

NOTIFICATION – 38-ACM/01/2020 dtd. 14.05.2020

Sub: Amendments in curriculum of M.Sc. Medical Biochemistry

Ref: Resolution of the Academic council at its 38th meeting held on 27.04.2020, vide agenda-07

The Academic Council at its 38th meeting held on 27.04.2020 and subsequently the Board of Management at its 49th meeting held on 30.04.2020 have accepted the proposal for amendments in the existing syllabus of M.Sc. Medical Biochemistry course.

Existing	Now Amended
<p>6) <i>Eligibility of Student:</i> M.B.B.S.; or B.Sc. with Chemistry /Biology/ Zoology / Botany / Biotechnology from a recognized institution.</p> <p>7) <i>Number of Admissions/ Student-Teacher Ratio:</i> The number of students to be admitted for <i>MSc Medical Biochemistry</i> together with <i>MD Biochemistry</i> shall be 1 P.G. per each eligible PG teacher.</p>	<p>6) <i>Eligibility of Student:</i> Bachelors degree in Life sciences/ Health sciences from a recognized Institution.</p> <p>7) <i>Number of Admissions / Student-Teacher Ratio:</i> The number of students to be admitted for <i>MSc Medical Biochemistry</i> together with <i>MD Biochemistry</i> shall be 2 P.G.s per each eligible PG teacher.</p>

Existing	Now Amended
<p>18) <i>Tuition Fees:</i> <i>Rs 1 lakh / annum</i></p>	<p><i>Rs 75,000/ annum</i></p> <p><i>Addition of fees for 2 electives to the tuition fees; Rs 2000 for each elective; 1 elective per year</i> <i>Total tuition fee to be 77,000/ annum</i></p>

ii) To correct the typographic errors and match numbering of headings and subheadings given under regulations and curriculum with that given in contents page (Ref: page no. 1 of Regulations and Curriculum for MSc Medical Biochemistry).

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iii) The following change was recommended in Methodology for Final year MSc (Medical Biochemistry) (Ref: page no. 4 of Regulations and Curriculum for MSc Medical Biochemistry):

Existing methodology	Now Amended
<p>6. Specialized training in Clinical Biochemistry: 1 month posting in the clinical biochemistry laboratory to learn sample collection, quality control methods, setting up of a clinical biochemistry laboratory, specialized assays, statistical analysis of data.</p>	<p>To increase the duration of training as: 6. Specialized training in Clinical Biochemistry: 1 month posting in each year of 2nd and 3rd year MSc, in the clinical biochemistry laboratory to learn sample collection, quality control methods, setting up of a clinical biochemistry laboratory, specialized assays, statistical analysis of data.</p>

iv) The following change was recommended in Final year MSc Medical Biochemistry (2nd and 3rd years) Theory syllabus.

Existing topic	Now Amended
Nil	Addition of topic- Environmentally sustainable good laboratory practices (as the last topic under Theory Paper III- Clinical Biochemistry and Nutrition)

v) The following changes were recommended in Final year MSc Medical Biochemistry (2nd and 3rd years) Practical syllabus.

General Experiments			
Expt No.	Days	Existing topic	Now Amended
7	3	Periodate oxidation of sugars	Deletion
8	2+2	Chromatography of carbohydrates: (using honey and other sugars) a) Paper b) Thin layer	Deletion of terms– using honey and other sugars
9	3	Analysis of honey	Deletion
13	4	Preparation of glucose- 1-phosphate from potato	Deletion
17	4	Reactions of lipids, saponification value, iodine number	Deletion
18	3	Isolation of cholesterol from goat brain/ Reactions of cholesterol	Deletion
19	3	Isolation of phospholipids from egg yolk	Deletion
20	3	TLC of lipids in plasma and rat brain	Deletion of terms – and rat brain

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21	2	Analysis of Milk Estimation of Lactose- Folin wu method Alkaline phosphatase activity	Deletion	
22	3	Isolation and estimation of DNA from spleen: effect of temperature on DNA	Modifying as: Isolation and estimation of DNA from tissues/blood: effect of temperature on DNA	
7	4	Estimation of Antioxidant activity Ferric reducing ability of plasma (FRAP) method DPPH (2,2-diphenyl-1-picryl-hydrazyl-hydrate) method	Addition	
	2	Spectrofluorometric analysis – screening for serum fluorescent advanced glycation end products (AGEs).	Addition	
Experiments for Demonstration				
<i>Molecular biology experiments:</i>				
	3	Polymerase Chain Reaction- PCR (conventional and real time)	Addition	
	4	Blotting techniques –Western and Southern	Addition	
	1	microRNA (miRNA)	Addition	
	2	Complementary DNA (cDNA)	Addition	
<i>Mass spectrometry-based Proteomics and Metabolomics:</i>				
	3	LCMS/ MS	Additions	
	2	High pressure liquid chromatography		
	2	Fourier-transform infrared spectroscopy (FTIR)	Addition	
Clinical investigations				
Expt. no	Days	Existing topics	Now Amended	
23	2 1 1	Blood sugar : • Folin- Wu method • O – Toluidine method • Glucose oxidase method	Deletion of O-Toluidine method	
24	2 2 2	Blood Urea - Diacetyl monoxime method ❖ Urease Nesslerization method ❖ Enzymatic method	Deletion of Urease Nesslerization method	

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27	3	Serum proteins	Deletion of
	2	❖ Lowry's method (including preparation of Folin's reagent	Albumin –Dye binding method
	1	❖ Biuret (Total and A/G)	Zinc sulphate turbidity
	1	❖ Albumin–Dye binding method	
	2	❖ Zinc sulphate turbidity	
	2	❖ Electrophoresis a) Agar Gel	
	2	b) Polyacrylamide Gel filtration	
29	2	Urine nitrogen by Kjeldahl method	Deletion
42	2	LDH a) Spectrophotometric method	Deletion of Isoenzyme separation
		b) Isoenzyme separation	
43	3	Lipid Profile: Total lipids	Deletion of Total lipids, phospholipids and Lipoprotein electrophoresis
	4	Cholesterol-Free & Ester	
	2	Triglyceride	
	2	Phospholipids	
	2	LDL and HDL	
	2	Lipoprotein electrophoresis	
44	1	Plasma Vitamin A	Deletion
46	2	Plasma Vitamin E	Deletion
Clinical Investigations to be added			
	10	Screening tests for Inborn errors of metabolism (IEM)	Addition
	10	Toxicology screening tests (Kit methods)	Addition
	2	ELISA (TSH)	Addition
Cell Fractions and Enzymes			
Expt. No.	Days	Existing topics	Proposed change
49	15	Factors effecting enzyme activity	Deletion of-
		a) Enzyme concentration	e) Inhibitors
		b) Substrate concentration	
		c) pH	
		d) Temperature	
		e) Inhibitors	
50	15	Purification of enzymes	Deletion
	3	Cytotoxicity and survival assays invitro	Addition
Training in Clinical Biochemistry Lab			
	Duration in days	Existing topics	Now Amended
	15	Plasma Iron and Iron binding	Modify as: Routine and specialized assays in clinical


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	Capacity Plasma sodium and potassium Urinary 17 ketosteroids Urinary V.M.A estimation. Stone analysis	biochemistry lab, sample collection methods, quality control methods, statistical analysis of data and setting up of clinical biochemistry laboratory. Days- 30 each in 2 nd and 3 rd years	
Postings in Microbiology and Hematology lab sections			
	Duration in days	Existing	Now Amended
	Nil	Nil	Addition of posting in microbiology section of central lab to observe routine culture methods and serological testing for common blood borne diseases. Duration: 7 days
	Nil	Nil	Addition of posting in blood bank and hematology sections of central lab to observe routine methods and testing. Duration: 7 days

vi) The following changes were recommended in the curriculum of Final year MSc (Medical Biochemistry) (Ref: page no. 3 of Curriculum for MSc Medical(Biochemistry):

Existing criteria	Now Amended	Duration
Nil	Addition of "Basic Course in Bio-medical Research", online course available on SWAYAM portal (recommended by MCI for Medical Postgraduates 2019 batch onwards).	8 weeks

Existing	Proposed change	Duration
Nil	Addition of electives; any two electives can be selected by student from the list of nine electives; one elective in each year of final MSc course (i.e. in 2 nd and 3 rd years).	7 days for each elective


Objectives: They are given for each elective as follows-

Sl. no.	Elective subject	Learning objectives	Learning outcomes	Faculty mentors	Assessment methods
1	Basics of animal ethics and handling	1.To explain the basics of animal ethics and CPCSEA guidelines. 2. To list the basic handling procedures for rodents.	To use the guidelines and employ proper procedures while working with experimental animals.	Dr. Megha Rani, Dept. of Pharmacology	Concept mapping, Short questions

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2	Diabetic care	1.To define American Diabetes Association guidelines for diagnosis and monitoring of diabetes mellitus. 2. To recognize common complications in diabetic patients. 3.To list examples of diet and treatment modalities suggested for diabetic care.	To apply the information gathered about proper diabetic care to educate the community.	Dr. Shaheen Banu Shaikh, Diabetic clinic	e-Portfolio, Short projects
3	Geriatrics	1. To describe theories of aging. 2. To detect common abnormalities in geriatric individuals from their lab reports.	To plan and recommend modifications in lifestyle, diet and supplement usage for healthy aging in populations.	Dr. Prithvi Nandalike, Dept. of Geriatric medicine	Create e-posters, Seminars Problem solving exercises
4	Community Nutrition	1. To demonstrate use of nutritional assessment methods. 2. To outline national nutritional policies. 3. To identify common nutritional problems in India.	To employ the nutritional assessment methods in different populations for identifying nutrition-related problems and to plan strategies to solve the problems	Dr. Shubankar Adhikari and Poulomi Chatterjee, Dept. of Community medicine	Create short educational videos, Short answer questions
5	Environmental studies	1. To describe the activities of the Centre for Environment studies. 2. To collect information about the ground water testing methods used.	To devise ways to overcome problems associated with poor water quality and to plan environment-friendly activities.	Dr. Bhagya Sharma, Centre for Environment studies	Short project, e-poster
6	Bioinformatics	1. To explain goals of Bioinformatics. 2. To describe the tools used for sequencing and analysis.	To plan and employ the tools for solving research problems.	Dr. Shyam Prasad Rao, Dept. of Bioinformatics	Short answer questions
7	Stem cell research	1. To explain goals of stem cell research. 2. To discuss methods used for isolation characterization and differentiation of stem cells.	To discover the potential of stem cells for therapeutic purposes.	Dr. Sudhir Shenoy, Dept of Stem cell research	Objective type questions, Assignments


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8	Prevention of substance abuse	<p>1.To indicate adverse effects of tobacco/ nicotine on various body systems.</p> <p>2.To state the National laws/ regulations governing substance abuse.</p> <p>3. To discuss modalities used in tobacco cessation clinic.</p>	To plan and design projects to improve effectiveness of substance abuse prevention programs.	Dr. Maji Jose, Centre for Prevention of substance abuse	Create short educational videos, Short answer questions
9	Gender equity and maternal health care	<p>1. To describe the barriers due to gender inequality in maternal health care.</p> <p>2. To list the complications during perinatal period and discuss ways to avoid them.</p>	To formulate strategies to promote gender equity and maternal health care	Dr Saiqa R Shah, Dr Raghavendra U, Dept of Biochemistry	Create short educational videos, e-posters Short answer questions

This is for implementation from the academic year 2020-21.

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To,

The Principal, Yenepoya Medical College

Copy to:

1. Professor & HoD, department of Biochemistry
2. Controller of Examinations
3. File copy

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