REGULATIONS AND CURRICULUM
FOR
POSTGRADUATE DEGREE AND DIPLOMA COURSES
2010

BIOCHEMISTRY

JSS UNIVERSITY
JSS MEDICAL INSTITUTIONS CAMPUS
SRI SHIVARATHREESHWARA NAGARA, MYSORE 570 015
KARNATAKA, INDIA
This book can be had from
The Registrar
JSS University
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Sri Shivarathreeshwara Nagara, Mysore 570 015
Karnataka

Price: `
# Postgraduate Medical Degree and Diploma Courses 2010

## BIOCHEMISTRY

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</table>
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CONTENTS

Chapter I Regulations
Chapter II Goals and General Objectives
Chapter III Curriculum
Chapter IV Monitoring Learning Progress
Chapter V Ethics
CHAPTER – III
CURRICULUM
M D BIOCHEMISTRY

I. Goal:
The postgraduate course MD in Biochemistry should enable the student to acquire an in-depth knowledge of the fundamental principles of the subject of biochemistry, so that the candidate can apply this knowledge, for understanding the basis of health and disease.
At the end of the course the student should have gained knowledge and expertise so that he/she is equipped to pursue a career in one or more of the following facets of biochemistry i.e., teaching, diagnostic work and research.

II. Objectives
At the end of the course the MD student should have gained knowledge in the following key areas of the subject:

1. The chemical and three dimensional structures of the various classes of biomolecules such as carbohydrates, proteins, lipids and nucleic acids as a prelude to understanding the correlation between structure and function.
2. An in-depth insight into the metabolic pathways of the major classes of biomolecules, regulatory mechanisms, interactions, significance and alterations in disease states.
3. Mechanism of energy release, conservation, utilization and derangements thereof.
4. Role of micro and macro nutrients such as vitamins and minerals in health and the pathophysiology of nutritional disorders.
5. Mechanism involved in the storage, transmission and expression of genetic information.
6. Biochemical techniques and methodology used to assess health and aid in the diagnosis and prognosis of diseases.
7. Develop skill in performing and interpreting data generated by advanced biochemical techniques such as electrophoresis, chromatography, enzyme assays, organ function tests, etc.

III. Outline of course contents.
Theory

and myoglobin. Methods of study of structure of proteins and different levels of structural organization. Biologically important peptides, conjugated proteins, lipoproteins and glycoproteins, structure of immunoglobulins.

2. Carbohydrates: Biological importance of carbohydrates, chemistry, structure and properties of monosaccharides, disaccharides and polysaccharides. Structure and functions of heteropolysaccharides.


4. Nucleic acids: Biological importance of nucleic acids. Structure of nucleic acids and biologically important nucleotides. Methods of study of base sequence of DNA. Structure and functions of gene with respect to mammalian genome, recombinant DNA technology. General principles of blotting techniques. PCR and its application in medicine.

5. Biophysical Chemistry
   b. Isotopes – detection and measurement of stable and radioactive isotopes; their application in biochemistry.
   c. Bioenergetics – free energy change, high-energy linkages, redox potentials.

6. Biochemical Techniques
   a. Chromatography: Principles and applications of paper, thin layer, ion exchange, gas phase and affinity chromatography, HPLC, gel filtration and its applications.
   c. Photometry and spectrophotometer: principle and applications.
   d. Flame photometry: principle and applications.
   e. Ultra centrifugation techniques: Their applications in the study of lipoproteins.
   g. Ion selective electrodes: Their applications in medicine.
   h. Cell fractionation: Isolation and purification of sub cellular particles, biochemical markers of different subcellular organelles.
   i. Recent advances in medical laboratory technology and instrumentation: semi auto analyser, auto analyzer, PCR etc.

Paper-II: Intermediary Metabolism and Biochemical Genetics

1. Introduction to intermediary metabolism, various methods of study of
intermediary metabolism with examples. Their advantages and disadvantages.
2. Biological oxidation – structure of mitochondria, its role in biological oxidation, electron transport chain, mechanisms of electron transport and oxidative phosphorylation. Regulation of oxidative phosphorylation.
3. Carbohydrate metabolism: A detailed discussion of the metabolic pathways as it occurs in humans.
6. Integration of metabolic pathways of carbohydrate, protein and lipid. Regulation of metabolic pathways.
7. Biosynthesis and catabolism of purine and pyrimidine, nucleotides.
8. Functions of Nucleic acid (DNA & RNA), DNA Organization into Chromosomes, Replication & Repair, RNA Synthesis, Processing and Modification, Genetic code, Mutations, Protein synthesis, post translational processing, Biochemical Basis of anticancer drugs, antibiotics etc., regulation of gene expression.

**Paper–III: Enzymes, Nutrition and Specialized Tissues**

1. Enzymes
   a. Classification, kinetics, specificity.
   b. Isoenzymes and coenzymes.
   c. Enzyme inhibition – competitive, non-competitive, uncompetitive and allosteric, mechanism and application. Enzyme poisons.
   e. Immobilized enzymes – application.
   g. Modification and supplement of dietary requirements in Health and Disease.
2. Nutrition:
b. Detailed account of metabolism of the micronutrients.
d. Protein, carbohydrates and fat requirements, RDA, biological value of proteins. Protein energy malnutrition.
e. Malabsorption syndromes, parenteral nutrition.
f. Modification and supplementation of dietary requirements in health and disease.

3. Specialized tissues
   i) Muscle tissue – composition, mechanism of muscle contraction.
   ii) Nerve tissue – composition, transmission of nerve impulse, neurotransmitters.
   iii) Erythrocytes – composition and metabolism, blood clotting, other blood cells. Phagocytosis.
   iv) Connective tissue – composition, chemistry of collagen, elastin and other fibrous proteins.
   v) Adipose tissue including brown adipose tissue metabolism.
   vi) Bone and teeth – composition, osteocalcin.
   vii) Composition of lens – biochemical changes during cataractogenesis.
   viii) Structure of biomembranes, transport across membranes.

Paper – IV Clinical Biochemistry

1. Basic concepts in laboratory investigations. Quality control.
2. Diagnostic enzymology – an exhaustive account.
3. Inborn errors of metabolism involving amino acids, carbohydrates, lipids, purines, pyrimidines and porphyrin metabolism, mucopolysaccharidoses.
5. Plasma lipoproteins in health and disease.
6. Liver function tests, jaundice, hepatic coma.
7. Kidney function tests.
8. Pancreatic function tests.
9. Gastric function tests.
11. Abnormal hemoglobins, anaemias, thalassemia.
12. Basic immunology, immune system. T & B Lymphocytes, antigen presenting cells, humoral immunity lymphokines. Immune regulation. Monoclonal antibodies, application of immunological techniques,
14. Water and electrolyte balance, acid base balance – their disturbances.
17. Laboratory investigations in myocardial infarction.
Practical

Part I – General Biochemistry

1. Estimation of amino acids by ninhydrin method.
2. Estimation of protein by Folin’s method.
5. Amino acid – paper chromatography, TLC. Two dimensional paper chromatography
7. Absorption spectra of phenylalanine, tyrosine, tryptophan (UV).
8. Ion exchange chromatography of amino acids.
10. Separation of mono and disaccharides by paper chromatography.
13. Estimation of vitamin C.
14. Estimation of vitamin A.
15. Estimation of vitamin E.
17. Enzyme inhibitions.
18. Effect of pH, temperature on enzyme activity: Determination of Km, Vmax.
22. Affinity chromatography

Part – II: Clinical Biochemistry

4. Serum creatinine – Jaffe’s kinetic and end-point methods.
5. Cholesterol/HDL cholesterol by enzymatic method.
6. Albumin / globulin ratio.
7. Serum calcium.
9. Serum bilirubin – direct and total.
10. Alkaline & acid phosphatases.
11. AST, ALT; UV kinetic methods and colorimetric and assay of gamma GT.
12. LDH isoenzymes, CPK isoenzymes.
13. Serum amylase – Somogyi amyloytic method
14. Fe, Fe binding capacity.
15. Agar gel electrophoresis of serum proteins, hemoglobin.
16. Lipoproteins – electrophoresis.
17. 17-ketosteroids in urine.
20. Plasma Cl, HCO₃, pH, PO₂, PCO₂, blood gas analysis
21. CSF analysis.

IV. Practical Training in Biochemistry: (First half of 1st year)

1. Introduction to research methodology and bio statistics. Every postgraduate student should be given an introductory course in research methodology and research techniques. He / she must be taught as to how a research project can be planned and implemented. He / she must also acquire a basic knowledge in the statistical methods and their applications.

2. The postgraduate student will be posted in departments of:
   a) Medicine 2 Months
   b) Paediatrics 30 days
   c) Nephrology 15 days
   d) Gastroenterology 15 days
   e) Obstetrics & Gynaec 15 days
   f) Cardiology 15 days

The student has to attend the clinical postings in the forenoon from 09.00 am to 12.00 noon and return back to the department of biochemistry, to do the experimental work in the afternoon. They shall not be posted for any duties in the clinical departments.

Every post graduate student shall be posted for six months to the clinical biochemistry laboratory of the department where clinical investigations of the attached hospital are done, from 9.00 AM to 1.00 pm every day on all days, including holidays, in the 2nd year and 3rd year. The post graduate students may also be posted at the clinical biochemistry laboratory for night duties during the 2nd and 3rd academic year.

Skills to be acquired during the clinical/laboratory postings

Clinical postings: During posting in clinical departments, the student should acquire relevant knowledge and skills. These generally include:

1. Taking the history, Clinical examination of a patient and presenting the case.
2. Investigations to be carried and their relevance.
3. Drawing of blood, collection of urine and / or other relevant specimens of investigations and their storage.
4. Biopsy techniques and handling of biopsy material to be sent for relevant tests / investigations.
5. Interpretation of laboratory data, X-ray and biopsy results.
Clinical biochemistry laboratory posting:

Student should be trained in collection of samples, carrying out investigations, interpretation, reporting of the results, maintenance of records of investigations and quality assurance, including quality control.

Practical – Observation book and Practical record:

Post graduate student should maintain an observation book, practical record for general & clinical biochemistry, separately of all practical carried out during the course. The practical exercises shall be carried out under the supervision of the assigned teaching staff (assistant professor and above) and get them approved after the completion of each exercise. At the end of the 3rd year, the practical records have to be submitted to the Head of the Department for certification. The observation book and the practical records, along with the log books and diary are to be presented compulsorily, to the examiners at the University examination.

VI. Seminars, Journal Clubs

Students of biochemistry are expected to actively participate in the departmental seminars and journal clubs. A record should be maintained for each student and the list of seminars and paper presented in journal club by each student should be presented at the time of University examination. The journal club and the subject seminars shall be held on alternate weeks.

Post graduate students should participate in undergraduate teaching, in theory, practical and tutorials.

Each of the above activities are to be assessed as per the annexures.

VII. Dissertation – Synopsis & Dissertation

The synopsis of the dissertation should be submitted within 6 months from the date of commencement of course. Every student should submit a dissertation on a selected research problem involving laboratory investigations. The dissertation has to be prepared by the student, in consultation with the allotted guide and submitted to the University 6 months prior to the final examination, as notified by the University.

VIII. Periodical Assessment

Every student should be assessed. For assessment, participation in seminars, journal clubs, standardization of analytical techniques and involvement in clinical laboratory investigations should be taken into consideration. The periodic internal assessment shall be conducted once a year as follows:

Ist Internal assessment (at the end of twelve months).
IInd Internal assessment (at the end of twenty four months).
IIIrd Internal assessment (at the end thirty two months).
IX Scheme of Examination

A. Theory – There shall be four papers of 100 marks each. Each paper shall be of three hours duration. Each paper shall have two long essay questions of 20 marks (20 x 2 = 40). And six short easy questions of 10 marks (10 x 6 = 60).

The distribution of topics/chapters for the papers will be as under*:


Paper – II - Intermediary metabolism and biochemical genetics.

Paper – III - Enzymes, nutrition and specialized tissues.

Paper – IV - Clinical biochemistry.

* 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.

Questions on recent advances may be asked in any or all papers

B. Practical Examination: 200 marks

Duration: Two days

Part – I - Clinical examination of a patient and listing of relevant investigations in clinical biochemistry.

Part – II - Laboratory procedures in general biochemistry.

The assignment of work under part I and part II should begin on first day and the candidate is expected to complete the work by forenoon on second day, so that viva voce and pedagogy examinations are held on the second day afternoon

Part I – Clinical Examination & Clinical Chemistry Experiments

Each candidate is expected to take the history, perform clinical examination, list the laboratory investigations and present the case to the examiners. The examiners would select two or three laboratory investigations, which the candidate will perform.

Clinical examination and discussion (30 minutes) 25 Marks

Clinical biochemistry (Three relevant biochemical investigations which includes preparation of standard graph, estimation of a relevant analyse in blood /plasma / serum / or other body fluids) 75 Marks
Part II – General Biochemistry

<table>
<thead>
<tr>
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<th>Marks</th>
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<tbody>
<tr>
<td>1</td>
<td>Qualitative analysis of any biological fluid (urine, CSF, pleural fluid) – interpretation and discussion.</td>
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<tr>
<td>2</td>
<td>Experiments on enzymes kinetics. ex. determination of pH optimum or Km value or temperature optimum or Vmax etc.</td>
</tr>
<tr>
<td>3</td>
<td>Experiments involving chromatography or electrophoresis to be given, separation and identification of amino acids or carbohydrates by chromatography or separation and interpretation of serum proteins, lipoproteins, isoenzymes of (LDH &amp; CPK) by electrophoresis to be given.</td>
</tr>
<tr>
<td>TOTAL</td>
<td>100 Marks</td>
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</tbody>
</table>

C. Viva – Voce 100 Marks

1) Viva-Voce Examination: 80 Marks
Viva voce examination will be conducted conjointly by all the examiners to test comprehension, analytical approach, expression and interpretation of facts. Student shall also be given case reports, charts for interpretation. It includes discussion on dissertation.

2) Pedagogy Exercise: 20 Marks
A topic would be given to each candidate along with the practical examination question paper on the first day. Student is asked to make a presentation on the topic on the second day for 8 – 10 minutes.

<table>
<thead>
<tr>
<th>Maximum marks for MD Biochemistry</th>
<th>Theory</th>
<th>Practical</th>
<th>Viva-Voce+ Pedagogy (80 + 20)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>400</td>
<td>200</td>
<td>100</td>
<td>700</td>
<td></td>
</tr>
</tbody>
</table>
X. Recommended Books and Journals

3. Colleen Smith, Allan D Marks, Michael Lieberman, Marks Basic Medical Biochemistry- A clinical approach; Lippincot Williams; 2nd edition; 2005.
8. Robert F. Dons and Frank H Wians; Endocrine and Metabolic Disorders; Clinical laboratory testing; CRC Press; 4th edition; 2009.

Journals and other periodicals:

1. Annual Review of Biochemistry
2. Clinical Chemistry (J).
5. Medical Biochemistry (J).
6. Recent Advances in Endocrinology and Metabolism.
7. Essays in Biochemistry, Biochemical Society, UK.
9. Indian Journal of Medical Research (J).
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 outcomes to be assessed should include:

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

1. **Personal Attitudes:** The essential items are:
   a. Caring attitude.
   b. Initiative.
   c. Organisational ability.
   d. Potential to cope with stressful situations and undertake responsibility.
   e. Trustworthiness 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. **Acquisition of Knowledge:** 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:

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

**Total Score**
Check List – II

MODEL CHECK-LIST FOR EVALUATION OF SEMINAR PRESENTATIONS

Name of the Student:

Name of the Faculty/Observer:

Date:

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

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

**Total Score**
## Check List - IV

### EVALUATION FORM FOR CLINICAL PRESENTATION

**Name of the Student:**

**Name of the Faculty:**

**Date:**

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

**MODEL CHECK LIST FOR EVALUATION OF TEACHING SKILL PRACTICE**

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

MODEL CHECK LIST FOR DISSERTATION PRESENTATION

Name of the Student:

Name of the Faculty:

Date:

<table>
<thead>
<tr>
<th>SI No</th>
<th>Points to be considered divine</th>
<th>Poor 0</th>
<th>Below Average 1</th>
<th>Average 2</th>
<th>Good 3</th>
<th>Very Good 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Interest shown in selecting a topic</td>
<td></td>
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<tr>
<td>2.</td>
<td>Appropriate review of literature</td>
<td></td>
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<tr>
<td>3.</td>
<td>Discussion with guide &amp; other faculty</td>
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<tr>
<td>4.</td>
<td>Quality of Protocol</td>
<td></td>
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<tr>
<td>5.</td>
<td>Preparation of proforma</td>
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</tbody>
</table>

**Total Score**
Check List - VII

CONTINUOUS EVALUATION OF DISSERTATION
WORK BY GUIDE / CO GUIDE

Name of the Student:

Name of the Faculty:

Date:

<table>
<thead>
<tr>
<th>Sl No</th>
<th>Items for observation during presentations</th>
<th>Poor 0</th>
<th>Below Average 1</th>
<th>Average 2</th>
<th>Good 3</th>
<th>Very Good 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Periodic consultation with guide/co-guide</td>
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<tr>
<td>2.</td>
<td>Regular collection of case Material</td>
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<td>3.</td>
<td>Depth of analysis / discussion</td>
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<td>4.</td>
<td>Departmental presentation of findings</td>
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<td>5.</td>
<td>Quality of final output</td>
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<tr>
<td>6.</td>
<td>Others</td>
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<td><strong>Total Score</strong></td>
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</tbody>
</table>
Table 1: Academic activities attended

Name:  
Admission Year:  
College:  

| Date | Type of Activity  
Specify Seminar, Journal Club,  
Presentation, UG teaching | Particulars |
<table>
<thead>
<tr>
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<tbody>
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</tbody>
</table>
**LOG BOOK**

**Table 2:** Academic presentations made by the student

<table>
<thead>
<tr>
<th>Name:</th>
<th>Admission year:</th>
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</thead>
<tbody>
<tr>
<td>College:</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Type of Presentation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Specify Seminar, Journal Club, Presentation, UG teaching</td>
</tr>
</tbody>
</table>
**LOG BOOK**

**Table 2:** Diagnostic and Operative procedures performed

Name:  
Admission year:  
College:  

<table>
<thead>
<tr>
<th>Date</th>
<th>Name</th>
<th>ID No.</th>
<th>Procedure</th>
<th>Category O, A, PA, PI*</th>
</tr>
</thead>
<tbody>
<tr>
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* 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:

<table>
<thead>
<tr>
<th>Sl No</th>
<th>Faculty Member &amp; Others</th>
<th>Name of Student and Mean Score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>A</td>
</tr>
<tr>
<td>1.</td>
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<tr>
<td>2.</td>
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<td>3.</td>
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<tr>
<td>4.</td>
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<tr>
<td>5.</td>
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</tbody>
</table>

**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/-


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