

زانکۆی پۆلیتەکنیکی هەولێر
کۆلیژی تەکنیکی تەندروستی و پزیشکی هەولێر / بەشی شیکاری نەخۆشیەکان
وانەکانی تاقیکردنەوەی توانستی زانستی خۆپەندنی بالـا- دبلۆمی بالـا

Subject	Topics	References
2. Molecular biology	- DNA and RNA structure, DNA replication, transcription, and translation, Prokaryotic and eukaryotic gene structure, Mutation, and Polymerase chain reaction (PCR).	1) Robert J. Brooker (2012). Genetics: analysis & principles (4th edition). 2) James D. Watson / Tania A. Baker / Stephen P. Bell / Alexander Gann / Michael Levine / Richard Losick (2013). "Molecular Biology of the Gene (7th edition).
2. Immunology:	Basic immunology: Structure of immune system, body line defenses, APC, Ab production, Ag, Ab, and Complement component.	Basic and Clinical Immunology / Authors: Mark Peakman, Diego Vergani.
4. Biochemistry	A. Carbohydrate: 1- Introduction (definition, Importance, classifications and food sources). 2- Digestion, 3- Glycolysis, 4- Glycogenolysis B. Lipids: a- Introduction (definition, Importance, classifications and food sources) b- Digestion, c- Lipoproteins, d- B-Oxidation. C. Proteins and Amino acid: a- Introduction about protein and amino acid, d. Digestion., c- Transamination and deamination, d- Urea cycle., Enzyme: (definition, Importance, classifications).	Harper's Illustrated Biochemistry
5. Microbiology: A. Bacteriology:	Morphology And Classification Of Bacteria -Nutrition And Growth Of Bacteria. -Sterilisation And Disinfection - Pathogenesis Of Bacterial Infection. - Bacterial Culture Media. -Methods Of Isolation Of Bacteria/ - Staphylococcus & Staphylococcus. - Antibiotic Resistance	Jawetz, Melnick & Adelberg's Medical Microbiology. (2019). 28th ed., McGraw Hill Medical.

زانکۆی پۆلیته کینی ههولێر

کۆلیژی ته کینی ته ندرۆستی و پزیشکی ههولێر / بهشی شیکاری نهخۆشیه کان

وانه کانی تاقیکردنهوهی توانستی زانستی خویندنی بالا- **ماستهر**

Subject	Topics	References
1. Molecular biology	<ul style="list-style-type: none"> - DNA (Structure, Replication, Transcription and Translation) in Eukaryotic and Prokaryotic. - DNA mutation and repair - Gene cloning - PCR - DNA Sequencing 	The Basics of Molecular Biology, Alexander Vologodskii, 2023. Springer publication.
2. Immunology:	<p>A. Basic immunology: Structure of immune system, Types of immunity, body line defenses, APC, Ab production, Ag, Ab, and Complement.</p> <p>B. Clinical immunology: Autoimmune disease, Tumor markers, and Immunodeficiency.</p> <p>C. Diagnostic immunology: Methods detection of Ag and Ab.</p>	- Basic and Clinical Immunology /Authors: Mark Peakman, Diego Vergani.
3. Hematology	<p>A. RBC and WBC structure and function</p> <p>B. Normal hemostasis</p> <p>C. Hematopoiesis and bone marrow microenvironment</p> <p>D. Anemia: general background and classification.</p>	Third Edition, Gary Moore, Gavin Knight, and Andrew Blann, Oxford
4. Biochemistry	<p>Carbohydrate: a- Metabolism of carbohydrate, b- Oxidative phosphorylation, c- Blood sugar, d- Hyperglycemia, e- hypoglycemia</p> <p>- Lipids: a- Lipid metabolism, b- Cholesterol biosynthesis, c- Dyslipidemia, d- Lipid profile.</p> <p>Proteins and Amino acid : a- Metabolism of proteins, b- Total protein , albumin and globulin, c- Liver enzyme.</p>	Harper's Illustrated Biochemistry
5. Microbiology:	<p>1. The Bacteria: cell structure, growth, nomenclature, pathogenicity and identification methods.</p> <p>2. Sterilization & Disinfection methods.</p> <p>3. Antibacterial agents (antibiotics).</p>	Jawetz, Melnick & Adelberg's Medical Microbiology. (2019).

A. Bacteriology:	4. Examples of medically significant bacterial species: Gram positive (Staphylococci & Streptococci). Gram Negative (The Enterobacteriaceae).	28th ed., McGraw Hill Medical.
B. Parasitology	General Introduction of parasitology <ul style="list-style-type: none"> Protozoa (Entamoeba histolytica, Giardia lamblia, Trichomonas, Leishmania) Helminths <ul style="list-style-type: none"> a)- Nematodes <ul style="list-style-type: none"> 1-Smallintestine Ascaris lumbricoides 2-Largeintestine Trichuris trichiura b)- Cestodes: Tapeworms <ul style="list-style-type: none"> 1- Diphyllbothrium latum 2- Taenia solium and Taenia saginata c)- Trematodes: Flukes <ul style="list-style-type: none"> Schistosoma and Fasciola 	<ol style="list-style-type: none"> PANIKER, C. J. & GHOSH, S. 2017. Paniker's textbook of medical parasitology, JP Medical Ltd. SASTRY, A. S. & BHAT, S. 2018. Essentials of medical parasitology, Jp Medical Ltd.
C. virology	<ol style="list-style-type: none"> Viruses, viroids and prions General characteristics of viruses and how viruses differ from other microorganisms. Virus structure in detail Different basis of virus classification. Replication of DNA and RNA viruses. Pathogenesis of viruses (mode of virus transmission and entry/ Mechanism of virus spread in the body). 	Kenneth J. Ryan. Sherris Medical Microbiology. 7th ed. McGraw Hill; 2017 Carroll Karen C Jeffery A Hobden Steve Miller Stephen A Morse Timothy A Mietzner Barbara Detrick Thomas G Mitchell J. H McKerrow and Judy A Sakanari. 2016. Jawetz Melnick & Adelberg's Medical Microbiology. 27th ed. Mcgraw-Hill Education; 2016. Samaranayake L. Essential Microbiology for Dentistry. 5th ed. Churchill Livingstone; 2018.

زانکۆی پۆلیتەکنیکی هەولێر
کۆلێژی تەکنیکی تەندروستی و پزیشکی هەولێر / بەشی شیکاری نەخۆشیەکان
وانەکانی تاقیکردنەوەی توانستی زانستی خۆبەدەستی بەل-دکتۆرا
پسپۆری (Immunology)

Subject	Topics	References
1- .Essential Immunology	APC, Complement component, CD, Cytokines, Vaccination	-Essentials of Clinical Immunology/ Helen Chapel, Mansel Haeney, Siraj Misbah, Neil Snowden.
2.Clinical mmunology	Immunodeficiency, Anaphylaxis and Allergy, Autoimmune diseases, Tumor immunology, Organ transplantation. Methods detection of Ag and Ab.	- Basic and Clinical Immunology /Authors: Mark Peakman, Diego Vergani. - Lippincott Immunology./ by Thao Doan & Roger Melvold & Susan Viselli & Carl Waltenbaugh.
3. Molecular Biology	Regulation of gene expression and protein activity, Mutation, Its types, relation to genetic disorders and Methods of detection, Hallmarks of cancer Types of RNA and their functions	The Basics of Molecular Biology, Alexander Vologodskii, 2023. Springer publication.
4.Biochemistry	Electrolytes, Enzymes, Hormones and their disorder, Liver function tests, Kidney function tests Carbohydrate metabolism and its disorder, Lipid metabolism and its disorder Protein metabolism and its disorder.	1. Harper's Illustrated Biochemistry (Isbn: 978-1-25-983794-4) 2. Clinical Biochemistry & Metabolic Medicine, Martin Andrew Crook.
5. Microbiology:	Development or novel antibiotics and antimicrobial Resistance, Pathogenicity and Virulence, Biotechnology and Synthetic	-Antibiotic Drug Resistance Editor(s):José-Luis Capelo-Martínez, Gilberto Igrejas - Medical Microbiology, 4th edition
A. Bacteriology:	Biology, Development of point of care tests for infection and their diagnosis, Infection control.	-Editor: Samuel Baron.Galveston (TX): University of Texas Medical --Branch at Galveston; 1996.

<p>B. Virology</p>	<p>Viruses, viroids and prions, General characteristics of viruses and how viruses differ from other microorganisms, Virus structure in detail, Different basis of virus classification, Replication of DNA and RNA viruses, Pathogenesis of viruses (mode of virus transmission and entry/ Mechanism of virus spread in the body).</p>	<p>-Kenneth J. Ryan. <i>Sherris Medical Microbiology</i>. 7th ed. McGraw Hill; 2017 Carroll Karen C Jeffery A Hobden Steve Miller Stephen A Morse Timothy A Mietzner Barbara Detrick Thomas G Mitchell J. H McKerrow and Judy A Sakanari. 2016. - <i>Jawetz Melnick & Adelberg's Medical Microbiology</i>. 27th ed. McGraw-Hill Education; 2016. Samaranayake L. -<i>Essential Microbiology for Dentistry</i>. 5th ed. Churchill Livingstone; 2018.</p>
<p>C. Parasitology</p>	<p>General features and classification of protozoa, (<i>Entamoeba histolytica</i>, <i>Leishmania</i>, <i>Plasmodium species</i>, <i>Toxoplasma</i>, <i>Trypanosomiasis</i>). Helminthology (<i>Schistosoma</i>, <i>echinococcosis</i>, <i>Fascioliasis</i> and <i>Wuchereria bancrofti</i>).</p>	<p>1. PANIKER, C. J. & GHOSH, S. 2017. Paniker's textbook of medical parasitology, JP Medical Ltd. 2. SASTRY, A. S. & BHAT, S. 2018. Essentials of medical parasitology, Jp Medical Ltd.</p>

زانکۆی پۆلیته کینی ههولێر
کۆلێژی ته کینی ته ندرۆستی و پزیشکی ههولێر / بهشی شیکاری نهخۆشیه کان
وانه کانی تاقیکردنه وهی توانستی زانستی خۆیندنی بالا- دکتۆرا
(Bio-Clinical Chemistry) پسپۆری

Subject	Topics	References
1. Biochemistry	1-Enzyme Kinetics and Inhibition 2-Biological Oxidation, Bioenergetics, Metabolism and Regulation of Metabolism I-Metabolism of Carbohydrates II-Metabolism of Lipids III-Metabolism of proteins & amino acids III-Metabolism of Nucleic acids. 3-Hormones—Chemistry, Mechanism of Action, physiological significance and Metabolic Role.	1. HARPER'S ILLUSTRATED BIOCHEMISTRY (ISBN: 978-1-25-983794-4) 2. CLINICAL BIOCHEMISTRY & METABOLIC MEDICINE, Martin Andrew Crook.
2. Clinical chemistry	1. Specific protein markers 2. Plasma enzymes in diagnosis (clinical enzymology) 3. Thyroid dysfunction 4. Assessment of hepatic function 5. Assessment of Renal function 6. Clinical biochemistry of the gastrointestinal tract 7. Clinical biochemistry of the cardiovascular system Immunology.	1. Harper's Illustrated Biochemistry (Isbn: 978-1-25-983794-4) 2. Clinical Biochemistry & Metabolic Medicine, Martin Andrew Crook. 3. Rodwell, V.W., Bender, D.A., Botham, K.M. and Weil, A.P. 2015. Illustrated Biochemistry 30ed. New York: McGraw-Hill.
3. Immunology:	Basic immunology: Structure of immune system, body line defenses, Types of immunity, APC, Ab production, Ag, Ab, and Complement. 2. Clinical immunology: Autoimmune disease, Tumor markers, and Immunodeficiency. 3. Diagnosis immunology: Methods detection of Ag and Ab.	-Basic and Clinical Immunology /Authors: Mark Peakman, Diego Vergani. -Lippincott Immunology./ by Thao Doan & Roger Melvold & Susan Viselli & Carl Waltenbaugh.
4. Physiology.	Cell membrane (Transport, Channels and controls of membrane), Membrane potential, Hormones, Renal Physiology, Gastrointestinal Physiology.	(Guyton Physiology) Arthur C. Guyton, John E. Hall - Textbook of Medical Physiology. Volume 9- Saunders (2005).
5. Endocrinology:	(hypothalamus-pituitary axis, thyroid and parathyroid glands, adrenal gland, male and female sexual reproductive glands).	Hinson, J , P Raven, and S Chew. The Endocrine System: Basic Science and Clinical Conditions. 3rd ed: Elsevier, 2022.

زانکۆی پۆلیتەکنیکی ھەولێر
کۆلێژی تەکنیکی تەندروستی و پزیشکی ھەولێر / بەشی شیکاری نەخۆشیەکان
وانەکانی تاقیکردنەوهی توانستی زانستی خۆبەدەست - دکتۆرا
بەسپۆری (Microbiology)

Subject	Topics	References
1. Bacteriology	Development or novel antibiotics and antimicrobial Resistance, Pathogenicity and Virulence, Biotechnology and Synthetic Biology, Development of point of care tests for infection and their diagnosis, Infection control.	-Antibiotic Drug Resistance Editor(s): José-Luis Capelo-Martínez, Gilberto Igrejas - Medical Microbiology, 4th edition, Editor: Samuel Baron. Galveston (TX): -Genentech: The Beginnings of Biotech (Synthesis) Paperback
2. Virology	Viruses and prions, RNA virus families and replication of RNA viruses, DNA virus families and replication of DNA viruses. Pathogenesis of viral diseases, <ul style="list-style-type: none"> • Modes of viral transmission and entry • Mechanisms of viral spread in the body • Cell tropism • Virus-cell interaction (infection outcome) • Virus virulence factors (attachment, entrance, immune escape, release, and oncogenesis) Herpes viruses' disease and pathogenesis (HSV 1 & 2 and EBV) Adenovirus disease and pathogenesis, Lab diagnosis of acute and chronic Hepatitis B and C viruses.	-Kenneth J. Ryan. <i>Sherris Medical Microbiology</i> . 7 th ed. McGraw Hill; 2017. -Carroll Karen C Jeffery A Hobden Steve Miller Stephen A Morse Timothy A Mietzner Barbara Detrick Thomas G Mitchell J. H McKerrow and Judy A Sakanari. 2016. <i>Jawetz Melnick & Adelberg's Medical Microbiology</i> . 27 th ed. McGraw-Hill Education; 2016. Samaranayake L. <i>Essential Microbiology for Dentistry</i> . 5 th ed. Churchill Livingstone; 2018.
3. Molecular Biology	Regulation of gene expression and protein activity, Mutation, Its types, relation to genetic disorders and Methods of detection, Hallmarks of cancer, Types of RNA and their functions.	The Basics of Molecular Biology, Alexander Vologodskii, 2023. Springer publication.
4. Immunology	Basic immunology: Structure of immune system, Types of immunity, body line defenses, APC, Ab production, Ag, Ab, and Complement. Clinical immunology: Autoimmune disease, Tumor markers, and Immunodeficiency. Diagnosis immunology: Methods of detection of Ag and Ab.	- Basic and Clinical Immunology /Authors: Mark Peakman, Diego Vergani. -Lippincott Immunology./ by Thao Doan & Roger Melvold & Susan Viselli & Carl Waltenbaugh

5. Biochemistry	<ul style="list-style-type: none"> • Electrolytes • Enzymes • Hormones and their disorder • Liver function tests • Kidney function tests • Carbohydrate metabolism and its disorder • Lipid metabolism and its disorder • Protein metabolism and its disorder. 	1. Harper's Illustrated Biochemistry (Isbn: 978-1-25-983794-4) 2. Clinical Biochemistry & Metabolic Medicine, Martin Andrew Crook.
------------------------	--	---

زانکۆی پۆلیته کینی ههولێر

کۆلیژی ته کینی ته ندروستی و پزیشکی ههولێر / بهشی شیکاری نهخۆشیه کان

وانه کانی تاقیکردنه وهی توانستی زانستی خویندنی بالا- **دکتۆرا**

پسپۆری (Cell biology)

Subject	Topics	References
1. Molecular biology	Regulation of gene expression and protein activity, Mutation, Its types, relation to genetic disorders and Methods of detection, Hallmarks of cancer, Types of RNA and their functions.	The Basics of Molecular Biology, Alexander Vologodskii, 2023. Springer publication.
2. Cell Biology	1. Cell to cell interaction 2. Cell Cycle. 3. Apoptosis 4. Cell Signaling 5. Cancer.	<i>Goodman's Medical Cell Biology FOURTH EDITION</i> Edited by Steven R. Goodman, PhD University of Tennessee Health Science Center, Memphis, TN, United States
3. Hematology	-Hematological Malignancies, Background, Full Classifications, Cellular and molecular Mechanism. - Basic laboratory techniques for hematological malignancies, Full blood tests, Bone marrow assessments, Immunophenotyping and molecular investigations. - Bleeding disorders and their lab. investigations. - Classification and details about different types of anemia. Hemoglobinopathy, red cell membrane disorder, red cell metabolism defects and Hemolysis.	Third Edition, Gary Moore, Gavin Knight, and Andrew Blann, Oxford.

4. Physiology:	-Cell membrane (Transport, Channels and controls of membrane). -Membrane potential. -Hormones. -Renal Physiology. -Gastrointestinal Physiology.	(Guyton Physiology) Arthur C. Guyton, John E. Hall - Textbook of Medical Physiology. Volume 9-Saunders (2005).
5. Biochemistry	<ul style="list-style-type: none"> - Electrolytes - Enzymes - Hormones and their disorder - Liver function tests - Kidney function tests - Carbohydrate metabolism and its disorder - Lipid metabolism and its disorder - Protein metabolism and its disorder. 	1. Harper's Illustrated Biochemistry (Isbn: 978-1-25-983794-4) 2. Clinical Biochemistry & Metabolic Medicine, Martin Andrew Crook.

زانكۆى پۆلىتەكنىكى ھەولير
كۆلىژى تەكنىكى تەندروستى و پزىشكى ھەولير / بەشى شىكارى نەخۆشپەكان
وانەكانى تاقىكردنەوہى توانستى زانستى خويندنى بالە- دكتورا
پسپورى (Physiology)

Subject	Topics	References
1. Molecular Biology	<ol style="list-style-type: none"> 1. Regulation of gene expression and protein activity 2. Mutation, Its types, relation to genetic disorders and Methods of detection. 3. Hallmarks of cancer 4. Types of RNA and their functions. 	The Basics of Molecular Biology, Alexander Vologodskii, 2023. Springer publication.
2. Physiology:	<ul style="list-style-type: none"> -Cell membrane (Transport, Channels and controls of membrane). -Membrane potential. -Hormones. -Renal Physiology. -Gastrointestinal Physiology. 	(Guyton Physiology) Arthur C. Guyton, John E. Hall - Textbook of Medical Physiology. Volume 9-Saunders (2005).
3. Hematology	<ul style="list-style-type: none"> -Hematological Malignancies, Background, Full Classifications, Cellular and molecular Mechanism. - Basic laboratory techniques for hematological malignancies, Full blood tests, Bone marrow assessments, Immunophenotyping and molecular investigations. - Bleeding disorders and their lab. investigations. - Classification and details about different types of anemia. Hemoglobinopathy, red cell membrane disorder, red cell metabolism defects and Hemolysis. 	Third Edition, Gary Moore, Gavin Knight, and Andrew Blann, Oxford.
4. Endocrinology:	(hypothalamus-pituitary axis, thyroid and parathyroid glands, adrenal gland, male and female sexual reproductive glands).	Hinson, J , P Raven, and S Chew. The Endocrine System: Basic Science and Clinical Conditions. 3rd ed: Elsevier, 2022.

زانكۆي پۆلىتەكنىكى ھەولير
كۆلىژى تەكنىكى تەندروستى و پزىشكى ھەولير / بەشى شىكارى نەخۆشپەكان
وانەكانى تاقىكردنەوھى توانستى زانستى خويندىنى بالە- دكتۇرا
(Parasitology) پسپۇرى

Subject	Topics	References
5. Protozoa:	General features and classification of protozoa, (<i>Entamoeba histolytica</i> , <i>Giardia lamblia</i> , <i>Trichomonas</i> , <i>Leishmania</i> , <i>Trypanosoma</i> , <i>Malaria</i> , <i>Toxoplasma gondii</i> , <i>Cryptosporidium parvum</i>).	
6. Helminthology	1/ Nematodes: Roundworms Small intestine: <i>Ascaris lumbricoides</i> Large intestine: <i>Trichuris trichiura</i> , <i>Enterobius vermicularis</i> , Lymphatic <i>Wuchereria bancrofti</i> Subcutaneous <i>Loa loa</i> I. Cestodes (<i>Diphyllobothrium spp.</i> , <i>Taenia solium</i> and <i>Taenia saginata</i> and <i>Echinococcus granulosus</i>) II. Trematodes: -Blood: <i>Schistosoma</i> -Biliary tract: <i>Fasciola</i> -Respiratory tract: <i>Paragonimus westermani</i> -All Ectoparasites of Medical Importance (Mites and Lice)	- Paniker, C. J. & Ghosh, S. 2017. Paniker's Textbook Of Medical Parasitology, Jp Medical Ltd. -Sastry, A. S. & Bhat, S. 2018. Essentials Of Medical Parasitology, Jp Medical Ltd.
7. Immunology:	Basic immunology: Structure of immune system, Types of immunity, body line defenses, APC, Ab production, Ag, Ab, and Complement. Clinical immunology: Autoimmune disease, Tumor markers, and Immunodeficiency. Diagnosis immunology: Methods detection of Ag and Ab	Basic and Clinical Immunology /Authors: Mark Peakman, Diego Vergani.
8. Molecular Biology	6. Regulation of gene expression and protein activity 7. Mutation, Its types, relation to genetic disorders and Methods of detection. 8. Hallmarks of cancer 9. Types of RNA and their functions.	The Basics of Molecular Biology, Alexander Vologodskii, 2023. Springer publication.

زانکۆی پۆلیته کنيکی ههولير
کۆلێژی ته کنيکی تهندروستی و پزیشکی ههولير / بهشی چارهسهری سروشتی
وانه کانی تاقیکردنهوهی توانستی زانستی خویندنی بالـا- ماستهر

No	Subjects	Topics	References
1-	Biomechanics and Kinesiology	<ul style="list-style-type: none"> • Force • Ground reaction force • Balance and Equilibrium • Levers • Posture • Biomechanics of bone and muscle • Normal, Pathological and abnormal gaits. 	Brunnstrom's Clinical Kinesiology
2-	Therapeutic exercise	<ul style="list-style-type: none"> • Classifications of types • Active and passive • Joint mobilization • ROM, Stretching, Strengthening • PNF • Balance 	(Therapeutic Exercise - Carolyn Kisner)
3-	Physical Modalities	<ul style="list-style-type: none"> • Heat therapy • Cold therapy • Electrical Stimulation • Traction • Shock wave 	(Therapeutic Modalities for Physical therapists – William E. Perntice)
4-	muscular -Neuro Physiotherapy	<ul style="list-style-type: none"> • Low back pain • Stroke • Spinal cord injury • Osteoarthritis • Bell's palsy • Multiple sclerosis • Carpal Tunnel syndrome • Shoulder complex • Hip joint disorders 	(Physiotherapy in Neuro conditions Gladly Samuel Raj) (Shweta Aggarwal - Physiotherapy in Musculoskeletal Conditions)
5-	Evaluation and assessments in physiotherapy -	<ul style="list-style-type: none"> • Manual Muscle testing • ROM • Muscle tone • ICF 	Stacie J. Fruth, PT, DHSc, OCS - Fundamentals of the Physical Therapy Examination_ Patient Interview and Tests & Measures-Jones & Bartlett Learning (2018) Daniels and Worthingham's Muscle Testing: Techniques of Manual Examination (Daniels & Worthington's Muscle Testing (Hislop))