DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY

CIRCULAR NO.ACAD/SU/Sci./B.Sc. & M.Sc. Syll./5/2015

It is hereby notified for information to all the concerned that, on the recommendation of the Faculty of Science the Academic Council at its meeting held on 30-05-2015 has accepted the **revised semester-wise syllabi as mentioned against their names in the Faculty of Science as under** :-

Sr. No.	Name of the Subject	Semester
[1]	B.Sc. Computer Science Degree Course	III & IV
[2]	B.Sc. Information Technology Degree Course	III & IV
[3]	B.C.A. Science Degree Course	III & IV
[4]	B.Sc. Animation Degree Course	III & IV
[5]	B.Sc. Bioinformatics Degree Course	III & IV
[6]	B.Sc. Computer Science [Optional]	III & IV
[7]	B.Sc. Information Technology [Optional]	III & IV
[8]	B.Sc. Computer Applications [Optional]	III & IV
[9]	B.Sc. Computer Maintenance [Optional]	III & IV
[10]	B.Sc. Environmental Science [Optional]	V & VI
[11]	B.Sc. Bio-Chemistry [Optional]	V & VI
[12]	B.Sc. Forensic Science Degree Course	V & VI
[13]	B.Sc. Industrial Chemistry [Optional]	V & VI
[14]	B.Sc. Electronics [Optional]	V & VI
[15]	B.Sc. Zoology [Optional]	V & VI
[16]	B.Sc. Microbiology [Optional]	V & VI
[17]	B.Sc. Instrumentation Practice [Optional]	V & VI
[18]	B.Sc. Statistics [Optional]	V & VI
[19]	B.A. Statistics [Optional]	V & VI
[20]	B.A. / B.Sc. Mathematics [Optional]	V & VI
[21]	B.Sc. Home Science Degree Course	V & VI
[22]	B.Sc. Textile Interior Decoration Degree Course	V & VI
[23]	B.Sc. Fishery Science [Optional]	V & VI
[24]	B.Sc. Dairy Science & Technology [Optional]	V & VI
[25]	B.Sc. Botany [Optional]	V & VI
[26]	B.Sc. Physics [Optional]	V & VI
[27]	M.Sc. Computer Science	III & IV
[28]	M.Sc. I.T.	III & IV

This is effective from the Academic Year 2015-16 & onwards as appended herewith.

All concerned are requested to note the contents of the circular and bring the notice to the students, teachers and staff for their information and necessary action.

University Campus,
Aurangabad-431 004.
REF.NO.ACAD/SU/SCI./
2015/3761-4160
Date:- 16-06-2015.

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Director,
Board of College and University Development.

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Copy forwarded with compliments to:-

1] The Principals, affiliated concerned colleges,
Dr. Babasaheb Ambedkar Marathwada University

Copy to :-

1] The Controller of Examinations,
2] The Director, [E-Suvidha Kendra], in-front of Registrar's Quarter,
Dr. Babasaheb Ambedkar Marathwada University,
3] The Superintendent, [B.Sc. Unit],
4] The Superintendent, [M.Sc. Unit],
5] The Programmer [Computer Unit-1] Examinations,
6] The Programmer [Computer Unit-2] Examinations,
7] The Record Keeper.

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DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, AURANGABAD.

REVISED SYLLABUS OF

B.Sc. THIRD YEAR

SEMESTER-V & VI

Biochemistry (optional)

[Effective from 2015-16 & onwards]

PAPER XVI: MOLECULAR BIOLOGY II: **Marks:50**

1) Translation:

Genetic Code: Basic features, biological significance of degeneracy, Wobble hypothesis, Mechanism of translation: Ribosome structure: A and F sites, charged, t-RNA, f-met-tRNA, initiator codon, formation of 70-S initiator complex, role of EF-tu, EF-Ts, EF,-G and GTF, Non-sense codons and release factors RF I & RF II concept of

2) Regulation:

Homoeostatis, Regulation by covalent modification, fed back inhibition: operon model (Lac-His-operon, Tryp-operon)

3) Mutation:

Molecular basis of mutation, types of mutation-transition transversion, frame shift, insertion, deletion, DNA repair: UV repair systems in E-coli.

4) Recombinant DNA Technology:

Restriction endonucleases, brief discussion of steps in DNA cloning, Applications of recombinant DNA technology, human genome project.

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad.

B.Sc. III Year Biochemistry

PAPER XV : MOLECULAR BIOLOGY-I **Marks: 50**

1) **Basic Concepts of Genetic information:**

Nucleic acids as genetic information carriers, experimental evidence eg. Bacterial genetic transformation, TMV reconstitution experiment. Central dogma in molecular biology, reverse transcription and retroviruses, salient features in eukaryotic, prokaryotic and viral genomes, highly repetitive, moderately repetitive and unique DNA sequences.

2) **Structural levels of Nucleic acids:**

Primary Structure of nucleic acids, Basic concepts about secondary structures of nucleic acid, 5'---3' direction secondary and tertiary structure of DNA: Watson and Crick model; anti-parallel strands, base composition, base equivalence base-pairing and base-stacking in DNA molecule, Tm and its relationship G-C content in DNA, A, B and Z types of DNA major and minor grooves, Structures and functions of RNAs, t-RNA, r-RNA, m-RNA,

3) **DNA replication:**

DNA replication in prokaryotes: conservative, Semi conservative and dispersive types, Experimental evidences for semiconservative replication, DNA polymerases, other enzymes and protein factors involved in replication. Mechanism of replication.

4) **Transcription:**

Transcription in prokaryotes, DNA polymerase, promoters, initiation, elongation and termination of RNA synthesis, post-transcriptional processing of RNA in eukaryotes

PAPER XVII: NUTRITIONAL BIOCHEMISTRY: Marks: 50

1) Introduction and definition of food and nutrition. The diet and its components, carbohydrates, fats, proteins, vitamins, minerals and water.

2) Composition of balanced diet, the nutritional value of carbohydrates, proteins-protein requirement nitrogen balance, essential and non-essential amino acids, Biologist value of proteins, supplementary value of proteins, nutritional value of lipids-essential fatty acids,

3) Vitamins A,D,E,K, Vit.B-complex and minerals (Ca, Fe Cu, P, Cl, K, Mg, Zn, Se, and Iodine) and their biological functions.

4) Basic concepts of energy expenditure, units of energy, Calorimetry, Measurement of energy value of foodstuffs by calorimetry, RQ of foods, determination of heat production of the diet.

5) The basal metabolism, measurement of basal metabolic rate (BMR) factors influencing BMR, energy requirements and recommended dietary allowances (RDA) for an average Indian, SDA of foods.

6) Malnutrition-Kwashiorkor and Marasmus.

7) Food adulteration, common adulterants and their ill effects, simple physical tests for detection of food adulterants, simple chemical tests.

PAPER XVIII: CLINICAL BIOCHEMISTRY: Marks: 50

1) Definition and scope of clinical biochemistry in diagnosis, a brief review of units and collection and preservation of biological fluids (blood, serum, plasma, urine and CSF Normal values of important constituents (in SI units) in CSF and urine.

2) Blood-general composition-plasma and erythrocyes, leukocyes and platelets composition of plasma-plasma proteins, normal values of important constituents (in SI units) in Blood (Plasma/serum) Structure and functions of hemoglobin. Abnormal hemoglobins sickle cell anemia, thalessemia.

3) Definition functional and non-functional plasma enzymes, enzyme pattern in health and diseases with special mention of plasma lipase, amylase, cholinesterase, alkaline and acid phosphatase, SGOT, SGPT, LDH and CPK.

4) Functional tests of kideney, liver and gastric fluids.

5) Genetic diseases (Inborn errors) of amino acid metabolism (alkaptonuria, phenylketonuria, Tyrosinemia, Cystinosis albinism) – Gout and hyperuricemia, orotic aciduria

   Carbohydrate metabolism (Diabetes, pentosuria, glycogen storage disease, glycosuria) Lipid metabolism (Libpoproteinaemia, Fatty liver, gangliosidosis, Atherosterosis, steatorrhoeas)

PAPER XIX & XX: Practical fo IIIrd Year: **Marks: 100**

1) Estimation of DNA by diphenylamine method.
2) Extraction of DNA.
3) Extraction of RNA by orcinol method.
4) Extraction of hemoglobin in blood.
5) Extraction of SGOT/SGPT in serum.
6) Isolation of starch from potato and its hydrolysis.
7) Determination of isoelectric point of protein.
8) Extraction of creatinine in mine/serum.
9) Preparation of protein free filtrate: qualitative tests of blood.
10) Extraction of glucose by Folin-Wu method.
11) Determination of organic constituents in urine.
12) Estimation of titratable acidity and ammonia in urine.

PAPER XXI & XXII: Practical fo IIIrd Year: Marks: 100

PRACTICAL PLACEMENT IN A LABORATORY

This course is to be conducted in the last semester of B.Sc. Biochemistry. However, it is convenient to take up this course during the vacation period in advance. The duration of the course is three weeks (minimum 40 Hrs), it is a practical placement in a suitable biochemistry-related facility, company, or research institute based on an own choice (in order to select suitable time period). Students may participate at the clinical analytical laboratories in hospitals biochemical or biotechnological companies or research institutes.

COURE CONTENTS

1) Prearation for practical placement.

Before starting the practical placement, student will receive a letter of recommendation from the college and the acceptance of partner organization should be returned to college.

2) Study of safety regulations, working procedures and regulations of the place.

3) Study of technical literature, methods, manuals and other resources related to the subject of the practice.

4) Actual practical placement (duration of 3 weeks)-according to suggestions and requirements of the supervisor from the organization.

During practice, all work carried out should be documented carefully, appropriate written notes should be taken. Photos of unique instrumentation / facility might be taken (if approved by the local supervisor) as these would be very useful for preparation of presentation for seminar.

5) Preparation of seminar and report based on placement.

After the placement, a certificate from the supervisor at partner organization and practical course in charge of the college should be obtained and submitted along with work report for evaluation during practical examination.

EXAMINATION

Evaluation based on work report, seminar and viva (40:40:20) at the time of practical exam.

Note: Vaccination etc for personal safety and other precautionary measures to be followed without fail. Personal safety is the responsibility of student.

SUGGESTED READING : B.Sc. BIGCHEMISTRY

BIOMOLECULES:

1) Lehninger's Principles of Biochemistry (2000) by Nelson, David L. and Cox M.M. Machnil Han / Worth N.Y.

2) Biochemistry 3rd (1994) by Lubert Stryer, WH freeman and Co. san-Francisco.

3) Outlines of Biochemistry (1987) by Eric E Conn. P.K. Stumpf, G. Bruening and Ray H.Doi, John Wiley and Sons, N.Y.

BIOCHEMICAL TECHNIQUES:

1) Outlines of Biochemistry by Eric E Conn. P.K. stumpff G. Bruening androy II Doi (1987) john Wiley and sons, N.Y.

2) Principles and Techniques of Practical Biochemistry William and Golding and / or William and Walker.

ENZYMOLOGY:

1) Biochemistry (3rd Ed) by Lubert Stryer, V.M. Freeman and Co. San Francisco

2) Enzymes (3rd Ed 1979)-Dixon M and Webb. E.C. Longmans, London,

3) Enzymes structure and function by S.Blackburn Marcel Dekker, Inc. N.Y.

4) Biotechnology by J.E. Smith

INTERMEDIARY METABOLISM:

1) Biochemistry By Geoffrey L. Zubay, Mc Graw Hill

2) Biochemistry (IV Ed 1996) by Lubert Stryer, WH Freeman and Co. San Francisco.

MOLECULAR BIOLOGY:

1) Molecular Biology of the gene (1987) J.D. Watson, NH Hopkins, J,W, Roberts, J.P. Stertz. A.M. Werner, Freeman, San Francisco,

2) Text Book oftliochemistry (IV ed) by Thomas M.Devlin, John Wilety and Sons, NY.

3) Molecular Biology: De Robert

4) Genetics: P.K. Gupta

5) Molecular Biology: David Freifelder

6) Gene VI; Benjamin Levin

NUTRITIONAL & CLINICAL BIOCHEMISTRY

1) Modern Nutrition in Health and Diseases by Whol and Goodhart.

2) Human Nutrition and Dietetics-S Davidson and J.R.Passmore; ELBS, Zurich

3) Tietz Fundamentals of Clinical chemistry by Carl A Burtis and E.R. Ashwood (Eds) (5th Edn.) Saunders WB Co.

4) Lecture Notes on clinical Biochemistry L.G. whilby, A.F. Smith, G.J. Beckett, S.M. Waiker, Blackwell Sci. Inc.

5) Text Book of Human Physiology and Biochemistry G.P. Talwar

6) Medical Biochemistry: S. Ramkrishnan

7) Fundamentals of food and Nutrition : R.R. Mudambi and M.V. Rajgopal

8) Clinical Biochemistry Principles and practice: P.B. Godekar

9) Varley's Practical Clinical Biochemistry: Alan B.H. Gowenlook