REGULATIONS AND CURRICULUM

FOR

POSTGRADUATE DEGREE AND DIPLOMA COURSES

2010

PHYSIOLOGY

JSS UNIVERSITY

JSS MEDICAL INSTITUTIONS CAMPUS

SRI SHIVARATHREESHWARA NAGARA, MYSORE 570 015

KARNATAKA, INDIA

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PHYSIOLOGY

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CHAPTER I

Regulations for Postgraduate Degree and Diploma Courses in Medical Sciences

1. Branch of Study

1.1 Postgraduate degree courses

Post Graduate Degree courses may be pursued in the following subjects:

a) MD (Doctor of Medicine)

i) Anaesthesiology
ii) Anatomy
iii) Biochemistry
iv) Community Medicine
v) Dermatology, Venereology and Leprosy
vi) Forensic Medicine
vii) General Medicine
viii) Microbiology
ix) Pathology
x) Paediatrics
xi) Pharmacology
xii) Physiology
xiii) Psychiatry

b) MS (Master of Surgery)

i) General Surgery
ii) Obstetrics and Gynaecology
iii) Ophthalmology
iv) Orthopedics
v) Oto-Rhino-Laryngology

1.2 Postgraduate Diploma Courses

Post Graduate Diploma Courses may be pursued in the following subjects:

a) Anesthaesiology (DA)
b) Child Health (DCH)
c) Clinical pathology (DCP)
d) Dermatology, Venerology and Leprosy (DDVL)
e) Obstetrics and Gynaecology (DGO)
f) Ophthalmology (DO)
g) Orthopaedics (D Ortho)
h) Oto-rhino-laryngology (DLO)
i) Psychiatry (DPM)

2. Eligibility for Admission

MD / MS Degree and Diploma courses : A candidate affiliated to this University and who has passed final year MBBS examination after pursuing a study in a medical college recognized by the Medical Council of India, or from a recognized medical college affiliated to any other university recognized as equivalent thereto and has completed one year compulsory rotating internship in a teaching institution or other institution recognized by the Medical Council of India, and has obtained permanent registration of any State Medical Council, shall be eligible for admission.

3. Obtaining Eligibility Certificate by the University before making admission

No candidate shall be admitted for any Postgraduate Degree/Diploma courses unless the candidate has obtained and produced the eligibility certificate issued by the University. The candidate has to make an application to the University with the following documents along with the prescribed fee:

a) MBBS pass/degree certificate issued by the university.
b) Mark cards of all the university examinations passed before MBBS course.
c) Attempt certificate issued by the Principal.
d) Certificate regarding the recognition of the medical college by the Medical Council of India
e) Completion of internship certificate.
f) In case internship was done in a non- teaching hospital, a certificate from the Medical Council of India that the hospital has been recognized for internship.
g) Registration by any state Medical Council.
h) Proof of ST/SC or Category I, as the case may be.

Candidates should obtain the eligibility certificate before the last date for admission as notified by the university.

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

4. Intake of students

The intake of students to each course shall be in accordance with the MCI and GOI permissions in this regard.

5. Course of study

5.1 Duration

a) **MD, MS Degree Courses:** The course of study shall be for a period of 3 years consisting of 6 terms.
b) **Diploma courses:** The course of study shall be for a period of 2 years consisting of 4 terms.

6. Method of training

The training of postgraduate for degree/diploma shall 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 take part in seminars, group discussions, grand rounds, case demonstration, clinics, journal review meetings, CPC and clinical meetings. Every candidate should be required to participate in the teaching and training programme of undergraduate students. Training should include involvement in laboratory and experimental work, and research studies. Basic medical sciences students should be posted to allied and relevant clinical departments or institutions. Similarly, clinical subjects' students should be posted to basic medical sciences and allied specialty departments or institutions.

7. Attendance, Progress and Conduct

7.1 A candidate pursuing degree/diploma course, should work in the concerned department of the institution for the full period as full time student. No candidate is permitted to run a clinic/laboratory/nursing home while studying postgraduate course, nor can he/she work in a nursing home or other hospitals/clinic/laboratory while studying postgraduate course.

7.2 Each year shall be taken as a unit for the purpose of calculating attendance.

7.3 Every student shall 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.

7.4 Every candidate is required to attend a minimum of 80% of the training during each academic year 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 year.

7.5 Any student who fails to complete the course in the manner stated above shall not be permitted to appear for the University Examinations.

8. Monitoring Progress of Studies:

8.1 **Work diary / Log Book:** Every candidate shall 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 may be made of the presentations by the

candidate as well as details of clinical or laboratory procedures, if any, conducted by the candidate. The work diary shall be scrutinised and certified by the Head of the Department and Head of the Institution, and presented in the University practical/clinical examination.

8.2 **Periodic tests:** In case of degree courses of three years duration (MD/MS, DM, M Ch.), the concerned departments may conduct three tests, two of them be annual tests, one at the end of first year and the other at the end of the second year. The third test may be held three months before the final examination. The tests may include written papers, practical / clinical and viva voce. Records and marks obtained in such tests will be maintained by the Head of the Department and sent to the University, when called for.

8.3 In case of diploma courses of two years duration, the concerned departments may conduct two tests, one of them at the end of first year and the other in the second year, three months before the final examination. The tests may include written papers, practical / clinical and viva voce.

8.4 **Records:** Records and marks obtained in tests will be maintained by the Head of the Department and will be made available to the University or MCI.

9. Dissertation

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

9.2 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 drawing conclusions.

9.3 Every candidate shall submit to the Director (Academic) of the University in the prescribed proforma, a synopsis containing particulars of proposed dissertation work within six months from the date of commencement of the course, on or before the dates notified by the University. The synopsis shall be sent through proper channel.

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

9.5 The dissertation should be written under the following headings

a) Introduction
b) Aims or Objectives of study
c) Review of Literature
d) Material and Methods
e) Results
f) Discussion
g) Conclusion
h) Summary
i) References
j) Tables
k) Annexure

9.6 The written text of dissertation shall be not less than *50* pages and shall not exceed 150 pages excluding references, tables, questionnaires and other annexure. 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 shall be certified by the guide, head of the department and head of the Institution.

9.7 Four copies of dissertation thus prepared shall be submitted to the Registrar (Evaluation), six months before final examination, on or before the dates notified by the University.

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

9.9 **Guide:** The academic qualification and teaching experience required for recognition by this University 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 five years teaching experience as Lecturer or Assistant Professor gained after obtaining post graduate degree shall be recognised as post graduate teachers.

9.10 **Co Guide:** A Co-guide may be included provided the work requires substantial contribution from a sister department or from another medical institution recognised for teaching/training by JSS University / Medical Council of India. The co-guide shall be a recognised post graduate teacher of JSS University.

9.11 **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 university.

10. Schedule of Examination

The examination for MD / MS courses shall be held at the end of three academic years (six academic terms). The examination for DM and M Ch courses shall be held at the end of three years. The examination for the diploma courses shall be held at the end of two academic years (four academic terms). For students who have already passed Post Graduate Diploma and appearing for MD examination, the examination shall be conducted after two academic years (four academic terms, including submission of dissertation) The University shall conduct two examinations in a year at an interval of four to six months between the two examination. Not more than two examinations shall be conducted in an academic year.

11. Scheme of Examination

11.1 MD / MS Degree

MD / MS Degree examinations in any subject shall consist of dissertation, written paper (Theory), Practical/Clinical and Viva voce.

11.1.1 **Dissertation:** Every candidate shall carryout work and submit a dissertation as indicated in Sl NO 9. Acceptance of dissertation shall be a precondition for the candidate to appear for the final examination.

11.1.2 **Written Examination (Theory):** A written examination shall consist of four question papers, each of three hours duration. Each paper shall carry 100 marks. Out of the four papers, the 1st paper in clinical subjects will be on applied aspects of basic medical sciences. Recent advances may be asked in any or all the papers. In basic medical subjects and para-clinical subjects, questions on applied clinical aspects should also be asked.

11.1.3 **Practical / Clinical Examination:** In case of practical examination, it should be aimed at assessing competence and skills of techniques and procedures as well as testing student's ability to make relevant and valid observations, interpretations and inference of laboratory or experimental work relating to his/her subject.

In case of clinical examination, it should aim at examining clinical skills and competence of candidates for undertaking independent work as a specialist. Each candidate should examine at least <u>one long case and two short cases</u>.

The total marks for Practical / clinical examination shall be 200.

11.1.4 **Viva Voce.** Viva Voce Examination shall aim at assessing depth of knowledge, logical reasoning, confidence and oral communication skills. The total marks shall be 100 and the distribution of marks shall be as under:

i) For examination of all components of syllabus 80 Marks
ii) For Pedagogy 20 Marks
If there is skills evaluation, 10 marks shall be reserved for Pedagogy and 10 marks for skill evaluation.

11.1.5 **Examiners.** There shall be at least four examiners in each subject. Out of them, two shall be external examiners and two shall be internal examiners. The qualification and teaching experience for appointment as an examiner shall be as laid down by the Medical Council of India.

11.1.6 **Criteria for declaring as pass in University Examination*.** 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. Failed candidate may appear in any subsequent examination upon payment of fresh fee to the Registrar (Evaluation).

11.1.7 **Declaration of class:** A successful candidate passing the University examination in first attempt and secures grand total aggregate 75% of marks or more will be declared to have passed the examination with distinction, 65% but below 75% declared as First Class and 50% but below 65% declared as Second Class.

A candidate passing the University examination in more than one attempt shall be declared as Pass Class irrespective of the percentage of marks.

11.2 DM/M Ch

The examination shall consist of theory, clinical/practical and viva voce examination.

11.2.1 **Theory (Written Examination):** The theory examination shall consist of four question papers, each of three hours duration. Each paper shall carry 100 marks. Out of the four papers, the first paper will be on basic medical sciences. Recent advances may be asked in IV Paper.

11.2.2 **Practical / Clinical Examination:** In case of practical examination it should be aimed at assessing competence, skills of techniques and procedures as well as testing student's ability to make relevant and valid observations, interpretations and experimental work relevant to his / her subject.

In case of clinical examination it should aim at examining clinical skills and competence of candidates for undertaking independent work as a specialist. Each candidate should examine at least one long case and two short cases.

The maximum marks for Practical / Clinical shall be 200.

11.2.3 **Viva-Voce:** Viva Voce examination shall aim at assessing thoroughly, depth of knowledge, logical reasoning, confidence and oral communication skills. The maximum marks shall be 100.This also includes spotters like instruments, anaesthesia machines, drugs, ECG, X – ray.

11.2.4 **Examiners:** There shall be at least four examiners in each subject. Out of them, two shall be external examiners and two shall be internal examiners. The qualification and teaching experience for appointment as an examiner shall be as laid down by the Medical Council of India.

11.2.5 **Criteria for declaring as pass in University Examination*:** 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. Failed candidate may appear in any subsequent examination upon payment of fresh fee to the Registrar (Evaluation).

11.3 Diploma Examination:

Diploma examination in any subject shall consist of theory (written papers), Practical / Clinical and Viva - Voce.

11.3.1 **Theory:** There shall be three written question papers each carrying 100 marks. Each paper will be of three hours duration. In clinical subjects one paper out of this shall be on basic medical sciences. In basic medical subjects and Para- clinical subjects, questions on applied clinical aspects should also be asked.

11.3.2 **Practical Clinical Examination:** In case of practical examination it should be aimed at assessing competence, skills related to laboratory procedures as well as testing students ability to make relevant and valid observations, interpretation of laboratory or experimental work relevant to his/her subject.

In case of clinical examination, it should aim at examining

clinical skills and competence of candidates for undertaking independent work as a specialist. Each candidate should examine at least one long case and two short cases.

The maximum marks for Practical / Clinical shall be 150.

11.3.3 **Viva Voce Examination.** Viva Voce examination should aim at assessing depth of knowledge, logical reasoning, confidence and oral communication skills. The total marks shall be 50. This also includes spotters like instruments, anesthesia machines, drugs, ECG, X-ray.

11.3.4 Criteria for declaring as pass in University Examination* 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. Failed candidate may appear in any subsequent examination upon payment of fresh fee to the Registrar (Evaluation).

11.3.5 **11.3.5 Declaration of distinction**. A successful candidate passing the University examination in first attempt will be declared to have passed the examination with distinction, if the grand total aggregate marks is 75 percent and above. Distinction will not be awarded for candidates passing the examination in more than one attempt.

11.3.6 **Examiners.** There shall be at least four examiners in each subject. Out of them, two shall be external examiners and two shall be internal examiners. The qualification and teaching experience for appointment as an examiner shall be as laid down by the Medical Council of India.

12. Number of Candidates per day

The maximum number of candidates for practical / clinical and viva-voce examination shall be as under:

MD /MS Course: Maximum of 6 per day.

Diploma Course: Maximum of 8 per day.

CHAPTER II

GOALS AND GENERAL OBJECTIVES OF POSTGRADUATE MEDICAL EDUCATION PROGRAM

GOAL

The goal of postgraduate medical education shall be to produce competent specialists and/or medical teachers:

1. Who shall recognize the health needs of the community and carry out professional obligations ethically and in keeping with the objectives of the national health policy.
2. Who shall have mastered most of the competencies, pertaining to the speciality, that are required to be practiced at the secondary and the tertiary levels of the health care delivery system.
3. Who shall be aware of the contemporary advance and developments in the discipline concerned.
4. Who shall have acquired a spirit of scientific inquiry and is oriented to the principles of research methodology and epidemiology and
5. Who shall 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 shall be able to:

1. Recognize the importance to the concerned speciality in the context of the health needs of the community and the national priorities in the health section.
2. Practice the speciality concerned ethically and in step with the principles of primary health care.
3. Demonstrate sufficient understanding of the basic sciences relevant to the concerned speciality.
4. Identify social, economic, environmental, biological and emotional determinants of health in a given case, and take them into account while planning therapeutic, rehabilitative, preventive and primitive measure/strategies.
5. Diagnose and manage majority of the conditions in the speciality concerned on the basis of clinical assessment, and appropriately selected and conducted investigations.

6. Plan and advice measures for the prevention and rehabilitation of patients suffering from disease and disability related to the speciality.
7. Demonstrate skills in documentation of individual case details as well as morbidity and mortality rate relevant to the assigned situation.
8. Demonstrate empathy and humane approach towards patients and their families and exhibit interpersonal behaviour in accordance with the societal norms and expectations.
9. Play the assigned role in the implementation of national health programme, effectively and responsibly.
10. Organize and supervise the chosen/assigned health care services demonstrating adequate managerial skills in the clinic/hospital or the field situation.
11. Develop skills as a self-directed learner, recognize continuing education needs; select and use appropriate learning resources.
12. Demonstrate competence in basic concepts of research methodology and epidemiology, and be able to critically analyze relevant published research literature.
13. Develop skills in using educational methods and techniques as applicable to the teaching of medical/nursing students, general physicians and paramedical health workers.
14. 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 discipline shall aim at development of specific competencies which shall be defined and spelt out in clear terms. Each department shall 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 POSTGRADUATE CURRICULUM:

The major components of the Postgraduate curriculum shall be:

- Theoretical knowledge
- Practical and clinical skills
- Thesis skills.
- Attitudes including communication skills.
- Training in research methodology.

(Source: Medical Council of India, Regulations on Postgraduate Medical Education, 2000)

CHAPTER - III

M D PHYSIOLOGY

I. Goals:

The Postgraduate course in MD Physiology should enable a medical graduate to be:

1. A competent physiologist.
2. A good medical teacher in physiology, practicing the required skills of teaching.

II. Objectives:

At the end of the course a post graduate student in physiology should be able to:

1. Demonstrate comprehensive knowledge and understanding of general and systemic physiology.
2. Comprehend and understand physiological basis of health and disease affecting various organ systems.
3. Select and use appropriate teaching techniques and resources.
4. Critically evaluate published journal literature and to effectively use the library facilities including CD Rom and internet search.
5. Carryout relevant research.
6. Function as an effective member of teaching team & / or research team.
7. Carryout professional obligations ethically and keeping in view national health policies.

III. Outline of course contents

A. Theory

1. History of Medicine with special reference to physiology
2. Comparative physiology.
3. General physiology at cellular, sub cellular and molecular levels.
4. Systemic physiology.
5. Exercise and sports physiology.
6. Environmental physiology, including effects of change in altitude temperature, thermal, humidity changes and space travel.
7. Clinical and applied physiology
8. Yoga, meditation.
9. Physiology of growth and development
10. Chrono physiology — new born, adult and old age physiology.
11. Laboratory animal ethics - Guidelines for care and use of animals in scientific research. - Breeding of and experiments on animals (control and supervision) rules, 1998 under Prevention of Cruelty to Animals Act 1960.

B. Practical Training

1. Haematology:

a. Haemocytometry
b. Determination of reticulocyte count, platelet count, WBC count, RBC count, absolute eosinophil count in normal and diseased states.
c. Differential count of WBC
d. Haemoglobinometry, spectroscopy
e. Blood grouping and cross matching
f. Determination of bleeding time, clotting time
g. Haemolysis & fragility test
h. Examination of normal bone marrow aspiration smear

2. Clinical Physiology:

A. Elementary principles of clinical examination
B. General examination
   a. Cardiovascular system
      i. Examination of the pulse, blood vessels and measurements of blood pressure.
      ii. Examination of heart
   b. Respiratory System
      i. Examination of respiratory system
   c. Gastro-intestinal system
      i. Examination of abdomen.
   d. Nervous System
      i. Examination of higher mental functions.
      ii. Sensory system
      iii. Motor functions
      iv. Examination of cranial nerves.
      v. Examination of autonomic nervous system

3. Human Experiments:

a. Cardio vascular system:
   i. Electrocardiography — ECG & its interpretation.
b. Respiratory System:
c. Mechanical spirometry
   i. Recording of lung function tests by computerised or electronic spirometer
   ii. Breath holding and endurance test
   iii. Stethography
   iv. Resuscitation and artificial respiration

d. Reproductive System:
   i. Methods to determine ovulation time – Basal body temperature chart
e. Cervical smear
   i. Vaginal smear
   ii. Pregnancy diagnostic test - immunological test
   iii. Sperm count
f. Gastro Intestinal System*:*
   i. Endoscopy
g. Nerve Muscle Physiology*:*
   i. Ergography
   ii. Recording of EMG – nerve conduction both sensory and motor.

4. Animal Experiments

a. Amphibian experiments (for demonstration only)

i. Preload and after load
ii. Effect of continuous repeated stimulation (study of phenomena of fatigue)
iii. Length tension diagram.
iv. Properties of cardiac muscle: long refractory period, all or none law.
v. Extrasystole and compensatory pause, beneficial effect
vi. Regulation of heart, dissection of vagus nerve and effect of vagal stimulation.
vii. Actions of acetylcholine, adrenaline and nicotine on heart (Langley's)
viii. Perfusion of isolated frogs heart — role of Na+ K+ , Ca+
ix. Decerebrate and spinal frog.

b. Mammalian:

General management of mammalian experiments

c. To be performed by students

i. Rat/guinea pig ileum : intestinal movement recording
ii. Rabbit heart : Langendorf preparation

d. Others:

i. Construction of dietry chart for -
   a) Growing Children
   b) Hypertensive patients
   c) CAD
   d) Diabetes mellitus patients

ii. Tests for physical fitness –

a) Field 2 km. walk
b) Lab Harvard step test
c) Bicycle ergometry
d) Treadmill protocols
e) Cardio respiratory response to whole body exercise.

5. Clinical Biochemistry:

a. Examination of normal and abnormal constituents of urine
b. Other kidney function tests
c. Estimation of blood sugar
d. Liver function tests
e. Glucose tolerance test

IV Time Schedule and Rotation postings

The candidates shall attend all the undergraduate theory and practical classes regularly during the first year of course. During the second year of the course, they shall attend the clinical and para-clinical subjects postings in co-ordination with concerned departments, only in the forenoon sessions as follows:

1. Cardiology dept. — 15 days
   Learn to operate ECG apparatus, Echo, Doppler, Cardiac monitor, learn the methodology of cardiac catheterisation. resuscitation technique, interpretation of ECG & other records.

2. Neurology — 15 days
   Observe and understand Neuro Physiological Techniques (Clinical Physiology).
   - Clinical Examination of patient.
   - Use of EEG, EMG and Interpretation of EEG, EMG & other investigation data
3. Medical gastroenterology — 15 days.
   Clinical examination of patients.
   Observe endoscopic techniques.
4. Clinical biochemistry — 15 days.
   To understand the principles of clinical biochemical tests and interpretation of data:
   - Liver function tests.
   - Renal function tests.
5. Haematology Department — 15 days
   To learn investigations
6. Blood bank - 15 days
   To learn blood grouping and cross matching, collection, storage and transfusion of blood.

7. Department of Anatomy - 15 days.
   (Histology laboratory) Staining techniques, moulding of specimens, slide identification characteristics.

8. Biostatistics and research methodology **-** To attend workshop on research methodology - 3 days
9. Postings in Institute of Aerospace Medicine, Bangalore for Applied Physiology - 1 week

   Training would include:

   a. Applied Cardio-Respiratory Physiology
   b. Thermal Physiology
   c. Space Physiology
   d. High altitude physiology and hyperbaric medicine
   e. Acceleration physiology

   The above topics would include hands-on training in spirometry, orthostatic stress test and evaluation of heat stress and heat strain. The students would be evaluated by means of presentation/symposium at the end of posting.

10. Obstetrics and Gynecology postings – 15 days.
    i. Methods to determine ovulation time
       - Basal Body Temperature chart.
       - Cervical smear.
       - Vaginal smear.
    ii. Clinical examination during pregnancy including antenatal checkup and investigations
11. Chest Medicine - 15 days, to learn in laboratory - lung function tests and interpretation of results.
12. General Medicine - 1 month.
    - Clinical examination of patients
    - Investigation procedures
    - Drawing of blood and storage.
    - Lumbar puncture.
    - Interpretation of X - Ray, ECG, biopsy report, biochemical results.
    - Endocrinology postings, clinical examination of patient, radio immuno assay techniques.
    - Ophthalmology for fundoscopy and measurement of intraocular pressure, refractometry & perimetry.

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

V. Seminars & Journal reviews

The post graduate students should actively participate in departmental seminars and journal club. A record showing the involvement of the student shall be maintained and also in the PG diary. 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 practical, tutorials and group discussions.

VI. Dissertation Work

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

The suggested time schedule for dissertation work is:

- Identification and selection of topic for dissertation - in first 4 weeks.
- Preparatory work for 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. Writing the dissertation in the following 1½ years.
- 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. Subject of dissertation will be scrutinised by the PG Training cum Research Committee and ethical committee of the institution. 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).

Submission of dissertation

The dissertation shall be submitted to the Registrar (Evaluation) of the University six months before final examination or as per the dates notified by the University. Approval of the dissertation by the panel of examiners is a pre-requisite for a candidate to appear in the University examination.

VII. Maintenance of Record of Work Done, periodical assessment and progress report.

1. A diary showing each day's work has to be maintained by the candidate, which shall be scrutinized by the Head of the Department once in every three months.

2. A list of the seminars 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.
3. A practical record has to be maintained by every candidate and duly scrutinized and certified by the head of the department and to be submitted to the external examiner during the final examination.

VIII. Scheme of Examination

University Examination

A. 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 physiology, membrane potential, transport across membrane, biophysical principles, comparative physiology, history of medicine with special reference to physiology.

Paper–II: Systemic physiology including applied aspects of blood, respiratory physiology; cardiovascular, digestive, excretory systems, exercise & sports physiology & environmental physiology.

Paper–III: Systemic physiology including applied aspects of central nervous system, muscle & nerve physiology, endocrines.

Paper – IV: Reproductive physiology, special senses, clinical physiology, chrono-physiology, behavioural physiology with yoga & meditation.

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: Long Essay type questions- 2 X 20 marks= 40

Short Essay type questions- 6 X 10 marks= 60

B. Practical 200 marks

i) Laboratory Procedures

a.	Human Normal subjects ...	50 marks
b.	Rabbit /Rat/guinea pigs ...	25 marks
c.	Haematology …	30 marks
d.	Histology …	20 marks

ii) Clinical Physiology:

a. Clinical examination of a given subject, discussion on investigations, interpretation of laboratory findings and physiological principles in diagnosis - 25 marks.

b. Discussion on investigations, interpretation of laboratory findings and physiological principles in diagnosis - 50 marks.

c. Viva- voce – 100 marks

a) The Viva-Voce would be on all components of syllabus including discussion on dissertation - 80marks
b) Pedagogy - 20 marks

D. Maximum marks for	Theory	Practicals	Viva-voce	Total
M D Physiology Examination	400	200	100	700

Pass Criteria: 50% of total marks in each head separately.

a) Theory including Viva (250/500)
b) Practicals (100/200)

Distinction: 75% and above.

X. Recommended Text, Reference books and Journals

1. JB West, Best & Taylor, Physiological basis of Medical Practice. Williams & Wilkins publications.
2. Guyton, Text Book of Medical Physiology. Elseveir publication
3. Ganong, Review of Medical Physiology, Mc Graw hill publications
4. Campbell, Clinical Physiology, ELBS & Blackwell publications
5. John Bullock, Joseph Boyle, III Michacel B. Wang, NMS, Physiology 3rd Edn, B.I. Waverly publications.
6. Sir John V Dacie SM Lewos, Practical Hematology, Churchill Livingstone publications
7. Donald Emslie-Smith, Colin R Paterson, Thomas Ccatcherd, Nicholas W.Read, Textbook of Physiology, ELBS/Churchill Livingstone publications
8. Vernon B Mount Castle, Medical Physiology, vol. I & vol. 2, CV Mosby Company publications
9. Robert M. Berne & Mathew N. Levy, Physiology, Mosby Year book
10. Car J Wiggers, Physiology in health and disease, Lea Febiger publications
11. Williams, Text book of Endocrinology, W.B. Saunders publications

12. Peters dort, Adams, Braunwald, Issel Bacher, Matir, Wilson, Harrison's Principles of Internal Medicine, 16th edition, Mc Graw hill publications
13. Harper, Biochemistry, McGraw-Hill publications
14. John Field, H W Magou, Vol 1,2,3. Hand Book of Neurophysiology, Williams & Wilkins publications
15. Wallance O Fem, Hand Book of respiratory Physiology, vol 1, Williams & Wilkins publications
16. Wintrobe, Clinical hematology, Lea Febiger publications
17. Kathryn L Mc. Cance Sue E Huether, Text Book of Pathophysiology, Mosby publications
18. Gyrila keela & Eric Neil, Samson wright's Applied Physiology, ELBS, Oxford University Press.
19. Howell-Fulton, Physiology and Bio-Physics, Ruch & Patton 20th edition, Saunders publications. Philadelphia

Journals:

1. Journal of Applied Physiology, By American Physiological Society
2. Physiological Reviews, By American Physiological Society
3. Annual review of Physiology, By American Physiological Society
4. Advances in Physiology Education, By American Physiological Society
5. Recent advances in Physiology, By American Physiological Society
6. Journal of Physiology, British Publication
7. Indian Journal of Physiology and Pharmacology, by APPI.
8. Indian Journal of Medical Research
9. Biomedicine, by Indian Assosciation of Bio-medical Scientist.
10. News in Physiological Sciences
11. New England Journal Medicine
12. British Medical Journal
13. Nature
14. Lancet

ADDITIONAL READING

1. Compendium of recommendations of various committees on Health and Development (1943· 1975). DGHS, 1985 Central Bureau of Health Intelligence, Directorate General of Heald Services, mina of Health and Family Welfare, Govt. of India, Nirman Bhawan, New Delhi. P - 335. II.
2. National Health Policy, Min. of Health & Family Welfare, Nirman Bhawan, New Delhi, 1983
3. Santosh Kumar, The elements of Research, writing and editing 1994, Dept. of Urology, JIPMER, Pondicherry
4. Srinivasa D K etal, Medical Education Principles and Practice, 1995. National Teachei Training Centre, JIPMER, Pondicherry
5. Indian Council of Medical Research, "Policy Statement of Ethical considerations involved in Research on Human Subjects", 1982, I.C.M.R, New Delhi.
6. Code of Medical Ethics framed under section 33 of the Indian Medical Council Act, 1956. Medical Council of India, Kotla Road, New Delhi.
7. Francis C M, Medical Ethics, Jr P Publications, Bangalore, I edn., 2004
8. Indian National Science Academy, Guidelines for care and use of animals in Scientific Research, New Delhi, 1994.
9. International Committee of Medical Journal Editors, Uniform requirements for manuscripts submitted to biomedical journals, N Engl J Med 1991; 424-8
10. Kirkwood B R, Essentials of Medical Statistics , 1" Ed., Oxford: Blackwell Scientific Publications 1988. III.
11. Mahajan B K, Methods in Bio statistics for medical students, 5'1' Ed. New Delhi, Jaypee **The** Brothers Medical Publishers, 1989.
12. Raveendran, B Gitanjali, A Practical approach to PG dissertation, New Delhi, J P Publications, 1998.

CHAPTER IV

Monitoring Learning Progress

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 shall 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. Model checklists are given in this chapter which may be copied and used.

The learning out comes to be assessed should include:

1. Personal Attitudes.
2. Acquisition of Knowledge.
3. Clinical and operative skills and
4. Teaching skills.

1. <u>Personal Attitudes</u>: The essential items are:

a. Caring attitude.
b. Initiative.
c. Organisational ability.
d. Potential to cope with stressful situations and undertake responsibility.
e. Trust worthiness and reliability.
f. To understand and communicate intelligibly with patients and others.
g. To behave in a manner that establishes professional relationships with patients and colleagues.
h. Ability to work in a team.
i. 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 and peers.

2. <u>Acquisition of Knowledge</u>: The methods used comprise of '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 are to be recorded. The log book should periodically be validated by the supervisors. Some of the activities are listed. The list is not complete. Institutions may include additional activities, if so, desired.

a. **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, Chapter IV)

b. **Seminars / Symposia.** The topics should 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 are to be assessed using a checklist (see Model Checklist-II, Chapter IV)

c. **Clinico-pathological conferences.** This should be a multidisciplinary 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.

d. **Medical Audit.** Periodic morbidity and mortality meeting shall be held. Attendance and participation in these must be insisted upon. This may not be included in assessment.

3. Clinical skills:

a. **Day to Day work:** Skills in outpatient and ward work should be assessed periodically. The assessment should include the candidates' sincerity and punctuality, analytical ability and communication skills (see Model Checklist III, Chapter IV).

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

c. **Clinical and Procedural skills:** The candidate should be given graded responsibility to enable learning by apprenticeship. The performance is assessed by the guide by direct observation. Particulars are recorded by the student in the log book. (Table No.3, Chapter IV)

4. Teaching skills: Candidates should be encouraged to teach undergraduate medical students and paramedical students, if any. This performance should be based on assessment by the faculty members of the department and from feedback from the undergraduate students (See Model checklist V, Chapter IV)

5. Periodic tests: In case of degree courses of three years duration, the department may conduct three tests, two of them be annual tests, one at the end of first year and the other in the second year. The third test may be held three months before the final examination. In case of diploma courses of two

year duration, the departments may conduct two tests. One of them at the end of first year and the other in the second year, three months before the final examination. The tests may include written papers, practical / clinical and viva voce.

6. Work diary: Every candidate shall 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 may be made of the presentations by the candidate as well as details of clinical or laboratory procedures, if any conducted by the candidate.

7. Records: Records, log books and marks obtained in tests will be maintained by the Head of the Department and will be made available to the University or MCI.

8. Log book: The log book is a record of the important activities of the candidates during his training. Internal assessment should be based on the evaluation of the log book. Collectively, log books are a tool for the evaluation of the training programme of the institution by external agencies. The record includes academic activities as well as the presentations and procedures carried out by the candidate. Format for the log book for the different activities is given in Tables 1, 2 and 3 of Chapter IV. Copies may be made and used by the institutions.

Procedure for defaulters: Every department should 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 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 him or herself right.

CHAPTER IV (Contd)

Format of Model Check Lists

Check List-I

MODEL CHECK-LIST FOR EVALUATION OF JOURNAL REVIEW PRESENTATIONS

Name of the Student:

Name of the Faculty/Observer:

Date:

Sl No	Items for observation during presentation	Poor 0	Below Average 1	Average 2	Good 3	Very Good 4
1.	Article chosen was					
2.	Extent of understanding of scope & objectives of the paper by the candidate					
3.	Whether cross references have been consulted					
4.	Whether other relevant publications consulted					
5.	Ability to respond to questions on the paper / subject					
6.	Audio-visual aids used					
7.	Ability to defend the paper					
8.	Clarity of presentation					
9.	Any other observation					
	Total Score					

Check List – II

MODEL CHECK-LIST FOR EVALUATION OF SEMINAR PRESENTATIONS

Name of the Student:

Name of the Faculty/Observer:

Date:

Sl No	Items for observation during presentation	Poor 0	Below Average 1	Average 2	Good 3	Very Good 4
1.	Whether other relevant publications consulted					
2.	Whether cross references have been consulted					
3.	Completeness of Preparation					
4.	Clarity of Presentation					
5.	Understanding of subject					
6.	Ability to answer questions					
7.	Time scheduling					
8.	Appropriate use of Audio-Visual aids					
9.	Overall Performance					
10.	Any other observation					
	Total Score					

Check List - III

MODEL CHECK LIST FOR EVALUATION OF CLINICAL WORK IN WARD / OPD

(To be completed once a month by respective Unit Heads, including posting in other departments)

Name of the Student:

Name of the Faculty/Observer:

Date:

Sl No	Points to be considered	Poor 0	Below Average 1	Average 2	Good 3	Very Good 4
1.	Regularity of attendance					
2.	Punctuality					
3.	Interaction with colleagues and supportive staff					
4.	Maintenance of case records					
5.	Presentation of cases during rounds					
6.	Investigations work up					
7.	Beside manners					
8.	Rapport with patients					
9.	Counseling patient's relatives for blood donation or Postmortem and Case follow up.					
10.	Overall quality of ward work					
	Total Score					

Check List - IV

EVALUATION FORM FOR CLINICAL PRESENTATION

Name of the Student:

Name of the Faculty:

Date:

Sl No	Points to be considered	Poor 0	Below Average 1	Average 2	Good 3	Very Good 4
1.	Completeness of history					
2.	Whether all relevant points elicited					
3.	Clarity of Presentation					
4.	Logical order					
5.	Mentioned all positive and negative points of importance					
6.	Accuracy of general physical examination					
7.	Whether all physical signs elicited correctly					
8.	Whether any major signs missed or misinterpreted					
9.	Diagnosis: Whether it follows follows logically from history and findings					
10.	Investigations required ▪ Complete list ▪ Relevant order ▪ Interpretation of investigations					
11.	Ability to react to questioning Whether it follows logically from history and findings					
12.	Ability to defend diagnosis					
13.	Ability to justify differential diagnosis					
14.	Others					
	Total Score					

Check List - V

MODEL CHECK LIST FOR EVALUATION OF TEACHING SKILL PRACTICE

Sl No		Strong Point	Weak Point
1.	Communication of the purpose of the talk		
2.	Evokes audience interest in the subject		
3.	The introduction		
4.	The sequence of ideas		
5.	The use of practical examples and/or illustrations		
6.	Speaking style (enjoyable, monotonous, etc., specify)		
7.	Attempts audience participation		
8.	Summary of the main points at the end		
9.	Asks questions		
10.	Answers questions asked by the audience		
11.	Rapport of speaker with his audience		
12.	Effectiveness of the talk		
13.	Uses AV aids appropriately		

Check List - VI

MODEL CHECK LIST FOR DISSERTATION PRESENTATION

Name of the Student:

Name of the Faculty:

Date:

Sl No	Points to be considered divine	Poor 0	Below Average 1	Average 2	Good 3	Very Good 4
1.	Interest shown in selecting a topic					
2.	Appropriate review of literature					
3.	Discussion with guide & other faculty					
4.	Quality of Protocol					
5.	Preparation of proforma					
	Total Score					

Check List - VII

CONTINUOUS EVALUATION OF DISSERTATION WORK BY GUIDE / CO GUIDE

Name of the Student:

Name of the Faculty:

Date:

Sl No	Items for observation during presentations	Poor 0	Below Average 1	Average 2	Good 3	Very Good 4
1.	Periodic consultation with guide/co-guide					
2.	Regular collection of case Material					
3.	Depth of analysis / discussion					
4.	Departmental presentation of findings					
5.	Quality of final output					
6.	Others					
	Total Score					

LOG BOOK

Table 1: Academic activities attended

Name: Admission Year:

College:

Date	Type of Activity Specify Seminar, Journal Club, Presentation, UG teaching	Particulars

LOG BOOK

Table 2: Academic presentations made by the student

Name: Admission year:

College:

Date	Topic	Type of Presentation Specify Seminar, Journal Club, Presentation, UG teaching

LOG BOOK

Table 2: Diagnostic and Operative procedures performed

Name: Admission year:

College:

Date	Name	ID No.	Procedure	Category O, A, PA, PI*

*** Key:**

O **-** Washed up and observed

A - Assisted a more senior Surgeon

PA - Performed procedure under the direct supervision of a senior Surgeon

PI - Performed independently

Model Overall Assessment Sheet

Name of the College: **Academic Fear:**

Sl No	Faculty Member & Others	Name of Student and Mean Score									
		A	B	C	D	E	F	G	H	I	J
1.											
2.											
3.											
4.											
5.											
	Total Score										

Chapter V

Medical Ethics

Sensitisation and Practice

Introduction

There is now a shift from the traditional individual patient- doctor relationship and medical care. With the advances in science and technology and the needs of patients, their families and the community, there is an increased concern with the health of society. There is a shift to greater accountability to the society. Doctors and health professionals are confronted with many ethical problems. It is, therefore necessary to be prepared to deal with these problems. To accomplish the Goal and General Objective stated in Chapter II and develop human values it is urged that ***ethical sensitisation*** be achieved by lectures or discussion on ethical issues, clinical discussion of cases with an important ethical component and by including ethical aspects in discussion in all case presentation, bedside rounds and academic postgraduate programmes.

Course Contents

1. Introduction to Medical Ethics

- What is Ethics?
- What are values and norms?
- Relationship between being ethical and human fulfillment.
- How to form a value system in one's personal and professional life.
- Heteronomous Ethics and Autonomous Ethics.
- Freedom and personal Responsibility.

2. Definition of Medical Ethics

- Difference between medical ethics and bio-ethics
- Major Principles of Medical Ethics
  - Beneficence = fraternity
  - Justice = equality
  - Self determination (autonomy) = liberty

3. Perspective of Medical Ethics

- The Hippocratic Oath.
- The Declaration of Helsinki.
- The WHO Declaration of Geneva.
- International code of Medical Ethics. (1993)
- Medical Council of India Code of Ethics.

4. Ethics of the Individual

- The patient as a person.
- The Right to be respected.
- Truth and Confidentiality.
- The autonomy of decision.
- The concept of disease, health and healing.
- The Right to health.
- Ethics of Behaviour modification.
- The Physician – Patient relationship.
- Organ donation.

5. The Ethics of Human life

- What is human life?
- Criteria for distinguishing the human and the non-human.
- Reasons for respecting human life.
- The beginning of human life.
- Conception, contraception.
- Abortion.
- Prenatal sex-determination.
- In vitro fertilization (IVF).
- Artificial Insemination by Husband (AIH).
- Artificial Insemination by Donor (AID).
- Surrogate motherhood.
- Semen Intra-fallopian Transfer (SIFT).
- Gamete Intra-fallopian Transfer (GIFT).
- Zygote Intra-fallopian Transfer (ZIFT).
- Genetic Engineering.

6. The Family and Society in Medical Ethics

- The Ethics of human sexuality.
- Family Planning perspectives.
- Prolongation of life.
- Advanced life directives – The Living Will
- Euthanasia
- Cancer and Terminal Care

7. Profession Ethics

- Code of conduct.
- Contract and confidentiality.
- Charging of fees, Fee-splitting.
- Prescription of drugs.
- Over-investigating the patient.

- Low – Cost drugs, vitamins and tonics.
- Allocation of resources in health care.
- Malpractice and Negligence.

8. Research Ethics

- Animal and experimental research / humaneness.
- Human experimentation.
- Human volunteer research — Informed Consent Drug trials.

9. Ethical workshop of cases

- Gathering all scientific factors.
- Gathering all human factors.
- Gathering all value factors.
- Identifying areas of value — conflict, setting of priorities
- Working out criteria towards decisions.

Recommended Reading

1. Francis C.M., Medical Ethics, 1 Ed, 1993, Jaypee Brothers, New Delhi, p 189, Rs. 150/-

2. Good Clinical Practices : GOI Guidelines for clinical trials on Pharmaceutical Products in India (www.cdsco.nic.in)

3. INSA Guidelines for care and use of Animals in Research – 2000.

4. CPCSEA Guidelines 2001 (www.cpcsea.org.)

5. Ethical Guidelines for Biomedical Research on Human Subjects, 2000, ICMR, New Delhi.

6. ICMR Guidelines on animal use 2001, ICMR, New Delhi.