



# **State Medical Faculty of West Bengal**

## **INFORMATION BROCHURE**

**FOR**

## **DIPLOMA IN PERFUSION TECHNOLOGY 2015**

**State Medical Faculty of West Bengal**

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**Price : Rs. 500/-**



## **INTRODUCTION:**

State Medical Faculty of West Bengal was established as a statutory body by the Government of West Bengal in the Year 1914. The Faculty was entrusted with conduction of Licentiate Courses in Medical Sciences (L.M.F.). Subsequently the Faculty started conducting examination of Diploma in Pharmacy.

With the rapid growth of medical sciences it was felt necessary to train the paramedical personnel of the State. With this object in view, the State Medical Faculty started conduction of different diploma and certificate courses with the approval of the Government of West Bengal. It is essential to have a uniform standard while conducting the courses not only in Government Institutions but also in the Private Organizations and as such, the Faculty has already stipulated minimum requirement for starting conduction of different Para Medical Courses.

As per provision of Clinical Establishment Act of West Bengal any Diagnostic Laboratory possessing Valid Licence under the said Act can start the Training Course with the permission of appropriate authority provided the diagnostic laboratory fulfills the minimum requirements as stipulated by the State Medical Faculty of West Bengal.

Any Institution desirous of starting Para Medical Courses with the affiliation of State Medical Faculty of West Bengal has to fulfill the stipulated requirements and to follow the syllabus as prescribed by the Faculty. The State Medical Faculty also acts as an Examining Authority for such courses.

Conduction of a Para Medical Course in Affiliated Institutions is being monitored by the Faculty so that uniformity is maintained while conducting the same course in different institutions.

Presently, the State Medical Faculty of West Bengal is considering grant of recognition to Institutions for conducting the following courses:

<u>Sl.</u>	<u>Name of the Courses</u>
1.	Diploma in Medical Laboratory Technology
2.	Diploma in Radiography
3.	Diploma in Radiotherapeutic Technique
4.	Diploma in Optometry with Ophthalmic Technique
5.	Diploma in Perfusion Technology
6.	Diploma in Neuro Electro Physiology
7.	Diploma in Cath-Lab-Technician
8.	Diploma in Dialysis Technician
9.	Diploma in Critical Care Technology
10.	Diploma in Operation Theatre Technology

## **COMMON PROCEDURES FOR OBTAINING AFFILIATION FOR ANY DIPLOMA COURSE RUN BY THE FACULTY**

### **PART – I**

The intending institute which wants to start a particular course is required to collect the booklet "**Information Brochure**" for that particular Course by paying the requisite fee of **Rs.500/-**.

The Institute should create the facilities required for starting the course as per norms of the course.

The Institute after fulfilling the norms for the course is required to apply in the prescribed form annexed in **Part-II** alongwith the requisite Inspection Fee of **Rs. 5000/- for each course**. Inspection fee is not refundable.

The Faculty will send Inspection Team for physical verification of the facilities to start the course.

On the basis of report received from the Inspection Team, the Faculty may ask the Institute for compliance or modification, as the case may be, or accord permission to start the course.

#### **Caution Money Deposit:**

- i) Private Institutions to be recognized are required to deposit with State Medical Faculty of West Bengal Caution Money of Rs.50,000/- per course.
- ii) Caution Money will be treated as one-time payment till students of private institutions continue their studies.
- iii) Caution Money deposited by Private Institutions will not accrue any interest payable to the concerned depositors.
- iv) Caution Money will be refunded without any interest at the time when the institute closes their course of studies with prior intimation to the Faculty.
- v) In the event of de-recognition of the institution by the Faculty, Caution Money deposited would be forfeited.
- vi) Caution Money deposit is applicable in case of new Institute / existing Institute to conduct new course(s).

#### **Conduction of Paramedical Courses:**

Paramedical Courses should exclusively be conducted at the institute premises under the control of the Affiliated Institute, save and except Blood Bank Training for DMLT [Tech] Course, which could be done in any Government Hospital or any Private Hospital with their consent. Consent letter to be attached in Application Form for recognition.

In case of rented building of the institute, three years' rental agreement with the owner of the premises be submitted with the Application Form for grant of recognition/extension of recognition.

#### **Fire Safety Measures:**

Fire Safety Measures should be ensured. Provision for alternative exist be arranged.

In case of non-availability of Fire Safety Measures, the same may be informed and also their plan of actions for introduction/improvement of Fire Safety Measures.

#### **Duration of Course:**

Duration of Para Medical Courses is 2 years followed by 6 months compulsory Post Examination Practical Training of minimum **600 hours in 6 months** after passing of Final Examination of Para Medical Courses.

#### **Eligibility:**

Any person seeking admission into the course of study in Para Medical Courses must fulfill the following conditions:

- a) That he/she has passed the Higher Secondary or an equivalent Examination of any Indian University or duly constituted Board, with pass mark in Physics, Chemistry and Biology.
- b) That he/she has attained the age of 17 years on 1<sup>st</sup> September of the respective year of his/her admission into the course in an approved institution.
- c) That he/she has furnished a certificate of physical fitness from a registered medical practitioner and two references from persons other than relatives testifying to satisfactory general character.

#### **Selection:**

Selection will be made on the basis of pass marks obtained in Physics, Chemistry and Biology in the Qualifying Examination [i.e. Higher Secondary and/or equivalent Examination]. The Faculty will, however, reserve the right to amend/alter/modify the selection procedure at its sole discretion.

#### **Fees:**

The admission and tuition fees will be charged by the individual institution with the approval of the Faculty. The Tuition Fees will be Rs.15,000/- per course per annum in respect of all Affiliated Institutions.

The Registration Fees of Rs.500/- per student per course and Examination Fees of Rs.400/- per student per examination will be charged by the State Medical Faculty of West Bengal separately in respect of students admitted in Para Medical Courses in Affiliated Institutions. Students of **ESI Hospitals, Kolkata Port Trust Centenary Hospital, Chittaranjan National Cancer Institute are required to pay Registration Fees and Examination Fees.**

**Academic Session:**

The Session will commence ordinarily in September of every year. The exact date is to be announced at the time of admission.

**Inspection, Counseling, etc.:**

**Inspection is to be carried out to all Institutions including existing Institutions.**

**All affiliated Institutions have to join Counseling of the Faculty on scheduled date, time and venue. Seed money for joining the Counseling is Rs. 4000/- for each course. However, if they do not get students in Joint Counseling then they will be allowed for second counseling at their end.**

**Prospectus and Application Forms, etc. are to be issued by the Affiliated Institutions by their own arrangements for the second counseling, if any. Subject to the approval of the Faculty.**

Students of the Non-Government Institutions, selected in the Joint Counseling, have to deposit Rs.15,000/- preferably by Demand Draft in favour of State Medical Faculty of West Bengal at the time of admission in the Counseling Hall. Faculty will remit this amount to the concerned Institution in due course.

Affiliated Institution has to pay Rs.500/- per student per month for six months as stipend to the students during Internship (Clinical) and/or Post-Examination Practical Training.

Affiliated Institution has to pay Recognition Fee of **Rs. 10,000/-** per course per annum.

Affiliated Institutions have also to pay **Rs.4000/-** as Examination Fee per examination per course.

New Institution (other than existing one) has to submit "No Objection Certificate" for conduction of course from the State Government.

Internship for all the passed out students of Diploma Courses is compulsory and that same should be completed just after passing the Final Examinations.

**No Objection Certificate**

**I. In case of new Institute proposed for affiliation to conduct different Para Medical course(s) is required to submit Noc from State Govt**

**II. Similarly existing Institutes intend to conduct new Para Medical course(s) is also required to submit Noc from State Govt.**

**PART II**

**Application for obtaining fresh affiliation or extension of affiliation of  
State Medical Faculty of West Bengal for conducting \_\_\_\_\_  
(Name of the Course(s))**

1. Name and address of the applicant:

Name \_\_\_\_\_

Address with Pin Code \_\_\_\_\_

\_\_\_\_\_

Phone No. \_\_\_\_\_ Fax No. \_\_\_\_\_ E-mail \_\_\_\_\_

2. Whether any other training course(s) are running by the Institute: Yes/No

If yes, please indicate the name of other course(s): \_\_\_\_\_

3. Status of the Institution: \_\_\_\_\_

4. Details of the Institution: \_\_\_\_\_

A. If it is Society/Trust \_\_\_\_\_

The Society Registration Act No. or the Trust No. under which the Society/Trust was formed:

(i) Registration No. -----

(ii) Date of Registration -----

(iii) Place of Registration -----

(Attached copy of Registration of Society/Trust alongwith detail of constitution/Memorandum of Association of the Society/Trust)

(iv) Details of member/Trustees and their experience in running Para Medical Courses alongwith present occupation and academic background:

Name of the Member/Trustees	Designation in Society	Present Occupation	Academic Background	Experience

B. If other, specify:

- i) Name and complete postal address of the proposed Institution.
  - ii) Name and address and Telephone No. of the authorized person for communication.
  - iii) Furnish the details of Resource and funding agencies.
  - iv) Number of students proposed to be admitted.
  - v) Year of starting/proposed date of starting the course.
  - vi) Specify the nature of attached hospital/laboratories with full description thereto and status of the same.
  - vii) Registration No. of the establishment for Practical Training.
5. Details of Fire Safety Measures are as under :  
(Attach separate sheet)
  6. Alternative exit arranged or not.
  7. Rented Building, Yes/No.
  8. Name of the authorized person to sign Registration forms, Admit Cards and other documents.

**Note:-**

- a) Copy of current license under Clinical Establishment Act of West Bengal be attached.
- b) In case of new Institution, copy of permission letter from the Government of West Bengal for conducting Para Medical Course be attached.
- c) In case of rented building of the institute, three years' rental agreement with the owner of the premises be submitted with the Application Form for grant of recognition/extension of recognition.
- d) Copies of **Blood Bank Facility (For DMLT [Tech] Course only)** provided by Govt. Hospital / Private Blood Bank if any.
- e) Copies of updated **Registration Certificate** of WBMC for Medical Faculty are attached.
- f) Copy of License under clinical Establishment Act is attached

Name :

Signature of the Head of Institute :

Date with stamp :

**Availability of Existing Infrastructural Facilities:**

1. Whether the Institution is/will be established in own building or in a rented building –  
(Documentary evidence is required in case of owned building and in case of rented building the rent receipt and Agreement with the owner is required.)

**Accommodation:-**

The Institution must provide adequate ventilation, lighting and maintain good hygienic condition. The Institute should have adequate number of toilets separately for teaching staff and for male & female students.

Administrative area should consist of the following:

Sl. No.	Particulars	Size of the room	Remarks of Inspectors
	Head of Department Room (1)		
	Room for Teaching Staff/Faculty Members (1)		
	Room for Technicians (1)		
	Office Room (1)		

2. Academic Area should consist of the following:

Sl. No.	Particulars	Size of the room	Remarks of Inspectors
	Class Room (1)		
	Library (1)		
	Students' Common Room (1)		

3. Staff:  
Non-Teaching staff –

**(a) Regular :**

Sl.No.	Designation	Name & Address	Qualification & experience	Date of Appointment	Inspector's Remarks
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

Non-Teaching staff –

**(b) Part Time :**

Sl.No.	Designation	Name & Address	Qualification & experience	Date of Appointment	Inspector's Remarks
1					
2					
3					
4					
5					
6					
7					

Whether potable water is supplied :  
 Whether Gas is provided :  
 Whether electricity is provided :  
 Whether waste disposal management system is followed :

Whether the following records are maintained :

1. Attendance for staff
2. Salary Payment Sheets
3. Cash Book
4. Store material receive and supply (Stock Ledgers)
5. Students Attendance
6. Student Register (Admission)
7. Dead Stock Register
8. Patients' Attendance Register/Daily Treatment Register in Clinic.

4. The Training Area should provide atleast two Operation Theatres where atleast 100 Open Heart Surgeries are performed each year.

5. Teaching Staff:  
 (A) Regular Faculty :

Sl.No.	Designation	Name & Address	Qualification & experience	Date of Appointment	Regn No*	Inspector's Remarks
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						

\* In case of Doctor

(B) Guest Faculty :

Sl.No.	Designation	Name & Address	Qualification & experience	Date of Appointment	Regn No*	Inspector's Remarks
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						

\* **In case of Doctor**

Name :

Signature of the Head of Institute :

Date with stamp :

Phone No. :

**PART III****Standard requirements of infrastructural facilities  
to start Para Medical Course : DPFT Course****Accommodation:**

The Institution must provide adequate ventilation, lighting and maintain good hygienic condition. The Institute should have adequate number of toilets separately for teaching staff and for male and female students.

## 1. Administrative Area:

Sl. No.	Particulars	Size of the room	Remarks of Inspectors
1	Head of Department Room (1)	150 Sq. ft.	
2	Room for Teaching Staff/ Faculty Members (1)	200 Sq. ft.	
3	Room for Technicians (1)	200 Sq. ft.	
4	Office Room (1)	150 Sq. ft.	

## 2. Academic Area:

Sl. No.	Particulars	Size of the room	Remarks of Inspectors
1	Class Room	300 Sq. ft.	
2	Library	500 Sq. ft.	
3	Students' Common Room	300 Sq. ft.	

3. The Training Area should provide atleast two Operation Theatres where atleast 100 Open Heart Surgeries are performed each year.

## 4. Staff -

## Non-Teaching Staff:

Sl.No.	Designation	Qualification	No. Required
1	Office Assistant	Graduate in any discipline with experience in Computer operation	One
2	Library Assistant	Graduate in Science	One

## 5. Teaching Staff:

The following Teaching Staff are required:

Sl.No.	Designation	Qualification	No. Required
1	Cardiac Surgeon	MCh and/or DNB with 10 years experience.	Two
2	Anaesthesiologist	MD Anaesthesiology with atleast 5 years experience	Two
3	Nephrologist	Teacher in Medicine with atleast 10 years experience or DM with 5 years experience	One
4	Perfusionist	Certificate holder with atleast 10 years experience	One

## 6. List of Equipment:

Sl.No.	Name of the Instruments	Minimum No. Required
1	Heart Lung Machine	One
2	Heater-Cooler	One
3	Multi-channel Monitor	Two
4	Defibrillator with internal Paddle	One
5	Defibrillator with external Paddle	One
6	Temporary Pacemaker	Two
7	Arrangement for Measuring ACT	One
8	Sternal Saw	One
9	ITU Ventilator	Two
10	Blood Gas & Electrolyte Analyser	One

## RULES, REGULATIONS AND SYLLABUS

### PART – IV

#### **Duration of the DPFT Course:-**

- (a) The first one year of the course shall be devoted to the training in the subjects of the Preliminary Courses.
- (b) On completion of the Preliminary Course, the Preliminary Examination will be held.
- (c) On passing the Preliminary Examination, the students shall follow for one year the curriculum of the Final Course. On completion of the course, the Final Examination will be held.
- (d) After successfully passing the Final Examination, the students shall undergo Compulsory Practical Training of not less than 600 hours in not less than 6 months in a recognized hospital.
1. The Preliminary and Final Course shall include the respective subjects as given in the Tables as well as the minimum number of hours devoted to each subject, lectures, practical and demonstration, subject to addition and alteration at the discretion of the Governing Body of the State Medical Faculty.

The detailed syllabus of each subject is given in **Appendix I**.

#### **Preliminary Course**

<u>Subject to be taught</u>	<u>Total Class Hours</u>
<u>Total Practical Classes</u>	
1. Anatomy	30
2. Physiology	50
3. Pathology	30
4. Bacteriology and Sterilization	10
5. Pharmacology	30
6. Basic Physics and Chemistry	50
7. Biomedical Electronics	50
8. Introduction to Perfusion Technology	100
9. Instrumentation and Measurement	50

#### **Final Course**

1) Details of Perfusion Techniques	150
2) Perfusion Equipments	100
3) Clinical Application of Bypass Techniques	150
4) Occupational Aspects of Perfusion	100
5) Postoperative Intensive Care Unit Management	200

### Examination for the Diploma Course:

1. No person other than a student borne on the roll of an approved training institution and studying therein at the time, shall be eligible for appearing at the examination held by the Governing Body of the Faculty.
2. Every student after admission into the course of study in an approved Institution shall apply in the prescribed form **Appendix II** through the Principal/Director of the Institution with a fee of Rs.500/- to have his/her name registered in the Students' Register maintained by the Governing Body. A registration certificate bearing serial number allotted to the student will be sent to him/her through the Head of the Institution.
3. (a) There will be two examinations – (a) Preliminary and (b) Final. The examinations shall be held twice a year at such time and place as may be determined by the Governing Body.

(b) **Internal Assessment** marks for all Para Medical Courses have been introduced from the academic session 2013, **20% of allotted marks in Theory and 10% of allotted marks in Oral and Practical in each paper of Diploma courses** would be assigned for internal assessment marks. **Pass marks in Internal assessment is 50% in each paper rounded off to the nearest five.** A candidate should not be allowed to sit for examination without pass marks in Internal Assessment.

4. **Preliminary Examination** : Only such students, who produce certificate from the Head of the approved Institutions in proof of their having regularly undergone the Preliminary Course of study by attending not less than 75% of classes, both in theoretical and practical in each subject, shall be eligible for appearing at the Preliminary Examination.

The Examination will be conducted according to the following table:

<u>Subject of Examination</u>	<u>Total marks Theory+IA</u>	<u>Total marks Oral &amp; Practical+IA</u>
1. Anatomy, Physiology	80+20	90+10
2. Pathology, Pharmacology	80+20	90+10
3. Basic Physics and Chemistry Biomedical Electronics		
Introduction to Perfusion Technology	80+20	90+10
4. Instrumentation and Measurement Details of Perfusion Technology	80+20	90+10

5. All written examinations shall be of three hours' duration and the number of papers in each subject shall be as mentioned above.
6. Every candidate for the Preliminary Examination shall apply to the Secretary, State Medical Faculty of West Bengal through the Head of the Institution where he/she is undergoing his/her study, in the prescribed form together with the necessary certificates **Appendix III**.
7. No application will be entertained unless it reaches the Secretary atleast 21 days before the date notified for commencement of the examination. An application received later but not later than 14 days before the commencement of examination, may on sufficient grounds being shown and accepted, be entertained provided that a late fee of Rs.20/- is paid for the delay.

8. **Final Examination:** Only such students, who produce certificate from the Head of the Institution concerned in proof of their having regularly undergone after successfully passing the Preliminary Examination by attending not less than 75% of classes – lectures, practical and clinical of each subject separately and has worked for atleast 350 days in the Cardio Thoracic Vascular Surgery Department of a recognized Hospital shall be eligible for appearing at the examination as given in the following table:

<u>Subject of Examination</u>	<u>Total Marks for Theory+IA</u>	<u>Total marks for Oral &amp; Practical+IA</u>
1) Perfusion Equipments Clinical Application of Bypass Techniques	80+20	90+10
2) Postoperative Intensive Care Unit Management, Occupational Aspects of Perfusion	80+20	90+10

9. Every candidate for the Final Examination shall apply to the Secretary, State Medical Faculty of West Bengal through the Head of the Institution where he/she had been undergoing his/her course of studies, together with the necessary certificates from the Head of the Institution **Appendix IV**.
10. The fee payable with the application shall be such as may be prescribed by the Governing Body from time to time. The fee is not refundable on any account.
11. No such application will be entertained unless it reaches the Secretary atleast 21 days before the date notified for commencement of the examination. An application received later but not later than 14 days before the commencement of examination, may on sufficient grounds being shown and accepted, be entertained provided that a late fee of Rs.20/- is paid for the delay.
12. A candidate declared to have passed the above examinations – both Preliminary and Final – if he/she secures 50% of the total marks in each subject – Theoretical + Oral – 50% and Practical – 50%. A candidate securing 75% marks or above in any subject or subjects, shall be declared to have obtained “Distinction” in that subject or subjects, provided he/she passes in all the subjects of the examination at the same time and at his/her first appearance at the examination.
13. A candidate, who appears at the Preliminary or Final Examination for the course but fails to pass in all the subjects or in one or more subjects, may be admitted to one or more subsequent examinations in subject or subjects in which he/she failed provided, however, that he/she passes in all the subjects in three subsequent examinations within a period of two years computed from the date of the examination in which he/she appeared for the first time. If he/she does not pass the entire examination within a period of two years, as mentioned above, he/she shall have to take the whole examination in all the subjects at the time when he/she appears next.

14. A failed candidate shall have to undergo a further course of training and produce a certificate from the Head of the Institution stating that he/she has, since the date of the last examination and within the period of six months proceeding his/her re-examination, attended to the satisfaction of the Head of the Institution further course of study in the subject or subjects in which he/she failed **Appendix V**.
15. The general rules and regulations regarding conduct of examinations of the State Medical Faculty of West Bengal shall apply with necessary modifications for the conduct of Diploma in Perfusion Technology. Detailed rules and regulations may be framed by the Governing Body from time to time.
16. The rates of remuneration to Paper Setters, Examiners, Assistants, Inspectors and Invigilators, etc. appointed to conduct the examinations and the rates of Travelling Allowance, Daily Allowances to Examiners and Inspectors, etc., shall be such as laid down by the Governing Body.

#### **AWARD OF DIPLOMA IN PPERFUSTION TECHNOLOGY : DPFT**

1. A candidate who passes successfully the Final Examination will be granted a Diploma in Perfusion Technology : DPFT.
2. Every such application shall be accompanied by a certificate from the Head of the recognized Hospital, in the form given in **Appendix VI**, with all the particular mentioned therein and the Head of the Institution shall forward the same to the Secretary, in the form given in **Appendix VII**, stating whether he/she considers him/her eligible to receive the Diploma in Perfusion Technology : DPFT.
3. The Governing Body may then, if satisfied that all requirements of these regulations have been fulfilled, issue the Diploma, which shall be in the form given in **Appendix VIII**.

Provided that the Board of Studies may, if satisfied, accordingly direct the issue of such Diploma in anticipation of the approval of the Governing Body.

**PART IV****Appendix I****SYLLABUS****Preliminary Course****1) ANATOMY:**

Heart, Blood vessels, Lungs, Kidney, Nervous system, Digestive system, Liver, Spleen, Endocrine system and congenital lesions.

**2) PHYSIOLOGY**

Heart and circulation, Conducting system within the heart, Control of cardiac functions, Cardiac output, Cardiac cycle, Heart block.

Basic review of cardiovascular system, Basic respiratory physiology, Basic fundamentals of Nervous system, Muscle physiology, Renal, Fluid and electrolyte, Blood and immunological system.

Details coverage of:

Blood, Blood flow, Blood gases and acid base balance, Oxygen and carbon dioxide transport, Electrolytes, Hypothermia, Cardiac haemodynamics, including congenital abnormalities, Basic ECG patterns, Microcirculation, Physiology and Pathophysiology of coagulation, Physiology of Haemodilution and plasma proteins.

**3) PATHOLOGY**

Blood vessels (atherosclerosis, medial necrosis), Heart (aneurismal changes, valvular lesions), Common congenital cardiac malformations requiring surgery, Common acquired heart disease, Ischemic heart diseases, Blood (results of exposure to foreign surfaces), Lungs (ARDS), Kidney (ischemia, acute tubular necrosis), Nervous system (results of embolism, ischaemia)

**4) PHARMACOLOGY**

Basic facts and pharmacological actions of drugs used in the cardiac operating room during perfusion:

Inotropes, Vasoactive agents, Anti-arrhythmic agents, Diuretics, Steroids, Antibiotics, Anaesthetic agents, Cardioplegia, Muscle relaxants, Beta blockers, Calcium antagonists, Anticoagulants, Antiplatelet drugs, Anti-hypertensives.

Detailed review of drugs, commonly added to the pump/oxygenator by the perfusionist and /or anaesthetist.

Mannitol, Sodium bicarbonate, Cardioplegic solutions, Potassium, magnesium and calcium ions, Heparin, Blood and blood products, Crystalloid and colloid solutions, Vaso-active drugs and Anaesthetic vapour agents.

## **5) BASIC PHYSICS AND CHEMISTRY**

Gas laws, Solubility of gases, volume, pressure, flow, Mass, Density, Viscosity, Heat units, Temperature scales, Heat transfer, Diffusion/osmosis, Molarity, Concentrations.

## **6) BIOMEDICAL ELECTRONICS**

Basic Electricity, Electronics, Principles of Electrical safety, Principles of recording biological signals, Principles of cardiac pacing and defibrillation.

## **7) INTRODUCTION TO PERFUSION TECHNOLOGY**

History and principles of operation of oxygenators, Design and efficiency of heat exchangers, oxygenators, roller pumps. Biocompatibility of equipment and techniques, Sterilization techniques of equipment, Technical aspects of ultrafiltration.

## **SYLLABUS**

### **Final Course**

## **1) INSTRUMENTATION AND MEASUREMENT**

Know the various methods and instruments for measuring the following parameters:

Temperature, cardiac output, Gas flow/concentrations, Physiological pressures, ECG, EEG, End-expired Co<sub>2</sub>, Blood gases, Oxygen saturation, Electrolytes, Haemoglobin/Haematocrit, Actiated coagulation.

Know methods to test equipment for accuracy.

- General information on artifact and distortion of physiological parameters and how they avoided.
- Quality controls.

## **2) DETAILS OF PERFUSION TECHNIQUES**

Adult perfusion, Paediatric perfusion, Assessment of patient (via history) before bypass, Assessment of patient post bypass, Calculation of prime components, Selection of cannulae, Assembly of equipment, Priming of oxygenator, Going on and coming off bypass, Adverse effects of CPB

Monitoring and control of:

Flow/pressure, Haemodilution, Haemodynamic aspect of total Heart Lung Bypass, Metabolic aspects of total Heart Lung Bypass, Acid/base balance, Oxygen and carbon dioxide exchange, Patient core temperature, Anticoagulation, Hypothermia, Total circulatory arrest, Pressure, Flow, Resistance, Adequacy of perfusion, Myocardial preservation. Management of complications and disasters, Auto transfusion, Recording of bypass data, Check lists, Safety of perfusion, Power and equipment failures, Preventive maintenance.

### **3) PERFUSION EQUIPMENTS**

Hardware: Heart-Lung machines/Centrifugal pumps, Pressure and low level alarm devices, Heart-lung heater/coolers, Mechanical/Electronic Flowmeters, Blenders, Temperature monitors, computerized perfusion data systems, Oxygen analysers, Cell savers, Intra-aortic ballon pumps.

Disposable: Various types of Membrane and bubble oxygenators, Reservoirs, Arterial filters, Pre-bypass filters, Arterial, Venous cannulae, Hemoconcentrator devices, Cardioplegia sets, filters, cannulae.

### **4) CLINICAL APPLICATION OF BYPASS TECHNIQUES**

General bypass, Coronary, Valvular, Redos, Congenital, Ventricular assist, Isolated limb perfusion, ECMO, Total body washout.

Monitoring : Setup for ECG and intravascular pressure monitoring, Resuscitation and support, Sterilization within the hospital and Administrative aspects of perfusion.

### **5) OCCUPATIONAL ASPECTS OF PERFUSION**

Infectious diseases, Precautions, Stress/fatigue, Professional standards and modes of conduct, Bioethics.

Management/Quality control:

Quality control, Quality assurance, Management.

### **6) POSTOPERATIVE INTENSIVE CARE UNIT MANAGEMENT**

Basic Respiratory Physiology, Transducers, Types, Storage and standardization, Collection and handling of blood gas samples, Reflection of photometry and Techniques, calculations of Cardiac output.

Cardioverter : Defibrillators, Uses, Hazards

Resuscitation : Detection of Cardiac arrest, Emergency Resuscitation, Equipment for resuscitation.

Respirators : Mechanics of ventilation, Various types of ventilators, Volume ventilators, Pressure ventilators, Mechanical ventilators, Oxygen saturation monitor, Infusion pumps, ACT monitors.

**STATE MEDICAL FACULTY OF WEST BENGAL**

**APPENDIX II**

Form of application for registration of the name of a student admitted to an approved Training institution for Diploma in Perfusion Technology : DPFT

[ Vide Regulation 2 of Part III ]

1. Name of the student in full :
2. Address –  
(a) Permanent :
  
- (b) Present :
3. Father's Name :  
{In case of married women, her  
Husband's name}
4. Age [as on the date of admission] :
5. Race – Caste or religion :
6. Name of the approved training Institution :
7. Date of admission :
8. Preliminary educational qualification :

\_\_\_\_\_  
Signature of the applicant

I hereby certify that the above particulars are true to my knowledge.

Dated, the .....20  
Place :

\_\_\_\_\_  
Signature of the Head of the Institute

**STATE MEDICAL FACULTY OF WEST BENGAL**

**APPENDIX III**

Application for admission to the Preliminary Examination for Diploma in Perfusion Technology : DPFT

[ Vide Regulation 6 of Part III ]

To  
The Secretary, State Medical Faculty of West Bengal.

Sir,

I beg to apply for admission to the ensuing Preliminary Examination for Diploma in Perfusion Technology : DPFT to be held by the Governing Body of the State Medical Faculty of West Bengal from .....

The required certificate from the Head of the Institution is given herewith and I have paid the prescribed fee of Rs. .... in his office.

- |    |                              |   |
|----|------------------------------|---|
| 1. | Name in full (Block letters) | : |
| 2. | Father's Name                | : |
| 3. | Present Age                  | : |
| 4. | Student Registration No.     | : |
| 5. | Permanent Address            | : |
| 6. | Present                      | : |

Dated, the .....20.....

Signature of the applicant in full

**Certificate of the Head of the Institution**

I certify as below –

[1] that the above named ..... was admitted in this Institution for the course of Diploma in Perfusion Technology : DPFT on .....

[2] that previous to his/her admission, he/she has attended regularly the course of studies as laid down in the Regulations. His/her attendance in the several subjects being as below:

<u>Subject Attendance</u>	<u>Hrs. of Theoretical Lecturers</u>	<u>No of Attendance</u>
1. Anatomy	30	
2. Physiology	50	
3. Pathology	30	
4. Bacteriology and Sterilization	10	
4. Pharmacology	30	
5. Basic Physics and Chemistry	50	
6. Biomedical Electronics	50	
7. Introduction to Perfusion Technology	100	
8. Instrumentation and Measurement	50	

That he/she has paid in my office the prescribed fee of Rs.400/- which is being separately remitted to the Faculty.

That his/her conduct in the Institution was satisfactory.

Signature of the Head of the Institute

Dated, the .....20  
Place :

**STATE MEDICAL FACULTY OF WEST BENGAL**

**APPENDIX IV**

Application for admission to the Final Examination for Diploma in Perfusion Technology : DPFT

[ Vide Regulation 9 of Part III ]

To  
The Secretary, State Medical Faculty of West Bengal.

Sir,

I beg to apply for admission to the ensuing Final Examination for Diploma in Perfusion Technology : DPFT to be held by the Governing Body of the State Medical Faculty of West Bengal from .....\*

The required certificate from the Head of the Institution is given herewith and I have paid the prescribed fee of Rs. .... in his office.

I passed the Preliminary Examination in ..... and my present age is .....

- |    |                              |   |   |
|----|------------------------------|---|---|
| 1. | Name in full (Block letters) | : | : |
| 2. | Father's Name                | : | : |
| 3. | Present Age                  | : | : |
| 4. | Student Registration No.     | : | : |
| 5. | Permanent Address            | : | : |
| 6. | Present                      | : | : |

Dated, the .....20

Signature of the applicant in full

\* State name of the training institution.

**Certificate of the Head of the Institution**

I certify as below –

[1] that the above named ..... passed the Preliminary Examination for Diploma in Perfusion Technology : DPFT in .....

[2] that he/she has attended regularly in this Institution. The 2<sup>nd</sup> Year's course of studies laid down in the Regulations and fulfilled the other requirements.. His/her attendance in the several subjects being as below:

<u>Subject Attendance</u>	<u>Hrs. of Theoretical Lecturers</u>	<u>No of Attendance</u>
1) Details of Perfusion Techniques	150	
2) Perfusion Equipments	100	
3) Clinical Application of Bypass Techniques	150	
4) Occupational Aspects of Perfusion	100	
5) Postoperative Intensive Care Unit Management	200	

[3] That he/she has paid in my office the prescribed fee of Rs.400/- which is being separately remitted to the Faculty.

[4] That his/her conduct in the Institution was satisfactory.

Signature of the Head of the Institute

Dated, the .....20

**STATE MEDICAL FACULTY OF WEST BENGAL**

**APPENDIX V**

(Certificate by the Head of the Institution regarding further course of training in the subject or subjects in case of a failed candidate)

[ Vide Regulation 14 of Part III ]

This is to certify that Sri/Sm. .... who appeared at the Preliminary/Final Examination for the Diploma in Perfusion Technology : DPFT in .....20 and failed in ..... has undergone a further course of training in the following subject/subjects since the date of the last examination to my entire satisfaction.

Sl. No.	Subject(s)	Number of Theoretical Lecturers/ Demonstrations attended
-----	-----	-----

Signature of the Head of the Institute

Dated, the .....20

Place :

**STATE MEDICAL FACULTY OF WEST BENGAL**

**APPENDIX VI**

(Certificates to be produced by students of Diploma in Perfusion Technology : DPFT after completion of Practical Training)

[ Vide Regulation 2 of Part IV ]

No. : .....

Date : .....

I....., hereby certify that..... [Name of the student] after passing the Final Examination for Diploma in Perfusion Technology : DPFT underwent practical training for .....hours during the period from .....to ..... under my supervision and guidance.

Signature .....

Name .....

Designation .....

Address .....

(Countersigned by the Head of the Hospital)

**STATE MEDICAL FACULTY OF WEST BENGAL**

**APPENDIX VII**

[ Vide Regulation 2 of Part II ]

To  
The Secretary  
State Medical Faculty of West Bengal  
Dated, the .....20

Sir,

I am to say that the under-mentioned students have passed the Final Examination for the Diploma in Perfusion Technology : DPFT held by the Faculty in .....20 and have thereafter undergone the practical training as required under the Regulations of which the necessary certificates are enclosed. I certify that I consider the students to be eligible to receive the Diploma in Perfusion Technology : DPFT.

Yours faithfully,

Head of the Institution

**STATE MEDICAL FACULTY OF WEST BENGAL**

**APPENDIX VIII**

[ Vide Regulation 3 of Part II ]

***Diploma in Perfusion Technology: DPFT***

*We, the President and Members of the Governing Body of the State Medical Faculty of West Bengal, acting under the authority vested in us by Article 27 of the Statutes of the said Faculty and in accordance with the Regulations made there under with the approval of the Government of West Bengal, do hereby declare that .....*after undergoing the prescribed course of training for the Diploma in Perfusion Technology : DPFT, duly passed the Final Examination for the Diploma in Perfusion Technology : DPFT held by this Faculty in the month of .....20 with distinction.

*And we, accordingly, grant him/her this Diploma in Perfusion Technology : DPFT of this Faculty.*

*Dated at Kolkata, the .....day of .....in the year .....*

*Signed on behalf of the Governing Body of the State Medical Faculty of West Bengal.*

*Secretary*

*President*

*Signature of the holder .....*

## **REPORT OF THE INSPECTORS**

### **Part V**

Summary of findings by the Inspectors in respect of \_\_\_\_\_  
 For \_\_\_\_\_ Course. Name of the Institution

1. Accommodation (including toilet, ventilation, light) :
2. Fire Safety Measures available or not? :
3. Water, Electricity, Gas & Waste Disposal :
4. If the Institute is in rented building, then 3 years Agreement is shown or not? :
5. Furniture :
6. Office Records :
7. Laboratory equipment :
8. Qualification of Teachers :
9. Teacher-student ratio :
10. Workload of teachers :
11. Library books and Journals :
12. No. of working days in the session :
13. Daily working hours :
14. Laboratory facilities provided to the students :
15. Standard of teaching :
16. Standard of students :
17. Performance of students in
  - i) Theoretical :
  - ii) Practical :
  - iii) Oral :
18. Facilities provided for conducting the examination (Examination hall rented may be allowed) :

19. Date of Last Inspection :
20. In case of DMLT [Tech] Course Blood Bank facilities have been shown in Government Hospital/Private Hospital and attendance of DMLT students in Blood Bank has been seen. :
21. Compliance of past deficiencies (if any) :
22. NOC from State Govt. for conduction of new course has been seen. :
23. Updated License for clinical Establishment Act. has been seen. :
24. Updated Registration Certificates of the Doctor Tutors from WBMC. :
25. Recommendation of Inspectors: The Institution may be granted affiliation/following conditions are to be fulfilled before consideration of extending/according affiliation.
- 1.
- 2.

Name and Signature of the Inspectors with date