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| **Identification** | | | **Course** | **GEOL 203- General Geology- 3 credits** | | |
| **Department** | Petroleum Engineering | | |
| **Program** | Undergraduate | | |
| **Term** | Spring, 2016 | | |
| **Instructor** | Assoc. Prof. Gasham Zeynalov | | |
| **E-mail:** | [gzeynalov@khazar.org](mailto:gzeynalov@khazar.org) | | |
| **Phone:** | (+994 12) 421-79-16 ext. 243 | | |
| **Class hours** | Monday, 13.40-15.10, 15.20-16.50 | | |
|  | | | **Office hours** | Friday 16.00-17.00 | | |
| **Prerequisites** | | | Consent of instructor | | | |
| **Language** | | | English | | | |
| **Compulsory/Elective** | | | Required | | | |
| **Required textbooks and course materials** | | | 1.Edward Tarbuck and Frederick Lutgens, ***Earth: An Introduction to Physical Geology***, Pearson, 2014  2. James S. Monroe and Reed Wicander, ***Physical Geology: Exploring the Earth,*** 5th ed., Thomson Publishing, 2003 | | | |
| **Course objectives** | | | This course is a major subject of a Petroleum Engineering.  Objectives of the Course:   * to acquaint the student with the materials which make up the Earth’s physical environment and the processes which act upon that environment * to understand the relation geologic processes and characteristics of rocks * to understand geologic time scale and important events * to learn Earth processes and plate tectonics theory * to learn minerals and basic rocks and their cycles * Sedimentology concept and textural properties of sediments. * to learn clastic and carbonate depositional environments * **Practical exercise**: many practical exercises will be assigned to the class that will require calculation and interpretation of the geological data (SEM images, photomicrographs, outcrop, logs, core etc.) along with other data using the methods studies during the lectures. * **Assignment and quizzes:**   Quizzes will be provided during the classes are based on the topic covered by lectures and home works. Two quizzes will be provided during semester. | | | |
| **Learning outcomes** | | | By the end of the course the students should be able to :   * understand importance of Geology, including Earth structure and processes; * learn Plate tectonics of the Lithosphere; * learn different rock types and their cycles, * describe and explain the processes which shape the Earth and how these have altered the Earth through time and be able to demonstrate such knowledge * demonstrate the ability to integrate knowledge and ideas about geoscience topics in a coherent and meaningful manner as evidenced by either responses to quizzes and exam questions * critically assess geologic hazards associated with various regions of the Earth and competently demonstrate that knowledge in exams | | | |
| **Teaching methods** | | | Lecture | | | x |
| Group discussion | | | x |
| Experimental exercises | | | x |
| Case studies | | | x |
| Simulation | | | x |
| **Grades** | | |  | |  | | |
| Evaluation Methods | | Percentage (%) | | |
| Midterm Exam | | 30 | | |
| Participation | | 5 | | |
| Assignment and quizzes | | 15 | | |
| Practical exercises | | 10 | | |
| Final Exam | | 40 | | |
| Total | | 100 | | |
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| **Policy** | | | * **Preparation for class**   The structure of this course makes your individual study and preparation outside the class extremely important. The lecture material will focus on the major points introduced in the text. Reading the assigned chapters and having some familiarity with them before class will greatly assist your understanding of the lecture. After the lecture, you should study your notes and work relevant problems.   * **Withdrawal (pass/fail)**   This course strictly follows grading policy of the School of Engineering and Applied Sciences. Thus, a student is normally expected to achieve a points of at least 60% to pass. In case of failure, he/she will be required to repeat the course the following term or year.   * **Cheating/plagiarism**   Cheating or other plagiarism during the Quizzes, Mid-term and Final Examinations will lead to paper cancellation.  **Professional behavior guidelines**  The students shall behave in the way to create favorable academic and professional environment during the class hours. Unauthorized discussions and unethical behavior are strictly prohibited. | | | |
| **Tentative Schedule** | | | | | | |
| **Week** | **Date/Day** | **Topics** | | | | **Textbook/Assignments** |
| 1 | 13.02.2016 | Introduction: Geology and Earth sciences:Key elements in geological studies Some historical notes about geology | | | | Chapt. 1 (1,2) |
| 2 | 20.02.2017 | Formation of the universe and the earth:  Origin of the Earth as a Planet  A view of the Earth as a Planet  The dynamic Earth | | | | Chapt.2 (1) |
| 3 | 27.02.2017 | Matter and Minerals: mineral properties  The structure of minerals  Physical properties of minerals  Identification and physical properties of Minerals.  Igneous, Metamorphic and Sedimentary rocks. Rock sycle | | | | chapt.3 (1,2) |
| 4 | 06.03.2017 | Basic Rocks and Rock Sycle  Magma, Igneous Rocks, and Intrusive Activity  Effusive and Intrusive Igneous rocks and their generation | | | | chapt.4 (1,2) |
| 5 | 13.03.2017 | Metamorphism and Metamorphic rocks:  Volcanoes and Volcanic Hazards | | | | Chapt.5(1), Chapt. 8 (2) |
| 6 | 20.03.2017 | Novruz Holiday | | | |  |
| 7 | 27.03.2017 | Weathering and Soils  Sedimentary rocks: classification of sedimentary rocks, generation mechanism of sedimentary rocks  Sedimentology concept and classification of sedimentary rocks, Sedimentary rocks and their mineral composition and pore fluids  Sedimentary textures and their petrophycal properties | | | | Chapt.6,7 (1,2). |
| 8 | 03.04.2017 | Geologic Time: Stratigraphic methods, Stratigraphy concepts and Geologic time scale table  Unconformity formation in sedimentation process  Quiz 1 | | | | Chapter 9 (1,2) |
| 9 | 10.04.2017 | Mid-term Exam | | | |  |
| 10 | 17.04.2017 | Earth’s interior  Crustal Deformation  Earthquake and Earthquake hazards. | | | | Chapter 10,11,12 (1,2) |
| 11 | 24.04.2017 | Earth processes: Plate Tectonics and evidence for plate tectonic theory  Types of plate margins (spreading and subduction zones) and associated basins  Divergent Plate Boundaries and Seafloor Spreading. Convergent boundaries: Origin of Mountains | | | | Chapt.2 (2)  Chapt.13,14 (1) |
| 12 | 01.05.2017 | Sedimentary Basins: basin formation in divergent and convergent margins  Controls on deposition in sedimentary basins | | | | Chapter 15 (1) |
| 13 | 08.05.2016 | Transportation and deposition of sediments  and their different models  Bedforms and Sedimentary structures: generation of bedforms and their models, primary and secondary sedimentary structures | | | | Chapter 18,19 (2) |
| 14 | 15.05.2017 | Structural geology and Rock deformation  Structural features: fold, fault, fracture, diapirs and their interactions, sealing and non-sealing faults, Fault seal analysis  Contractional and extensional structures  Geological maps  Quiz 2 | | | | Chapt. 16 (1) |
| 15 | 22.05.2017 | Types of Mapping  Course review and Summary | | | | Chapt 15.16 (1,2) |
|  | TBA | **Final Exam** | | | |  |