

POST GRADUATE CURRICULUM **MD- BIOCHEMISTRY**

GOAL

The main goal of the post graduate education in Biochemistry is to enable a student understand, envisage and explain life processes as molecular events and apply his knowledge and skills in clinical problem solving and scientific research.

OBJECTIVES

At the end of 3 years training in Biochemistry the Post graduate student is expected to explain life processes as molecular events and apply his knowledge and skills in clinical problem solving and scientific research.

KNOWLEDGE

Demonstrate his/her understanding of the

1. Concepts and principles of general biochemistry

This includes molecular motif of a living cell, structural and functional hierarchy of biomolecules and their structure-function relationships. Biochemistry of human nutrition, metabolism, metabolic interrelationships, metabolic homeostasis, molecular and cell biology, body defense against xenobiotics and pathogens, principles of various laboratory estimations, instrumentations and rationale underlying biochemical laboratory investigations.

2. Fundamentals of Biostatistics

SKILLS

1. Conduct Biochemical laboratory investigations and experimentations relevant to clinical management and biomedical research. Analyze, interpret and evaluate the data. Rationalize their application in clinical management and experiment research.

2. Plan & conduct lecture, practical demonstrations, tutorial classes and small group discussions on clinical problems for undergraduate students of medical and allied disciplines.

3. Be familiar with literature survey/computer skills.

4. Critically review & comment on research papers and give oral presentation

5. Prepare research protocols, conduct experimental studies analyze and solve clinical and experimental problems.

HUMAN VALUES, ETHICAL PRACTICE AND COMMUNICATION ABILITIES

1. Adopt ethical practice principles in all aspects of his/her practice; professional honesty and integrity are to be fostered. Care is to be delivered irrespective of the social status, caste, creed or religion of the patient.
2. Develop communication skills, in particular the skill to explain various options available in management and to obtain a true informed consent from the patients.
3. Provide leadership and get the best out of his team in a congenial working atmosphere.
4. Apply moral and ethical standard while carrying out human or animal research.
5. Be humble and accept the limitations in his knowledge and skill and to ask for help from colleagues when needed.
6. Respect patient's right and privileges including patient right to information and right to seek a second opinion.

COURSE AND CURRICULUM OF M.D. BIOCHEMISTRY TEACHING AND LEARNING ACTIVITIES

A. Theoretical Teaching:

1. **Lectures:** Lectures are to be kept to a minimum. Certain selected topics can be taken as lectures. Lectures may be didactic or integrated.
2. **Journal Club:** Recommended to be held once a week. All PG students are expected to attend and actively participate in discussion and enter in the log book the relevant details. The presentations would be evaluated using check list and would carry weightage for internal assessment. A time table with names of the students and the moderator should be announced in advance.
3. **Subject seminar:** Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter in the log books relevant details. The presentations would be

evaluated using check lists and would carry weightage for internal assessment. A time table for the subject with the student names and moderator should be announced in advance.

4. **Case discussion:** Recommended to be held once a week. All PG students are expected to attend and actively participate in discussion and enter in the log book the relevant details. The presentations would be evaluated using check list and would carry weightage for internal assessment. A time table with names of the students and the moderator should be announced in advance.
5. **Ward rounds:** Ward rounds may be service or teaching rounds.
 - a) **Service rounds:** Post graduate students should do service rounds everyday for the care of the patients. Newly admitted patients should be worked up by postgraduate student and presented to the faculty members the following day.
 - b) **Teaching rounds:** Any rare cases or findings biochemically should be discussed with the faculty members the following day.
6. **Skills:** Post graduate students must teach under graduate students (eg. Medical, nursing) by taking demonstrations, bedside case discussion, tutorials, lectures etc. Assessment should be made by medical faculty as well by the students.

Record of their participation is to be kept in log book. Training of postgraduate students in educational science and technology is recommended.
7. **Continuing Medical Education Programmes (CME):** recommended that at least 1 state level CME programme should be attended by each student during the course.
8. **Conferences:** Attending conference is compulsory. Post graduate student should attend one national and one state level conference during the course.
9. **Research Activities:** The postgraduate students to be encouraged to carry out research activities in the department other than dissertation work.

B) Clinical/ Practical Training:

a) Clinical Biochemistry Laboratory Postings:

Every postgraduate student in biochemistry shall be posted to clinical biochemistry laboratory of the department where clinical investigations of the attached hospital are done. Student should be trained in collection of samples, carrying out investigations, interpretations, reporting of the results and maintenance of records of investigations.

Period: 6 months/year.

b) Practical record:

Students should maintain practical record for general and clinical Biochemistry separately for all practical done during the course and submit during the time of University Examination after duly certified by the head of department.

OTHER CRITERIA TO BE FULFILLED FOR THE DEGREE COURSE:

1. Internal evaluation:

During the course of three years, the department will conduct three tests. One at the end of first year and other at the end of second year. The third test will be a preliminary examination which may be held three months before the final examination. The test may include the written papers, practicals/ clinicals and viva voce. Records and marks obtained in such tests will be maintained by the head of the department and will be sent to the university when called for. Results of all evaluations should be entered into PG's diary departmental file for documentation purposes. Main purpose of periodic examination and accountability is to ensure clinical expertise of students with practical and communication skills and balance broader concept of diagnostic and therapeutic challenges.

2. Maintenance of log book:

Every candidate shall maintain a log book/ 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. All the procedures performed by the post graduate students should be maintained in the log book. All the daily activities including the ward rounds and the routine

procedures performed on day to day basis should be entered in the log book and it should be verified and signed by the faculty member. The log book shall be scrutinized and certified by the Head of the Department and Head of the institution and presented in the University practical/ clinical examination

3. Dissertation:

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

POST GRADUATE TEACHING SCHEDULE FOR ACADEMIC YEAR 2015-16 & 2016-17

CLINICAL SEMINARS:

Sr. No.	DATE	SEMINAR TOPIC	PRESENTED BY	TEACHER'S ATTENDED
1.	04/07/2015	Evaluation of the role of Vitamin D, Vitamin A , Vitamin C & Antioxidants in type II DM patients	Dr. Shanti . P D'Almeida	Dr. Chitra Y. Dhume (Prof & HOD), Dr. Manisha Audi (Assoc Prof), Dr. Carlos Noel Menezes (Asst Prof), Dr. Jano Zore (Lecturer), Dr. Sudeep Lokapure (Lecturer), Dr. Reshama Morje (Asst. Lecturer)
2.	04/08/2015	Metabolism of Lipoprotein	Dr. Shanti . P D'Almeida	Dr. Chitra Y. Dhume (Prof & HOD), Dr. Manisha Audi (Assoc Prof), Dr. Carlos Noel Menezes (Asst Prof), Dr. Jano Zore (Lecturer), Dr. Milind Karapurkar (Asst. Lecturer), Dr. Reshama Morje (Asst. Lecturer)
3.	08/09/2015	NABL and Laboratory quality management: current scenario	Dr. Shanti . P D'Almeida	Dr. Chitra Y. Dhume (Prof & HOD), Dr. Manisha Audi (Assoc Prof), Dr. Carlos Noel Menezes (Asst Prof), Dr. Jano Zore (Lecturer), Dr. Milind Karapurkar (Asst. Lecturer), Dr. Reshama Morje (Asst. Lecturer)
4.	10/10/2015	Techniques in Biochemistry: Electrophoresis, Chromatography, Ultracentrifugation	Dr. Shanti . P D'Almeida	Dr. Chitra Y. Dhume (Prof & HOD), Dr. Manisha Audi (Assoc Prof), Dr. Tanuja Kamat (Asst Prof), Dr. Carlos Noel Menezes (Asst Prof), Dr. Jano Zore (Lecturer), Dr. Sudeep Lokapure (Lecturer), Dr. Milind Karapurkar (Asst. Lecturer), Dr. Reshama Morje (Asst. Lecturer)
5.	21/11/2015	Point of Care Testing (POCT)	Dr. Shanti . P D'Almeida	Dr. Chitra Y. Dhume (Prof & HOD), Dr. Manisha Audi (Assoc Prof), Dr. Tanuja Kamat (Asst Prof), Dr. Carlos Noel Menezes (Asst Prof), Dr. Milind Karapurkar (Asst. Lecturer), Dr. Reshama Morje (Asst. Lecturer), Dr. Michelle Menezes (Asst Lecturer)
6.	05/12/2015	Biochemistry of Metabolic syndrome	Dr. Shanti . P D'Almeida	Dr. Chitra Y. Dhume (Prof & HOD), Dr. Manisha Audi (Assoc Prof), Dr. Tanuja Kamat (Asst Prof), Dr. Carlos Noel Menezes (Asst Prof), Dr. Jano Zore (Lecturer), Dr. Milind Karapurkar (Asst. Lecturer), Dr. Reshama Morje (Asst. Lecturer), Dr. Michelle Menezes (Asst Lecturer)

7.	02/01/2016	Autoanalyzers	Dr. Shanti . P D'Almeida	Dr. Chitra Y. Dhume (Prof & HOD), Dr. Manisha Audi (Assoc Prof), Dr. Tanuja Kamat (Asst Prof), Dr. Carlos Noel Menezes (Asst Prof), Dr. Jano Zore (Lecturer), Dr. Sudeep Lokapure (Lecturer), Dr. Milind Karapurkar (Asst. Lecturer), Dr. Reshama Morje (Asst. Lecturer), Dr. Michelle Menezes (Asst Lecturer)
8.	06/02/2016	Thyroid function tests	Dr. Shanti . P D'Almeida	Dr. Chitra Y. Dhume (Prof & HOD), Dr. Carlos Noel Menezes (Asst Prof), Dr. Manisha Audi (Assoc Prof), Dr. Jano Zore (Lecturer), Dr. Milind Karapurkar (Asst. Lecturer), Dr. Reshama Morje (Asst. Lecturer),
9.	04/03/2016	Phlebotomy and Specimen Handling	Dr. Shanti . P D'Almeida	Dr. Chitra Y. Dhume (Prof & HOD), Dr. Manisha Audi (Assoc Prof), Dr. Tanuja Kamat (Asst Prof), Dr. Carlos Noel Menezes (Asst Prof), Dr. Jano Zore (Lecturer)
10.	02/04/2016	Preanalytical errors and Preanalytical Variable	Dr. Shanti . P D'Almeida	Dr. Chitra Y. Dhume (Prof & HOD), Dr. Manisha Audi (Assoc Prof), Dr. Tanuja Kamat (Asst Prof), Dr. Carlos Noel Menezes (Asst Prof), Dr. Jano Zore (Lecturer), Dr. Sudeep Lokapure (Lecturer), Dr. Reshama Sawant (Asst. Lecturer)
11.	07/05/2016	Spectrophotometric techniques	Dr. Shanti . P D'Almeida	Dr. Chitra Y. Dhume (Prof & HOD), Dr. Tanuja Kamat (Asst Prof), Dr. Carlos Noel Menezes (Asst Prof), Dr. Jano Zore (Lecturer)
12.	25/06/2016	PCR, ELISA & Blotting Techniques	Dr. Shanti . P D'Almeida	Dr. Chitra Y. Dhume (Prof & HOD), Dr. Manisha Audi (Assoc Prof), Dr. Sudeep Lokapure (Lecturer), Dr. Reshama Sawant (Asst. Lecturer)
13.	02/07/2016	Biochemistry of Atherosclerosis	Dr. Shanti . P D'Almeida	Dr. Chitra Y. Dhume (Prof & HOD), Dr. Manisha Audi (Assoc Prof), Dr. Carlos Noel Menezes (Asst Prof), Dr. Jano Zore (Lecturer), Dr. Sudeep Lokapure (Lecturer), Dr. Milind Karapurkar (Asst Lecturer), Dr. Reshama Sawant (Asst. Lecturer)
14.	20/08/2016	Tumor Markers	Dr. Shanti . P D'Almeida	Dr. Chitra Y. Dhume (Prof & HOD), Dr. Carlos Noel Menezes (Asst Prof), Dr. Jano Zore (Lecturer), Dr. Sudeep Lokapure (Lecturer), Dr. Milind Karapurkar (Asst Lecturer)

15.	17/09/2016	Trehalose: Its structure and property as a suppressant in oxidative stress and protein denaturation	Dr. Shanti . P D'Almeida	Dr. Chitra Y. Dhume (Prof & HOD), Dr. Manisha Audi (Assoc Prof), Dr. Tanuja Kamat (Asst Prof), Dr. Carlos Noel Menezes (Asst Prof), Dr. Jano Zore (Lecturer), Dr. Sudeep Lokapure (Lecturer), Dr. Milind Karapurkar (Asst Lecturer), Dr. Lavita D'Costa (Asst. Lecturer)
16.	01/10/2016	Newborn screening	Dr. Shanti . P D'Almeida	Dr. Chitra Y. Dhume (Prof & HOD), Dr. Jano Zore (Lecturer), Dr. Milind Karapurkar (Asst Lecturer), Dr. Lavita D'Costa (Asst. Lecturer)
17.	05/11/2016	Urine Analysis	Dr. Shanti . P D'Almeida	Dr. Chitra Y. Dhume (Prof & HOD), Dr. Carlos Noel Menezes (Asst Prof), Dr. Lavita D'Costa (Asst. Lecturer)
18.	10/12/2016	Microalbuminuria	Dr. Shanti . P D'Almeida	Dr. Chitra Y. Dhume (Prof & HOD), Dr. Manisha Audi (Assoc Prof), Dr. Tanuja Kamat (Asst Prof), Dr. Carlos Noel Menezes (Asst Prof), Dr. Jano Zore (Lecturer), Dr. Sudeep Lokapure (Lecturer), Dr. Milind Karapurkar (Asst Lecturer), Dr. Lavita D'Costa (Asst. Lecturer)

JOURNAL CLUBS:

Sr. No.	Date	TOPIC	NAME OF THE JOURNAL	PRESENTED BY	TEACHER'S ATTENDED
01.	07/07/2015	Creatinine Clearance and the Assessment of Renal function	Australian Prescriber Vol 24 No.1, 2001	Dr. Shanti . P D'Almeida	Dr. Chitra Y. Dhume (Prof & HOD), Dr. Carlos Noel Menezes (Asst Prof), Dr. Jano Zore (Lecturer), Dr. Sudeep Lokapure (Lecturer), Dr. Milind Karapurkar (Asst. Lecturer), Dr. Reshama Morje (Asst. Lecturer)
02.	15/09/2015	Quality standards for sample collection in coagulation testing	Seminars in Thrombosis and Haemostasis Vol 38, No. 6, 2012	Dr. Shanti . P D'Almeida	Dr. Chitra Y. Dhume (Prof & HOD), , Dr. Jano Zore (Lecturer), Dr. Sudeep Lokapure (Lecturer), Dr. Milind Karapurkar (Asst. Lecturer), Dr. Reshama Morje (Asst. Lecturer)
03.	20/10/2015	Stroke: Role of B vitamins, Homocysteine and Antioxidants	Nutrition Research Reviews Vol 22,2009 Page No 49-67	Dr. Shanti . P D'Almeida	Dr. Chitra Y. Dhume (Prof & HOD), Dr. Carlos Noel Menezes (Asst Prof), Dr. Sudeep Lokapure (Lecturer), Dr. Reshama Morje (Asst. Lecturer)
04.	24/11/2015	Mechanism of Male infertility :Role of Antioxidants	Current Drug Metabolism Vol 6, No. 5, 2005 Page No 495-501	Dr. Shanti . P D'Almeida	Dr. Chitra Y. Dhume (Prof & HOD), Dr. Manisha Audi (Assoc Prof), Dr. Tanuja Kamat (Asst Prof), Dr. Carlos Noel Menezes (Asst Prof), Dr. Jano Zore (Lecturer), Dr. Sudeep Lokapure (Lecturer), Dr. Milind Karapurkar (Asst. Lecturer), Dr. Reshama Morje (Asst. Lecturer)
05.	05/01/2016	Vitamin D and the athlete : Risk Recommendation and benefits	Nutrients Vol 5, 2013 Page No 1856-1868	Dr. Shanti . P D'Almeida	Dr. Chitra Y. Dhume (Prof & HOD), Dr. Manisha Audi (Assoc Prof), Dr. Tanuja Kamat (Asst Prof), Dr. Carlos Noel Menezes (Asst Prof), Dr. Jano Zore (Lecturer), Dr. Sudeep Lokapure (Lecturer), Dr. Milind Karapurkar (Asst. Lecturer), Dr.

					Reshama Morje (Asst. Lecturer), Dr.Mitchelle Menezes(Asst. Lecturer)
06.	09/02/2016	Review Article:Organ specific Tumor Markers: What's new?	IJCB Vol 27(2), April-June 2012 Page No 110-120	Dr. Shanti . P D'Almeida	Dr. Chitra Y. Dhume (Prof & HOD), Dr. Manisha Audi (Assoc Prof), Dr.Tanuja Kamat (Asst Prof),Dr. Carlos Noel Menezes (Asst Prof), Dr. Jano Zore (Lecturer), Dr. Sudeep Lokapure (Lecturer), Dr.Milind Karapurkar (Asst. Lecturer), Dr. Reshama Morje (Asst. Lecturer), Dr.Mitchelle Menezes(Asst. Lecturer)
07.	02/04/2016	Association of serum Ferritin levels with metabolic syndrome and subclinical coronary atherosclerosis in post menopausal women.	Clinica Chimica acta	Dr. Shanti . P D'Almeida	Dr. Chitra Y. Dhume (Prof & HOD), Dr. Manisha Audi (Assoc Prof), Dr.Tanuja Kamat (Asst Prof), Dr. Carlos Noel Menezes (Asst Prof), Dr. Jano Zore (Lecturer), Dr. Sudeep Lokapure (Lecturer), Dr. Reshama Morje (Asst. Lecturer)
08.	10/05/2016	Role of Zinc in Diabetes Mellitus, Oxidative stress and other human healthy : A review article	American Journal of research Communication Vol 1(11), 2013 Page No 411-426	Dr. Shanti . P D'Almeida	Dr. Chitra Y. Dhume (Prof & HOD), Dr.Tanuja Kamat (Asst Prof),Dr. Jano Zore (Lecturer)
09.	05/07/2016	Newborn screening in India: current perspectives	American Journal of research Communication Vol 47, 2010 Page No 219-224	Dr. Shanti . P D'Almeida	Dr. Chitra Y. Dhume (Prof & HOD), Dr. Manisha Audi (Assoc Prof), Dr. Carlos Noel Menezes (Asst Prof), Dr. Jano Zore (Lecturer), Dr. Sudeep Lokapure (Lecturer), Dr. Milind Karapurkar (Asst.Lecturer)
10.	04/10/2016	Trace element status in psoriasis of their relationship	Iranian journal of dermatology	Dr. Shanti . P D'Almeida	Dr. Chitra Y. Dhume (Prof & HOD), Dr. Manisha Audi (Assoc Prof), Dr.Tanuja Kamat (Asst Prof), Dr. Carlos Noel Menezes (Asst Prof), Dr. Jano

		with the severity of disease			Zore (Lecturer), Dr. Sudeep Lokapure (Lecturer), Dr. Milind Karapurkar (Asst.Lecturer), Dr.Lavita D'Costa (Asst.Lecturer)
11.	19/11/2016	Association between hypertriglyceridemia and protein oxidation and proinflammatory markers in normo cholesterolemic and hypercholesterolemic individual	Clinica Chimica Acta 2015	Dr. Shanti . P D'Almeida	Dr. Chitra Y. Dhume (Prof & HOD), Dr.Tanuja Kamat (Asst Prof),Dr. Carlos Noel Menezes (Asst Prof),Dr. Sudeep Lokapure (Lecturer), Dr. Milind Karapurkar (Asst.Lecturer) , Dr.Lavita D'Costa (Asst.Lecturer)
12.	06/12/2016	Review: Trehalose Metabolism: from Osmoprotection to signaling	International Journal molecular science Vol:10, 2009 Page No 3793-3810	Dr. Shanti . P D'Almeida	Dr. Chitra Y. Dhume (Prof & HOD), Dr.Tanuja Kamat (Asst Prof), Dr. Carlos Noel Menezes (Asst Prof), Dr. Jano Zore (Lecturer), Dr. Sudeep Lokapure (Lecturer), Dr. Milind Karapurkar (Asst.Lecturer), Dr.Lavita D'Costa (Asst.Lecturer)

CASE DISCUSSION:

Sr. No.	DATE	TOPIC	PRESENTED BY	TEACHER'S ATTENDED
1.	07/07/2015	Case of Phenylketonuria	Dr. Shanti . P D'Almeida	Dr. Chitra Y. Dhume (Prof & HOD), Dr. Carlos Noel Menezes (Asst Prof), Dr. Jano Zore (Lecturer), Dr. Sudeep Lokapure (Lecturer), Dr. Milind Karapurkar (Asst. Lecturer), Dr. Reshama Morje (Asst. Lecturer)
2.	15/09/2015	Case of Galactosemia	Dr. Shanti . P D'Almeida	Dr. Chitra Y. Dhume (Prof & HOD), , Dr. Jano Zore (Lecturer), Dr. Sudeep Lokapure (Lecturer), Dr. Milind Karapurkar (Asst. Lecturer), Dr. Reshama Morje (Asst. Lecturer)
3.	20/10/2015	Case of Fructose Intolerance	Dr. Shanti . P D'Almeida	Dr. Chitra Y. Dhume (Prof & HOD), Dr. Carlos Noel Menezes (Asst Prof), Dr. Sudeep Lokapure (Lecturer), Dr. Reshama Morje (Asst. Lecturer)
4.	24/11/2015	Case of Familial Hypercholesterolemia	Dr. Shanti . P D'Almeida	Dr. Chitra Y. Dhume (Prof & HOD), Dr. Tanuja Kamat (Asst Prof) Dr. Carlos Noel Menezes (Asst Prof), Dr. Jano Zore (Lecturer), Dr. Sudeep Lokapure (Lecturer), Dr. Milind Karapurkar (Asst. Lecturer), Dr. Reshama Morje (Asst. Lecturer)
5.	05/01/2016	Case of Classical Homocysteinuria	Dr. Shanti . P D'Almeida	Dr. Chitra Y. Dhume (Prof & HOD), Dr. Tanuja Kamat (Asst Prof), Dr. Carlos Noel Menezes (Asst Prof), Dr. Jano Zore (Lecturer), Dr. Sudeep Lokapure (Lecturer), Dr. Milind Karapurkar (Asst. Lecturer), Dr. Reshama Morje (Asst. Lecturer), Dr. Michelle Menezes (Asst. Lecturer)
6.	09/02/2016	Case of diabetes with hyperlipidemia	Dr. Shanti . P D'Almeida	Dr. Chitra Y. Dhume (Prof & HOD), Dr. Tanuja Kamat (Asst Prof), Dr. Carlos Noel Menezes (Asst Prof), Dr. Jano Zore (Lecturer), Dr. Sudeep Lokapure (Lecturer), Dr. Milind Karapurkar (Asst. Lecturer), Dr. Reshama Morje (Asst. Lecturer), Dr. Michelle Menezes (Asst. Lecturer)
7.	02/04/2016	Case of Glucose-6-Phosphate deficiency	Dr. Shanti . P D'Almeida	Dr. Chitra Y. Dhume (Prof & HOD), Dr. Tanuja Kamat (Asst Prof), Dr. Carlos Noel Menezes (Asst Prof), Dr. Jano Zore (Lecturer), Dr. Sudeep Lokapure

				(Lecturer), Dr. Reshama Morje (Asst. Lecturer)
8.	10/05/2016	Case of Hyperosmolar-Hyperglycemic nonketotic syndrome	Dr. Shanti . P D'Almeida	Dr. Chitra Y. Dhume (Prof & HOD), Dr.Tanuja Kamat (Asst Prof), Dr. Jano Zore (Lecturer)
9.	05/07/2016	Case of Gaucher's disease	Dr. Shanti . P D'Almeida	Dr. Chitra Y. Dhume (Prof & HOD), Dr. Carlos Noel Menezes (Asst Prof), Dr. Jano Zore (Lecturer), Dr. Sudeep Lokapure (Lecturer), Dr. Milind Karapurkar (Asst.Lecturer)
10.	04/10/2016	Case of Maple syrup urine disease	Dr. Shanti . P D'Almeida	Dr. Chitra Y. Dhume (Prof & HOD), Dr.Tanuja Kamat (Asst Prof), Dr. Carlos Noel Menezes (Asst Prof), Dr. Jano Zore (Lecturer), Dr. Sudeep Lokapure (Lecturer), Dr. Milind Karapurkar (Asst.Lecturer), Dr.Lavita D'Costa (Asst.Lecturer)
11.	19/11/2016	Case of Hyperammonemia	Dr. Shanti . P D'Almeida	Dr. Chitra Y. Dhume (Prof & HOD), Dr.Tanuja Kamat (Asst Prof), Dr. Carlos Noel Menezes (Asst Prof),Dr. Sudeep Lokapure (Lecturer), Dr. Milind Karapurkar (Asst.Lecturer) , Dr.Lavita D'Costa (Asst.Lecturer)
12.	06/12/2016	Case of Lactose Intolerance	Dr. Shanti . P D'Almeida	Dr. Chitra Y. Dhume (Prof & HOD), Dr.Tanuja Kamat (Asst Prof), Dr. Carlos Noel Menezes (Asst Prof), Dr. Jano Zore (Lecturer), Dr. Sudeep Lokapure (Lecturer), Dr. Milind Karapurkar (Asst.Lecturer), Dr.Lavita D'Costa (Asst.Lecturer)

CONFERENCES

Dr. Shanti Priyadharsini D'Almeida attended following conferences

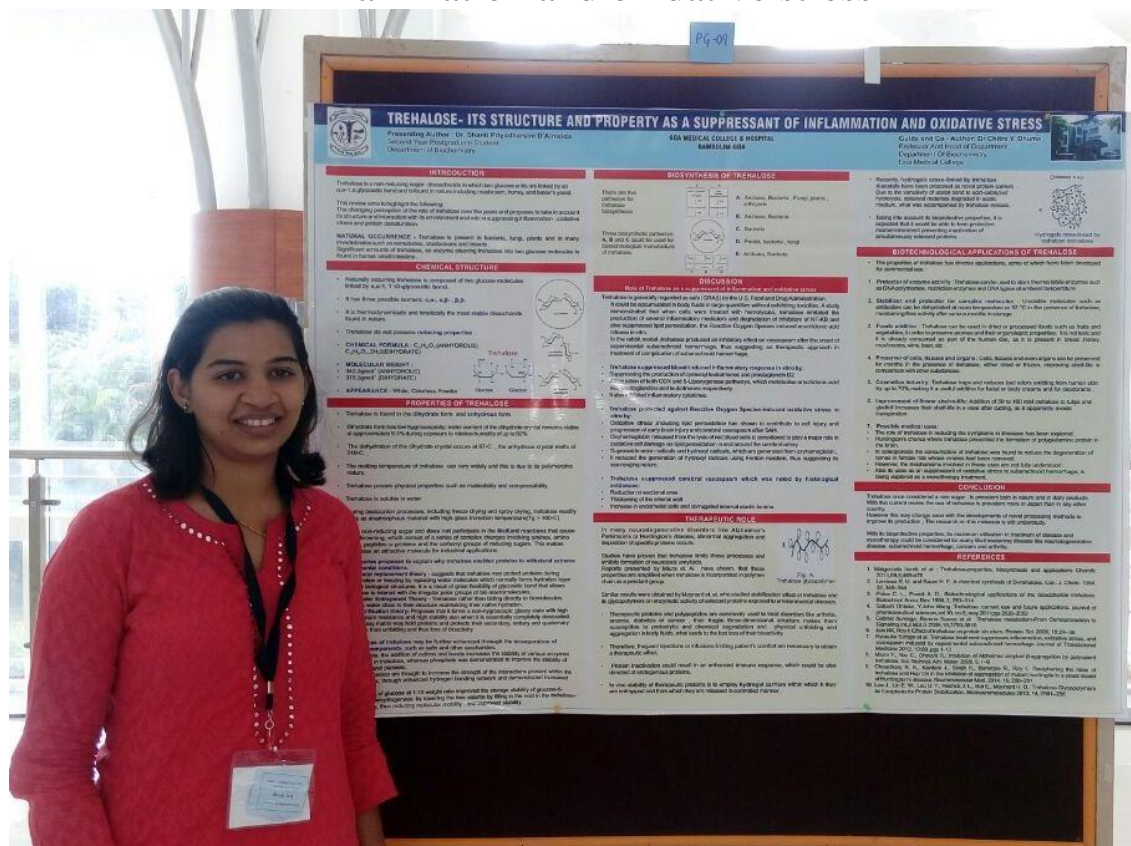
1. 03/10/2015 to 04/10/2015 – GIMACON GOA 2015

2. 22/09/2016 to 24/09/2016 -- 4th State level conference of Association a Medical Biochemist, Karnataka chapter at KLE, Belgavi.

Presented Poster

Topic: -

Trehalose – Its structure and property as a suppressant of inflammation and oxidative stress



3. 24/09/2016 to 25/09/2016 -- GIMACON GOA 2016

4. 13/12/2016 to 15/12/2016 – ACBICON 2016 (43rd National Conference of Association of Clinical Biochemists of India) at Dr. T M A Pai International Convention Centre, Kasturba Medical College, Mangaluru



5. 10/08/2017-12/08/2017- MediACE 2017 at Shrimati Kashibai Navale Medical College and General Hospital Narhe, Pune
Presented Paper

Topic:-

Homocysteine in Risk Prediction for Coronary Heart Disease in Postmenopausal Women

M.D. SYLLABUS: THEORY

- Paper I** : Biophysical and Bio organic Chemistry
Biochemical Techniques
- Paper II** : Fundamental Biochemistry.
Intermediary Metabolism.
Biochemistry of special tissues.
- Paper III** : Cell Biology; Membrane biochemistry.
Molecular Biology, Metabolism of Aging.
Cancer, Neurochemistry Immunology.
- Paper IV** : Clinical Biochemistry
Nutrition
Hormones
Occupational Hazards
Recent advances.

PAPER – I

1. Acid, bases, pH, buffers, titrations.
2. Oxidation- reductions, redox potentials
3. Elementary concepts of thermodynamics, reaction kinetics, bioenergetics
4. Nature of chemical bonds: - hydrogen bonds, Vander-walls forces, hydrophobic interactions, covalent and coordinate covalent bonds, electrovalency etc(water, solutions, colloids/ crystalloids).
5. Configuration and conformations of molecules, optical and geometrical isomerism, elementary concepts of mechanisms of organic reactions
6. Isotopes: - chemistry, use in biochemical research, diagnostic and therapeutic uses. Principles and methods of liquid scintillation counting. Radiation hazards
7. Techniques and applications:-
Spectrophotometry:-abs. UV. Vis. Flame photometry-atomic absorption spectrophotometry, NMR,
E.S.R. Centrifugation – differential, gradient and analytical ultra centrifugation Chromatography: -
Principles and techniques, partition, adsorption, molecular exclusion, ion exchange, affinity, HPLC.

Electrophoresis- principles and techniques (paper, starch gel, agarose gel and advanced electrophoretic methods). PAGE, SDS-PAGE, Isoelectric focusing, 2D electrophoresis. Molecular weight determination (Macromolecules) - by analytical ultracentrifugation, gel filtration, SDS-PAGE

Tissue culture: techniques and applications

PAPER- II

1. Biochemistry of Carbohydrates
2. Biochemistry of Lipids: introduction to membrane
3. Biochemistry of Protein : primary, secondary, tertiary and quaternary structures, conformations, denaturation, end group of analysis, sequencing of proteins, separation and purification, peptide synthesis, X-ray diffraction techniques of Hemoglobin and myoglobin
4. Chemistry of Nucleic acids:
5. Enzymes: Basic concepts, units, kinetics, inhibitions, allosteric modification, covalent modifications, purification methods, mechanisms of enzymes reactions, lysozyme, chymotrypsin, carboxypeptidase, ribonuclease etc. co-enzymes, isoenzymes. Immobilized enzymes.
6. Intermediary metabolism
7. Biochemistry of special tissues: CSF, Bones, Muscles, Nerves

PAPER-III

1. Ultra structure of cell: sub cellular organelles, microtubules, intermediate filaments, eukaryotes and prokaryotes
2. Models of biological membrane: membrane transport, channels, Na^+ - K^+ ATPase, Na^+ channel, Ca^{++} channel (detailed study), artificial membranes, ionophores, gap junctions, cell-cell interaction, signal transduction
3. Molecular biology: general concepts of genes, genetic code, DNA polymerases, types of RNA, structure of RNA transcription, protein biosynthesis, regulation of gene expression, restriction endonucleases, genetic engineering, replication of DNA and RNA viruses, transformations, conjugation and transduction, oncogenes.
4. Neurochemistry: Ultrastructure of synapse, generation and propagation of nerve impulses, synaptic transmission, neurotransmitter biosynthesis, degradation and turn over studies, detailed study of acetylcholine, adrenergic GABA receptors, mono amine and peptide neurotransmitters, Neurohormones
5. Immunology: Immune system, immune response, structure, classification and functions of immunoglobins, complements, hypersensitivity reactions, genetic diversity of antibody molecules, immunological techniques

PAPER- IV

Clinical Biochemistry:

Basic concepts in laboratory investigations, quality control

Diagnostic enzymology- an exhaustive account

Inborn errors of metabolism involving amino acid, carbohydrate, lipid, purine, pyrimidine and porphyrins metabolism

Diabetes mellitus and its metabolic implications

Plasma lipoproteins in health and diseases

Liver function tests, biochemical findings and clinical correlation, jaundice, hepatic coma

Kidney function tests- biochemical parameters and clinical correlations

Pancreatic function tests

Gastric function tests

Abnormal Hemoglobin's, anemia's

Diagnostic immunology

Disorders of calcium and phosphorus metabolism

Electrolytes, water and acid base balance- their disturbances

Biochemical aspects of cancer, tumor markers

Composition of CSF, alteration in diseases

Nutrition

1. Detailed account of chemistry and biochemical roles of fat soluble and water soluble vitamins, requirements source and deficiency symptoms. Hypervitaminosis
2. Detailed account of metabolism of principal trace elements
3. Energy metabolism- BMR, RQ, energy requirement at different stages, balanced diet. Diet planning in health and diseases
4. Protein, carbohydrate and fat requirements, RDA, Biological values of proteins. Protein energy malnutrition
5. Malabsorption syndromes, parenteral nutrition

Hormones: Endocrines- A detailed account of chemistry and regulatory role of hormones secreted by pituitary, pancreas, adrenal, thyroid, parathyroid and gonads. Molecular mechanism of hormone action, receptors, GIT hormones, endocrine disorders. Methods of assay and clinical interpretations. Occupational Hazards Recent advances

First Year MD:

Demonstrate his/her understanding of the:-

Biophysical and Bio organic Chemistry

Biochemical Techniques

Fundamental Biochemistry

Cell Biology

Membrane Biochemistry

Biochemical techniques

Occupational Hazards

Second Year MD

Demonstrate his/her understanding of the:-

Metabolism

Intermediary Metabolism

Biochemistry of special tissue

Neurochemistry

Immunology

Cancer

Biochemistry of Ageing

Third year MD

Demonstrate his/her understanding of the:-

Clinical Biochemistry

Recent advances

Hormones

Nutrition

Biostatistics

M.D. PRACTICALS

- Analytical and separation techniques:-

Flame photometer:- determination of Na^+ , K^+ , Cl^{++}

- Separation techniques:-

Isolation of mitochondria from rat liver...demonstration.

Polyacrylamide gel electrophoresis: denaturing and non-denaturing gels

Determination of molecular weight of protein by SDS- PAGE

- Clinical Biochemistry:-

Estimation of:

- a) Glucose- glucose oxidase and O- toluidine method
- b) Blood urea
- c) Blood uric acid
- d) Serum creatinine
- e) Cholesterol/ HDL cholesterol/ Lipidogram
- f) Albumin/Globulin ratio
- g) Calcium in serum
- h) Flame photometry: - determination of Na^+ , K^+ .
- i) Serum Bilirubin
- j) Alkaline/Acid Phosphatase
- k) SGOT/SGPT
- l) LDH isoenzymes
- m) Serum amylase- Somogyi / dye method
- n) Fe, Fe binding capacity
- o) Lipoproteins electrophoresis
- p) 17- Ketosteroids
- q) Creatinine clearance
- r) Urea clearance
- s) CSF analysis

Recommended Books

Sr. No.	Title of the Book	Author	Publisher
1	Varley's Practical clinical – latest edition	Guwnelock	-----
2	TB of Medical Biochemistry – 7 th edition	Chatterjea	Jaypee
3	Biochemistry	Pankaja Naik	Jaypee
3	TB of Biochemistry for Medical Students – 5 th edition	Vasudevan	--do--
4	Practical clinical Biochemistry 3 rd edition	Ranjna Chawla	--do--
5	TB of Biochemistry 2 nd edition	Pattabiraman	All India publisher distribution

Reference Books

Sr. No.	Title of the Book	Author	Publisher
1	Varley's Practical clinical – latest edition	Guwnelock	-----
2	TB of Medical Biochemistry – 7 th edition	Chatterjea	Jaypee
3	TB of Biochemistry for Medical Students – 5 th edition	Vasudevan	--do--
4	Biochemistry for Physiotherapy & allied health sciences students 2008	Shetty	--do--
5	Clinical Biochemistry 1 st edition	Maheshwari	--do--
6	Practical clinical Biochemistry 3 rd edition	Ranjana Chawla	--do--
7	Practical TB of Biochemistry for Medical Students- latest edition	DM Vasudevan & Subir Kumar Das	--do--
8	Biochemistry for Nurses – 2 nd edition 2004	Anthikad	--do--
9	Tietz Fundamentals of clinical chemistry – latest edition	Carl Burtis	Saunders
10	Tietz Fundamentals of clinical chemistry & molecular diagnostics– latest edition	Carl Burtis	Elsevier
11	Cell Biology- 2 nd edition	Pollard	--do--
12	Medical Biochemistry 2 nd edition	Baynes	--do--
13	Clinical Chemistry- 5 th edition	Marshall	--do--
14	Medical Genetics- 3 rd edition	Jorde	--do--
15	Biochemistry Illustrated – 5 th edition	Campbell	--do--
16	Clinical Chemistry made easy- 1 st edition	Hughes	--do---
17	Practical Biochemistry for Medical Students- latest edition	Rajagopal G & Ramakrishnan S	Medical Sciences-

			Universities Press
18	TB of Medical Biochemistry – 3 rd edition	Ramakrishnan S ,Rajan R & Prasannan KG	--do--
19	Short Introduction to Biomedical Engineering	Sarbadhikari SN	--do--
20	Lippincott's illustrated reviews: biochemistry 4 th edition	Champe	Wolter Kluwer/ Lippincott Williams & Wilkins
21	Clinical Chemistry: Techniques, Principles, Correlations 7 th edition	Bishop	--do--
22	Mark's essentials of Medical Biochemistry, A clinical approach	Lieberman	---do---
23	Cell and Molecular biology – latest edition	EDP De Robertis & EMF De Robertis Jr	Lea & Febiger
24	Biochemistry – latest edition	Lubert Stryer	WH Freeman & company
25	Harper's Illustrated Biochemistry – 28 th edition	RK Murray, Daryl Granner, K Botham	Mc Graw Hill
26	Lehninger Principles of Biochemistry – 6 th edition	Lehninger	Vikas Publishers
27	TB of Biochemistry with Clinical correlations – 6 th edition	Devlin	Vikas Publishers
28	Basic Separation Techniques in Biochemistry – 1 st edition	R O Oketere	New Age
29	TB of Biochemistry 2 nd edition	Pattabiraman	All India publisher distribution
30	Harper's Illustrated Biochemistry – 28 th edition	RK Murray, Daryl Granner, K Botham	Mc Graw Hill
31	Cell biology, genetics molecular biology evolution and ecology 1 st edition	P S Verma V K Agarwal	S. Chand
32	Handbook of spectroscopy	Dinesh Sharma	Int Scientific Pub Acad
33	MCQ in biochemistry	G. Vidyasagar	New Age Int pvt ltd
34	Biotechnology demystified	Walker	Mc Graw hill
35	Lange case files biochemistry	Toy	-do-
36	Basic and clinical endocrinology	Green span	-do-
37	Basic concepts in medical genetic	Horwitz	-do-
38	Biochemistry & Genetics	Ingram- Smith	-do-

39	Abnormal laboratory results	Kellerman	-do-
40	Manual of Laboratory & diagnostic tests	Wilson	-do-
41	Lange Flash cards Biochemistry and Genetics	S J Baron C Lee	Jaypee
42	USMLE road map: Biochemistry	R McDonald W Chaney	-do-
43	Deja review Biochemistry	SM Manzuel	-do-
44	T B of Medical Biochemistry	Dinesh Puri	Elsevier
45	Pharmaceutical Organic Chemistry	J Dharuman	AITBS
46	MCQs in Biochemistry	D C Sharma	-do-
47	Viva Voce in Biochemistry	D C Sharma	-do-
48	Biochemistry and Clinical Pathology	N Kumar	-do-
49	Handbook Of Biochemistry	U N Panda	-do-
50	Textbook of Biochemistry	K Rambabu	-do-
51	Fundamentals of Biochemistry	-do-	-do-
52	MTF in Biochemistry	-do-	-do-
53	TB of Biochemistry for Nurses	Ashok Kumar	IK International
54	Practicals & Viva in Medical Biochemistry	Dandekar	Elsevier
55	Clinical Biochemistry	A Gaw, M J Murphy	-do-
56	Clinical Chemistry	Bishop, Fody	Lippincott, Williams and Wilkins
57	Foye's Medicinal Chemistry	Lemke, Williams	-do-
58	Manual of Clinical Biochemistry	Manipal	Vikas
59	Biochemistry	Naik	-do-
60	Integrated Biochemistry	Pelley	-do-
61	Practical Biochemistry	Rajgopal	-do-
62	T B of Medical Biochemistry	Ramkrishnan	-do-
63	Biochemistry	Satyanarayana	-do-
64	Essentials of Biochemistry	-do-	-do-
65	Biochemistry & Molecular Biology	Swanson	-do-
66	Principles of Medical Biochemistry	Gerhard Meisenberg	-do-
67	Viva in Biochemistry	Pattabiraman	National Book Depot
68	Biochemistry & Genetics	Pretest	-do-
69	Molecular Cloning : A laboratory manual	J Sambrook, E. F. Fritsch & T. Maniatis	Cold Spring harbor laboratory press
70	Henry's clinical Diagnosis and Management by Laboratory Methods	Richard McPherson Pinup	Elsevier

MD BIOCHEMISTRY (SCHEME OF EXAMINATION)

A. Theory Examination

<u>Paper I</u>	: Biophysical and Bio organic Chemistry Biochemical Techniques	100 marks
<u>Paper II</u>	: Fundamental Biochemistry. Intermediary Metabolism. Biochemistry of special tissues.	100 marks
<u>Paper III</u>	: Cell Biology; Membrane biochemistry. Molecular Biology, Metabolism of Aging. Cancer, Neurochemistry Immunology.	100 marks
<u>Paper IV</u>	: Clinical Biochemistry Nutrition Hormones Occupational Hazards Recent advances.	100 marks

B. Practical Examination **400 marks**

I. Practical I	180 marks
a) Long case	60 marks
b) Long case	60 marks
c) Long case	60 marks

II. Practical II	120 marks
• Reagent preparation	20 marks
• Short case	40 marks
• Short case	40 marks
• Micro Teaching	20 marks

C. Oral Examination	100 marks
Viva Voce – 80 marks	Dissertation Discussion 20 marks

TOTAL MARKS IN BIOCHEMISTRY **400 Marks Theory**

400 Marks Practicals

MD Biochemistry Paper I (100 marks)

Q.I Long question 26 marks

Q.II Long question 26 marks

Q.III Write Notes on 24 marks

a)

b)

c)

Q.III Write Notes on 24 marks

a)

b)

c)

MD Biochemistry Paper II (100 marks)

Q.I Long question 26 marks

Q.II Long question 26 marks

Q.III Write Notes on 24 marks

a)

b)

c)

Q.III Write Notes on 24 marks

a)

b)

c)

MD Biochemistry Paper III (100 marks)

Q.I Long question 26 marks

Q.II Long question 26 marks

Q.III Write Notes on 24 marks

a)

b)

c)

Q.III Write Notes on 24 marks

a)

b)

c)

MD Biochemistry Paper IV (100 marks)

Q.I Long question 26 marks

Q.II Long question 26 marks

Q.III Write Notes on 24 marks

a)

b)

c)

Q.III Write Notes on 24 marks

a)

b)

c)