

| MBG301 BIOCHEMISTRY I SYLLABUS 2023-24 SESSION | | |
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| 1. | Course Title: | Biochemistry I |
| 2. | Course Code: | MBG301 |
| 3. | Course Status: | Core |
| 4. | Year of Study: | 3 |
| 5. | Semester: | First |
| 6. | ECTS Credits allocated: | 9 |
| 7. | Theoretical (hours/week): | 3 |
| 8. | Laboratory sessions: | 0 |
| 9. | Prerequisite: | None |
| 10. | Language: | English |
| 11. | Mode of delivery: | In-person |
| 12. | Course coordinator: | Muse Oke |
| 13. | Contact information of coordinator: | museoke@iyte.edu.tr |
| 14. | Description of the course: | The Biochemistry I course aims to instruct students on the structure-function relationships of macromolecules and the role of enzymes in biochemical reactions |
| 15. | Learning outcomes: | By the end of the course, students should be able to demonstrate knowledge and understanding of: <ul style="list-style-type: none"> i. Structures and functions of macromolecules and their roles in survival and reproduction of living things ii. Mechanisms of action of enzymes and determination of enzyme kinetics iii. Relevance of the laws of thermodynamics to the survival of living things iv. how to pursue independent and self-directed learning |
| 16. | Course content: | |
| | Week 1: | Introduction to Biochemistry; Cell chemistry: carbon chemistry and formation of chemical bonds |
| | Week 2: | Carbohydrate structure and function I: monosaccharide structure, function and stereochemistry |
| | Week 3: | Carbohydrate structure and function II: oligosaccharide structure formation and function |
| | Week 4: | Nucleic acid function and structure; nucleotide structure; formation of chemical bonds, stability and structure-function relationship of the DNA double helix structure; formation of RNA secondary structures |

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| | Week 5: | Protein structure & function I: structures, stereochemistry and physicochemical properties of amino acids; peptide bond formation; primary, secondary, tertiary and quaternary structures of proteins |
| | Week 6: | Protein structure & function II: evolution of protein structure and function |
| | Week 7: | Midterm I |
| | Week 8: | Protein enzymes & ribozymes: 3D structures, catalytic strategies, nomenclature and classification of enzymes |
| | Week 9: | Thermodynamics: laws and relevance to biochemical processes; definition and derivation of Gibbs free energy |
| | Week 10: | Enzyme kinetics: definition and derivation of the kinetic parameters – k_{cat} , K_M , V_{max} and catalytic efficiency |
| | Week 11: | Lipids and Biological membranes: structure, nomenclature and physicochemical properties of fatty acids, phospholipids, glycolipids and cholesterol; constituents, structure and function of the biological membrane |
| | Week 12: | Macromolecular interactions: associations of macromolecules and their roles in biological processes |
| | Week 13: | Midterm II |
| | Week 14: | Revision week |
| | Week 15: | Final exams |
| 17. | Recommended Textbooks: | <ul style="list-style-type: none"> i. Lehninger Principles of Biochemistry Eighth Edition (2021) by David L. Nelson & Michael M. Cox ii. Molecular Cell Biology Ninth Edition (2021) by Harvey Lodish, Arnold Berk, Chris A. Kaiser, Monty Krieger, Anthony Bretscher, Hidde Ploegh, Kelsey C. Martin, Michael Yaffe & Angelika Amon iii. Biochemistry 9th Edition (2019) by Lubert Stryer iv. Molecular Biology of the Cell Sixth Edition (2015) by Bruce Alberts, Alexander Johnson, Julian Lewis, David Morgan, Martin Raff, Keith Roberts & Peter Walter v. |
| 18. | Assessment: | |
| | Mode of Assessment | Weight/Dates |
| | Midterm exams 1 & 2 | 20% midterm I 20% midterm II |
| | Final exam | 60% |