PFT2201	Medicine in perfusion technology	2	1	-	-	3	50	50	100
PFT2221	Instrumentation specific to Perfusion technology	-	2	4	-	4	100	-	100
PFT2231	Clinical Perfusion - IV	-	-	-	12	4	50	50	100
PFT****	Program Elective - I	2	1	-	-	3	50	50	100
Total		**10**	**4**	**4**	**12**	**20**	**310**	**290**	**600**
Note: ESE for PHC2203 will be conducted for 50 marks and normalized to 70 marks for Grading. ESE for BST3201 will be conducted for 100 marks and normalized to 70 marks for Grading.									

SEMESTER - V

CODE	COURSE TITLE	Credit Distribution					Marks distribution		
		L	T	P	CL	CR	IAC	ESE	Total
PFT3101	Perfusion Technology - Clinical	2	-	-		2	50	50	100
PFT3102	Perfusion Technology - Applied	2	-	-		2	50	50	100
PFT3121	Procedure related to Adult cardiac surgery	-	3	6	-	6	100	-	100
PFT3131	Clinical Perfusion - V	-	-	-	21	7	100	-	100
*******	Open Elective - II	-	-	-	-	3	S/NS		
Total		**4**	**3**	**6**	**21**	**20**	**300**	**100**	**400**

SEMESTER - VI

CODE	COURSE TITLE	Credit distribution					Marks distribution		
		L	T	P	CL	CR	IAC	ESE	Total
PFT3201	Perfusion technology-advanced	2	-	-	-	2	50	50	100
PFT3251	Project work and viva - voce	-	2	6	-	5	50	50	100
PFT3221	Procedure related to Pediatric and neonatal cardiac surgery	-	2	4	-	4	100	-	100
PFT3231	Clinical Perfusion - VI	-	-	-	18	6	50	50	100
PFT****	Program Elective - II	2	1	-	-	3	50	50	100
TOTAL		**4**	**5**	**10**	**18**	**20**	**300**	**200**	**500**
Note: ESE for the PFT3251 will be in the form of Viva-Voce									

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	PFT2241	Accidents during CPB, its Management and Safety	2	1	-	-	3
	PFT2242	Congenital Heart Diseases and Management of Pediatric Perfusion	2	1	-	-	3
VI Semester	PFT3241	ECMO and Patient management	2	1	-	-	3
	PFT3242	Organ Transplantation	2	1	-	-	3

SEMESTER - VII and VIII

Internship (1 year, 48 hours/week)

COMPULSORY ROTATORY CLINICAL POSTING

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

TOTAL DEGREE CREDIT DISTRIBUTION

Semester	Credits					Marks		
	L	T	P	CL	Total	IAC	ESE	Total
Semester - I	11	2	6	12	20	510	190	700
Semester - II	9	2	6	18	20	410	190	600
Semester - III	8	3	4	12	20	310	190	500
Semester - IV	10	4	4	12	20	310	290	600
Semester - V	4	3	6	21	20	300	100	400
Semester - VI	4	5	10	18	20	300	200	500
Semester - VII	-	-	-	48	NA	-	-	-
Semester - VIII	-	-	-	48	NA	-	-	-
TOTAL	**46**	**19**	**36**	**189**	**120**	**2140**	**1160**	**3300**