

1) **NAME:** Biochemistry

2) **NAME OF INSTITUTION:** CHIRAYU MEDICAL COLLEGE & HOSPITAL

**Place:** Bhainsakhedi, Bairagarh, Bhopal, (M.P.)

3) **NAME OF HOD:**

4) **COURSES OFFERED:** - M.B.B.S., M.D., BMLT, and DMLT

5)

7) **DEPARTMENTAL LIBRARY-CUM-SEMINAR ROOM:**

- a. Size : **37.25 sqm.**
- b. Accomodation : to seat **15** members
- c. Number of Books in Biochemistry and allied subjects: 103 available
- d. No.of Journals : 1. **National Journals: 3**

**2. International Journals: 2 (In Central Library)**

8) **DEMONSTRATION ROOM:**

- a) Number : 2
- b) Size : 1) 89 sq.m.  
2) 91.68 sq.m.
- c) Accomodation : 75 Students
- d) Facilities of audiovisual aids available:  
LCD Projector, DVD player, Television, OHP, Black Board, Screen

9) **PRACTICAL CLASS ROOM/LABORATORIES:**

- a) Size : 293.76 sqm.
- b) Accommodation : 90 students
- c) Accomodation with facilities of:
  - Water supply, Sinks, Electric points, Cupboard for storage
- d) Preparation room
  - Size : 18.76 Sqm.
  - Capacity : Adequate
- e) Laboratory manual is provided to the student
- f) Other teaching aids: Charts/Models/Black Board.
- g) List of total Instrument/Equipment

<b>Sl. No.</b>	<b>Name of Instruments / Equipments</b>	<b>NO.</b>
<b>01</b>	Autoclave Electric	<b>2</b>

02	Auto Pipette (2-20 $\mu$ l)	2
03	Auto Pipette (10-100 $\mu$ l)	2
04	Auto Pipette (20-200 $\mu$ l)	1
05	Auto Pipette (100-1000 $\mu$ l)	1
06	Auto Pipette (10 $\mu$ l)	3
07	Auto Pipette (25 $\mu$ l)	3
08	Auto Pipette (100 $\mu$ l)	3
09	Balance Semi Micro (0.1g – 220g)	2
10	Balance Micro	1
11	Balance Open Pan (0.1g – 600g)	6
12	Binocular Research Microscope	2
13	Boiling Water Bath	6
14	Bottle Dispenser with bottle	10
15	Centrifuge Machine	6
16	Chromatography Chamber	2
17	Colorimeter (Digital)	6
18	Constant Temperature Water Bath	4
19	Cork Borer Set	1
20	Desiccator Large(Glass)	6
21	Desiccator Small (Glass)	6
22	Distillation Apparatus (All Glass)Single	1
23	Distillation Apparatus (All Glass)Double	1
24	Distillation Apparatus (All Glass)Triple	1
25	Distillation Plant (Metallic)	3
26	D.V.D Player	2
27	Electrophoresis Apparatus (Immuno.)	1
28	Electrophoresis (Mini Vertical Gel)	2
29	Electrophoresis(Submarine Gel)	2
30	Electrophoresis(Midi submarine Gel)	1
31	Electrophoresis Power Pack	2
32	Flame Photometer	2
33	Fume Cupboard	2
34	Homogenizer	3
35	Hot Air Oven	4
36	Incubator	4
37	Magnetic Stirrer	2
38	Microscope (Student)	6
39	Over Head Projector	2
40	pH Meter	3
41	Pump Vacuum	2
42	Ryle's Tube	4
43	Refrigerator	4
44	Spectrophotometer	1
45	Spirit Lamp	50
46	Stop Watch Digital	4
47	Screen for O.H.P	3

<b>48</b>	Thermometer	<b>7</b>
<b>49</b>	T.V.	<b>2</b>
<b>50</b>	Volume Dispensing unit (2.5-30ml)	<b>2</b>
<b>51</b>	Volume Dispensing unit (1-10ml)	<b>3</b>
<b>52</b>	Vortex mixer	<b>2</b>
<b>53</b>	Urinometer	<b>47</b>
<b>54</b>	UV Lamp	<b>1</b>

## 10) RESEARCH LABORATORIES

- a) Size : 58.90 sqm.
- b) Lists of Instruments/Equipments in Research Laboratory

<b>Sr. No.</b>	<b>Instruments/equipments</b>	<b>Quantity</b>
1.	Autoclave Electric	1
2.	Autopipettes	2
3.	Balance micro	1
4.	Balance Semi micro	1
5.	Binocular Research Microscope	1
6.	Bottle Dispenser	2
7.	Centrifuge	1
8.	Chromatography Chamber	1
9.	Colorimeter	1
10.	Constant temperature water bath	1

11.	Dessicator large size	1
12.	Dessicator small size	1
13.	Distillation apparatus(all glass)	1
14.	Electrophoresis with power pack	1
15.	Flame Photometer	1
16.	Homogeniser	1
17.	Hot air oven	1
18.	Incubator	1
19.	Magnetic stirrer	1
20.	PH meter	1
21.	Spectrophotometer	1
22.	Stop watch digital	1
23.	Thermometer	2
24.	UV Lamp	1
25.	Vortex mixer	1
26.	Refrigerator	1

**11) Computer System & Internet Facility** – Available to Faculty members & Computer Operators

**12) List of Major Equipments in Clinical Biochemistry Lab:**

Cobas Integra 400 plus	1
Minvidas	1
C 111	1
Microlab 300 LX	1
9180 Electrolyte Analyzer	2
Centrifuge	1
Incubator	1
Vortex Mixture	1

**13 (a) Syllabus as per MPMS University, Jabalpur****PAPER – 1**

		Weightage of Marks
1	Cell Structure and function, sub cellular organelles, cell membranes, transport across the membranes.	5
2	Chemistry, digestion, absorption and metabolism of carbohydrates	20
3	Chemistry, digestion, absorption and metabolism of lipids.	
4	Amino acids and protein chemistry, general reaction of amino acids, digestion and absorption, urea cycle and metabolism of amino acids.	
5	Vitamins	5
6	Minerals	5
7	Endocrine functions and Biochemical tests	5
8	Detoxification and Xenobiotics	5
9	Enzymes, Biological oxidation, integration of metabolism, TCA cycle and regulation of metabolism.	5

**PAPER – 2**

		Weightage of Marks
1	Nucleotides and nucleic acid chemistry	5
2	Purine and pyrimidine metabolism, DNA metabolism RNA metabolism, protein Biosynthesis	5
3	Molecular genetics, regulation of gene expression. Recombinant DNA technology, PCR and gene therapy	5
4	Electrolyte and water balance, acid base balance	20
5	Nutrition and energy metabolism	
6	Haem metabolism, normal and abnormal hemoglobins, Plasma proteins and immunoglobulins	
7	Free radical and antioxidants, biochemistry of ageing.	5
8	Biochemistry of cancer, Oncogenes and tumor markers	5
9	Liver function tests	5
10	Kidney function tests	5
11	Clinical chemistry, quality control interpretation and reference values and analysis	5

### List of Practical's of Biochemistry

S.No.	Name of Experiment
1	Reactions of Monosaccharides
2	Reactions of Disaccharides
3	Osazone Formation
4	Reactions of Polysaccharides
5	Detection of unknown Carbohydrates
6	Precipitation Reactions of Protein
7	Colour Reactions of Protein
8	Detection of unknown Protein
9	Properties and Reactions of Lipids
10	Analysis of Bile
11	Normal Constituents of Urine
12	Abnormal Constituents of Urine
13	Gastric Analysis: Free & Total Acidity
14	Spectroscopic Examination of Blood Pigments
15	Determination of serum Total Protein, Albumin and A/G Ratio
16	Estimation of Blood Glucose by enzymatic(GOD-POD) method.
17	Estimation of Blood Urea
18	Estimation of serum Creatinine & urine Creatinine
19	Estimation of serum Uric Acid
20	Estimation of serum Cholesterol
21	Estimation of serum Bilirubin
22	Estimation of S.G.O.T. and S.G.P.T.
23	Estimation of serum Alkaline Phosphatase
24	Estimation of C.S.F. Protein and Glucose
25	Estimation of serum Calcium and Phosphorus
26	Estimation of milk Lactose
27	<b>L.C.D. :-</b> 1. Colorimetry 2. pH meter & pH measurement 3. Flame photometer

4. Chromatography 5. Electrophoresis 6. L.F.T. (Liver function tests) 7. K.F.T. (Kidney function tests) 8. T.F.T. (Thyroid function tests) 9. G.T.T. (Glucose tolerance tests)
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### 13 (b) Total Teaching Hours

(For duration of the entire course)

	<u>Number</u>
1) Didactic Lectures	80
2) Demonstrations, Tutorials, Seminars, Practical, Presentation	160

### 14) Tentative Time Table

Day	8:30am-9:30am	9:30am-10:30am	10:30am-12:30pm	12:30pm-1:30pm	1:30 pm-2:30pm	2:30pm-4:30pm
MON	ANATOMY (Lecture)	PHYSIOLOGY (lecture)	PHYSIOLOGY/BIOCHEMISTRY (PRACTICAL)	LUNCH	ANATOMY (Lecture)	ANATOMY (dissection/histology)
TUE	ANATOMY (Lecture)	BIOCHEMISTRY (Lecture)	PHYSIOLOGY/BIOCHEMISTRY (PRACTICAL)		PHYSIOLOGY (lecture)	ANATOMY (dissection/histology)
WED	ANATOMY (Lecture)	PHYSIOLOGY (lecture)	PHYSIOLOGY/BIOCHEMISTRY (PRACTICAL)		ANATOMY (Lecture)	ANATOMY (dissection/histology)
THUS	BIOCHEMISTRY (Lecture)	ANATOMY (Lecture)	PHYSIOLOGY/BIOCHEMISTRY (Demo/Semi/Tut./practical)		PHYSIOLOGY (lecture)	ANATOMY (dissection)
FRI	PHYSIOLOGY (lecture)	ANATOMY (Lecture)	PHYSIOLOGY/BIOCHEMISTRY (Demo/Semi/Tut./practical)		ANATOMY (Lecture)	ANATOMY (dissection)
SAT	PHYSIOLOGY (lecture)	ANATOMY (Lecture)	COMMUNITY MEDICINE		BIOCHEMISTRY (Lecture)	ANATOMY (dissection)

### 15) Examination & Marking System – At College Level & at University Level

#### a) At College Level:-

	<u>Theory</u>	<u>Viva</u>	<u>The.+Viva</u>	<u>Practical</u>	<u>Total</u>
1 <sup>st</sup> PCT	25				
1 <sup>st</sup> Sessional	50	10	60	40	100
2 <sup>nd</sup> PCT	25				
2 <sup>nd</sup> Sessional	50	10	60	40	100
Pre University	100	20	120	40	160

**b) Examination & Marking System at University Level Theory & Practical:**

PAPER1	PAPER2	VIVA VOCE	TOTAL	PRACTICAL	INTERNAL ASSESSMENT	TOTAL
50	50	20	60/120	20/40	14/40	100/200

**Practical:**

**Practical examination will include**

- a) Exercise I – Quantitative estimation.
- b) Exercise II – Qualitative analysis
- c) Exercise III – Spotters
- d) Viva voce examination.

Students enter the practical hall and they will pick up lots for getting their set of Question.

**Exercise I Quantitative Estimation**

- a) Students will be instructed to write principle & procedure for the given estimation in the first five minutes – (their papers will be collected after 5 minutes).
- b) Students will be provided with the procedure for estimation.

They are supposed to write

1. Results - 5 Marks
  2. Calculation & reporting - 5 Marks
  3. Interpretation - 5 Marks
- c) Case study, graph or charts will be given and discussed - 5 marks

**Exercise II Qualitative analysis (15 marks)**

1. Select appropriate tests - 5 Marks
2. Reasoning of analysis - 5 Marks
3. Interpretation - 5 Marks

**Exercise III Spotters - 5 Marks**

**Exercise IV Viva voce Examination: 20 Marks**

- Table 1 – Portions of Paper I - 5 Marks
- Table 2 – Portion of Paper II - 5 Marks
- Table 3 – General Biochemistry - 5 Marks
- Table 4 – Applied Biochemistry - 5 Marks



## 16) RESEARCH PAPERS, PUBLICATIONS (LAST THREE YEARS)

- **Induced biochemical changes and associated complications in smokers.**  
Dr. Manishi Singh, Surya Tiwari  
IOSR Journal of Biotechnology and Biochemistry (IOSR-JBB)  
Vol. 1, Issue 4 (May – June 2015) IP 15-18
- **Effect of exchange transfusion in biochemical parameters in neonatal hyperbilirubinemia**  
Dr. Manishi Singh, Dr. Manika Singh, Ms. Surya Tiwari, Dr. M.P. Singh.  
Journal of pure and applied microbiology. Accepted for publication. ISSN:  
09737510  
JPAM Vol.9 No. 03 2015 10.06.2015
- **Study of ascorbic acid in the precancerous stage of Oral – Cancer.**  
Dr. Manishi Singh, Dr. Manika Singh, Ms. Surya Tiwari, Dr. M.P. Singh.  
National Journal of Medical and Dental Science. ISSN(p): 23200367 ISSN(e):  
23200375 njmdr\_3416\_15 Vol. 3 issue 4 July – September.
- **Effect of exchange Transfusion in bilirubin and calcium level in Neonatal hyperbilirubinemia.**  
Dr. Manishi Singh, Dr. Manika Singh, Ms. Surya Tiwari  
International journal of Medical Research and Review. ISSN online: 2320-8686  
ISSN Print: 2321-127x Vol. 03 issue 7 2015
- **Efficacy of antioxidant vitamins and trace elements level in the prognosis of oral cancer.**  
Dr. Manishi Singh (3<sup>rd</sup> Author), Surya Tiwari (2<sup>nd</sup> author)  
Journal of oral medicine, oral surgery, orl pathology and oral radiology.2015;1(4):160-164.
- **Efficacy of antioxidant vitamins and trace elements level in the prognosis of oral cancer.**  
Dr. Manishi Singh (3<sup>rd</sup> Author), Surya Tiwari (2<sup>nd</sup> author)  
Journal of oral medicine, oral surgery, orl pathology and oral radiology.2015;1(4):160-164.
- **Anti-inflammatory action of ginger: A critical review in anemia of inflammation and its future aspects**  
Subodh Kumar, Kiran Saxena, Uday N. Singh, Ravi Saxena  
ISSN 2321-2187 IJHM 2013; 1 (4): 1-6
- **Supplementation of Ginger with Anti-Tuberculosis Treatment (ATT): A better Approach to Treat Anemic Pulmonary Tuberculosis Patients**  
Subodh Kumar\*, U.N. Singh, Kiran Saxena, Ravi Saxena  
ISSN 2321-2187 IJHM 2013; 1 (3): 17-20
- **Hematological And Biochemical Abnormalities In Case Of Pulmonary Tuberculosis**

### **Patients In Malwa Region (Indore)**

Subodh kumar, U. N. Singh, Kiran Saxena, Ravi Saxena

IJPBS |Volume 3| Issue 3 |JUL-SEP|2013|237-241

- **Comparative Study Of Acute Phase Proteins In Case Of Anemia Of Chronic Disease (Acd) And Iron Deficiency Anemia (Ida) And Its Relationship With Erythropoietin**

Subodh Kumar<sup>1</sup>, Dr. U. N. Singh<sup>2</sup>, Mrs. Kiran Saxena<sup>3</sup>, Ravi Saxena<sup>4</sup>

IJPBS |Volume 3| Issue 3 |JUL-SEP|2013|323-328

- **Neuron specific enolase and C reactive protein levels in stroke and its subtypes: correlation with degree of disability.**

Aparna Pandey, Amit Kumar Shrivastava & Kiran Saxena

Neurochemical Research

Volume 39 No. 6 May 2014

ISSN 0364-3190; DO/10.007/S11064-014/1329-9

- **Effect of Deep Breathing Test on female patients of Iron Deficiency Anemia.**

Dr. Aniruddha Jibhkate, Dr. Richa Lath, Sonali Pande, Swati Tadas.

International journal of Recent Trends in Science & Technology Volume 8,

Issue 2,

2013.

- **Insulin Resistance and Lipid Profile in Polycystic Ovary Syndrome.**

Dr. Richa Lath, Reshakiran Shendye, Dr. Aniruddha Jibhkate.

International journal of Biomedical and Pharamaceutical Sciences, 5(47), 2015, 30-35.

- **Oxidative stress in Chronic Smokers.**

Surya Tiwari (2<sup>nd</sup> author).

Flora and Fauna 2014, Vol. 20 No. 1 PP 156-160.

### **17) RESEARCH PROJECTS IN BIOCHEMISTRY DEPARTMENT**

1. A study of biochemical parameters of lipid metabolism in hemodialysis patients.

**Submitted by-**

Dr. Manishi Singh (Principal

Investigator) Dr. A.D. Suri

Ms. Surya Tiwari

2. Evaluation of thyroid function test in chronic renal failure.

**Submitted by –**

Ms. Akanksha Dubey

### **18) PHOTOGRAPH OF IMPORTANT AREAS OF DEPARTMENT**



**Student Lab**



**Demonstration Room:**



**Clinical Biochemistry Lab in Hospital (Our lab is NABL Accredited)**



## Department Research Lab:

