UNDERGRADUATE CURRICULUM

GOAL

The broad goal of the teaching of undergraduate students in biochemistry is to make the students understand the scientific basis of the life processes at the molecular level and to orient them towards the application of the knowledge acquired in solving clinical problems.

EDUCATIONAL OBJECTIVES OF BIOCHEMISTRY DEPARTMENT

GOA MEDICAL COLLEGE, GOA

1. To sensitize the upcoming doctors to the absolute truth that normal function and disease alterations are dependent upon bio-molecules.

2. The students are given a basic input of various metabolic processes and nutrition. A foundation is laid in the young minds to think about medicine in terms of molecular biology.

3. To expose the students to laboratory work and understanding fundamental analytical tests – with a positive bias towards clinical applied problems.

4. To update students with trends and advances, so that their research interest in awakened.

5. The entire study of Biochemistry is geared to broadly cover all aspects with particular reference to diagnostics, enzymology, inborn errors and evaluation of various function tests.

SKILLS

At the end of the course, the student should be able to:

(1) make use of conventional techniques/instruments to perform biochemical analysis relevant to clinical screening and diagnosis;

(2) analyze and interpret investigative data;

(3) demonstrate the skills of solving scientific and clinical problems and decision making

INTEGRATION

The knowledge acquired in biochemistry should help the students to integrate molecular events with structure and function of the human body in health and disease.

METHODOLOGY

(For duration of the entire course)

		Duration	No	Total Hours
1)	**Didactic Lectures**	1 hour	126	126hrs
2)	**Demonstrations**	2 hours	05	10 hrs
3)	**Tutorials**	45 mins	24	18 hrs

4) **Seminars conducted during the year**

(Number of students attending each): 150 students are attending the seminar in Biochemistry

	Duration	No	Total Hours
Seminar	1hr	02	02
Elective seminars	3 hrs	01	03

(Genetics)

15 students per batch

5) **Practical**

Duration	No	Total Hours
3 hours	32	96 hrs

6) **Any other teaching/training activities :**

	Duration	**No**	**Total Hours**
Quiz	1 hr	03	03
Slide sessions	1 hr	03	03

Total Teaching hours ---- 261 hrs

7) Integrated teaching at horizontal level

8) Records Methods of Assessment thereof :

1) Student card system

2) Day today Assessment

3) Periodic Test --- theory and practicals

4) Quiz and semester examinations

TEACHING SCHEDULED PROGRAMME 1ST MBBS FOR THE YEAR 2017-2018 IN THE DEPARTMENT OF BIOCHEMISTRY

August 2017 - Functions of water, Cell structure & its functions, Cell fractionation, Carbohydrate Chemistry, Physical chemistry, Lipid Chemistry and Prostaglandins, Protein Chemistry and Plasma proteins

September 2017- Separation techniques-Electrophoresis & Chromatography, Nucleoproteins Chemistry and Enzymes

October 2017- Fat soluble Vitamins, Digestion & Absorption, Detoxification, Hemoglobin & Myoglobin, Radioisotopes, GFT

November 2017- Water soluble vitamins, LFT, Occupational Hazards, Bioenergetics & Biological oxidation, TFT

December 2017 - Lipid Metabolism, Genetics

January 2018- Diet & Nutrition

February 2018 – Carbohydrate metabolism, Integration of Metabolism, Mineral metabolism & Protein metabolism, RFT

March 2018 - Alcohol metabolism, Nucleotide Metabolism, Obesity & Starvation, Immunoglobulins, Acid base balance, Water and electrolyte balance

April 2018 - Oncogenes, Free radicals & Antioxidants,

May 2018 –Self Study

Demonstrations: pH Meter, Ostwald's Viscosimeter, Traube's Stalagmometer, Laurent's Polarimeter, Flame photometer, Spectroscope, Colorimeter, Electrophoresis, Chromatography and GTT

Oral Viva & Written Test – one per month

Quizzes- Water, Cell, Physical Chemistry, Carbohydrate chemistry and Metabolism, Lipid Chemistry and Metabolism, Protein Chemistry and Metabolism, Nucleotide Chemistry and metabolism, Separation techniques, Enzymes, Vitamins, Digestion and Absorption, Haemoglobin and Myoglobin, Bioenergetics & Biological oxidation, RFT, Alcohol Metabolism, Genetics

Seminars- Genetics, DNA Probes.

Practical schedule- Practicals held on Monday, Wednesday & Friday

(2 pm to 5 pm)

Topics

1. Monosaccharides
2. Disaccharides
3. Polysaccharides
4. Unknown Carbohydrates, Proteins & substances of Biomedical importance
5. Physical Chemistry
6. Chemistry of Lipid
7. Chemistry of Proteins

   (Colour reactions and Precipitation tests, Albumin, Globulin, Peptones & Proteoses, Casein)
8. Chemistry of Gastric juice
9. Lambert-Beer's law, Spectroscopic examination of Blood
10. Quantitative estimations of Blood Sugar, Cholesterol, Proteins, Albumin, Globulin, SGOT,SGPT, Blood Urea, Serum Creatinine, Serum Chloride, Calcium, Amylase, Phosphorus, Uric acid, Bilirubin, Alkaline Phosphatase, Urinary Glucose.
11. Normal & Abnormal constituents of Urine
12. CSF Examination
13. Case studies
14. Spotters

COMMON TIME TABLE FOR FIRST MBBS

2017-2018 BATCH

Day	9-10am	10-11am	11am-11.15am	11.15-12.15	12.15-1.15pm	1.15-2pm	2-5pm
Monday	Biochemistry Lecture	Physiology Lecture	B	Histology Practicals Demonstration		L	Physio/Biochem Practicals
Tuesday	Physiology Lecture	Biochemistry Lecture	R	Anatomy Lecture	Physiology Lecture	U	Anatomy Dissection
Wednesday	P. S. M. Lecture	Physiology Lecture	E	Histology Practicals Demonstration		N	Physio/Biochem Practicals
Thursday	Biochemistry Lecture	Anatomy Lecture	A	Physiology Lecture	Biochemistry Lecture	C	Anatomy Dissection
Friday	Anatomy Lecture	Anatomy Lecture	K	Histology Practicals Demonstration		H	Physiol/Biochem Practical
Saturday	Physiology Lecture	Anatomy Lecture	No break	Anatomy Lecture	P. S. M. Lecture		

Note:- No break of 15 minutes duration i.e. 11-11.15am on saturday

PAPER FORMAT
1st MBBS Examination
Biochemistry (Paper I)

Duration: 3 Hours **Max Marks- 50**

Instructions:

1) All answer to be written in answer books for section I & II separately.
2) No negative marking for MCQ, overwriting will not secure marks.
3) Draw structures and diagrams wherever required.
4) Figures to right indicates full marks.
5) Question paper to be returned along with Answer Books.

SECTION I

1. Applied biochemistry question as five problems from:- **2 x 5 = 10**

a) Carbohydrates
b) Enzymes/Isoenzymes
c) Proteins and amino acids
d) Hemoglobin/L.F.T
e) Occupational Hazards/R.F.T

2. Write on any four (out of five) **2.5x4=10**
Cell-Cell membrane, Cell components, pH, buffers, G.F.T
L.F.T, R.F.T, Enzymes, Isoenzymes, Co-enzymes

3. Write notes on any two (out of three) **2.5x2=5**
Seperation techniques, Haemoglobin
Chemistry of proteins and amino acids
Chemistry of carbohydrates

SECTION II

4. Write notes on any four (out of five) **2.5x4=10**
Carbohydrate metabolism and its regulation and inborn errors

5. Write briefly on any four (out of five)
Protein metabolism/amino acids/inborn errors **2.5x4=10**

6. Multiple choice questions/objective: **0.5x10=5**
a) Draw in mixed pattern from paper I Syllabus

PAPER FORMAT
1st MBBS Examination
Biochemistry (Paper II)

Duration: 3 Hours **Max Marks- 50**

Instructions:

1) All answer to be written in answer books for section I & II separately.
2) No negative marking for MCQ, overwriting will not secure marks.
3) Draw structures and diagrams wherever required
4) Figures to right indicates full marks.
5) Question paper must to be returned along with Answer books.

SECTION I

1. Applied biochemistry as five problems on the following **2 x 5 = 10**
Nutrition
Vitamins
Nucleic acids
Genetics
Acid base balance/water and electrolyte balance
Minerals, Purines & Pyrimidines metabolism/biological oxidation

2. Write on any four (out of five) **2.5x4=10**
Nutrition and malnutrition
Minerals and trace elements
Biological oxidation and oxidative phosphorylation & bioenergetics
Chemistry of Nucleic acids and biological free and nucleotides
Chemistry of lipids

3. Write notes on any two (out of three) **2.5x2=5**
Acid base balance, water electrolyte balance
Immunoglobulins/Vitamins
Purines & Pyrimidines metabolism & inborn errors

SECTION II

4. Write notes on any four (out of five) **2.5x4=10**
Lipid Metabolism and its regulation & inborn errors

5. Write briefly on any four (out of five) **2.5x4=10**
a) Nucleic acids metabolism/genetics

6. Multiple choice questions/objectives **0.5x10=5**
a) Draw in mixed pattern from paper II Syllabus

M.B.B.S.(SCHEME OF EXAMINATION)

A. Theory Examination

1. Paper I	50 marks
2. Paper II	50 marks
3. Internal Assessment	20 marks
4. Theory Viva	20 marks
Total Marks	140 marks

B. Practical Examination

Question 1	15 marks
Question 2	10 marks
Question 3	10 marks
SPOTS	05 marks
Internal Assessment	20 marks
Total Marks	60 marks
Total (Theory & Practical)	200 marks

Recommended text books for 1st M.B.B.S (2017-18)

THEORY

1.	Biochemistry **(4TH edition)**	Pankaja Naik
2.	Text book of Biochemistry for Medical Students	M. Rafi
3.	Text books of Medical Biochemistry **(8th edition)**	M.N.Chatterjee & Rana Shinde
4.	Text book of Biochemistry for Medical Students **(7th edition)**	D.M. Vasudevan & Shree Kumari S.
5.	Text book of Harper's illustrated Biochemistry **(29th edition)**	R.K. Murray, Daryl Granner. V.W.Rodwell

REFERENCE BOOKS

1. Test book of Biochemistry ……. Lehninger
2. Biochemistry ……. Stryer

PRACTICAL

1.	Manual of Practical Biochemistry for MBBS	S. K. Gupta, Veena Singh Ghalaut, Anju Jain