SRI DEVARAJ URS ACADEMY OF HIGHER EDUCATION AND RESEARCH
(A Deemed to be University Declared under Section 3 of UGC Act, 1956)
Comprising Sri DevarajUrs Medical College
[Constituent Unit of Sri DevarajUrs Educational Trust for Backward Classes (Regd.)]
TAMAKA, KOLAR-563103, KARNATAKA, INDIA
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(With effect from 2019-2020 batches)

Competency Based Postgraduate Curriculum for Doctor of Medicine

Physiology

Dean Faculty Of Medicine
Sri Devaraj Urs Academy of Higher
Education & Research, Tamaka, Kolar.

Approved as per BOM-56-2019, (Resolution No-LVI.06) Dated-20/12/2019

REGULATIONS GOVERNING

POST GRADUATE DEGREE PROGRAMMES

CURRICULUM 2019-2020

SRI DEVARAJ URS ACADEMY OF HIGHER EDUCATION AND RESEARCH

Comprising Sri Devaraj Urs Medical College

A Deemed To Be University

Declared under section 3 of UGC, Act,1956,
MHRD GOI NO.F,9-36/2006-U.3(A), Dt.25th may 2007
Post box No.62, Tamaka, Kolar-563101, Karnataka, INDIA
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REGULATIONS AND CURRICULA
FOR
POST GRADUATE DEGREE PROGRAMMES
IN
MEDICAL SCIENCES
2019-2020

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Edition Year: 2020 **Published by SDUAHER**

VISION:

"UNIVERSITY OF EXCELLENCE - KNOWLEDGE FOR POSTERITY"

MISSION:

1. To be a global centre of excellence for Teaching, Training and Research in the field of Higher education.
2. To inculcate scientific temper, research attitude and social accountability amongst faculty and students.
3. To promote with value based education for the overall personality development and leadership qualities to serve the humanity.

OBJECTIVES:

1. To provide need based infrastructure and facilities to students to become responsible professionals with social commitment and accountability.
2. To implement effectively innovative programs in teaching learning and evaluation.
3. To impart scientific and socio cultural temperament among students to forge national identity and needs.
4. To provide instruction and training in Basic and advanced branches of learning.
5. To provide facilities for research for the advancement and dissemination of knowledge.
6. To undertake extra mural studies, consultancy, extension programmes and field outreach services for the development of society.
7. To collaborate with other Universities, Institutions of excellence and research organizations within the country and outside for the purpose of teaching, training and research.
8. To undertake need based activities for the betterment of socially and educationally backward society.

At a glance this logo is abstract, yet it contains the vital ingredients for an institution like Sri Devaraj Urs Academy of Higher Education and Research, Tamaka, Kolar.

The institution's medical background, Humanitarian values, Compassion,

Approachability, Social Commitment and the subsequent research towards the most precious thing, the human life, is the core theme.

The graphic form of a person in the centre of a bud represents the humanity. It denotes the growing process of life and its existence. And the two hands safeguarding them show the care and a sense of security. It is also capable of holding something within the vast expanse of knowledge by the University for the People's benefit. Hence, the motto "Knowledge for Posterity" is very appropriate and gives a punch in Red. The four light blue half circles (smaller to bigger) depict the unending quest for knowledge and imparting it to a wider horizon, growing higher and higher.
And finally, the whole unit is embedded in a "D" shaped graphic template as background to give it a corporate identity.

COLORS USED:

Deep Blue: Credible, Confident and Dependable. Represents Peace, Tranquility, Stability, Harmony, Trust, Security, Cleanliness and Loyalty

Light Blue: For Sky and Water (color scheme for 4 half circles)

Red: A dominant color for strengths.

Green: For Nature, Health and Generosity. It is cool quality soothes and has great healing powers

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No. SDUAHER/KLR/ADMN/1322/2020-21 Date:12/10/2020

NOTIFICATION

Sub: Regulations, curricula and syllabi of Postgraduate medical degree programmes in Preclinical, Paraclinical and clinical subjects- reg

Ref.

I. **Proceedings of the Academic Council meetings**
II. **Proceeding of the Board of Management meetings**
III. **MCI notifications**
IV. **SDUAHER notification:**

Academic Council Meetings		**Board of Management Meetings**	
19th	17.11.2014	34th	19.06.2015
21st	25.04.2015	36th	04.12.2015
22nd	18.11.2015	44th	23.06.2017
27th	29.04.2017	45th	09.11.2017
28th	04.11.2017	48th	20.06.2018
30th	05.05.2018	50th	22.12.2018
31st	03.11.2018	54th	06.07.2019
33rd	04.06.2019	56th	20.12.2019
34th	15.11.2019	59th	09.10.2020
36th	30.09.2020		

Agenda discussed:

- Objectives of external postings of Post Graduates
- Internal & External postings of PG's with assessment tools
- Minimum marks to be scored in PG theory examinations
- Topics to be included in Forensic medicine and toxicology in paper 4 for PG students
- Work placed based assessment for PG students
- Introduction of Assessment of AETCOM in formative/summative assessment
- Design and development of E-portfolio for all PG's
- Patient handover as common EPA for all departments
- Preparation of Question paper from question bank using software

- Coding of answer booklet by software enabled barcoding
- Development of CBME in PG programmes
- Quarterly formative assessment as an assessment tool for all PGs
- Start course in MD psychiatry
- Implement E- Portfolio of PG's
- Discontinuation of practice for 5th evaluation in PG exam
- Post graduate training programme MCI-PG Medical Education Regulations 2000, amended upto May 2018
- Approval of EPA's as competency based medical training for PG's
- Work placed based assessment as part of quarterly assessment for PG's
- PLO's for all programmes

V. MCI Notifications

- MCI Notification dated 09-12-2009, vide No.MCI.18(1)/2009-Med.55455
- No. MCI-23(1)/2014/Med/153433 Dated 28-01-2015
- MCI Guidelines 2017(CBME based)
- MCI postgraduate medical education regulations 2000 amended upto 2018
- (clause 13.2,gazette notification dated 05/04/2018)
- Basic Programme in Biomedical Research(MCI-23(1)/2019-Med./141602 dated 27-08-2019).
- MCI-12(2)/2019-Med.Misc./189334.- Dated:12th February 2020
- MCI-18(1)/2020-Med./121415.-date 16/09/2020- (District Residency Programme' (DRP)

VI. Office Memorandum No. SDUAHER / KLR/ ADMN /8071/2019- 20 Dated 22/06/2019

VII. SDUAHER / KLR/ ADMN /1571/2019-20 dated 12/09/2019

REGULATIONS FOR POST GRADUATE DEGREE PROGRAMME IN MEDICAL SCIENCES

CHAPTER- I

1. Branches of Study

1.1 Postgraduate Degree Programme
The following programmes may be pursued.

A. M.D. (Doctor of Medicine)

1. Anatomy
2. Physiology
3. Biochemistry
4. Pharmacology
5. Pathology
6. Microbiology
7. Forensic Medicine
8. Community Medicine
9. General Medicine
10. Dermatology, Venereology and Leprosy
11. Anesthesiology
12. Paediatrics
13. Radio-Diagnosis
14. Psychiatry

B. M.S. (Master of Surgery)

1. General Surgery
2. Obstetrics and Gynecology
3. Orthopedics
4. Ophthalmology
5. OTO-Rhino-Laryngology

1.2. Eligibility for Admission

1.2.1 MD / MS Degree Programme: A candidate affiliated to this academy and who has passed final year M.B.B.S. examination after pursuing a study in a medical college recognised by the Medical Council of India, from arecognised Medical College affiliated to any other Academy recognised as equivalent thereto, and has completed one year compulsory rotating internship in a teaching Institution or other Institution recognised by the Medical Council of India, and has obtained permanent registration of any State Medical Council will be eligible foradmission.

1.2.2 A Candidate seeking admission should have successfully cleared the qualifying examination – NEET (National Eligibility cum Entrance Test) conducted by NBE (National Board of Examination).

1.3. Obtaining Eligibility Certificate by the Academy before making Admission

No candidate will be admitted for any postgraduate degree programme unless the candidate has obtained and produced the eligibility certificate issued by the Academy. The candidate has to make an application to the Academy with the following documents along with the prescribed fee:

1. S.S.L.C Marks card
2. 10+2 Certificate
3. All MBBS Marks Cards
4. Internship Completion Certificate
5. Attempt / Academic certificate
6. Degree Certificate
7. Transfer Certificate
8. Migration Certificate
9. Study/Bonafide Certificate
10. Character & Conduct certificate
11. MCI Recognisized Certificate by college
12. Karnataka Medical Council/State medical council
13. MCC Allotment Letter
14. NEET Admission Ticket
15. NEET Rank card
16. Caste (SC/ST) /OBC certificate (domicile) & Income Certificate
17. Aadhar card of both candidate and parents / sponsors
18. Bond for SR Ship
19. Remaining years fee bond

NOTE: The NRI/NRI Sponsor students have to submit the documents as per the MCC/DGHS Criteria for NRI status

Candidates should obtain the Eligibility Certificate before the last date for admission as notified by the Academy.

A candidate who has been admitted to postgraduate programme should register his / her name in the Academy within a month of admission after paying the registration fee.

1.4. Intake of Students

The intake of students to each programme will be in accordance with the ordinance in this behalf.

1.5. Duration of Study

a) M.D /M.S Degree Programme

The programme of study will be for a period of 3 years consisting of 6 academic terms.

1.6. Method of training

The training of postgraduate for degree will be residency pattern with graded responsibilities in the management and treatment of patients entrusted to his/her care. The participation of the students in all facets of educational process is essential. Every candidate should participate in seminars, group discussions, grand rounds, case demonstration, clinics, journal review meetings, CPC and clinical meetings. Every candidate should participate in the teaching and training programme of undergraduate students. Training includes involvement in laboratory and experimental work and research studies.

1.6.1. Teaching methodology

1.6.1.1 Includes Didactic lectures, small group discussion such as seminars, journal clubs, symposia, reviews and guest lectures for acquiring theoretical knowledge.

1.6.1.2 Bedside teaching, grand rounds, structured interactive group discussions and clinical demonstrations should be the hallmark of clinical/practical learning with appropriate emphasis on e-learning. Student should have hand-on training in performing various procedures and ability tointerpret varioustests/investigations.

1.6.1.3 Exposure to newer specialized diagnostic/therapeutic procedures concerning her/his subject should be given.

1.6.4 Self-learning tools like assignments and case-based learning should be promoted.

1.6.2. Clinical postings and Rotation of posting

Basic medical sciences students will be posted to allied and relevant clinical departments or institutions. Students working in clinical departments will be posted to basic medical sciences and allied speciality departments or institutions. It should be done as concurrent studies during the 1st year of training Similarly Inter-unit rotation in the department should be done for a period of up to one year. Rotation in appropriate related subspecialties **should not extend for a period exceeding 06 months.** Postings to other specialty departments will be during the second year.

All postgraduates' students pursuing MD/MS in broad specialities shall undergo a compulsory residential rotation of three months in District Hospital / District Health system as a part of the course curriculum. Such rotation shall take place in the 3rd or 4th or 5th semester of the postgraduates programme. This rotation shall be termed as District residency programme and the postgraduate medical student undergoing training shall be termed as a District Resident.

Satisfactory completion of the District Residency shall be an essential condition before the candidate is allowed to appear in the final examination of the respective postgraduate course. The District Residency Programme Coordinator (DRPC) shall issue certificate of satisfactory completion of DRP and report on the performance of the District Resident on a prescribed format to the concerned Medical College and the Government of State/Union Territory. No. MCI-18(1)/2020-Med./121415.—date16/09/2020

1.6.3. Clinical meetings:

Clinical meetings will be conducted within the department weekly and also inter departmental meetings will be conducted monthly to discuss uncommon/interesting cases.

1.6.4 Log book:

Each student should maintain a logbook and document day to-day activities like documentation of ward work, teaching and learning activities , clinical case discussion, procedures performed , seminars, journal clubs, symposium ,CPC meets, inter-unit/interdepartmental teaching sessions, mortality meets, workshops, CME/conferences .The Log books will be checked and assessed periodically by the faculty members imparting the training. This will in turn be evaluated/assessed by an external reviewer appointed by the Director of PG Studies biannually during the months of July and January. The log book should be preserved and presented at the time of summative examinations conducted by the Academy.

1.6.5 Research activities:

1.6.5.1 The student should know the basic concepts of research methodology plan a research project and be able to retrieve information from the library. The student should have a basic knowledge of statistics.

1.6.5.2 A postgraduate student of a postgraduate degree programme in broad specialities should present one poster presentation, read one paper at a national/state conference and publish one research paper which should be published /accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination. MCI Notification No.18(1)/2009/ medicine/55455 Dated:09-12-2009

1.6.5.3 Department should encourage e-learning activities.

1.6.6 Basic Programme in Biomedical Research:

In order to improve the research skills of post-graduate students, the Board of Governors (BoG) has recommended a uniform research methodology programme across the country, the online programme, "Basic programme in Bio-medical Research", will be offered by ICMR-National Institute of Epidemiology (ICMR-NIE), Chennai (www.nie.gov.in). The programme will explain fundamental concepts in

Research methodology. This programme is being offered through SWAYAM programme of ministry of human resource development through SWAYAM NPTEL (http://swayam.gov.in/nc details/NPTEL)

1.6.7 Synopsis and Dissertation:

Every candidate will submit to the Registrar of the Academy in the prescribed proforma, a synopsis containing particulars of proposed dissertation work within six months from the date of commencement of the programme on or before the dates notified by the Academy. The synopsis will be sent through the properchannel.

Such synopsis will be reviewed and the dissertation topic will be registered by the Academy. No change in the dissertation topic or guide will be made without prior approval of the Academy.

Every candidate pursuing MD/MS degree programme is required to carry out work on a selected research project under the guidance of a recognized post graduate teacher. The results of such a work will be submitted in the form of a dissertation.

The dissertation is aimed to train a post graduate student in research methods and techniques. It includes identification of a problem, formulation of a hypothesis, search and review of literature, getting acquainted with recent advances, designing of a research study, collection of data, critical analysis and comparison of results and drawingconclusions.

The dissertation should be written under the following headings:

- Introduction
- Aims or Objectives of study
- Review of Literature
- Material and Methods
- Results
- Discussion
- Conclusion
- Summary
- References
- Tables
- Annexures

The written text of dissertation will be not less than 50 pages and will not exceed 150 pages excluding references, tables, questionnaires and other annexures. It should be neatly typed in double line spacing on one side of paper (A4 size, 8.27" x 11.69") and bound properly. Spiral binding should be avoided. The dissertation will be certified by the guide, Head of the department and Head of theInstitution.

Six hard copies of dissertation and one soft copy thus prepared will be submitted to

the Controller of Examination (CoE), six months before final examination on or before the dates notified by the Academy.

The dissertation will be valued by examiners appointed by the Academy. Approval of dissertation work is an essential precondition for a candidate to appear in the Academy examination.

Guide: The academic qualification and teaching experience required for recognition by this Academy as a guide for dissertation work is as per Medical Council of India, Minimum Qualifications for Teachers in Medical Institutions Regulations, 1998. Teachers in a medical college/institution having a total of eight years teaching experience out of which at least four years teaching experience as Assistant Professor with at least one research publication in indexed journals gained after obtaining post graduate degree will be recognized as post graduate teachers. (No.MCI- 12(2)/2019-Med.Misc./189334.- Dated: 12th February 2020)

Co-guide: may be included provided the work requires substantial contribution from a sister department or from another medical institution recognized for teaching/training by Sri Devaraj Urs Academy /Medical Council of India. The co- guide will be a recognized post graduate teacher of Sri Devaraj Urs Academy.

Change of guide: In the event of a registered guide leaving the college for any reason or in the event of death of guide, guide may be changed with prior permission from the academy.

1.6.8 Journal Club:

Journal club will be conducted once a week. All the PG students are expected to attend and actively participate in discussion and enter the relevant details in the log book. Further, every candidate must make a presentation from the allotted journal(s), selected articles, at least four times a year and a total of 12 presentations in three years. The presentations would be evaluated using check lists and would carry weightage for internal assessment (See checklist - I in Chapter V). A time table with names of the student and the moderator should be announced periodically, (Quarterly).

1.6.9 Subject Seminar:

Subject seminar will be conducted once a week. All the PG students are expected to attend and actively participate in discussion and enter the relevant details in the log book, Further, every candidate must present selected topics at least four times a year and a total of 12 seminar presentations in three years. The presentations would be evaluated using check lists and would carry weightage for internal assessment (See checklist-II in Chapter V). A timetable for the subject with names of the student and the moderator should be announced periodically, (Quarterly).

1.6.10 Student Symposium:

Student Symposium as an additional inter departmental programme will be conducted periodically, once in three months. The evaluation may be similar to that described for subject seminar.

1.6.11 Ward Rounds:

Ward rounds are service or teaching rounds.

i. ***Service Rounds:*** Postgraduate students and Interns will do every day for the care of the patients. Newly admitted patients should be worked up.by the PGs and presented to the seniors the following day.

ii. ***Teaching Rounds:*** Every unit will have 'grand rounds' for teaching purpose.
A diary should be maintained for day to day activities by the students.
Entries of (i) and (ii) should be made in the Log book.

1.6.12 Clinico-Pathological Conference:

CPC will be conducted once in two months for all post graduate students. Presentation will be done by rotation. If cases are not available due to lack of clinical postmortems, it could be supplemented by published CPCs.

1.6.13 Inter Departmental Meetings:

These will be conducted once a month. These meetings will be attended by post graduate students and relevant entries must be made in the Log Book.

1.6.14 Teaching & Learning Skills:

Post graduate students must teach under graduate students (Eg. medical, nursing) by taking demonstrations, bed side clinics, tutorials, lectures etc.

Assessment is made using a checklist by surgery faculty as well as students. (See model checklist -III in Chapter V). Record of their participation should be documented in the Log book. Training of post graduate students in Educational Science and Technology is recommended.

Further, all postgraduate students are required to attend at least about 35 hours of didactic lecture as notified by the individual departments.

1.6.15 Entrustable Professional Activity:

EPAs are units of professional practice, defined as tasks or responsibilities to be entrusted to the unsupervised execution by a trainee once he or she has attained sufficient specific competence. EPAs are independently executable, observable, and measurable in their process and outcome, and therefore, suitable for entrustment decisions. The Entrustable professional activity (EPA) concept allows faculty to make competency-based decisions on the level of supervision required by trainees. The Academy has identified few such EPA's for all students in various degree programme. These are:

1. EPA 1: Gather a history and perform a physical examination

2. EPA 2: Prioritize a differential diagnosis following a clinical encounter
3. EPA 3: Recommend and interpret common diagnostic and screening tests
4. EPA 4: Obtain informed consent for tests and / or procedures
5. EPA 5: Recognize a patient requiring urgent or emergent care and initiate evaluation and management
6. EPA 6: Give or receive a patient handover to transition care responsibility
7. EPA 7: Undertake complete patient monitoring including the preoperative and post-operative care of the patient.
8. EPA 8: Provide basic and advanced lifesaving support services in emergency situations
9. EPA 9: Collaborate as a member of an inter-professional team
10. EPA 10: Perform general procedures of a physician
11. EPA 11: Enter and discuss orders and prescriptions
12. EPA 12: Prepare a comprehensive discharge summary.
13. EPA 13: Form clinical questions and retrieve evidence to advance patient care.

However in addition to these common EPA's individual departments are advised to develop their own EPA's.

1.7. Continuing Medical Education (CME):

Every PG student must attend at least 2 CME programes either at state/regional /zonal/national levels.

1.8. Conferences:

Attending conferences is optional. However it has to be encouraged. All students are encouraged to attend conferences (at state/national/international levels) to enable them to make paper/poster presentations, which is a mandatory requirement to fulfill before appearing for final examinations.

1.9. Attendance, Progress and Conduct:

- A candidate pursuing degree programme will work in the concerned department of the institution for the full period as a full time student. No candidate is permitted to run a clinic/laboratory/nursing home while studying postgraduate programme.
- Academic term of 6 months will be taken as a unit for the purpose of calculating attendance. The candidate should have 80% attendance in each academic term of 6 months.

- Every student will attend symposia, seminars, conferences, journal review meetings, grand rounds, CPC, case presentation, clinics and lectures during each year as prescribed by the department and not absent himself / herself from work without valid reasons.
- Every candidate is required to attend a minimum of 80% of the training during each academic term of the post graduate programme. Provided further, leave of any kind will not be counted as part of academic term without prejudice to minimum 80% attendance of training period every term.
- All the candidates joining the Post Graduate training programme will work as 'Full Time Residents' during the period of training and will attend not less than 80% (Eighty percent) of the imparted training during each academic term. Including assignments, full time responsibilities and participation in all facets of the education process.
- Any student who fails to complete the programme in the manner stated above will not be permitted to appear for the Academy Examinations.
- A Postgraduate student of a postgraduate degree programme would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published / accepted for publication/sent for publication during the period of postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.
  Ref: As MCI Notification dated 09-12-2009, vide No.MCI.18 (1)/2009- Med.55455 and Para No.4.

Procedure for defaulters:

Every department will have a committee containing Head of the department and PG guides to review such situations. The defaulting candidate is counseled by the guide and head of the department. In extreme cases of default the departmental committee may recommend that defaulting candidate be withheld from appearing the examination, if she/he fails to fulfill the, requirements in spite of being given adequate chances to set himself or herself right.

2 Monitoring Progress of Studies:

It is essential to monitor the learning progress of each candidate through continuous appraisal and regular assessment. It not only helps teachers to evaluate students, but also students to evaluate themselves. The monitoring will be done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment be done using checklists that assess various aspects. Checklists are given in Chapter V.

The learning out comes to be assessed should include:

- Personal Attitudes,
- Acquisition of Knowledge,
- Clinical and operative skills,
- Teaching skills and
- Dissertation.

a. Personal Attitudes:

The essential items are:

- Caring attitudes
- Initiative
- Organisational ability
- Potential to cope with stressful situations and undertake responsibility
- Trustworthiness and reliability
- To understand and communicate intelligibly with patients and others
- To behave in a manner which establishes professional relationships with patients and colleagues
- Ability to work in team
- A critical enquiring approach to the acquisition of knowledge

The methods used mainly consist of observation. It is appreciated that these items require a degree of subjective assessment by the guide, supervisors, self, peers, faculty from the unit and nurses. (Multi source feedback MSF)checklistXII

b. Acquisition of Knowledge:

The methods used comprise of

2.1 Log book: (Check List – XIII Chapter – V)

'Log Book' which records participation in various teaching / learning activities by the students. The number of activities attended and the number in which presentations are made must be recorded. The log book will periodically be validated by the supervisors. Some of the activities are listed. During the training period, the post graduate student should maintain a Log Book indicating various teaching / learning activities, duration of the postings/work done in Wards including super specialty, OPDs and Casualty. This should indicate the specified number of cases for clinical discussion, procedures and operations observed, assisted and performed /presented seminars and review articles from various journals in inter- unit/inter departmental teaching sessions.

The purpose of the Log Book is to:

- Help maintain a record of the work done during training,
- Enable Consultants to have direct information about the work; intervene if necessary,
- Use it to assess the experience gained periodically.

The log book will be used to aid the internal evaluation of the student.
The Log books will be checked and assessed periodically, monthly basis by guide / head of the unit/ head of the department and biannually by external reviewer.

Procedure for defaulters:
Every department will have a committee to review such situations. The "defaulting candidate is counseled by the guide and head of the department. In extreme cases of default the departmental committee will recommend that defaulting candidate be withheld from appearing the examination, if she/he fails to fulfill the requirements in spite of being given adequate chances to set himself or herself right

2.2 Journal Review Meeting (Journal Club):
The ability to do literature search, in depth study, presentation skills, and use of audio-visual aids are to be assessed. The assessment is made by faculty members and peers attending the meeting using a checklist (see Model Checklist -I, in Chapter V)

2.3 Seminars / Symposia:
The topics will be assigned to the student well in advance to facilitate in depth study. The ability to do literature search, in depth study, presentation skills and use of audio- visual aids will be assessed using a checklist (see Model Checklist -II, Chapter V)

2.4 Clinico'-Pathological conferences:
This will be a multidisciplinary case study of an interesting case to train the candidate to solve diagnostic and therapeutic problems by using an analytical approach. The presenter(s) are to be assessed using a check list similar to that used for seminar.

2.5 Surgical Audit:
Periodic morbidity and mortality meeting must be held. Attendance and participation in these must be insisted upon. This may not be included in assessment.

2.6 Clinical skills
Day to Day work: Skills in outpatient and ward work will be assessed periodically. The assessment should include the candidates' sincerity and punctuality, analytical ability and communication skills (see Model Checklist -V, Chapter V). – Mini CEX (Model check list VII, Chapter V)

2.7 Clinical meetings (Clinical Presentations :) *:*
Candidates should periodically present cases to his peers and faculty members. This should be assessed using a check list (see Model checklist V, Chapter V).

2.8 Clinical and Operative skills:

The candidate will be given graded responsibility to enable learning by apprenticeship. The performance is assessed by the guide by DOPS (Model check list VI, Chapter V). Particulars are recorded by the student in the log book.

2.9 Teaching skills:

Post graduates are required to teach undergraduate medical students and paramedical students, if any *(as a part of Post graduate training)*. This performance should be based on assessment by the faculty members of the department and from feedback from the undergraduate students (See Model checklist III, Chapter V) - Microteaching Pedagogy (Model check list VIII, Chapter V)

2.10 Dissertation in the Department:

Periodic presentations must be made in the department. Initially the topic selected is to be presented before submission to the Academy for registration and again before finalization for critical evaluation and before final submission of the completed work (See Model Checklist IX & X, Chapter V)

2.11 Periodic tests:

The concerned departments will conduct quarterly tests. The final test will be held three months before the final examination. The tests may include written papers, practical's / clinical and viva voce. Records and marks obtained in such tests will be maintained by the Head of the Department and sent to the Academy, when called for.

2.12 Work diary / Log Book-

Every candidate will maintain a work diary and record his/her participation in the training programmes conducted by the department such as journal reviews, seminars, etc. Special mention must be made of the presentations by the candidate as well as details of clinical or laboratory procedures, if any conducted by the candidate.

2.13 Records:

Monthly and quarterly reviews of records, log books and marks obtained in tests will be maintained by the Head of the Department and will be made available to the Academy, when called for.

3. ASSESSMENT:

3.1 Formative Assessment

It is essential to monitor the learning progress of each candidate through **continuous appraisal and regular assessment.** It not only helps teachers to evaluate students, but also students to evaluate themselves. The monitoring to be done by the staff of the department based on participation of students in various teaching /learning

activities. It may be structured and assessment be done using checklists that assess, various aspects. This includes assessment of patient care, procedural & academic skills, interpersonal skills, professionalism, self-directed learning and ability to practice in the system.

Checklists are given in Chapter-V

Assessment during the MS/MD training should be based on:

Assessment at end of rotation (Quarterly Postgraduate Student's Appraisal Form) by the Unit Head. The student to be assessed periodically as per categories listed in **Postgraduate Student Appraisal Form** (See Model checklist-X, Chapter V).

Multisource Feedback (MSF) – Quarterly

MSFs should be obtained quarterly from:- 2 from faculty of the unit/department; 2 from peers posted in the unit; 2 from interns,2 from staff nurses from the areas attached to the unit,2 from patient/patient relative. (Checklist XII – Chapter V)

Periodic assessment –The Quarterly tests may include written papers (theory), practical's / clinical and viva voce.

Quarterly Postgraduate Student's Appraisal Form (See Model checklist-X I, Chapter V).

- Journal based/ recent advances learning
- Patient based or Skill based learning
- Self-directed learning and teaching
- Departmental & interdepartmental learning activity
- External & Outreach activities/ Continuing Medical Education (CME)
- Attendance, Progress and Conduct

A candidate pursuing degree programme should work in the concerned department of the institution for the full period as a full time student. No candidate is permitted to run a clinic/laboratory/nursing home while studying postgraduateprogramme.

Academic term of 6 months will be taken as a unit for the purpose of calculating attendance. Every student will attend symposia, seminars, conferences, journal review meetings, grand rounds, CPC, case presentation, clinics and lectures during each year as prescribed by the department and not absent himself / herself from work without valid reasons.

Every candidate is required to attend a minimum of 80% of the training during each academic term of the post graduate programme. Provided further, leave of any kind will not be counted as part of academic term without prejudice to minimum 80% attendance of training period every term.

All the candidates joining the Post Graduate training programme will work as 'Full Time Residents' during the period of training and will attend not less than 80% (Eighty percent) of the imparted training during Academic Term of 6 months including assignments, full time responsibilities and participation in all facets of the education process.
Any student who fails to complete the programme in the manner stated above will not be permitted to appear for the Academy Examinations.

A Postgraduate student of a postgraduate degree programme in broad specialities/super specialities would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published / accepted for publication/sent for publication during the period of postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.
Ref: As MCI Notification dated 09-12-2009, vide No.MCI.18 (1)/2009-Med.55455 and Para No.4.

Procedure for defaulters:

Every department should have a committee containing Head of the department and PG guides to review such situations. The defaulting candidate is counseled by the guide and head of the department. In extreme cases of default the departmental committee may recommend that defaulting candidate be withheld from appearing the examination, if she/he fails to fulfill the, requirements in spite of being given adequate chances to set himself or herself right.

3.2 Scheme of examinations

Summative assessment

The summative examination would be carried out as per the Rules given in POSTGRADUATE MEDICAL EDUCATION REGULATIONS, 2000 and amended up to 2018. (The Clause 14 under the heading "EXAMINATION" shall be substituted in terms of Gazette Notification published on 05.04.2018).
The examination will be in three parts:

3.2.1 DISSERTATION

Every post graduate student will carry out work on an assigned research project under the guidance of a recognized Post Graduate Teacher, the result of which will be written and submitted in the form of a dissertation. Work for writing the dissertation is aimed at contributing to the development of a spirit of enquiry, besides exposing the candidate to the techniques of research, critical analysis, acquaintance with the latest advances in medical science and the manner of identifying and consulting available literature. Dissertation will be submitted at

least six months before the Theory and Clinical / Practical examination. The dissertation will be examined by a minimum of three examiners; one internal and two external examiners, who will not be the examiners for Theory and Clinical examination. A candidate will be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the dissertation by the examiners.

3.2.2. THEORY

There will be four question papers, each of three hours duration. Each paper will consist of ten questions each question carrying 10 marks, so the total marks for each paper will be 100. Questions on recent advances maybe asked in any or all the papers. The examinations will be organised on the basis of 'Grading'or 'Marking system' to evaluate and to certify candidate's level of knowledge, skill and competence at the end of the training. The Clause 14 under the heading "EXAMINATION" shall be substituted in terms of Gazette Notification published on 05.04.2018 and the same is as under:-

Obtaining a minimum of 40% marks in each theory paper and not less than 50% cumulatively in all the four papers for degree examinations and three papers in diploma examination. Obtaining of 50% marks in Practical examination shall be mandatory for passing the examination as a whole in the said degree/diploma examination as the case may be. Obtaining a minimum of 50% marks in 'Theory' as well as 'Practical' separately will be mandatory for passing examination as a whole. The examination for MS/MD will be held at the end of 3rd academic year.

3.2.3. Clinical / Practical and viva voce Examination

Clinical examination will be conducted to test the knowledge, skills, attitude and competence of the post graduate students for undertaking independent work as a specialist/Teacher, for which post graduate students will examine a minimum one long case and two short cases.

The Oral examination will be thorough and will aim at assessing the post graduate student's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty, which form a part of the examination.

Assessment may include Objective Structured Clinical Examination (OSCE) Oral/Viva-voce examination needs to assess knowledge on X-rays, instrumentation, operative procedures. Due weightage should be given to Log Book Records and day to-day observation during the training.

ALLOTMENT OF MARKS

THEORY	MARKS ALLOTMENT	MAXIMUM MARKS	
PAPER-I	10 X 10	100	400
PAPER-II	10 X 10	100	
PAPER-III	10 X 10	100	
PAPER-IV	10 X 10	100	

CLINICALS/ PRACTICALS		200
VIVA VOCE	80	100
PEDAGOGY	20	
TOTAL		**700**

3.2 Examiners:

There will be at least four examiners in each subject. Out of them two will be external examiners and two will be internal examiners. The qualification and teaching experience for appointment as an examiner will be as laid down by the Medical Council of India. No person will be appointed as internal examiner in any subject unless he/she has three years' experience as recognized PG teacher in the concerned subject. For external examiners he/she should have minimum six years of experience as recognized PG teacher in the concerned subject.

3.2.4 Criteria for declaring as pass in Academy Examination:

A candidate should score minimum 40% marks in each theory paper and not less than 50% marks cumulatively in all the papers in postgraduate degree/diploma, to be declared as pass in the examinations. A candidate shall secure not less than 50% marks in each head of passing which shall include (1) Theory, (2) Practical including clinical and viva voce examination. A candidate securing less than 50% of marks as described above shall be declared to have failed in the examination. (No. MCI-23(1)/2014/Med/153433 Dated 28-01-2015) A failed candidate may appear in any sub-sequent examination upon payment of fresh fee to the Registrar of the University.

3.2.5* Declaration of distinction*:

A successful candidate passing the Academy examination in first attempt will be declared to have passed the examination with distinction, if the grand total aggregate marks are 75 percent and above. Distinction will not be awarded for candidates passing the examination in more thanone attempt.

3.2.6 Number of Candidates per day.

The maximum number of candidates for practical/clinical and viva-voce examination will be as under: MD / MS Programme: Maximum of 8 per day

4. ELIGIBILITY CRITERIA FOR APPEARING FOR EXAMINATIONS 4.1 ATTENDANCE

All the candidates joining the Post Graduate training programme will work as 'Full Time Residents' during the period of training and will attend not less than 80% (Eighty percent) of the imparted training during Academic Term of 6 months including assignments, full time responsibilities and participation in all facets of the education process.

- Every student will attend all teaching programmes during each year as prescribed by the department and not absent himself / herself from work without valid reasons
- Every candidate is required to attend a minimum of 80% of the training during each academic year of the post graduate programme. Provided further, leave of any kind will not be counted as part of academic term without prejudice to minimum 80% attendance of training period every term.
- Any student who fails to complete the programme in the manner stated above will not be permitted to appear for the Academy Examinations.

4.2. PROGRESS AND CONDUCT

- Every student will attend symposia, seminars, conferences, journal review meetings, grand rounds, CPC, case presentation, clinics and lectures during each term as prescribed by the department and not absent himself / herself from work without valid reasons.
- Every candidate is required to attend a minimum of 80% of the training during each academic term of the post graduate programme. Provided further, leave of any kind will not be counted as part of academic term without prejudice to minimum 80% attendance of training period every term.

4.3. RESEARCH ACTIVITIES-PAPER/POSTER/PUBLICATIONS

- A Postgraduate student of a degree programme in broad speciality would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published / accepted for publication/sent for publication during the period of postgraduate studies so as to make him eligible to appear at the postgraduate degree examination. Ref: As MCI Notification dated 09-12-2009, vide No.MCI.18 (1)/2009-Med.55455 and Para No.4.
- It is mandatory for all postgraduate students to undergo training in online programme in "Basic Programme in Biomedical Research" Which should be completed by the end of second semester .Not completing the programme will make them ineligible for appearing for the final academy examinations.(MCI-23(1)/2019-Med./141602 dated 27-08-2019).

4.4 DISSERTATION

Every post graduate student will carry out work on an assigned research project under the guidance of a recognised Post Graduate Teacher, the result of which will

be written and submitted in the form of a dissertation. Dissertation will be submitted at least six months before the Theory and Clinical / Practical examination. The dissertation will be examined by a minimum of three examiners; one internal and two external examiners, who will not be the examiners for Theory and Clinical examination. A candidate will be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the dissertation by the examiners.

4.5 District Residency Programme

All postgraduates students pursuing MD/MS in broad specialties shall undergo a compulsory residential rotation of three months in District Hospital / District Health system as a part of the course curriculum. Such rotation shall take place in the 3rd or 4th or 5th semester of the postgraduates programme. This rotation shall be termed as District residency programme and the postgraduate medical student undergoing training shall be termed as a District Resident.

Satisfactory completion of the District Residency shall be an essential condition before the candidate is allowed to appear in the final examination of the respective postgraduate course. The District Residency Programme Coordinator (DRPC) shall issue certificate of satisfactory completion of DRP and report on the performance of the District Resident on a prescribed format to the concerned Medical College and the Government of State/Union Territory. No. MCI-18(1)/2020-Med./121415.—date 16/09/2020

Procedure for defaulters:

Every department should have a committee containing Head of the department and PG guides to review such situations. The defaulting candidate is counseled by the guide and head of the department. In extreme cases of default the departmental committee may recommend that defaulting candidate be withheld from appearing the examination, if she/he fails to fulfill the, requirements in spite of being given adequate chances to set himself or herself right.

CHAPTER II

GOALS AND GENERAL OBJECTIVES OF POSTGRADUATE MEDICAL EDUCATION PROGRAM

GOALS:

The goal of postgraduate medical education will be to produce a competent specialist and /or a medical teacher:

i. Who will recognize the health needs of the community, and carry out professional obligations ethically and in keeping with the objectives of the national health policy;
ii. Who will have mastered most of the competencies, relating to the specialty, that are required to be practiced at the secondary and the tertiary levels of the health care delivery system:
iii. Who will be aware of the contemporary advances and developments in the discipline concerned;
iv. Who will have acquired a spirit of scientific inquiry and is oriented to the principles of research methodology and epidemiology; and
v. Who will have acquired the basic skills in teaching of the medical and paramedical professionals.

GENERAL OBJECTIVES:

At the end of the postgraduate training in the discipline concerned the student will be able to:

i. Recognize the importance of the concerned specialty in the context of the health need of the community and the national priorities in the health sector.
ii. Practice the specialty concerned ethically and in step with the principles of primary health care.
iii. Demonstrate sufficient understanding of the basic sciences relevant to the concerned specialty.
iv. Identify social, economic, environmental, biological and emotional determinants of health in a given case, and lake them into account while planning therapeutic, rehabilitative, preventive and promotive measures/strategies.
v. Diagnose and manage majority of the conditions in the specialty concerned on the basis of clinical assessment, and appropriately selected and conducted investigations.
vi. Plan and advice measures for the prevention and rehabilitation of patients suffering from disease and disability related to the specialty.
vii. Demonstrate skills in documentation of individual case details as well as morbidity and mortality data relevant to the assigned situation,
viii. Demonstrate empathy and humane approach towards patients and their families and exhibit interpersonal behavior in accordance with the societal norms and expectations.
ix. Play the assigned role in the implementation of national health programmes, effectively and responsibly.

x. Organize and supervise the chosen/assigned health care services demonstrating adequate managerial skills in the clinic/hospital or the field situation.
xi. Develop skills as a self-directed learner, recognize continuing educational needs; select and use appropriate learning resources.
xii. Demonstrate competence in basic concepts of research methodology and epidemiology, and be able to critically analyse relevant published research literature.
xiii. Develop skills in using educational methods and techniques as applicable to the teaching of medical/nursing students, general physicians and paramedical health workers.
xiv. Function as an effective leader of a health team engaged in health care, research or training.

STATEMENT OF THE COMPETENCIES

Keeping in view the general objectives of postgraduate training, each disciplines will aim at development of specific competencies, which will be defined and spelt out in clear terms. Each department will produce a statement and bring it to the notice of the trainees in the beginning of the programme so that he or she can direct the efforts towards the attainment of these competencies.

COMPONENTS OF THE PG CURRICULUM

The major components of the PG curriculum will be:

- Theoretical knowledge
- Practical/clinical Skills
- Training in Thesis.
- Attitudes, including communication.
- Training in research methodology.

Source: Medical Council of India, Regulations on Postgraduate Medical Education, 2006 and 2008.

COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR M.D. PHYSIOLOGY

Goals:

The Postgraduate programme in M.D.Physiology should enable a Postgraduate to be:

- A competent physiologist with necessary knowledge, skills and attitude to impart education.
- A good medical teacher in Physiology and to carry out research.

Programme outcomes:

At the end of the program a postgraduate student in physiology should be able to:

1	Understand and deal with all aspects of general, systemic and applied Physiology.
2	Teach effectively the basic physiological mechanisms of human body with reference to their implications in the pathogenesis of diseases (pathophysiology) affecting various organ systems and the physiological basis of their management to undergraduate medical, paramedical and all other basic science students.
3	Understand general principles of medical education (use of appropriate teaching techniques and resources).
4	Explain how the knowledge of physiology can be effectively used in a various clinical settings to solve diagnostic and therapeutic problems.
5	Interpret and evaluate research publications critically.
6	Use the library facilities (Literature database using computer, CD ROM, internet search and any other available newer techniques).
7	Conduct relevant clinical/experimental research which may have significant bearing on human health and patient care.
8	Interpret the research findings in the light of its basic and applied significance.
9	Acquire skills in conducting collaborative research in the field of physiology with allied sciences, clinical sciences and biomedical engineering.
10	Interact with the allied departments and render services in advanced laboratory investigations.
11	Serve as interface with society at large.
12	Acquire administrative skills to set up concerned department / laboratories and initiate purchase procedure and procure necessary items for running such laboratories.
13	Function as a member of a teaching or research team.

Physiology Specific Competencies:

1	Able to teach the basic physiological mechanisms of human body with reference to their implications in the pathogenesis of diseases (pathophysiology) and their management to undergraduate medical and paramedical students.
2	Conduct such clinical and experimental research, as would have a significant bearing on human health and patient care.
3	Interact with other departments by rendering services in advanced laboratory investigations and relevant expert opinion.
4	Participate actively in various workshops/seminars/journal clubs/demonstration in the allied departments, to acquire various skills for collaborative research.
5	Contribute to society by imparting physiological understanding of health problems.
6	Plan a research study and conduct basic and clinical systemic investigations.

1	Demonstrate self-awareness and personal development in routine conduct. (Self-awareness)
2	Communicate effectively with peers, students and teachers in various teaching-learning activities. (Communication)
3	Demonstrate a. Due respect in handling human body parts & cadavers during dissection (Ethics & Professionalism) b. Humane touch while demonstrating living surface marking in subject/patient (Ethics & Professionalism)
4	Acquire capacity of not letting his/her personal beliefs, prejudices and limitations come in the way of duty.
5	Appreciate the issues of equity and social accountability while exposing students to early clinical exposure (Equity and social accountability)

The student should acquire competencies in the following tasks:
Practical Training

A.Animal Experiments

I.	***Amphibian experiments (Chart discussion***	1. Freeload and After Load 2. Effect of continues repeated stimulation (study of phenomena of fatigue) 3. Length tension diagram. 4. Properties of Cardiac Muscle: Long refractory period, all or None Law. 5. Extra systole and Compensatory Pause, Beneficial effect 6. Regulation of Heart, Vagus dissection and effect of vagal stimulation. 7. Actions of acetylcholine, Adrenaline and Nicotine on Heart (Langley's) 8. Perfusion of isolated frogs heart - Role of Na+ , K+ , Ca+ 9. Decerebrate and Spinal frog.
II.	***Mammalian experiments*** **(chart discussion)**	1. Rat/guinea pig ileum : Intestinal movement recording 2. Rabbit/Rat heart: Langendrof preparation

	B. Human Physiology	
I.	***Clinical Physiology*)**	1. Elementary principles of clinical examination 2. Methods of Inspection / palpation / percussion / auscultation 3. Plan of conduction and scheme of recording 4. General examination
II.	***Cardiovascular system***	1. Clinical examination of circulatory system. 2. Examination of the pulse, blood vessels and measurements of blood pressure. 3. Effect of posture & exercise on pulse & BP
III.	***Respiratory System***	1. Clinical examination of respiratory system
IV.	***Gastro-intestinal system***	1. Clinical examination of abdomen
V.	***Central Nervous System***	1. Clinical examination of the central nervous system and autonomic nervous system and its physiological basis 2. Examination of higher mental functions. 3. Clinical examination of the special senses. Outline of the examination of cranial nerves. 4. Tests of hearing and deafness & audiometry.

	C. Laboratory Procedures (Normal human subjects)	
I.	***Hematology***	1. Haemocytometry 2. Determination of Reticulocyte count, platelet count, WBC count, RBC count an absolute eosinophil count in normal and diseased states. 3. Differential count of WBC 4. Haemoglobinometry, spectroscopy 5. Blood grouping and cross matching 6. Determination of bleeding time, clotting time
II.	***Cardio vascular system***	1. Electrocardiography - ECG & its interpretation. 2. Autonomic Function Tests including HRV analysis.
III.	***Respiratory System***	1. Mechanical spirometry 2. Recording of lung function tests by computerized or electronic spirometer 3. Breath holding and endurance tests 4. Stethograph 5. Resuscitation and artificial respiration.
IV.	***Nerve Muscle Physiology***	1. Ergography 2. Recording of EMG - Nerve conduction, both sensory and motor
V.	***Central nervous system***	1. Recording evoked potentials (SSEP, VEP & BAEP)
VI.	***Others***	Tests for physical fitness – 1. Field 2 km. walk 2. Lab Harvard step test 3. Bicycle ergometry 4. Treadmill protocols leading to determination of vo2 max. 5. Cardio respiratory response to whole body exercise. 6. Construction of dietary chart for growing children, pregnant woman, elderly individuals, hypertensive patients, & diabetes mellitus patients.
	D.Clinical Biochemistry	
I.	***Clinical Biochemistr y (Chart discussion)***	1. Examination of normal and abnormal constituents of urine 2. Kidney function tests 3. Estimation of blood sugar 4. Liver function tests 5. Glucose tolerance test

IV. Syllabus

	Paper-I	
I.	***General and Cellular Physiology including Genetic Basis and Historical perspectives***	1. Physiology of cell, various cellular mechanisms and genetic control mechanisms. 2. Various principles of Physics and Physical Chemistry involved in physiological phenomenon e.g. haemo-dynamics, bio-electrical potentials, body fluids, methods of measurements. 3. History of Physiology. 4. Biostatistics, Biophysics, Biochemistry, Micro-anatomy. 5. Growth and Development including aging. 6. Excretion, pH, water and Electrolyte balance.
	Paper-II	
II.	***Systemic Physiology (system providing transport, nutrition and energy) including comparative Physiology***	1. Blood and Immunity. 2. Cardiovascular System. 3. Respiratory System. 4. Gastro- Intestinal Tract (GIT) and dietary requirements.
	Paper-III	
III.	***Systemic Physiology (system concerned with procreation, regulation and neural control)***	1. Nerve-Muscle Physiology including muscle mechanics 2. Endocrine Physiology 3. Nervous System (Central, peripheral and autonomic) 4. Special Senses 5. Reproduction & family planning/foetal & neonatal Physiology

	Paper-IV	
IV.	***Applied Physiology including recent advances***	1. Patho-physiology pertaining to systemic Physiology 2. Physiological basis of various clinical investigation tests 3. Interaction of human body in ambient environment- high altitude, space and deep sea 4. Sports physiology 5. Yoga and Meditation 6. Recent advances relevant to Physiology 7. Social responsibilities of physiologists

		8. Chrono-physiology 9. Laboratory animal ethics

Time Schedule and Rotation postings

The candidates shall attend all the undergraduate theory and practical classes regularly in the first year of PG. During the second year of the course they are to undergo the following postings. During the internal postings they will attend departmental work in the afternoon session.

NAME OF POSTINGS	DURATION	OBJECTIVES
Cardiology	7 days	• ECG recording & interpretation • Physiological basis of echocardiography • Cardiac catheterization procedure • Resuscitation technique
Hematology	7 days	• Peripheral smear • Reticulocyte count • Platelet count, osmotic fragility test • Absolute eosinophil count
Blood bank	7 days	• Grouping &cross matching • Collection ,storage &transfusion of blood
Anatomy	7 days	• Staining techniques • Slide identification • Gross Anatomy in Brain and cut sections at different levels
General medicine	15 days	• Clinical examination of patients • Investigations procedures • Lumbar puncture • Interpretation of X-ray ,ECG,biochemical results
*Neurophysiology NIMHANS	15 days	• Procedure &interpretation of EEG • Neurophysiology of sleep & wakefulness • Heart rate variability • Autonomic function tests
*Sports physiology SAI, Bangalore	15 days	• Endurance & strength training methods • Fatigue & exhaustion • Aging & exercise • Nutrition &exercise • High altitude changes & adaptation
*S-Vyasa Yoga, Bangalore	15 days	• Physiological basis of Yoga • Role of yoga in health & disease
Elective post graduate specific postings	3 months	• Candidates have to design & do a short term research project that is publishable

Total six months of clinical postings. At the end of these postings, a certificate has to be obtained from the concerned Heads of the Departments about satisfactory learning or otherwise.

Biostatics and Research Methodology –

- to attend workshop on research methodology – 3 days
- In order to improve the research skills of Indian medical postgraduates (PG) the Board of Governors (BoG) in supersession of the Medical Council of India (MCI) has mandated a uniform research methodology course.
- This online course, Basic Course in Biomedical Research", should be completed compulsorily by the Postgraduate student at the end of first year and obtain pass certificate by ICMR.
- The course will explain the fundamental concepts of research methodology in health. It will be delivered through video lectures and reading materials. Certification will be done based on lecture wise assignments and a final proctored exam.

OBJECTIVES OF EXTERNAL POSTING OF POST GRADUATE STUDENTS IN PHISIOLOGY

At the end of each postings the second year Postgraduate student should be able to:

Department	Days	objectives	Assessment
Cardiology	07	1. Understand and apply the principles of electrophysiology in interpreting ECG recording, it clinical application & interpretation. 2. Understand and apply the principles of hemodynamics with echocardiography. 3. Describe the steps of Cardiac catheterization and its clinical application	1. In the practical class, the student will record the ECG, discuss the various ECG waves, principles of recording and clinical application. 2. Write a short answer on echocardiography. 3. Write a short answer on cardiac catheterization.
Hematology	07	1. Classify the different types of stain used and their uses. 2. Preform and	1. In the practical class make a peripheral smear, report it and discuss the clinical

		interpret the battery of tests for coagulation profile tests. 3. Detect abnormal cells in a peripheral smear and make a provisional diagnosis.	implications of changes in appearance of cells and counts, and the different stains used. 2. In the practical class, preform the tests of coagulation. 3. In a practical class be able to have a case based discussion on abnormal coagulation profile
Blood blank	07	1. Perform cross matching 2. Document blood collection and storage techniques 3. Understand the changes in store blood.	1. In the practical class, perform blood grouping and cross matching and discuss blood banking techniques and transfusion reactions.
Anatomy	07	1. Identify the histology slides of the different systems and co-relate their function 2. Understand neuroanatomy by correlating with the help of gross and cut sections brain for the understanding of neurophysiology.	1. In the practical class, identify the histology slides with 2 characteristic identifying features. 2. Understand the neuroanatomy along with functions of thalamus, hypothalamus, Basal ganglia, cerebellum & cerebrum for seminars
General medicine	15	**1.** Acquire the skill of Clinical examination of patients. **2.** Acquire the skill of history taking. **3.** Describe the technique of Lumbar puncture and interpret the results. **4.** Interpret Chest X-ray and ECG.	1. In the practical class, elicit case history and perform clinical examination 2. In the practical class, discuss the SCF results of the given case history. 3. In the practical class, interpret ECG and discuss the abnormal findings.

Neurophysiology	15	1. Document the steps involved in recording of EEG and discuss the Principles involved. 2. Interpret the changes in EEG during sleep 3. Understand the neurophysiology of sleep & wakefulness with EEG changes. 4. Classify the different methods of conducting memory tests on rats and describe. 5. Record Heart rate variability and interpret. 6. Perform and interpret the Autonomic function tests	1. In a seminar, discuss EEG waves and write a short answer and evolution by check list. 2. In a seminar, discuss on sleep and wakeful ness and evolution by check list. 3. In a seminar, discuss on memory and learning with experimental evidence and evolution by 4. check list. 5. 4.In the clinical class, record and interpret autonomic function tests including heart rate variability
Sport physiology	15	1. Classify Endurance & strength training methods. 2. Understand the physiology of Fatigue & exhaustion 3. Understand the role of Aging in exercise. 4. Understand the role of nutrition in exercise.	1. In the practical class, discuss the different methods of assessing work done. 2. In the practical class, discuss Fatigue and causes of fatigue with specific mention of nutrition and aging.
Yoga Centre	15	1. Elucidate the physiological basis of Yoga 2. Explain role of yoga in health & disease.	1. In a seminar, discuss the role of yoga in health and disease. 2. Write an essay on the above topic
Elective post graduate specific postings	90	1. Postgraduate study should design & conduct a short term research project that is publishable	**1.** Completion of project and send the paper for publication.

Seminars & Journal reviews.

The post graduate students should actively participate in departmental seminars and journal clubs. A record showing the involvement of the student shall be maintained. A diary should be maintained. Seminars and journal clubs are suggested to be conducted alternately once in every 15 days. See chapter for model check lists.

During three years of the course. Postgraduate students shall participate in teaching undergraduate students in Practicals, tutorials and group discussions.

Dissertation Work

During the course of study every candidate has to prepare a dissertation individually on a selected topic under the direct guidance and supervision of a recognized post graduate teacher as per MCI and SDUAHER regulations.

The suggested time schedule for dissertation work is:

- Identification and selection of topic for dissertation - in first 4 weeks.
- Preparatory work of dissertation/synopsis including pilot study if necessary and submission of the synopsis to the University within first 6 months from the beginning of course or as per the dates notified by the University.
- Data collection for dissertation- 1 year.
- Writing the dissertation in the following l year.
- Submission of the dissertation six months prior to the final examination or as per the dates notified by the University.

Registration of dissertation topic

- Every candidate shall submit a synopsis in the prescribed proforma of the University for Registration of dissertation topic.
- The synopsis shall be sent within first 6 months from the commencement of course as notified in the University calendar of events, to the Registrar (Academic).

Maintenance of Record of Work Done (Log book), Periodical assessment and progress report.

- A log book showing each day's work has to be maintained by the candidate, which shall be scrutinized by the Head of the Department and feedback and reflection should be recorded.
- A practical record has to be maintained by the candidate and duly scrutinized and certified by the HOD and to be submitted to the external examiner during the final examination.
- A list of the records and journal reviews that have been attended and participated by the student has to be maintained which should be scrutinized by the Head of the Department.

Entrust able Professional Activity

Core Entrust able Professional Activity (EPA) are listed below

7. EPA 1: Gather a history and perform a physical examination
8. EPA 2: Prioritize a differential diagnosis following a clinical encounter
9. EPA 3: Recommend and interpret common diagnostic and screening tests
10. EPA 4: Obtain informed consent for tests and / or procedures
11. EPA 5: Recognize a patient requiring urgent or emergent care and initiate evaluation and management
12. EPA 6: Give or receive a patient handover to transition care responsibility
13. EPA 7: Undertake complete patient monitoring including the preoperative and post-operative care of the patient.
14. EPA 8: Provide basic and advanced life saving support services in emergency situations

List of EPA's of Department of Physiology.

1. Perform and interpret p300 event related evoked potential as a test of cognition
2. Perform and interpret of cardiovascular efficiency by the Queens College Step test
3. Conducting research project from inception to completion.
4. To conduct interactive teaching session for undergraduates
5. Performance & Interpretation of SPIROMETRY

I. Work place based assessment (WPBA): as a part of quarterly assessments for postgraduates. Physiology Dept has prepared DOPS checklist for performance and interpretation of spirometry.

II. ASSESSMENT

A. FORMATIVE ASSESSMENT - during the training Formative assessment should be continual and should assess medical knowledge, procedural & academic skills, interpersonal skills, professionalism, self-directed learning and ability to practice in the system.

1. General Principles

Internal Assessment will be done quarterly, which cover's all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills. The Internal Assessment should be conducted in theory and clinical examination.

2. Quarterly Assessment during the MD training programme should be based on:

a. Journal based / recent advances learning
b. Patient based /Laboratory or Skill based learning
c. Self-directed learning and teaching
d. Departmental and interdepartmental learning activity
e. External and Outreach Activities / CMEs

B. SUMMATIVE ASSESSMENT- assessment at the end of training
The summative examination would be carried out as per the Rules given in POSTGRADUATE MEDICAL EDUCATION REGULATIONS, 2000.

The post-graduate examinations should be conducted in 3 parts:

1. Thesis

- Every post graduate student shall carry out work on an assigned research project under the guidance of a recognized Post Graduate Teacher, the result of which shall be written up and submitted in the form of a Thesis.
- Work for writing the Thesis is aimed at contributing to the development of a spirit of enquiry, besides exposing the post graduate student to the techniques of research, critical analysis, acquaintance with the latest advances in medical science and the manner of identifying and consulting available literature.
- Thesis shall be submitted at least six months before the Theory and Clinical / Practical examination to the Registrar (Evaluation) of the university.
- The thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination.
- A post graduate student shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the examiners.

2. University Scheme of Examination:

Theory: The written examination consists of four papers of 100 marks each. Each paper will be of three hours duration. Questions on recent advances may be asked in any or all papers*.

Paper I	***General and Cellular Physiology including Genetic Basis and Historical* perspectives**	Physiology of cell, various cellular mechanisms and genetic control mechanisms, Various principles of Physics and Physical Chemistry involved in physiological phenomenon e.g. haemo-dynamics, bio- electrical potentials, body fluids, methods of measurements, History of Physiology, Biostatistics, Biophysics, Biochemistry, Micro-anatomy, Growth and Development including aging.
Paper II	***Systemic Physiology (system providing transport, nutrition and energy) including comparative Physiology.***	Blood and Immunity. Cardiovascular System. Respiratory System. Gastro- Intestinal Tract (GIT) and dietary requirements
Paper III	***Systemic Physiology (system concerned with procreation, regulation and neural control)***	Nerve-Muscle Physiology including muscle mechanics Endocrine Physiology Nervous System (Central, peripheral and autonomic)

		Special Senses Reproduction & family planning/foetal & neonatal Physiology
Paper IV	***Applied Physiology including recent advances***	Patho-physiology pertaining to systemic Physiology Physiological basis of various clinical investigation tests Interaction of human body in ambient environment- high altitude, space and deep sea Sports physiology Yoga and Meditation Recent advances relevant to Physiology Social responsibilities of physiologists

**The topics assigned to the different papers are given as general guidelines. A strict division of subjects may not be possible. Some overlapping of topics is inevitable. Students should be prepared to answer the overlapping topics.*

Each theory paper will consist of 10 questions of 10 marks each

Theory paper	Marks
Paper-I	100
Paper-II	100
Paper-III	100
Paper-IV	100
Total	**400**

1. Practicals

i. Laboratory procedures	**Marks**
Human experiments	50
Rabbit/Rat/guinea pigs(charts only)	25
Hematology	30
Histology	20
ii. Clinical Physiology: Clinical examination of a given subject, discussion on investigations, interpretation of laboratory findings and Physiological principles in diagnosis	50
iii. Clinical Biochemistry (Discussion of charts)	25
Total	**200**

2. VivaVoce - 100 marks

	Marks
1. Pedagogy	20

2. Presentation of dissertation	10
3. The Viva-Voce would be on all components of syllabus	70
Total	**100**

Maximum marks for

	Theory	**Practical's**	**Viva-voce**	**Total**
M-Physiology Examination	**400**	**200**	**100**	**700**

III. Attendance (Leave Policy)

- A candidate pursuing postgraduate programme should work in the concerned department of the institution for the full period as a full time student. No candidate is permitted to run a clinic/laboratory/nursing home while studying postgraduate programme.
- Every student should compulsorily attend symposia, seminars, conferences, journal review meetings, CPC, and lectures during each year as prescribed by the department and not absent himself / herself from work without valid reasons.
- Every candidate is required to attend a minimum of 80% of the training during each academic term of the post graduate course. Provided further, leave of any kind shall not be counted as part of academic term without prejudice to minimum 80% attendance of training period every term.
- All the candidates joining the Post Graduate training programme shall work as 'Full Time Residents' during the period of training and shall attend not less than 80% (Eighty percent) of the imparted training during 6 months of tenure.
- Any student who fails to complete the course in the manner stated above shall not be permitted to appear for the University Examinations.
- A Postgraduate student in broad specialties/super specialties would be required to present one poster presentation, to one oral presentation at national/state conference and to present one research paper which should be published / accepted for publication/sent for publication during the period of postgraduate studies so as to make him/her eligible to appear at the postgraduate degree examination.

Ref: As MCI Notification dated 09-12-2009, vide No.MCI.18 (1)/2009-Med.55455 and Para No.4.

Recommended Text, Reference books and Journals

- J B West, Best & Tayor, Physiological basis of Medical Practice. Williams & Wilkins
- Guyton, Text Book of Medical Physiology,. Elseveir.
- Ganong, Review of Medical Physiology, Me Graw hill
- Campbell, Clinical Physiology ., ELBS & Blackwell
- John Bullock, Joseph Boyle, III Michael B. Wang, NMS, Physiology 3rd Edn, B. I. Waverly.
- Sir. John V Dacie S M Lewis, Practical Hematology , Churchill Livingstone

- Donald Emslie-Smith, Colin R Paterson, Thomas Ccatcherd, Nicholas W.Read, Textbook of Physiology, ELBS/ Churchill Livingstone
- Vernon B Mount Castle, Medical Physiology, vol. 1 & vol. 2 , CV Mosby Company
- Robert M. Berne & Mathew N. Levy, Physiology , Mosby Year book
- .Carl J Wiggers, Physiology in health and disease , Lea Febiger
- Williams, Text book of Endocrinology, W.B. Saunders
- Peters dort, Adams, Braunwald, Issel Bacher, Matir, Wilson, Harrison's Principles of Internal Medicine ,16 th edition., Me Graw hill
- Harper, Biochemistry , McGraw-Hill
- John Field, H W Magou , Vol 1,2,3. Hand Book of Neurophysiology, Williams & Wilkins
- Wallance O Fern, Hand Book of respiratory Physiology, vol 1,. Williams & Wilkins
- Wintrobe, Clinical Hematology, Lea Febiger
- Kathryn L Me. Cance Sue E Huether, Text Book of Pathophysiology, Mosby
- Gyrila Keele & Eric Neil, Samson wright's Applied Physiology, ELBS, Oxford University Press.
- Neurophysiology- Kendell
- Clinical Neurophysiology – U.K.Misra
- Human Physiology An Integrated approach – Silver Thorn
- Gastrointestinal physiology – Leonard R.Johnson

Journals:

- Journal of Applied Physiology, By American Physiological Society
- Physiological Reviews, By American Physiological Society
- Annual Review of Physiology, By American Physiological Society
- Advances in Physiology Education, By American Physiological Society
- Recent advances in Physiology, By American Physiological Society
- Journal of Physiology, British Publication
- Indian Journal of Physiology and Pharmacology.
- Indian Journal of Medical Research
- News in Physiological Sciences
- New England Journal Medicine
- British Medical Journal
- Nature
- Lancet

Additional Reading:

- Compendium of recommendations of various committees on Health and Development (1943-1975). DGHS, 1985 Central Bureau of Health Intelligence, Directorate General of Health Services, Min.of Health and Family Welfare Govt.of India. Nirman Bhavwan, New Delhi. P-335
- National Health Policy, Min.of Health & Family Welfare. Nirman Bhawan, New Delhi, 1983

- Santhosh Kumar, The Elements of Research, writing and editing 1994. Dept. of Urology, JIPMER, Pondicherry
- Srinivasa D K etal. Medical Education Principles and Practice, 1995. National Teacher Training Centre, JIPMER, Pondicherry.
- Indian Council of Medical Research, "Policy Statement of Ethical considerations involved in Research on Human Subjects", 1982, 1.C.M.R New Delhi
- Francis C M, Medical Ethics, J P Publications. Bangalore. I edn..2004
- Indian National Science Academy, Guidelines for care and use of animals in Scientific Research, New Delhi, 1994.
- International committee of Medical Journal Editors. Uniform requirements for manuscripts submitted to biomedical journals, N Engl J Med 1991; 424-8
- Ktrkwood B R, Essentials of Medical Statistics, 1" Ed., Oxford: Balckwell Scientific Publications 1988.
- Mahajan B K, Methods in Bio statistics for medical students, 4th Ed. New Delhi Jaypee Brothers Medical Publishers, 1989.
- Raveendran, B Gitanjali, A Practical approach to PG dissertation, New Delhi, J P Publications, 1998.