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**Department of Biology**

**College of Science**

**University of Salahaddin**

**Subject: Hematology**

**Course Book – 3**

**Lecturer's name: Dr. Mudhir S. Shekha**

**Academic Year: 2020/2021**

**Course Book**

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| **1.Course name** | | **Hematology** | |
| **2. Lecturer in charge** | | **Mudhir S. Shekha** | |
| **3. Department/ College** | | **Biology department/ college of science** | |
| **4. Contact** | | **e-mail:** [**mudhir.shekha@su.edu.krd**](mailto:mudhir.shekha@su.edu.krd)  [**msurchi@yahoo.com**](mailto:msurchi@yahoo.com)  **Phone No. 009647504535746** | |
| **5. Time (in hours) per week** | | **Theory: 2**  **Practical: 6** | |
| **6. Office hours** | | **8 hours per week** | |
| **7. Course code** | | **SBio 304** | |
| **8. Teacher's academic profile** | | I awarded M.Sc. of animal physiology in 2003 and pursuit in biology department, college of science, Salahaddin university in 2003 as assistance lecturer. Then, I started to work in the same department, as an assistant lecturer. Then I finished the Ph.D. in Duhok- university and then upgrading to lecturer in 2010.  **The teaching experience is both theoretical and practical including:**  **Undergraduate:**   1. Animal physiology. 2. Hematology. 3. Ecophysiology. 4. Histology and embryology. 5. General biology. 6. Endocrinology. 7. Academic Debate   **Postgraduate:**   1. Cardiovascular physiology. 2. Molecular Physiology.   2014-2018Supervising MSc Student.  **Administration:**  During 2010 I become the directorof animal house of of the college of science till 2018  **List of Publications**   1. Govand Qadir, Mukhlis Aali, Karwan M Amen, Kazhan Mahmood, Bestoon Hasan, **Mudhir Shekha**, 2020. Dara K Mohammad, Hastyar H Najmuldeen, Dler Mahmood, Farhang Awla, Karzan Mohammed, Abbas Salihi. The Status of Cancer Publications in the Kurdistan Region of Iraq. Journal of Cancer Policy (Scopus **Citescore=0.95**) 2. Majid Sharifi, Sara Haji Hosseinali, Reza Hossein Alizadeh, Anwarul Hasan, Farnoosh Attar, Abbas Salihi, **Mudhir Sabir Shekha**, Karwan M Amen, Falah Mohammad Aziz, Ali Akbar Saboury, Keivan Akhtari, Akbar Taghizadeh, Nasrin Hooshmand, Mostafa A El-Sayed, Mojtaba Falahati. 2020. Plasmonic and chiroplasmonic nanobiosensors based on gold nanoparticles. Talanta. (**IF: 4.916**) 3. Majid Sharifi, Sara Haji Hosseinali, Pedram Yousefvand, Abbas Salihi, Mudhir Sabir Shekha, Falah Mohammad Aziz, Amir JouyaTalaei, Anwarul Hasan, Mojtaba Falahati. 2019. Gold nanozyme: Biosensing and therapeutic activities. Materials Science and Engineering: C (**IF: 4.959**) 4. Mohammad Javad Sohrabi, Ahmad-Reza Dehpour, Farnoosh Attar, Anwarul Hasan, Nahid Mohammad-Sadeghi, Ali Akbar Meratan, Falah Mohammad Aziz, Abbas Salihi, **Mudhir Sabir Shekha**, Keivan Akhtari, Koorosh Shahpasand, Seyed Mohammad Masood Hojjati, Majid Sharifi, Ali Akbar Saboury, Seyed Mahdi Rezayat, Seyyedeh Elaheh Mousavi, Mojtaba Falahati. 2019. Silymarin-albumin nanoplex: preparation and its potential application as an antioxidant in nervous system in vitro and in vivo. International Journal of Pharmaceutics. **(IF=4.213)** 5. Majid Sharifi, Kousar Faryabi, Amir Jouya Talaei, **Mudhir Sabir Shekha**, Mahsa Ale-Ebrahim, Abbas Salihi, Nadir Mustafa Qadir Nanakali, Falah Mohammad Aziz, Behnam Rasti, Anwarul Hasan, Mojtaba Falahati. 2019. Antioxidant properties of gold nanozyme: A review. Journal of Molecular Liquids. Volume 296, 111839. **(IF=4.561)** 6. Seyedeh Zahra Khoshgozaran Roudbaneha, Sepideh Kahbasi,Mohammad Javad Sohrabi, Anwarul Hasan, Abbas Salihi, Amir Mirzaie, Ali Niyazmandh, Nadir Mustafa Qadir Nanakali, **Mudhir Sabir Shekha**. ,Falah Mohammad Aziz, Gholamreza Vaghar-Lahijani, Aliasghar Bagheri Keshtali, Ehsan Ehsani, Behnam Rasti, Mojtaba Falahati. 2019. Albumin binding, antioxidant and antibacterial effects of cerium oxide nanoparticles. Journal of Molecular Liquids. Volume 296, 111839. **(IF=4.561)** 7. Niusha Abbasi Gamasaee, Hawzheen A Muhammad, Elahe Tadayon, Mahsa Ale-Ebrahim, Mirsasan Mirpour, Majid sharifi, Abbas Salihi, **Mudhir Sabir Shekha**, Asaad A.B. Alasady, Falah Mohammad Aziz, Keivan Akhtari, Anwarul Hasan & Mojtaba Falahati. The Effects of Nickel Oxide Nanoparticles on Structural Changes, Heme Degradation, Aggregation of Hemoglobin and Expression of Apoptotic Genes in Lymphocyte Cells. Journal of Biomolecular Structure and Dynamics. Taylor & Francis. P 1-15. **(IF=3.310)** 8. Francesco Moccia, Sharon Negri, **Mudhir Shekha**, Pawan Faris and Germano Guerra. 2019. Endothelial Ca2+ Signaling, Angiogenesis and Vasculogenesis: Just What It Takes to Make a Blood Vessel. International Journal of Molecular Sciences. 20, 3962. **(IF=4.331)** 9. Chnar Najmaddin, Fouad Hussein Kame, **Mudhir Sabir Shekha** and Falah Mohammad Aziz. 2019. Developed Silver Nitrate Pigment for Plant, Animal Tissue and Bacterial Staining. The Journal of Research on the Lepidoptera Volume 50 (2): 196-202. **(Scopus)** 10. Pawan Faris, Giorgia Pellavio, Federica Ferulli, Francesca Di Nezza, **Mudhir Shekha**, Dmitry Lim, Marcello Maestri, Germano Guerra, Luigi Ambrosone, Paolo Pedrazzoli, Umberto Laforenza, Daniela Montagna and Francesco Moccia. Nicotinic Acid Adenine Dinucleotide Phosphate (NAADP) Induces Intracellular Ca2+ Release through the Two-Pore Channel TPC1 in Metastatic Colorectal Cancer Cells. Cancers **2019**, 11(4), 542. **(IF=6.162)** 11. Pawan Faris, **Mudhir Shekha**, Daniela Montagna, Germano Guerra, Francesco Moccia. (2019). Endolysosomal Ca2+ Signalling and Cancer Hallmarks: Two-Pore Channels on the Move, TRPML1 Lags Behind!. Cancers **2019**, 11(1), 27; <https://doi.org/10.3390/cancers11010027>. **(IF=6.162)** 12. **Mudhir S. Shekha** and Almas M.R. Mahmud. (2017). Protective Effect of Exercise and alpha-tocopherol on atherosclerosis promotion in hypercholesterolemic domestic rabbits. AIP Conference Proceedings, 1888, 020049; 1-10. (**Scopus)** 13. Abbas B. Q. Salihi1, **Mudhir S. Shekha**, Peshraw S. Hamadamin, Ismail M. Maulood, Khder H. Rasul, Muhammed A. Salim, Fikry A. Qadir, Goran Q. Othman, Almas M. R. Mahmud, and Omar A. M. Al-Habib. (2017). In vivo cardiac electrical activity of nitric oxide in barium chloride treated male rats. AIP Conference Proceedings 1888, 020048.1-8 **(Scopus)** 14. **Mudhir S. Shekha**, Muhsin J. Abulwahid, Peshraw S.Hamadamin, Trifa F. Ismail, Saman R. Hamad bakir, Laween M. Ibrahim and Lana M. Ahmed. (2017). Curative effects of pomegranate and ginger on hepatic and renal functions of indomethacin-induced peptic ulcers in albino rats. Journal University of Zakho, Vol 5 No 1. 48-52 15. **Mudhir S. Shekha**, Abbas A. Q. Salihi, Ismail M. Moulood, Almas M. R. Mahmud. (2017). Roles of magnesium ion in vascular relaxation via calcium channel and cyclooxygenase pathway in isolated rat aorta. ZANCO Journal of Pure and Applied Sciences, Vol 29, No 3. 55-61. 16. Abbas A. Q. Salihi, **Mudhir S. Shekha**, Ismail M. Moulood, Almas M. R. Mahmud and Omer A. M. Al-Habib. (2016). Nitric Oxide Donor Dilates Aorta in Salt Loaded Rats Via Ativation of Inward Rectifier Potassium Channels. ZANCO Journal of Pure and Applied Sciences. ZJPAS, 28 (5); 69-77 17. Abbas B.Q. Salihi, **Mudhir S. Shekha**, Omar A.M. Al-Habib. Vasodilatory effects of nitric oxide, hydrogen sulfide and sulfur dioxide in rats: Time-dependent interaction study. Progress in Biological Sciences. Vol. 6, Number 1, Winter / Spring 2016/19-30. 18. Farhang Ali Awla, Almas Muhamad Rashid Mahmud, **Mudhir Sabir Shekha**. 2015. The Role of Endothelium-Derived Relaxing Factor in The Regulation of SNP Induced Vasorelaxation: Sodiumpotassium-Chloride Cotransporter. Journal University of Zakho, Vol. 3(A) , No.2, Pp 164-170. 19. **Mudhir Sabir Shekha**, Trifa F. Ismail, Falah M. Aziz: (2015) *Anti-Urolithiatic and anti-inflamationeffect of Fenugreek in Ethylene Glycol-Induced Kidney Calculi in Rat*. Volume 8, Number 2. Jordan Journal of Biological Sciences 20. Abbas B.Q. Salihi, **Mudhir S. Shekha**, Omar A.M. Al-Habib: *PP13. Time-dependent interaction between hydrogen sulfide, nitric oxide and sulfur dioxide in the relation of rat aorta*. Nitric Oxide 05/2015; 47:S18-S19. DOI:10.1016/j.niox.2015.02.043 21. **Mudhir Sabir Shekha**: (2014) *vasorelaxant and antispasmodic effects of some polyphenols and glycoside in rat smooth muscles*. Vol. 2(A), No.2, Pp 220-227, Journal of University of Zakho, 22. **Mudhir S. Shekha**, Abbas B. Qadir, Haval H. Ali, Xebat E. Selim: (2014). *Effect of Fenugreek ( Trigonella Foenum-Graecum ) on Ethylene Glycol Induced Kidney Stone in Rats*. 12/2014; 7(4):257-260. DOI:10.12816/0008248. Volume 7, Number 4. Jordan Journal of Biological Sciences. 23. **Mudhir Sabir Shekha**, Omar A M Al-Habib. (2013). *Relaxant Effects of Rutin on Rat Smooth Muscles*. Journal of University of Zakho, Vol.1, (A) No.2, Pp 139-144. 24. **Mudhir Sabir Shekha**, Abdullah O. Hassan, Safin A. Othman: (2013). *Effects Of Quran Listening And Music On Electroencephalogram Brain Waves*. 9(1): 1 – 7. Egyptian. Journal. Experimental Biology. (Zool.). 25. **Mudhir S Shekha**, Omar A M Al-Habib: (2011). *Vasorelaxant, antispasmodic and Cardiotonic effect of the Chloroform Fraction of Crataegus aronia on isolated rat muscles*. International Journal of Biological and Biomedical Sciences. Vo. 1, No. 1, PP. 06-011 26. **Mudhir Sabir Shekha**, Omer A.M AL-habib: *Physiological Effects of Crataegus aronia Fractions on Isolated Smooth Muscles in Albino Rats*. P 122-130. Conference Proceeding’s Book, The Third International Conference for Medical Sciences, 24- 26 October 2012 27. Omar A. M Al-Habib, **Mudhir Sabir Shekha**: (2010). *Vasorelaxant Effect of Aqueous Extract of Crataegus Azarolus Aronia and Quercetin on Isolated Albino Rat's Thoracic Aorta*. *Journal of Duhok* .Vol. 13, No. 1 28. Abbas Burhan Qadir Salihi, **Mudhir Sabir Shekha**, Shahid Salahaddin Omer: (2010). *Effects of Ginkgo Biloba and Α-Tocopherol on CCl4- Induced Liver Fibrosis and Thrombosis in Male Albino Rats*. *Journal of Duhok* Vol. 13, No. 1 29. **Mudhir Sabir Shekha**, Karzan T. Sabir, Hiwa R. Fatah: (2009). *protective influence of vitamin c & piracetam on blood parameters of rats treated with cadmium*. *Journal of Duhok* . Vol. 12, No. 1 30. **Mudhir Sabir Shekha**: (2008). *The Effects of Rhubarb Root and Antihyperlipidemic Drug On Some Physiological Parameters In Male Rats*. *Journalof Duhok* . Vol. 11, No. 1 31. Mustafa Sabir Al-attar, **Mudhir Sabir Shekha**: (2006). *The Prevalence of Thalassemia in Erbil Province*. *Zanko Journal* Vol. 18, No. 3 32. **Mudhir Sabir Shekha**, Almas Mohammad, Rasheed Mahmood. (2005). *The effects of exercise and vitamin E on some haematological values in immature male domestic rabbits. Zanko Journal.* Vol. 17, No. 1   **Further academic training and Participation in Conferences**   1. 2nd Hawler Pharmaceutical Sciences Conference: HPSC.12-14, 2019. organized by College of Pharmacy, Hawler medical university. Held in Divan Erbil Hotel. Erbil-Kurdistan Region- Iraq. 2. 1st International Conference on Clinical Research and Medical Sciences in Kurdistan. Tishk International University. 18- 20 September, 2019. Erbil-Kurdistan Region – Iraq 3. Isolation and Purification of Mesenchymal Stem Cell from Various References: Bone Marrow Dental Pulp and Adipose Tissue. Royan Institute / Tehran – Iran. 26 August 2019 4. Culture Proliferation and Maintenance of Mouse Embryonic Stem Cell. Royan Institute / Tehran – Iran. 25 August 2019 5. International Workshop of Diagnosis. In Biology. Department of Biology and Research centre Salahaddin University- Erbil / Iraq. 29th – 30th April 2019. 6. Special Assay in Snibe, Why Snibe, Leading Immunoassay. Maxmedcia Company. Devan Hotel- Erbil/ Iraq. 11th April, 2019. 7. Bologna Process Workshop. Salahaddin university Culture Centre. Erbil/ Iraq. 7/1/2019 8. Promoting Personnel Reliability Programs in Iraq Workshop. Al-Nahrain Center for strategic studies in Baghdad - Iraq Dec 3-5, 2018. 9. HORIZON 2020 INFO DAYS, 7th , November. Iraq- Erbil. Crystal Hotel. 10. Calcium Signalling by florescent microscope workshop on 7-8, June 2018. ( Pavia University. Pavia – Italia. 11. Isolation of Extracellular Vesicles (EVs) using Ultracentrifugation. 30, March (Karolinska Institute -Stockholm – Sweden) 12. Western Blotting Technique workshop. 28-29, March (Karolinska Institute -Stockholm – Sweden) 13. MSIF MSIF Awareness-Raising Campaign Workshop on 25 and 26 November 2017 (Dubai, UAE) by MS International Federation. 14. 3rd MENACTRIMS Congress which held on Friday 24th to Saturday 25th of November, 2017 at the Intercontinental Hotel, Dubai, United Arab Emirates. 15. 5th International Congress of the Molecular Biology Association of Turkey on 8-10 September 2017 at Bogazici University. 16. 2nd Symposium Internationalization of Scientific Research in Kurdistan. 2-3/ may/ 2017. Erbil Polytechnique University. Erbil-Kurdistan Region – Iraq. 17. Participation in Conference of Cihan University – Erbil on Biological Sciences (CIC-BIOS’17) Erbil- Kurdistan Region – Iraq during 26-27 April 2017 18. 2nd International Scientific Conference, University of Zakho, Kurdistan Region – Iraq, April 18th -19th 2017. 19. Participation in 6th International Conference and workshops on Basic and Applied Sciences (6th ICOBAS 2017) as ORAL Presentation, 18-19 March 2017, Erbil-Kurdistan Region – Iraq 20. Committee Member of 6th International Conference and workshops on Basic and Applied Sciences (6th ICOBAS 2017) 18-19 March 2017, Erbil Kurdistan Region – Iraq 21. ENDNOTE Certification of Completion as Instructor, Erbil- Kurdistan Regional Governorate- Iraq, July, 4, 2016 22. Training of Trainer (TOT) Course. 50 Hrs. Training course. East Global & Development Academy. Erbil- Iraq. 16-24 July, 2016. 23. Training of Trainer (TOT) Course. 50 Hrs. Training course. Chare Organization for Capacity Building and Human Development. Erbil- Iraq. 16-24 July, 2016. 24. Training of Trainer (TOT) Course. 50 Hrs. Training course. Canada Global Consulting & Training Centre . Erbil- Iraq. 16-24 July, 2016 25. Personality Type, 10 Hrs. Training, Arabian Global Academy has therefore conferred upon holder diploma in Personality Type,. Erbil-Iraq. 17-18/Feb. 2016. 26. AD-instruments Training Course (Workshop), held in Istanbul-Turkey , 2-3 june 2014 (2014) 27. IBRO Course in Neuroscience, held at department of Biology, College of Science Salahaddin University – Erbil, Kurdistan, Iraq, 11-19 March 2014 (2014) 28. Developing Higher Education, Training Program – Iraqi Almortaqa Foundation For Human Development Held In Erbil – IRAQ, 25/11 to 2/12/ 2014 (2014) 29. The 9th Annual International Conference of the Egyptian Society of Experimental Biology at Cairo University Conference Center 23-27/ Feb 2013 (2013) 30. Examining Committee for PhD Student (Dlzar Ali Khider) in University of Zakho (2013) 31. First International Scientific Conference April 23-25, 2013. (2013) 32. The Third International Conference for Medical Sciences, 24- 26 October 2012 (2012) 33. English Language Training online http://www.corporate.englishtown.com/ Diploma in English Language at Level 4 – Elementary (2012) 34. Examining Committee for MSc Student (Chinar Bergary) in University of Zakho (2012) 35. Workshop on PowerLab (The Use of PowerLab in Advanced Physiology Education and Research) held in University of Sulaimani (2012) 36. Workshop on PowerLab (PowerLab Data Acquisition System as a Modern and Advanced High Tech instrument for Teaching and Research) held in MRC in Hawler Medical University (2012) 37. Director of Animal House in College of Science, University of Salahaddin, Department of Biology (Directing and Supervising of Animal House/ Experience in Managing, Breeding, medical caring and regulation of animal house for more than 12 years) (2003-2015) 38. Workshop on PowerLab (The Use ADInstruments Data Acquisition Systems in Teaching and Research) held at University of Zakho. (2011) 39. 4th International Scientific Conference of Salahaddin University –Erbil (2011) 40. Workshop on (Cell Culture and Production of Biopharmaceutical) held University of Koya / Faculty of Science/ School of Biology (2011) 41. Workshop on Physiological Instruments (The Use of PowerLab, LabChart and LabTuter as an Efficient Practical Teaching System) Held in university of Duhok (2010) 42. 3rd Kurdistan for Biological Science – Duhok- Kurdistan Region – Iraq (2010) 43. Workshop on Physiological and Pharmacological Instruments (2nd PowerLab Workshop and New Technique in Bio-Science) held in Tehran- Iran (Experience in PowerLab ADinstrument for pharmacological and Physiological experiment for more than 5 years)( 2008) 44. Director of Animal House in College of Science-SalahaddinUniversity (2004-2006) 45. Teaching Mode Training held in Salahaddin University (College of Education, Salahaddin University) (2003) 46. Training courses in all Computer Program (Microsoft windows , Word, Excel, Photoshop……etc) (2000-2002)   **Scientific and Academic committees partaken**  2000 Kurdistan Biology Syndicate /Hawler  2013 The Egyptian Society of Experimental Biology  2003 Kurdistan Union Teachers  2013 Sazgar Organization for Multiple Sclerosis (NGO)  2011-2013 (Member in Chare NGO )  2013-2014 Head of KOSR (Kurdistan Organization for Scientific Organization)  2015 Member of Arab Scientific Community Organization | |
| **9. Keywords** | Hematology, Blood , disorder, bone marrow | | |
| **10. Course overview:**  Haematology is a science that deals with blood and its components, their structure, function, and disorders. The course will be 5 credit hours. Two credit hours will be designated for theory lectures and three credit hours for laboratory. The course will contain an introductory part, in which basic concepts of haematology are introduced and major terms are defined; then, specialized topics will be tackled in a systematic approach to cover the major diseases of blood and its components.  Hematologic is a dynamic field that has always been on the frontier of clinical investigation within the scope of human disease, therefore student can get secure employment through having more scientific knowledge about all blood disorder. The best way for investing their quality in making private laboratory. | | | |
| **11. Course objective:**  The course is especially planned for undergraduate students who intend to work in diagnostic laboratories. Upon the completion of the course, students would have benefited from the following objectives of the course:  1. Explain major concepts in hematology, including Haemopoiesis, bone marrow structure, blood composition, and functions of blood components.  2. Elucidate the basis of blood diseases, including Anemias, hemoglobinopathies, bleeding disorders, and hematological malignancies  3. Clarify in detail the major concepts regarding blood transfusion, and bone marrow transplantation.  4. Provide the latest information regarding the newest techniques utilized by hematologists to treat and diagnose hematological disorders, including hematological analyzer. | | | |
| **12. Student's obligation**   * Students should attend all lectures and not miss any lecture time. * Additionally, for each lecture, the student should prepare and follow up with sufficient studying time to cover the material presented in the class during that lecture. * It is highly advised not to accumulate material until before the examination time. Cramming will definitely weaken the student's ability to understand and retain valuable information. * Students prefer to attend all the seminars on time which held in our department especially seminar about hematology. | | | |
| **13. Forms of teaching**  Teaching with technology can deepen student learning by supporting instructional objectives.   * Data Show Projector * Blackboard * Bound * Video | | | |
| **14. Assessment scheme**  Breakdown of overall assessment and examination  **Grading System:**  Exam No. 1 (Theory): 12.5%  Exam No.2 (Theory) : 12.5%  Mean Examination (Theory) : 12.5 %  Practical Examination : 7.5%  Total =20 %  Final examination: 10 practical + 20 theory = 30%  20+30 = **50%** | | | |
| **15. Student learning outcome:**  1. Interpret haematology test results and evaluate blood film morphology to analyse the differential diagnosis and suggest further tests to determine the actual diagnosis for a wide range of haematological disorders. 2. Understand and be able to communicate the normal physiology and pathophysiological conditions associated with dysfunction of various organ systems. 3. Understand the aetiology, pathophysiology and laboratory diagnosis or a wide range of conditions including leukaemia, proliferative disorders, various anaemic conditions, haemolytic disorders, haemoglobin disorders and haemostatic dysfunction. 4. Communicate scientific and haematological concepts clearly, concisely and logically. 5. Practise haematology within the laboratory environment safely and with due regard to occupational health and safety guidelines. | | | |
| **16. Course Reading List and References‌:**   1. A–Z of Haematology by Barbara J. Bain and Rajeev Gupta, 2003 by Blackwell Publishing Ltd. 2. A beginners' guide to blood cells by Barbara J. Bain, 2nd Edition, 2004 by Blackwell Publishing Ltd. 3. Colour Atlas of Haematology Practical Microscopic and Clinical Diagnosis by Harald Theml, Heinz Diem, and Torsten Haferlach, 2nd revised edition, 2004, Thieme Stuttgart · New York. 4. Diagnostic Hematology by James A. Ker, 2009, Springer-Verlag London Limited. 5. Seely,R.R., Stephens, T.D. and Tate, P. (1998).Anatomy and physiology. Fourth edition, WCB McGraw – Hill. 6. Hematology, Basic Principles and Practice by Ronald Hoffman, Edward J. Benz, Sanford J. Shattil, Bruce Furie et al., Copyright © 2005, Elsevier Inc. 7. Haematolgy at a Galance. 2000. Atul B. Mehta and A. Victor Hoffbrand. BlackWell Science. 8. Hematology in Clinical Practice. 2005. Robert S. Hillman, Kenneth A. Ault and Henry M. Rinder. 4th Edition. McGraw-Hill. 9. Modern Hematology. 2007. Biology and clinical management. Reinhold Munker, Erhard Hiller, Jonathan Glass, and Ronald Paquette. Humana Press Inc. 10. PDQ Hematology. 2002. William F. Kern*.* BC Decker Inc 11. Williams Hematology. 2007. Marshall A. Lichtman. Ernest Beutler. Uri Seligsohn . Thomas J. Kipps and Kenneth Kaushansky. 7th edition. The McGraw-Hill Companies. | | | |
| **17. The Topics: Lecturer's name** | | |  |
| **Week 1:** Introduction, short history, role of blood, composition of blood.  **Week 2:** Hematopoiesis, Cell Structure and Function  Erythrocyte Production and Destruction  Haematopoiesis, erythrocyte production, regulation of erythrocyte production, leucocytes production, platelets production.  **Week 3:** Hemoglobin, structure and function, Transport of oxygen, Adjustment to the Metabolic Needs of Individual Tissues, Transport of Carbon Dioxide, Carbon Monoxide Poisoning.  **Week 4:** Oxygen Delivery and Storage, myoglobin. Erythrocyte destruction, The Fate of Expired Erythrocytes and Hemoglobin, Iron Metabolism, The Pathway of Iron Absorption, Transport, and Storage.  **Week 5:** Hemostasis—The Control of Bleeding, Vascular Spasm, Platelet Plug Formation, Coagulation, Initiation of Coagulation, Completion of Coagulation.  **Week 6:** Blood Groups, Blood Typing and Blood Transfusions, The discovery of blood groups, ABO blood grouping system, Rh factor blood grouping system, Cross-matching, Hemolytic disease of newborn (HDN) or erythroblastosis fetalis, Blood Transfusions for Pets.  **Week 13: Examination** | | | 8/10/2020 Biomedical    15/10/2020 Biomedical    22/10/2018 Biomedical    29/10/2018 Biomedical  5/11/2018 Biomedical  12/11/2018 Biomedical    19/11/2018 Biomedical  26/11/2018 Biomedical  3/12/2018 Biomedical    10/12/2018 Biomedical  17/12/2018 Biomedical  24/12/2018 Biomedical  31/1/2019 Biomedical |
| **18. Practical Topics (If there is any)** | | |  |
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| **19. Examinations:**  **Examples of Semester Examinations**  Q1: Define the following  Carboxyhemoglobin, Myoglobin, Hemolysis, Biliverdin, Iron overload, Chronic leukemia, beta thalassemia, Polycythemia.  Q2: Complete the following sentences with suitable words:  1- The process of blood cell production, called ----------------  2- Each erythrocyte contains about---------------- Molecules of hemoglobin.  3-When hemoglobin is 100% saturated, every molecule of it carries ------------  4- Blood transfusion is the process of receiving ---------------- into one's circulation intravenously.  5. --------------------------is the formation of a blood clot inside a blood vessel  Q3: Explain the following:  1- The causes of hypoxemia.  2- Vascular spasm.  3- Secondary polycythemia  4. Process of Erythropoiesis (Diagram)  Q4: Write the reasons of the following:  1- Warfarin (coumadin) prevents clot formation.  2-Platelets will not adhere to the endothelium of undamaged blood vessels.  Q5: Draw and labels the following:  1- Effects of Temp and pH on oxyhemoglobin dissociation.  2- The life and death of erythrocytes.  Q6 Multiple choice:   1. Which types of anaemia is occur in the absence of folic acid and intrinsic factor? 2. Thalassaemia **b. Iron deficiency anemia** c. *Macrocytic anemia d.* Hemolytic anemia 3. Erythropoietin is a hormone responsible for the process--------------------?   a. Leukopoiesis b. Thrombopoiesis c. **Erythropoiesis** d.. lymphopoiesis  3. ----------------------------- s a relative decrease of platelets in blood  a. **Thrombocytopenia**  b. Leukopenia  c. anaemia d. neutropenia Q7: Answer the following questions "True" or "False" and Correct the false  1. Red blood cells are **Bi**-concave cell that **no contain** nucleus **to easily moved through blood vessel**. **(F)** 2. Beta thalassemia are due to mutations in the HBB gene on chromosome **11**. **(F)** 3. The megakaryocyte is a bone marrow cell responsible for the production of blood **Thrombocyte**. **(F)** 4. Haemochromatosis characterized by excessive intestinal absorption of dietary iron resulting in a pathological increase in total body iron stores. **(T)** 5. Multiple myeloma is a cancer of plasma cells normally responsible for producing antibodies. **(T)** | | | |
| **20. Extra notes:** | | | |
| **21. Peer review پێداچوونه‌وه‌ی** | | | |