



# **SREE CHITRA TIRUNAL INSTITUTE FOR MEDICAL SCIENCES AND TECHNOLOGY**

**TRIVANDRUM – 695011, KERALA, INDIA**

**An Institute of National Importance under Government of India with the status  
of  
University established by an Act of Parliament (No.52 of 1980)**

## **THE PhD MANUAL- 2018**

*(Modified in July 2018)*

## 1) INTRODUCTION

SreeChitraTirunal Institute for Medical Sciences and Technology(SCTIMST), Trivandrum,was established by an Act of Parliament in 1980 as an Institute of National Importance with the status of a University.

The genesis of the Institute can be traced to the gift of a hospital by the Royal Family of Travancore. Conversion of the royal gift into an Autonomous Centrefor treatment of cardiovascular and neurological diseases was made by the then Chief Minister of Kerala, Shri C. Achutha Menon, in 1973. The Medical Center had already established its credibility as a Centre of Excellence for hospital-based services by the time it was elevated to the status of an Institute of National Importance.

SCTIMST is a unique institution with a *Biomedical Technology Wing, a Hospital Wing, and Public Health Sciences Wing*. The main purpose of setting up this institution was to bring about a convergence of medical sciences, health care and technology, which was expected to provide the engine of growth through development of indigenous technology and medical devices. This was felt necessary as there was hardly any attention paid to the development of technology for health care in this country and industry was unwilling or unable to invest in research and development (R&D) in health care technology. During the last three decades, the Institute has surged ahead in the fields of technology development, compassionate medical care and academics, which have been summedup in an Institute publication "*Silver Lines*" (available for purchase from the Academic Office).

The Institute is a member of the Association of Commonwealth Universities and the Association of Indian Universities. The Institute harnesses the academic and technological expertise of its multidisciplinary research faculty to conduct high quality, patient-focused translational research; which involves taking research from the laboratory to the bedside. The Institute's work culture with each of its three wings working independently and at the same time interdependently, extending the benefits of scientific and technological advances to the poor and disadvantaged, can be best summed up through the following words written by Claude Bernard more than a century ago: "*I tell people whose pathways will lead them to theoretical or pure science never to lose sight of the main purpose of medicine, which is to preserve health and cure diseases. I tell the people whose careers will lead them to practice medicine never to forget that, just as theory is destined to enlighten practice, practice must in its turn be of profit to science*".

### **i) The Biomedical Technology Wing**

The Biomedical Technology (BMT) Wing was set up with a mandate to develop technologies to meet the health care needs of India through research in biomedical technology. The *materials research group* has a proven record of research towards synthesis and characterization of biomedical polymers, and testing for biocompatibility to qualify the material for medical applications. *The engineering and device development group* has successfully developed and commercialized several products, which include blood bag, artificial heart valve, oxygenator, ventriculo-peritoneal shunt and electromyography needle.

Major programs include development of materials for orthopedic and dental applications, cardiovascular device fabrication, drug delivery systems, nanomedicine, sensors and tissue engineering scaffolds. *Biological research* focuses

on culture and differentiation of adult stem cells for regenerative medicine, in vitro tissue engineering, neuronal regeneration, development of bio therapeutics and diagnostic reagents and tissue response to materials at the cellular and molecular level.

*Sophisticated analytical equipment* are available in the Institute for characterization of materials, which include scanning and transmission electron microscopes, Raman and Fourier transform (FT)-Raman spectroscope, atomic force microscope, inductively coupled plasma (ICP), X-ray diffraction, micro computerized tomography, chromatography systems such as high performance liquid chromatography (HPLC), gas chromatography and liquid chromatography- mass spectrometry (LCMS). Other routinely used and well maintained equipment and facilities are available in all labs.

Important *biological research equipment* available are confocal microscope, transmission and scanning electron microscope, fluorescent activated cell sorter (FACS), Thermal cyclers for Reverse transcriptase- polymerase chain reaction (PCR), ultra centrifuge and continuous flow centrifuge, Imaging systems for fluorescence/luminescence/ radioisotope detection, live cell imaging and facilities for proteomic and genomic analysis etc., apart from routinely used equipment that are available in almost all cell biology research labs.

The well maintained small and large *animal facility* with excellent operating theatre, facilitates the *in vivo* evaluation of materials; and all biocompatibility studies of materials are carried out under Quality Management System conforming to ISO/IEC 17025 accredited by Le Comite Francais d'Accreditation (COFRAC) of France. Tissue analysis is done to evaluate the results of experimental research using state-of-the-art histological/immunochemical/imaging techniques facilitated with sophisticated sample processing and analysis tools.

## **ii) The Hospital Wing**

Started as a small medical center, the hospital with 240 beds is currently well recognized both in India and abroad as a leading center for the treatment of cardiovascular and neurological disorders. All the departments and divisions of the hospital have kept up with the advances in their respective fields and have also initiated several innovative programs for the first time in the country.

*The Department of Neurology* extends diagnostic and therapeutic services on a subspecialty basis in stroke, neuromuscular disorders, epilepsy, movement disorder, dementia and clinical neurophysiology. India's first Comprehensive Care Centers for Epilepsy and Movement Disorders were established in the department. More than 1100 successful operations have been completed for patients with intractable epilepsy applying the latest advances in the presurgical evaluation and surgical treatment of epilepsies. The Center for Movement Disorders likewise offers all modalities of treatment for Parkinson's disease including state-of-the-art deep brain stimulation. The Centers for Stroke and Sleep Disorders have recently been started. The department also runs two outreach epilepsy clinics in North Kerala, and maintains registries for stroke and epilepsy in pregnancy.

*The Department of Neurosurgery* is one of the foremost centers of India in the field of microvascular neurosurgery. In addition to all common surgeries for intracranial and spinal lesions, the department also specializes in stereotactic surgery, ultrasound and image guided surgeries, awake craniotomies, all of them treated with

the aid of latest diagnostic and monitoring techniques. The department is one of the first to start neuro-endoscopic surgery. The faculty of the department interact with the scientists and technologists of BMT Wing to pioneer the development of hydrocephalus shunt, burr hole buttons and fibrin glue.

In keeping with the times, the practice in the *Department of Cardiology* has become more intervention-oriented with several congenital heart diseases being corrected through less invasive catheter based interventional procedures instead of major surgery. Similarly electro-anatomic mapping of various conduction abnormalities of the heart and magnetic resonance angiography are being undertaken on a regular basis. The diagnosis of ischemic coronary artery diseases will also soon be based on non-invasive coronary CT angiogram.

The *Department of Cardiovascular and Thoracic Surgery* in addition to providing advanced treatment for congenital, valvular and ischemic heart diseases, and diseases of the lungs, oesophagus and blood vessel, also assisted in the successful development of heart valves, blood oxygenators and vascular grafts.

One of the first to introduce interventional radiology in the country, the *Department of Imaging Sciences and Interventional Radiology* has the latest MRI and CT scanners. A large number of interventional procedures including aneurysm coiling, embolization of arterio-venous malformations, carotid stenting, arterial thrombolysis, vertebroplasty and laser discectomy are routinely undertaken in the department.

The hospital is supported by laboratory facilities provided by *Departments of Biochemistry, Microbiology and Pathology*.

### **iii) The Public Health Wing: The Achutha Menon Centre for Health Science Studies**

The Achutha Menon Centre for Health Science Studies (AMCHSS) was started when public health was not given any importance at the national or state level health planning and policy making in India. Recognizing this need, the Institute decided in the early 1990s to set up a centre to address the issues of quality training and research in public health. In 1997, a school of public health, the AMCHSS, was set up for research, training and consultation in public health and the country's first Masters' Program in Public Health was started. The centre also conducts several short courses in subjects which have growing significance on healthcare, such as research and professional ethics, gender sensitization, maternal and child health, etc., in addition to research and providing consultancy services to national and international agencies. Within a decade, this model received wide national acceptance and set the trend for public health education in the country.

As a part of its mandate for training, AMCHSS conducts two-year Master of Public Health (MPH) program, one-year Diploma in Public Health (DPH) program (exclusively meant for medical officers from government services) and PhD in addition to short courses in Ethics, Gender, Reproduction, Child Health and Research Methodology. PhD Programs are being offered in wide variety of topics in public health including Epidemiology, Health Economics, Health Policy, Issues in Health System and Gender Issues in Health. These training programs are well accepted throughout the country and abroad. In fact, the curriculum for the new MPH programs being started by the Indian Council for Medical Research's (ICMR) School of Public Health and Public Health Foundation of India are based on the one that was developed at AMCHSS. The Institute has undertaken major research programs

in Epidemiology, Health Economics, Tobacco Cessation, and Gender issues in Health etc., many of them with international collaboration. The AMCHSS has also extended consultancy services to Ministry of Health and Family Welfare, Government of India, World Health Organization (WHO), World Bank, UNICEF and other national and international agencies. All these courses have attracted students not only from India, but also from South Asian and South African countries. The AMCHSS also helped in setting up schools of public health in Nepal, Myanmar and South Africa. In the ten years of its existence, AMCHSS has proved its significance to public health in the country so much so that it is proved to be trail-blazer and trendsetter in the field of public health in India.

## **2) MAJOR RESEARCH AREAS**

### **i) Physical Sciences**

- Biophotonics&Bioimaging
- Plasma Coating
- Nanobiotechnology
- Biomedical and Biomaterial Physics

### **ii) Chemical Sciences**

- Polymer Synthesis, Characterization & Processing
- Smart Polymers & Interpenetrating Polymer Networks
- Dental Polymers
- Surface Modification of Polymeric Devices
- Radiopaque Polymers

### **iii) Biological Sciences**

- Adult Stem Cells and Regenerative Medicine
- Biochemistry
- Cell Biology
- Cellular & Molecular Cardiology
- Implant Biology
- Microbial Technology
- Neurobiology
- Pathology
- Physiology
- Tissue engineering & Regenerative Technologies
- Thrombosis
- Toxicology
- 3D construction of Tissue Substitutes

### **iv) Bioengineering**

- Artificial Organs
- Biosensors
- Bioinstrumentation
- Medical Device Technology
- Functional Neuroimaging
- Magnetic Resonance Imaging
- Medical Image Processing

### **v) Biomaterial Science & Technology**

- Bioceramics

- Dental Materials
- Material tissue Interactions
- Drug Delivery & Sensing
- Biomedical Polymers
- Scaffolds for Tissue Engineering

#### **vi) Health Sciences (Full Time & Part Time)**

- Epidemiology
- Gender Issues in Health
- Health Policy
- Health Systems

#### **vii) Medical Sciences**

- Cardiac sciences
- Neurosciences
- Imaging Sciences and Interventional Radiology

### **3) ADMISSION**

The selection for PhD will be carried out twice in a calendar year, in June and November for July and January session respectively. The announcement will be made in the Institute website (<http://www.sctimst.ac.in>) and in leading newspapers in the month of May/September.

#### **i) January Session**

*This session is open to both national level fellowship holders and those who do not have fellowship.*

The selection of Research Fellows will be based on performance in a written test and interview held in the first week of November.

- Those who hold National level Fellowships (UGC/CSIR/ICMR/DBT Junior Research Fellowships (JRF)/ MPhil (Biomedical Technology) from SCTIMST need to appear only for the interview. However, MPhil (Biomedical Technology) candidates, who wish to be considered for Institute Fellowship, need to appear for the written examination and interview along with other candidates.
- Candidates awarded INSPIRE Fellowships, Senior Research Fellowships from all sources (KSCSTE, UGC, CSIR, ICMR, etc.) have to qualify in the written test and interview conducted by the Institute.
- Individual KSCSTE JRF holders have to qualify in written test and interview.

Written test will be held only in November.

#### **ii) July Session**

July session is open for Fellowship holders and MPhil (Biomedical Technology from SCTIMST) degree holders only. No written test will be conducted for selection in this session. Candidates are selected based on their performance in the interview only.

The announcement will be made on the Institute's website only (<http://www.sctimst.ac.in>) soon after publication of NET results.

- Individual Junior Research Fellowship holders (UGC, CSIR, ICMR and DBT) and MPhil (Biomedical Technology from SCTIMST) degree holders can apply for this session.
- The notification will be made based on the availability of seats and availability of research guides at the Institute.

**Note: Selection in both sessions through written test/interview does not necessarily guarantee admission to the program and is subjected to availability of suitable guides and fellowship positions with them.**

### iii) Educational qualifications for admission

- Post-graduate degree in Physics, Chemistry, Materials Science, Polymer Chemistry/ Polymer Sciences, Biochemistry, Biotechnology, Physiology, Zoology or any other branch of Life sciences (excluding Plant sciences and Bioinformatics), MTech in Polymer Engineering/Technology, MTech in Materials science, MTech/ME/MSc (Engineering) /MS in either Biomedical Engineering/ Electronics and Communication, Electrical and Electronics/ Computer Science/ Information Technology/ Instrumentation/Biotechnology or Post graduate degree in Medicine, Public Health, Cardiovascular Sciences, Neurosciences and Imaging & Interventional Radiology, Dentistry, Nursing, Veterinary Sciences, Social Sciences, and Statistics.
- *Minimum marks required for science, technology and engineering streams:* Consistently GOOD academic record with 60% (GPA 6.5/10) marks in undergraduate and postgraduate degree examinations.
- Medical graduates applying for PhD must have MBBS degree from any university recognized by MCI. Candidates should have completed one year compulsory rotating internship or its equivalent as recognized by MCI after passing the final MBBS examination. Candidates should have full registration with state medical council. Candidates with postgraduate medical qualification can also apply but no special reservation or preference will be given. MBBS candidates should have a minimum of 55% marks in MBBS and need to be holders of national level fellowship from UGC/CSIR/ICMR. They should not have made more than 2 attempts in MBBS program.
- Two letters of reference are required to be enclosed along with the duly filled in application form for PhD admission.
- Second year MPH students of the Institute can also apply for the PhD program. However, for the November session their admission will be subjected to the outcome of their MPH result and obtaining the minimum percentage of marks before the time stipulated for admission.
- Students with master's degree from foreign institutions of good reputation, irrespective of the duration of the course, will be considered for PhD registration provided that they should qualify in the written examination and interview conducted by SCTIMST.

#### iv) Method of selection

- a) The selection of research scholars will be based on the performance in written test and interview conducted at SCTIMST, Thiruvananthapuram.
- b) Those who have national level UGC/CSIR/ICMR/ DBT individual JRF need to appear only for the interview.
- c) Candidates awarded INSPIRE Fellowship, Senior Research Fellowships (SRF) and fellowships from state level tests (e.g., KSCSTE) have to qualify in the written test and interview.
- d) Candidates awarded MPhil (Biomedical Technology) degree from SCTIMST, Trivandrum with not less than 60% marks are exempted from writing the PhD entrance examination and will be eligible to appear for direct interview of this institute. However, those who wish to be considered for Institute Fellowship need to appear for the written examination and interview along with other candidates.
- e) The Institute reserves the right to short list candidates based on the number of seats available every year, academic merit and scientific records of the applicants, letters of reference, availability of research guide/s, etc.
- f) Candidates must submit a "Research Proposal (about 300 to 400 words)" and a "Statement of Purpose for undertaking a research career (about 100 to 150 words)" when they submit their application for PhD admission.

#### v) Age limit

There is no age limit for PhD admission.

#### vi) SCTIMST Fellowship/Contingency Grant

Six Institute Fellowships are awarded each year, two of which will be reserved for Health Science Studies.

The Fellowship will be offered for a period of five years or until submission of the thesis, whichever is earlier.

The Institute Fellowship offered to the Institute PhD Fellows will be on par with the fellowship (JRF/SRF) offered by DST including HRA and Contingency Grant. The same assessment criteria of DST will be followed in these cases.

The unspent balance of contingency grant at the end of a year may be carried forward to the next year.

**Sustenance Allowance:** Only students whose fellowship or project salary have come to an end prematurely, will be eligible for sustenance allowance. Indian Rupees 5000/- per month will be given for maximum of six months as sustenance allowance. Students, who are already in their extended period of their PhD program (beyond five years for males and 6 years for female candidates) will not be provided with sustenance allowance.



#### **4)REGISTRATION FOR THE PhD PROGRAM**

- i) Candidates who have qualified in the entrance examination for admission to PhD are encouraged to meet the recognized guides and decide to join one of them based on area of interest and the available facilities. The list of Research Guides along with their areas of specialization is available in the Institute website. A topic of research that falls in line with the interests of the Institute may be submitted to the Division of Academic Affairs along with the “Acceptance Letter” of the Research Guide for the process of registration.  
*(Format of the Registration form is available on the website).*
- ii) Those candidates who qualify in the entrance examination and do not have a Fellowship can join with the guides who have externally funded projects matching their area of interest.

#### **5) Validity of the list**

January Session: Valid up to the end of June of the particular calendar year.

July Session: Valid up to the end of December of the particular calendar year.

#### **6) Duration of the Program**

Minimum duration of the doctoral work shall be three years after registration and maximum duration is five years for male scholars and six years for female scholars with subsequent two extensions of six months each if requested by the student and recommended by the guide stating valid reasons (This includes the period of maternity leave also, if availed). In case of any further request for extension (after 6/7 years both for male/female candidate) is made after the maximum period of registration, they will be allowed only under extraordinary circumstances for a maximum period of another six months (in this case, candidate is required to pay twice the annual tuition fee for these six months). For those who have passed the MPhil/MPH Degree course from this Institute and selected for similar area of research for PhD program, the minimum period of doctoral work can be reduced to two and a half years as they would have completed their course work during their MPhil/MPH tenure. The maximum duration for internal faculty members who register for PhD within the Institute is seven years. They should submit their thesis within this period and no further extension will be given to internal faculty members.

#### **7) STRUCTURE OF THE PhD PROGRAM**

##### **A) Course work**

- i) Course work will be an integral part of the PhD program.

##### BMT and Hospital Wing:

- a) Mandatory courses –A scholar shall acquire 6 credits from mandatory courses. The Course in Research Methodology offered as part of the MPhil program of the Institute will be mandatory.
- b) Optional courses - In addition to the Research Methodology course, students should attend courses related to their field of research. The course work should cover a minimum of 4 credits. The students may select modules from one of the following:
  - (i) The courses offered for MPhil students at the BMT Wing.
  - (ii) Courses in Cardiac Sciences and Neurosciences conducted at the Hospital Wing.

(iii) The students registered for PhD in areas of Public Health may select the modules from the courses offered as part of the MPH program.

## ii) Seminars

Six seminars related to the topic of research shall be presented by the student. The schedule of the 6 seminars will be decided by the Doctoral Advisory Committee (DAC). A PhD scholar shall acquire 2 credits through seminars.

## iii) Evaluation

- a) Log book - Details of the courses attended, seminars presented and examinations passed will be recorded.
- b) Course work- The student has to score a minimum of 50% marks for each module to qualify for the credits of that module.
- c) Seminars- Objective evaluation system will be introduced for seminars, and the evaluation will be done by the DAC. (Format of the Evaluation form is published on the website).

A scholar may acquire a minimum of 12 credits (10 credits through courses & 2 credits through seminars) within the first 2 years of the PhD program.

The Guide and DAC may encourage the student to attend more courses as per the requirement of the specific research area. Based on the recommendations of the DAC and the Dean, the Director can waive the entire Course work, mandatory and optional courses, if the student has good score in the MPhil or MPH courses offered at this Institute.

Semi-annual reports have to be submitted by the student to the Academic Division through the DAC.

The details of the courses completed and a soft copy of the seminars may be submitted to the Division of Academic Affairs prior to the comprehensive examination.

## B) Comprehensive examination

- Within 24 months after joining, the student shall take a Comprehensive examination which will be a written test and Oral examination to assess his/her basic knowledge of the subject and research methodology. The Guide may initiate the process for the conduct of the comprehensive examination. A minimum score of 60% is required to pass the written test before the Oral examination is conducted. A pass in Comprehensive examination may entitle him/her to a Senior Research Fellowship.
- In the event of failure in the comprehensive examination, a second attempt will be allowed within one year. In case the candidate fails in the second attempt too, he/she will be deregistered from the PhD program.

## C) Change of title of PhD thesis

- Modification of the title of thesis may be effected on the recommendations of the research guide and the DAC members with the approval of the Director and Academic Committee any time before the presentation of colloquium.

- Change of Research Area is not allowed. However, under exceptional circumstances only, it may be allowed with the approval of the Academic Committee.

#### **D) Change of research guide**

Change of Research Guide is not encouraged. In extraordinary cases, change of Research guide may be permitted with the approval of the Academic Committee on the recommendation of the Head of the Department and The Director.

### **8) THESIS SUBMISSION**

#### **A) Procedure**

- (i) There shall be a colloquium at which the student presents his/her work before the DAC, PhD Guide, PhD students and interested faculty from the Institute. Relevant suggestions may be incorporated into the thesis.
- (ii) Four copies of synopsis may be submitted three months before submission of thesis. The synopsis of the work done will have to receive recommendation of the Doctoral Advisory Committee before submission to the Division of Academic Affairs. (*The Application form is published on the Institute's website.*)
- (iii) A candidate is expected to have, as first author, either one publication with impact factor not less than 3 OR 2 publications in indexed journals. The publications shall be related to the subject of the thesis (Review articles may not be considered). The articles may be published/ accepted for publication before the viva-voce examination.
- (iv) Thesis should be prepared as per the "style manual" published in the Institute website.
- (v) Four softbound copies of thesis may be submitted to the Division of Academic Affairs – (*The Application form for thesis evaluation is published on the Institute's website.*)
- (vi) It is the responsibility of the student and research guide to subject the thesis for plagiarism check (at SCTIMST library) and attach the report certified by the guide and student along with the thesis to the Academic Division.
- (vii) After receiving the evaluation reports on the thesis from the examiners, the candidate will take the *viva voce* examination.
- (viii) Two hardbound copies need to be submitted to the Division of Academic Affairs within two weeks after the final viva voce examination. The Research Guide and Co-guide may also be given the corrected copies. If any soft bound copies submitted for evaluation are available in the Division of Academic Affairs, they may be returned to the candidate.
- (ix) A CD (Soft copy) of the corrected thesis may be submitted to the Academic Section. (*The Application form for submission of Final Thesis is published on the website.*)

#### **B) BOARD OF THESIS EXAMINATION**

The Guide, in consultation with the DAC members, shall submit to the Division of Academic Affairs a panel of 6-8 external examiners, 6 months prior to the

proposed submission of thesis. It is advisable to select the thesis examiners who are experts in the subject area from prestigious academic institutions/national institutes across India rather than local experts to avoid conflict of interest. The panel of examiners should accompany the title of the thesis. If the title of the thesis was changed, the recommendation of the DAC and approval of the Director may also be submitted. (The format of the application is published on the Institute's website).

To evaluate the thesis and submit the report, two external examiners will be selected from the panel proposed by the Doctoral Advisory Committee or from the panel modified by the Academic Committee. The Guide/Guides will also be asked to submit a report on the thesis.

## **C) THESIS EVALUATION**

The thesis should reflect substantial work for the advancement of scientific knowledge or design and development or applied work of an innovative nature. It should show competence in critical analysis of scientific data as well as thorough familiarity with background literature.

- 1) The evaluation of the thesis will consist of:
  - (a) Evaluation by the two external examiners and the Research Guide/s.
  - (b) The final viva-voce of the candidate on the thesis by one of the external examiners and the research guide/s.
  - (c) Consolidated recommendation based on the reports of the two external examiners and the viva-voce.
  
- 2) The Evaluation Report submitted by the external examiners should highlight the salient features of the thesis and make a clear recommendation regarding its acceptance or rejection for PhD Degree. Out of the three evaluators (2 external examiners and Research Guide), if any one gives a definite recommendation against and two for the award of the degree, reference to a fourth examiner will be made. If the report from the fourth examiner is positive, the viva-voce will be held. If the fourth examiner's report is negative, the thesis will be rejected. Likewise, if the first two external examiners, in the first instant itself, recommend against the award of the degree, the thesis will be rejected. If a thesis is rejected, the candidate will be allowed to re-submit the thesis within one year, after addressing the issues raised by the examiners.

### **i) Evaluation Report from Examiners**

1. Each examiner will be requested to send his/her report to the Registrar/Deputy Registrar with a copy to the Dean within two months of receipt of the thesis.

The Research Guide/s may also send the report within this period.

The report must contain a critical evaluation of the thesis and clear recommendation.

2. In case the examiners are unable to make a definite recommendation, they should indicate one of the following alternatives:
  - a) Minor revision/clarifications not involving retyping of the thesis. This may be carried out and the approval of the examiner may be obtained at the time of the viva voce.
  - b) Major revision involving rewriting of one or more sections, but not involving additional research. In this case the thesis will be sent back to the examiner.

## **ii) Thesis Defense and Viva-voce Examination**

There shall be an open defense of the thesis in the presence of the examiners, the faculty and the students of the Institute.

The viva-voce examination is closed and is designed to assess the general scientific background of the candidate and his/her own particular contribution embodied in the thesis. In instances where the thesis involves instrumentation/devices, the candidate will be expected to demonstrate them and explain their features.

1. Viva-voce examination will be conducted at the Institute after the thesis has been adjudged to be satisfactory. This examination in which a pass is obligatory shall be conducted by a Board, which will consist of:
  - a) One of the external examiners who evaluated the thesis.  
If both the examiners cannot be present for the viva-voce, the Director will appoint substitutes.
  - b) Research Guide.
2. Members of the Board for viva voce should report to the Registrar /Deputy Registrar as to whether the candidate's performance in the examination was satisfactory or not. No marks are allotted in the viva voce examination.
3. If a candidate fails in the Viva voce examination, he/she may be permitted to appear again between 3 to 12 months (second attempt). If he/she fails in the second attempt, he/she will not be permitted to continue with the PhD program.
4. The members of the viva voce examination board shall forward to the Registrar/Deputy Registrar a consolidated recommendation consisting of the reports of the examiners who evaluated the thesis and the reports on the candidate's performance in the viva voce. Before submitting the consolidated recommendation they must ensure that the thesis is corrected and ready for placement in its final form in the library.

## **9) ADMISSION AND EXAMINATION FEES**

Admission Fee	: Rs.1000/-
Tuition Fee	: Rs. 10000/- per year
Caution Deposit	: Rs.10,000/-
Library	: Rs.500/-
Identity Card	: Rs.220/-
Student Welfare Fund	: Rs.500/-
Certificates	: Rs.1000/-
Comprehensive Exam. Fee	: Rs.6000/-
Thesis Evaluation Fee	: Rs.10000/-
Hostel fee	: As per the rules of the Institute.

## **10) MEDICAL REIMBURSEMENT**

PhD students (not their family members) may be permitted medical reimbursement as per the rules of the Institute.

## **11) CANDIDATES LEAVING THE ACADEMIC PROGRAM MIDWAY**

All candidates selected for the PhD program shall be required to give an undertaking/execute a bond to the effect that he/she would not leave the course midway and if he/she leaves the Institute, he/she has to pay the penalty to the Institute.

Institute Fellows who resign without completing the program shall return the whole amount of scholarship received by him/her till the time of resignation OR fellowship for 6 months, whichever is higher.

The norms of the funding agency will be applicable for those candidates supported by other Fellowships.

## **12) INDUSTRY SPONSORSHIP FOR PhD STUDENTS**

Industry sponsorship for PhD students will be entertained on a case-to-case basis. However, such industry-sponsored candidates have to clear the entrance examination and fulfill all other conditions for admission.

## **13) DESIGNATION OF THE DEGREE**

The PhD degree awarded by the Institute is designated as Doctor of Philosophy of the SreeChitraTirunal Institute for Medical Sciences & Technology, Trivandrum.

The certificate will carry the title of the thesis but not the subject.

Transcript of the course work shall be given along with the Degree Certificate.

## **14) LEAVE RULES APPLICABLE FOR PhD SCHOLARS**

Apart from the holidays of the Institute, 20 days personal leave and 10 days medical leave per year is allowed.

### **i) Maternity Leave for Institute Fellows**

Women Fellows with less than two surviving children are entitled for full stipend plus HRA (if applicable) for a period up to 240 days. The Director shall sanction such leave. However, the Fellows have to make up the deficiency during the remaining tenure.

### **ii) Leave to attend Conferences/Seminars/Workshops**

Scholars will be allowed to avail seven days of leave per year for attending conferences/ seminars/ workshops. Train fare (A/C 3-tier) + Registration fee will be given only once in a year. Travel expenses will be granted only if a paper is presented at the conference. The application for National Conferences has to be forwarded through the DAC. (Refer to the Institute web site for guidelines to attend International Conferences).

In case the student does not present a paper, leave will be granted subject to the approval of DAC; and the expenses shall be met either from contingent grant of Fellows or from Project funds.

## **15) HOSTEL ACCOMMODATION**

Hostel accommodation will be provided to the PhD students subject to availability.

If hostel accommodation is not given for Institute Fellows, HRA similar to DST/CSIR/ICMR will be paid.

## **16) GUIDELINES FOR GUIDES**

- a) Must be continuously available.
- b) Established credibility in the scientific world as reflected by scientific publications in indexed journals.
- c) He/She must have been the Principal Investigator of at least one major research project funded by external agencies after receiving the PhD/MD Degree in the concerned subject.
- d) Must have published at least five papers in standard indexed journals (not review articles) as a first or a corresponding author after obtaining the PhD/MD degree and the papers so published should not be from his/her thesis.
- e) Must have had three years of post-doctoral experience after obtaining PhD/MD degree.
- f) The maximum number of students who could be registered at any given time under a guide will be six.
- g) A guide may be co-guide for another candidate of an external university with the approval of the Academic Committee of the Institute provided the area of research of the external candidate is similar to the area of work of the faculty at this Institute. He/she may also go through the formalities of the external University to be a co-guide on his own and the Institute will not take any liability, financial or otherwise.
- h) The number of new students in a year may be restricted to 2 for each guide.

- i) PhD guides of SCTIMST should desist from taking in fresh students under their direct guidance three years before their superannuation and co-guide should take over when the guide retires, in the case the student has not completed the research work.
- j) Only faculty members at or above the level of Assistant Professor/Scientist D/Engineer D with PhD/MD/MS degree would be considered for PhD guideship.
- k) Faculties below the rank of Additional Professors/Scientist F are required to make a personal presentation before the Academic Committee to obtain PhD guideship. The scrutiny of the applications of Additional Professors/Scientist F and above will be made in detail to ensure that they meet all the criteria to make them eligible for PhD guideship.
- l) It is mandatory that the guide should have funds through project(s) to meet the expenses towards consumables, test charges, etc. related to the PhD work of students. When a student is accepted for PhD program, the guide should give an undertaking in this regard.
- m) Guide shall ensure 5 years of stipend for students if the student does not have fellowship/ other salary support.

## 17) OBLIGATION OF THE RESEARCH GUIDE

The Guide is expected to supervise the progress of the student at every stage of the program. He/She is expected to inculcate ethics in research. The other responsibilities include:

1. Constitution of the DAC. The Application form is published on the Institute's website.
2. Conducting courses and Seminars and the submission of the minutes of DAC meetings.
3. Submit Syllabus and Panel of Examiners (4 names with contact details) 3 months before the oral comprehensive examination with the approval of DAC. The Application form is published on the Institute's website.
4. After the Oral comprehensive examination and 6 months before the submission of Thesis a panel of 5 external examiners may be submitted with the approval of DAC for Thesis Evaluation. The Application form is published on the Institute's website.

## 18) APPOINTMENT OF CO-GUIDE

It is mandatory to include one co-guide in the Doctoral Advisory Committee of PhD students. Maximum number of co-guides permitted is two and all co-guides must have either PhD or MD or MS qualification. One of the co-guides must be a recognized guide of SCTIMST. However, the appointment of Co-guide will not be a temporary arrangement or alternate to the Guide when the Guide is on leave for small/long duration.

Medical faculty who are not currently PhD guides can act as co-guides after getting permission from Division of Academic Affairs (permission will be granted on case to case basis and based on the merits of the case).



## **19) CRITERIA FOR SELECTION OF DAC MEMBERS**

- There should be a minimum of 2 DAC members excluding the Research Guide. At least one of the DAC members should be a recognized guide.
- It is mandatory to include one co-guide in the Doctoral Advisory Committee.
- Maximum number of co-guides permitted is two and all co-guides must have either PhD or MD or MS qualification and one of the co-guides must be a recognized guide of SCTIMST.
- The experience and expertise of the DAC members should be in the area of research of the candidate.
- An additional external DAC member can be appointed, if necessary, and he/she can also be the Co-guide.
- Internal faculty without PhD degree, but with ten years of experience in the area of expertise can be nominated as DAC member.

## **20) OBLIGATION OF DAC**

The members of the DAC have to be proactive in enhancing the quality of the thesis.

## **21) DUE DATES**

Proposed from the date of admission of a candidate.

### **Basic steps are as follows**

- 1) Registration form, details of the research topic with the acceptance letter of the research guide must be submitted within the stipulated time until the admission is valid.
- 2) Application form for the constitution of Doctoral Advisory Committee (DAC) must be submitted to the Division of Academic Affairs by the guide within one month of the payment of tuition fees along with the request for confirming the registration.
- 3) The comprehensive examination will be conducted as soon as the student has completed his/her course work and six seminars satisfactorily. The Application form along with the list of four Examiners and the syllabus to set question paper for comprehensive examination may be submitted to the Division of Academic Affairs three months before the proposed examination through the DAC members.
- 4) Request for Colloquium and a list of 5 examiners for thesis evaluation may be submitted at least 6 months before the colloquium.
- 5) Submission of synopsis (4 copies), 3 months before the submission of thesis.
- 6) Submission of thesis: On completion of the third year or any time before the end of 5<sup>th</sup> year from the date of admission.

## 22) QUALIFICATION FOR PhD EXAMINERS

### **Educational:**

- 1) PhD/MD Degree from a recognized University
- 2) A recognized expert in the subject matter of research or in an area closely related to it.
- 3) Minimum five years postdoctoral experience in conducting and guiding research.
- 4) Active involvement in research activities at least 3 years prior to the examination.

## 23) PhD REGISTRATION OF INTERNAL CANDIDATES

***Permanent Faculty of SCTIMST can apply as Internal Candidates subjected to the following conditions.***

1. Academic staff having MSc/MTech/MD/MPH degree with First Class and have satisfactorily completed probation in the Institute is eligible to apply.
2. Applications (in the prescribed format) for admission would be considered along with the regular admission to the full time PhD program.
3. The applicant should write the Institute's PhD Entrance examination and score a minimum of 60% or qualify in any of the National examinations. They will not be ranked with other open candidates.
4. The same committee interviewing the regular PhD candidates will interview these applicants.
5. The recognized guide who accepts responsibility to guide any internal candidate should not exceed the existing ceiling of 6 students under his/ her research guideship.
6. It is expected that like in regular PhD registrations, the guide has the requisite qualifications to supervise the student in the proposed area of research.
7. The guide has to certify that facilities and resources are available with him or her for the PhD work of the student.
8. The HOD has to certify and report at regular intervals during the PhD program that the PhD work is not affecting the regular work for which the staff member was originally recruited to the Institute.
9. The staff member (student) shall use only original data gathered by him and not data he or she collected as part of the routine services rendered for someone else's project or commissioned by an outside agency to the Institute.
10. The criteria for assessing aptitude should be same as for other regular candidates. Academic staff should be encouraged to register for PhD at an early stage of their career.
11. Appointment of external guides for in service employees

The faculty at BMT Wing, who are contributing to the teaching program at BMT Wing, with minimum five years of service, can register with an external

guide from an IIT or NIT or other national Institutes in the absence of an eligible guide in the BMT Wing. These employees may select the guides from the above institutes and the list of guides provided has to be approved by the academic committee separately for this purpose. No written entrance examination is required for these candidates. It is mandatory that the PhD work has to be done in SCTIMST and the area of research is in line with SCTIMST's mandate for research and development. Such work should not affect the routine work of the individual in any way. Funds provided for Institute work should not be diverted for thesis work. These employees should satisfy all the requirements of the Institute for award of PhD degree. These students should also have a co-guide from the Institute to monitor progress of the work.

#### **24) CANDIDATES REGISTERED AT CMC Vellore, NIE Chennai, IITMK Thiruvananthapuram UNDER THE JOINT PhD PROGRAM**

The same rules are applicable for students registered for the SCTIMST PhD program at these Institutions. The Course work may be designed on the same pattern as that followed by SCTIMST. The course work conducted at SCTIMST is also open to these students.

The students may be registered with Guides recognized by SCTIMST.

#### **RULES FOR DE-REGISTERING A REGULAR AND PART-TIME PHD SCHOLAR**

- 1) A candidate does not finish the course work successfully within the stipulated time (two and a half years from the date of admission for full time PhD students and three and half years from the date of admission for part time PhD students) OR
- 2) He/she does not successfully complete the comprehensive examination within a maximum of two attempts OR
- 3) If a candidate has not submitted the PhD thesis within the maximum stipulated time inclusive of the extension period.
- 4) If the candidate's progress of work is not found satisfactory by the Guide and DAC members, who furnish supporting documentation for making such an assessment.

#### **SPECIAL LEAVE FOR PHD STUDENTS AND KEEPING REGISTRATION ALIVE**

Any break during the program after clearing the comprehensive examination may be termed as special leave for PhD students and they may be allowed to keep their registration alive. The request from the student with robust justification, by the guide through the DAC has to be endorsed by the Dean and the Director.

During the period the student will not receive any fellowship from the Institute.

If leave is sanctioned, the student can be away for a maximum period of two years.

Upon return, the PhD thesis has to be submitted, after meeting all requirements, within the normal duration from the date of registration excluding the period of absence. These students will not be eligible for the one year extension beyond the normal tenure that is granted to those without a break. Necessarily, it shall be the responsibility of the guide and the DAC to recommend such leave only after ascertaining that there will be no need for any extension beyond normal tenure.