1. Course Name:	
Biochemistry	
2. Course Code:	
3. Semester / Year:	
Year	
4. Description Preparation Date:	
18-11-2025	
5. Available Attendance Forms:	
Weekly (Theory: 2 hours, Practically: 2 hours)	
6. Number of Credit Hours (Total) / Number of Units (Total)	
Theory: 30 Hours **Practically: 30 hours** **Total: 60 hours** **Total Units: 6**	
7. Course administrator's name (mention all, if more than one name)	
Name: Asst. Lec. Murtadha Hadi Athab **Email: Murtadha.hadi@muc.edu.iq**	
8. Course Objectives	
Course Objectives	• **Understand the biochemical structure and function of major biomolecules** (proteins, carbohydrates, lipids, nucleic acids) relevant to oral tissues. • **Explain metabolic pathways and their regulation**, with emphasis on energy production and oral health implications. • **Describe biochemical mechanisms underlying dental caries, periodontal disease, and enamel/dentin formation.** • **Apply biochemical principles to clinical scenarios**, including saliva composition, acid–base balance, and oral microbiology. • **Interpret biochemical laboratory tests** commonly used in dental practice and integrate them into patient diagnosis. • **Link biochemical abnormalities to systemic diseases** that influence oral health, such as diabetes and nutritional deficiencies.
9. Teaching and Learning Strategies	
Strategy	• **Interactive Lectures:** Use case-based discussions and visual aids to link biochemical concepts with dental applications. • **Laboratory Sessions:** Hands-on experiments to reinforce biomolecule analysis, enzyme activity, and clinical biochemistry tests. • **Problem-Based Learning (PBL):** Small-group activities using clinical dental cases to promote critical thinking and application. • **E-Learning Tools:** Utilize animations, quizzes, and virtual labs to enhance understanding and self-paced learning.

1. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	**Th.:2H Pr.: 2H**	Enzymes	Enzymes: Definition, Terminology, and Classification	Lect. & Lab.	Presentation
2	**Th.:2H Pr.: 2H**	Enzymes	Mechanism of enzyme action	Lect. & Lab.	Quiz
3	**Th.:2H Pr.: 2H**	Clinical significance enzyme assays	Clinical assessment	Lect. & Lab.	Homework
4	**Th.:2H Pr.: 2H**	Vitamins & Minerals	Vitamins, definition, classification	Lect. & Lab.	Exam
5	**Th.:2H Pr.: 2H**	Metabolism	Digestion and absorpti of carbohydrates, lipids and proteins	Lect. & Lab.	Quiz
6	**Th.:2H Pr.: 2H**	Carbohydrates	Chemistry of carbohydrates	Lect. & Lab.	Homework
7	**Th.:2H Pr.: 2H**		**Exam**		**Exam**
8	**Th.:2H Pr.: 2H**	Metabolism of Carbohydrates	Metabolism of Carbohydrates: part 1	Lect. & Lab.	Quiz
9	**Th.:2H Pr.: 2H**	Absorption and secretion	Metabolism of Carbohydrates: part 2	Lect. & Lab.	Homework
10	**Th.:2H Pr.: 2H**	Overview	Carbohydrates metabolism regulation	Lect. & Lab.	Exam
11	**Th.:2H Pr.: 2H**	Amino acid	Chemistry of Proteins a amino acids	Lect. & Lab.	Quiz
12	**Th.:2H Pr.: 2H**	Proteins	Proteins and amino aci	Lect. & Lab.	Homework
13	**Th.:2H Pr.: 2H**	Catabolism and anabolism of protein	Metabolism of Protein and amino acid regulati	Lect. & Lab.	Exam
14	**Th.:2H Pr.: 2H**	Disorder and disease	Metabolism of Protein and amino acid inherite disorder	Lect. & Lab.	Quiz
15	**Th.:2H Pr.: 2H**	Lipids	Lipid: definition, classification	Lect. & Lab.	Homework
16	**Th.:2H Pr.: 2H**	Metabolism of lipids	Metabolism of Lipid: oxidation of Fatty Acids	Lect. & Lab.	Presentation
17	**Th.:2H Pr.: 2H**	Anabolism of Lipids	Biosynthesis of Fatty Acids	Lect. & Lab.	Quiz
18	**Th.:2H Pr.: 2H**	Seminar	Integration of metaboli of carbohydrates, lipid, and Proteins	Lect. & Lab.	Seminar
19	**Th.:2H Pr.: 2H**	Purines and pyrimidines	Metabolism of Purines and pyrimidines	Lect. & Lab.	Exam

20	**Th.:2H Pr.: 2H**	Diseases with purine	Metabolism of Purines and pyrimidines disord	Lect. & Lab.	Quiz
21	**Th.:2H Pr.: 2H**	DNA & RNA	Nucleic Acids Definitio and Protein synthesis	Lect. & Lab.	Homework
22	**Th.:2H Pr.: 2H**	**EXAM**	**Exam**	**Lect. & Lab.**	**Exam**
23	**Th.:2H Pr.: 2H**	Hormones	Hormone definition, classification	Lect. & Lab.	Quiz
24	**Th.:2H Pr.: 2H**	Hormonal diseases	Hormone disorder	Lect. & Lab.	Homework
25	**Th.:2H Pr.: 2H**	Body fluids	Acid-base balance	Lect. & Lab.	Exam
26	**Th.:2H Pr.: 2H**	Minerals	Trace elements disorde	Lect. & Lab.	Quiz
27	**Th.:2H Pr.: 2H**	Electrolytes	Electrolytes and body fluids	Lect. & Lab.	Homework
28	**Th.:2H Pr.: 2H**	nutrition	Nutrition	Lect. & Lab.	Exam
29	**Th.:2H Pr.: 2H**	Liver & Renal	Liver and kidney functions	Lect. & Lab.	Quiz
30	**Th.:2H Pr.: 2H**		**Mid-term Exam**		**EXAM**

2. Course Evaluation

The grade distribution is as follows:
Assessment: Formative 40 marks (Theory 30 marks, Practical 10 marks)
Final exam: Theory 50 marks, Practical 10 marks

3. Learning and Teaching Resources

Required textbooks (curricular books any)	
Main references (sources)	1- Lippincott Illustrated Reviews: Biochemistry, 9e
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	1- https://lib.zu.edu.pk/ebookdata/Biochemist/lippincotts-biochemistry-6th-edition.pdf

Course Description Form

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