

T.C.

ATILIM UNIVERSITY FACULTY OF MEDICINE

EDUCATION IN 2025-2026 ACADEMIC YEAR

ACADEMIC CALENDAR

**Laboratory Lessons:**

1. Laboratory Instruments, Normal, Molar, Percent Solutions (Dr. Kılıç & Dr. Boyacıoğlu)
2. DNA isolation (Dr. Sönmez)
3. Mitosis (Dr. Tevlek)
4. Serum protein determination (Dr. Boyacıoğlu)
5. Gram staining (Dr. Tülek, Dr. Usluca & Dr. Özcan)
6. Lining Epithelium (Dr. Aykanat)
7. Glandular Epithelium (Dr. Aykanat)
8. Connective tissue (Dr. Aykanat)
9. **Clinical Skills:** Gloving Techniques (Dr. Eren, Dr. Erol Demirbilek, Kemal Berk ÜNAL (peer-education Phase V))
10. **Clinical Skills:** Heimlich manoeuvre (Dr. Bozdereli Berikol)

| COMMITTEE NAME | STARTING DATE | COMPLETION DATE |
|----------------|---------------|-----------------|
| MED 101        | 22.09.2025    | 17.10.2025      |
| MED 103        | 20.10.2025    | 05.12.2025      |
| MED 105        | 08.12.2025    | 09.01.2025      |

| COMMITTEE NAME                                                   |         |         |            |         |         |         |
|------------------------------------------------------------------|---------|---------|------------|---------|---------|---------|
|                                                                  | MED 101 | MED 102 | MED 103    | MED 104 | MED 105 | MED 106 |
| CLINICAL SKILLS EXAM DATE                                        |         |         | 05.12.2025 |         |         |         |
| HISTOLOGY AND EMBRYOLOGY AND MEDICAL BIOLOGY PRACTICAL EXAM DATE |         |         | 05.12.2025 |         |         |         |
| COMMITTEE EXAM DATE                                              |         |         | 04.12.2025 |         |         |         |

### MED103 THE CELL

|                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                               |                                   |                   |
|------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-----------------------------------|-------------------|
| <b>PHASE I COORDINATOR</b>                     | Assoc. Prof. Dr. Nuriye Ezgi BEKTUR AYKANAT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                               |                                   |                   |
| <b>CHAIR OF THE MED 103 COMMITTEE</b>          | Asst. Prof. Dr. Özge BOYACIOĞLU                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                               |                                   |                   |
| <b>MED 103 COMMITTEE DATE RANGE</b>            | 20.10.2025- 05.12.2025                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                               |                                   |                   |
| <b>ACADEMIC STAFF AT THE MED 103 COMMITTEE</b> | Prof. Dr. Necla TÜLEK- Medical Microbiology<br>Prof. Dr. Nedret KILIÇ- Medical Biochemistry<br>Prof. Dr. Ayşe ÇAYLAN- Family Medicine<br>Prof. Dr. Çağla SÖNMEZ- Medical Biology<br>Prof. Dr. Yekbun ADIGÜZEL- Biophysics<br>Assoc. Prof. Dr. Selma USLUCA- Medical Microbiology<br>Assoc. Prof. Dr. Nuriye Ezgi BEKTUR AYKANAT- Histology and Embryology<br>Assoc. Prof. Dr. Ali Doğan DURSUN- Physiology<br>Assoc. Prof. Dr. Göksu BOZDERELİ BERİKOL- Emergency Medicine<br>Asst. Prof. Dr. Melike EROL DEMİRBİLEK- Medical Biochemistry<br>Asst. Prof. Dr. Atakan TEVLEK- Medical Biology<br>Asst. Prof. Dr. Gülin ÖZCAN KUYUCU- Medical Microbiology<br>Asst. Prof. Dr. Özge BOYACIOĞLU- Medical Biochemistry |                               |                                   |                   |
| <b>ACADEMIC STAFF</b>                          | <b>THEORETICAL LECTURE TIME</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>PRACTICAL LECTURE TIME</b> | <b>INTERACTIVE EDUCATION TIME</b> | <b>TOTAL TIME</b> |
| Histology and Embryology                       | 9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 3                             | -                                 | 12                |
| Medical Microbiology                           | 13                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1                             | -                                 | 14                |
| Medical Biochemistry                           | 20                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 2                             | -                                 | 22                |
| Medical Informatics                            | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | -                             | -                                 | 2                 |
| Biostatistics                                  | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | -                             | -                                 | 2                 |
| Physiology                                     | 9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | -                             | -                                 | 9                 |
| Medical Biology                                | 21                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 2                             | 2                                 | 25                |
| Biophysics                                     | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | -                             | -                                 | 3                 |
| Emergency                                      | -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | -                             | 5                                 | 5                 |
| Family Medicine                                | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | -                             | -                                 | 2                 |
| <b>TOTAL</b>                                   | <b>81</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>8</b>                      | <b>7</b>                          | <b>96</b>         |

|                      |          |
|----------------------|----------|
| <b>Advisor Visit</b> | <b>3</b> |
|----------------------|----------|

**CONTENT OF THE MED 103 COMMITTEE**

The basic cell structure, DNA and RNA structure, methods used in DNA isolation, cellular organelles, their structure and function, general overview to cell and cytoplasm, membranous and non-membranous organelles, cell nucleus, cellular secretion, cell skeleton, motor proteins, movement and polarization in the cell, mechanics of cell division and cytokinesis, tissue preparation techniques, classification and histological organisation of tissues, intracellular structures, amino acids, bacteria, viruses

**MED 103 COMMITTEE AIM**

To introduce basic biochemistry, genetics and microbiology in order to learn the normal structure, function and their pathological conditions. To be able to understand basic interaction techniques and medical applications. To be able to understand the four basic tissue types and organization of them.

**MED 103 COMMITTEE LEARNING OBJECTIVES**

The students who succeeded in this course;

1. Describes the basics of cell structure and cytoskeleton; the intracellular communication pathways.
2. Explains the structure and function of DNA and RNA that store genetic information and interprets the relation between them; DNA isolation from cell.
3. Describes the structures and functions of organelles found in cell.
4. Describes the physiological features of homeostasis and properties of body fluid compartments.
5. Explains the transport system of substances through cell membrane.
6. Explains the electrical potential mechanisms and action potential in a neuron.
7. Understands the mechanism of protein synthesis including transcription, translation, posttranscriptional and posttranslational modifications and intracellular protein trafficking.
8. Lists the cell structures of microorganisms.
9. Understands the classification and metabolism of bacteria; bacterial genetics.
10. Explains the mechanisms of bacterial pathogenesis.
11. Describes the classification, structure and replication of viruses; viral pathogenesis.
12. Describes the structure of a cell under microscope.
13. Describes the types of cell death and the mechanisms of them.
14. Explains DNA repair mechanisms.
15. Applies basic cultivation techniques.
16. Classify enzymes into their six major groups (oxidoreductases, transferases, hydrolases, lyases, isomerases, ligases) and explain the function of each class with examples.
17. Describe the factors that influence enzyme activity, including temperature, pH, substrate concentration, and cofactors/coenzymes.
18. Analyze Michaelis-Menten kinetics and interpret Lineweaver-Burk plots to determine enzyme kinetic parameters.
19. Differentiate between competitive and non-competitive enzyme inhibition and explain how each affects enzyme kinetics.
20. Explain the main mechanisms of enzyme regulation, including allosteric regulation, feedback inhibition, and covalent modification.
21. Relate enzyme activity to metabolic control and cellular signaling pathways.
22. Classify carbohydrates into monosaccharides, disaccharides, and polysaccharides based on their structure.

23. Identify common monosaccharides (glucose, fructose, galactose) and disaccharides (sucrose, lactose, maltose) and describe their functions.
24. Differentiate between storage polysaccharides (starch, glycogen) and structural polysaccharides (cellulose) and explain their biological roles.
25. Discuss the clinical importance of carbohydrate metabolism at a basic level.
26. Define and distinguish between glycosaminoglycans (GAGs), proteoglycans, and glycoproteins.
27. Describe the fundamental structure of GAGs and explain their biological roles in the extracellular matrix and connective tissues.
28. Relate the function of proteoglycans and glycoproteins to their specific structures.
29. Correlate defects in GAG synthesis or degradation with associated diseases at a basic level.
30. Define bioenergetics and explain their fundamental principles (free energy, enthalpy, entropy).
31. Describe the role of ATP as the universal energy currency of the cell.
32. Explain the process of biological oxidation and reduction, and identify key electron carriers.
33. Outline the stages of cellular respiration (glycolysis, Krebs cycle, electron transport chain) and calculate the net ATP yield.
34. Describe the biochemical composition of connective tissue, focusing on collagen and elastin.
35. Explain the synthesis and post-translational modifications of collagen and relate structural defects to diseases.
36. Summarize the role of proteoglycans and GAGs in the extracellular matrix.
37. Discuss the role of matrix metalloproteinases in tissue remodeling and their clinical relevance.
38. Identify and explain the function of basic biochemistry laboratory instruments.
39. Apply the principles of dilution and concentration in a laboratory setting.
40. Describes how to calculate normality, molarity and percent volumes of solutions and calculates concentrations based on volume or volume and weight or the degree of saturation.
41. Explain the clinical significance of measuring serum protein levels.
42. Identify the major serum proteins (e.g., albumin, globulins) and describe their primary functions.
43. Practice how to interpret results using a standard graph for protein solutions.
44. Calculate and discuss the protein concentration in an unknown solution using bovine serum albumin standard graph.
45. Describes the drug and routes and mechanism of drug administration.
46. Distinguishes cell membrane, nucleus, cytoplasm and organelles with histochemical dyes.
47. Examines and explains the parts of the microscope.
48. Sorts cell skeleton components and indicates their differences.
49. Defines the tissue organization with a histological view
50. Counts four basic tissues in human body
51. Counts subtypes of basic tissues in human body
52. Defines the epithelial tissue with a histological view
53. Defines the connective tissues with a histological view
54. Describes the diagnostic stages and techniques in a used in routine pathology laboratory
55. Describes the functions of the cell membrane;
56. Explains the selective permeability property of the cell membrane;
57. Explains the properties of structural elements of the cell membrane, their relations with each other, and their functional importance.
58. Explains the transport mechanisms in the cell membrane;
59. Describes the role that osmotic pressure and hydrostatic pressures play together in body fluid balance;

60. Explains the difference between osmotic and oncotic pressure and defines the physiological meaning of these pressures.
61. Explains the signal transduction ways in the control of cells with chemical messengers.
62. Defines secondary messenger molecules.
63. Explains receptor localizations and differences in response.
64. Explains the content of physiology science, establishes a relationship between physiology and clinics.
65. Defines homeostasis;
66. Explains the regulation mechanisms of body functions;
67. Explains control systems;
68. Defines the physiological importance of feedback systems
69. Defines the body fluid compartments (intracellular and extracellular fluid);
70. Explains the content differences of fluid compartments;
71. Defines the physiological importance of body fluids.

#### **RECOMMENDED BOOKS**

1. Emery's Elements of Medical Genetics (15th Edition); Peter D. Turnpenny, Sian Ellard; Elsevier, Philadelphia, 2017.
2. Harper's Illustrated Biochemistry (31st Edition); Robert K. Murray, David A. Bender, Kathleen M. Botham, Peter J. Kennelly, Victor W. Rodwell, P. Anthony Weil McGrawHill-Lange, 2018
3. Lippincott Illustrated Reviews: Biochemistry (7th Edition); Denise R. Ferrier; Lippincott Wilwims & Wilkins; Philadelphia, 2017.
4. Marks' Basic Medical Biochemistry A Clinical Approach (5th Edition); Michael Lieberman, Alisa Peet; Wolters Kluwer, Philadelphia, 2018.
5. Thompson & Thompson Genetics in Medicine (8th Edition); Robert L. Nussbaum, Roderick R. McInnes, Huntington F. Willard; Elsevier, Philadelphia, 2016.
6. Histology and Cell Biology: An Introduction to Pathology (4th Edition); Abraham Kierszenbaum Laura Tres, Elsevier Saunders, Philadelphia, 2015.
7. Histology: A Text and Atlas: With Correlated Cell and Molecular Biology (7<sup>th</sup> Edition); Wojciech Pawlina, Michael H. Ross Walters Kluwer, 2020
8. Robbins Basic Pathology (10th edition); 2018 [edited by] Vinay Kumar, Abul K. Abbas, Jon C. Aster
9. Cell and Molecular Biology (2nd edition); Nalini Chandar, PhD, Susan Viselli, PhD, Lippincott Williams & Wilkins, 2019.
10. Molecular Cell Biology (8th edition); Harvey Lodish, W.H. Freeman & Co Ltd, 2016.
11. Molecular Biology of the Cell (6th edition); Bruce Alberts, W. W. Norton & Company, 2015.
12. Campbell General Biology (12<sup>th</sup> edition); Lisa A. Urry, Michael Lee Cain, Steven Alexander Wasserman, Peter V. Minorsky, Rebecca B. Orr, 2021
13. Jawetz, Melnick, & Adelberg's Medical Microbiology, 28e, McGraw-Hill Education, 2019.
14. Medical Microbiology (9th Edition); Murray, Rosenthal, Pfaller, 2020.
15. Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases (9th Edition); Bennett, JE, Dolin R, Blaser MJ. Elsevier, 2019.
16. Lehninger Principles of Biochemistry, 8th Edition, David L. Nelson, Michael M. Cox. W.H. Freeman & Company, 2021.
17. Lippincott® Illustrated Reviews: Biochemistry, 9th Edition, North American Edition. Emine Ercikan Abali, Susan D. Cline, David S. Franklin, Dr. Susan M. Viselli, 2025.
18. Textbook of Biochemistry with Clinical Correlations (7th Edition); Thomas M. Devlin (Editor) John Wiley & Sons, 2011.

19. Integrative Medical Biochemistry: Examination and Board Review, 1st Edition Michael W. King, Mc Graw Hill
20. Peter J. Kennelly, Kathleen M. Botham, Owen McGuinness, Victor W. Rodwell, P. Anthony Weil - Harper's Illustrated Biochemistry-McGraw Hill, 2022.
21. John W. Baynes PhD, Marek H. Dominiczak Dr Hab Med FRCPATH (Editor), Medical Biochemistry, 6th Edition, Elsevier, 2022.
22. Tietz Fundamentals of Clinical Chemistry and Molecular Diagnostics (Tietz Textbook of Clinical Chemistry and Molecular Diagnostics) 9th Edition, Nader Rifai PhD (Editor), 2023.
23. Alberts, Bray, Hopkin, Johnson, Lewis, Raff, Roberts, Walter, 2017, Essential Cell Biology, Garland Science T&F, 4th Edition
24. Guyton and Hall Textbook of Medical Physiology, 14th Edition
25. Ganong's Review of Medical Physiology, 26th Edition
26. Vander's Human Physiology: The Mechanisms of Body Function, 16th Edition
27. Lippincott Illustrated Reviews Physiology, 3rd Edition

#### **MED 103 COMMITTEE EXAM WEEK**

MED 103 COMMITTEE EXAM WEEK

| DATE                                                       | EXAM NAME                                                                                                                                                                                                                                                                      | EXAM HOUR                                       |                                                   |                                                   |
|------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|---------------------------------------------------|---------------------------------------------------|
| 05.12.2025                                                 | MED 103 Practical Exam                                                                                                                                                                                                                                                         | 09:30-12:20                                     |                                                   |                                                   |
| 04.12.2025                                                 | MED 103 Committee Exam                                                                                                                                                                                                                                                         | 09:30-12:20                                     |                                                   |                                                   |
| 05.12.2025                                                 | MED 103 Clinical Skills Exam                                                                                                                                                                                                                                                   | 09:30-12:20                                     |                                                   |                                                   |
| Teaching Methods and Techniques                            |                                                                                                                                                                                                                                                                                |                                                 |                                                   |                                                   |
|                                                            | <input checked="" type="checkbox"/> Lecture                                                                                                                                                                                                                                    | <input type="checkbox"/> Case based learning    | <input type="checkbox"/> Case discussion          | <input type="checkbox"/> Student presentation     |
|                                                            | <input type="checkbox"/> Role playing                                                                                                                                                                                                                                          | <input type="checkbox"/> Problem Based Learning | <input type="checkbox"/> Project                  | <input type="checkbox"/> Homework                 |
|                                                            | <input checked="" type="checkbox"/> Laboratory practice                                                                                                                                                                                                                        | <input type="checkbox"/> Team Based Learning    | <input checked="" type="checkbox"/> Self Learning | <input checked="" type="checkbox"/> Flipped class |
| Evaluation Method                                          | Theoretical Exam (76%), Practical Exam (10%; Histology and Embryology: 3%, Medical Biology: 2%, Medical Microbiology: 2%, Medical Biochemistry: 3%), Clinical Skills Exam (10%), Quiz (2%; Medical Biology: 1%, Medical Biochemistry: 1%), Flipped Class (2%; Medical Biology) |                                                 |                                                   |                                                   |
| Language of lectures, practical and all other applications | English                                                                                                                                                                                                                                                                        |                                                 |                                                   |                                                   |