**UBT**

**Technician dental program**

**Department of Natural Sciences**

**Curriculum of the subject**

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| --- | --- | --- | --- | --- |
| OBJECT | **Biology and Human Genetics** | | | |
| Type | Semester | ECTS | Code |
| OBLIGATIVE (O) | 1 | 4 |  |
| Course Lecturer | Prof. assoc. Dr. Naser Kamberi | | | |
| Course Assistant |  | | | |
| **Aims and Objectives** | The course is designed to teach students of the Dental Technician Program about the fundamental concepts of contemporary biological science, which is of great importance to modern diagnostics and therapy, as well as to the future of human medicine.  Also, students will get to know molecular biology methods as well as embryonic stem cells which are expected to be used in dental technology. The objective of the subject "Biology with Human Genetics" is to acquaint students with basic knowledge about the organism of the living world in general, and about the human organism in particular, from the molecular level, continuing with the cellular structure, the construction and functions of organelles, reactions cellular metabolism.  **The main purpose of the course is:**  • The student will gain knowledge about cellular structure, construction and functions of organelles, cellular metabolic reactions.  • Formation of cellular energy, protein biosynthesis, cell division, structure and functions of DNA,  • Human genes, the construction and biological functions of organs and basic knowledge about the environment.  • Molecular methods that find application in Biotechnology such as PCR, Interspersed short palindromic regular repeat groups (CRISPR)-Cas9,  • Mechanisms of inheritance, causes of genetic changes (mutations), rules of inheritance, diseases as a result of changes in the number and structure of chromosomes. | | | |
| **Learning outcomes** | **Upon satisfactory completion of the course, a student will be able to**:  • Critically discuss theories of the cell and its evolution.  • Convincingly appreciate the cellular organelles that work closely together.  • I will convincingly reflect that the cell is the basic entity of life based on its multiplication during the process of mitosis and meiosis.  • I will present ideas about the role of nucleic acids DNA and RNA, which are the basis of the existence of every species on planet Earth.  • Accurately perform a common technical procedure according to written laboratory instructions (such as a Standard Operating Procedure or). They will accurately make laboratory measurements of volume, temperature, and mass that are commonly used in the cell biology laboratory. Recognize and describe common laboratory safety issues and apply laboratory safety procedures. | | | |
|  | **1. Application of theoretical knowledge:**  **o** Bachelor program; from the teaching, the students have managed to become familiar with the use of the microscope with molecular methods in biology (Result 1,2,7.)  **2. Evaluation and critical analysis:**  **o** Bachelo Program (Result 3, 4, 5, 6): Includes the function of cellular organelles Mitochondria, Golgi Apparatus, Granular Rep. Packaging of materials inside the cell, production of Energy (ATP). Making proteinsin the ribosome and its subunits**.** | | | |
| **. Alignment of Course’s Learning Outcomes to Programs’ Learning Outcomes.** | **3. Development of practical skills:**  **o** Bachelo program (Outcome 5, 6, 8, 9, ): Involves explaining how DNA duplication or multiplication is done in the cell. They will reflect on the activation of the enzymes that by copying the old strings they will form two new strings and as a result from 46 DNA they will be doubled to 92 DNA.  **o** Biology with Human Genetics: Focuses on the processes of inheritance of qualities from parents to offspring.  **4. Cell formation systems for reproduction:**  **o** Bachelo program (Result 6, 7, 9, 10,): This process  occur in the sex glands. During meiosis, they will learn why brothers and sisters differ even though they are the product of their parents. And so they will become able to reflect on these.  **o** Biology and Human Genetics subjects: Although not directly related, the skills acquired here can be applied to understanding and managing knowledge in these wider contexts**.**  **5. Evidence-based approach:**  **o** Bachelo program (Outcome 11, 12, 13): Apply knowledge about the disruption of the genetic balance of the human population.  The subject of Population Genetics deals with these factors: Emigration, immigration, genetic chance, artificial selection and genetic mutations. The development is also done by calculating the frequencies of dominant and recessive alleles. And that concludes this subject. Students will know how to evaluate approaches based on theories, models and frameworks**.** | | | |
| **Course Content** | **Cours plan** | | | **Week** |
| Presentation of the subject, Biology branches:  Molecular biology, single and multicellular organisms, inorganic and organic chemical construction,  Human genetics types of inheritance. | | | 1 |
| Cells, Discovery of Cells, Cell Theory, Prokaryotes, Eukaryotes, Structure and Function of the Cell, Membranes Diffusion, Osmosis, Endocytosis | | | 2 |
| Membrane contacts, Role of organelles with one and two membranes, Nucleus, Endoplasmic reticulum,  Golgi Apparatus, Mitochondria, Chloroplasts | | | 3 |
| Lysosomes, Peroxisomes, Organelles without membranes  Cytoskeleton, Flagellum, Ribosomes, Inclusions | | | 4 |
| Cell energy and metabolism, cellular glycolysis enzymes, Krebs cycle,Oxidative phosphorylation, transport system of,electrons | | | 5 |
| - Nucleic Acids, structure (DNA and RNA),- Replication, genetic code, protein biosynthesis.transcription and translation. | | | 6 |
| Presentation of Seminars | | | 7 |
| Life and cell division, Interphase,Mitosis, Phases of Mitosis, Cytokinesis, Meiosis, Phases of Meiosis, Gametogenesis | | | 8 |
| Genetics, the subject of study, genes, genotype, phenotype, mechanism of inheritance, Mendel and genetic experiments, numerical and structural aberrations of chromosomes. | | | 9 |
| uman Genetics, Dihybrid Crosses, Crossingover between two genes. multiple alleles,Blood groups, hereditary diseases, blood diseases, types of inheritance.  Consequences of marriages in close relatives. | | | 10 |
| Sex chromosomes, Sex determinations, Human genetic disorders, Population genetics, Hardy-Vajberg.  Factors that disturb the genetic balance, Selection, Mutations, Migrations, population genetic exercises. | | | 11 |
| DNA technology, bacterial genetics,  Human karyotype, the sex chromosome of the Grass body,  Cancer and Carcinogenesis, factors affecting carcinogenesis, Teratogenic, Mutagenic, Radioactive pollution. | | | 12 |
| Gene therapy, regenerative medicine and the future of medicine human genetics, genetic mapping, genomics, proteomics | | | 13 |
| Evaluation and presentation of research | | | 14 |
| Final exam | | | 15 |
| **Teaching/**  **Learning**  **Methods** | **Teaching/Learning Activity – Weights (%)** | | | |
| **Lecture: 15%**  **o** Purpose: To present the main concepts, models and theories in cell biology.  **o** Relevant for: Building fundamental understanding and providing a theoretical framework for the subject. | | | |
| **1. Case studies and analysis: 25%**  **o** Purpose: To apply the theoretical knowledge in different forms depending on the legislation or exercise.  o Important for: Critical evaluation of the effectiveness of knowledge management in different contexts and reflection on practical examples. | | | |
| **1. Group discussions and seminars: 20%**  **o** Purpose: To encourage group learning through quizzes, the exchange of ideas and the development of critical thinking**.**  **o** Relevant for: Discussing different models and theories in depth and reflecting on their application in molecular PCR analysis. | | | |
| **1. Project work: 20%**  **o** Purpose**:** To promote creativity, application of practical skills and collaborative learning.  **o** Important for: Developing new and creative ways in cellular, molecular research about gene editing. | | | |
| **1. Tasks and Research Papers: 10%**  **o** Purpose: To enhance research skills and the ability to critically analyze information.  **o** Relevant to: In-depth study of specific topics within Human Genetics, increasing understanding through research.Crips method for Cas9 applied to gene editing. | | | |
| **1. Invited Lecturers and Workshops: 10%**  **o** Purpose: To provide exposure to experts who know the practical way of PCR, Electrophoresis and Crips Pr Cas9 molecular methods.  **o** Relevant to: Gaining different perspectives on practical exercises will be a great achievement in Medical Genetics. | | | |
| **Total** | | | **100 %** |
| **Assessment**  **Methods** | **Assessment Activity – Weights (%)** | | | |
| **1. Written exams: (20%)**  **o** Purpose: To assess understanding of key concepts, theories and frameworks in knowledge management.  **o** Important for: Assessing basic knowledge and the ability to recall and explain essential principles**.** | | | |
| **2. Analysis of case studies: (25%)**  **o** Purpose: To assess the application of theoretical and practical knowledge in the real world.  **o** Relevant to: Demonstrating critical thinking and problem-solving skills by analyzing and suggesting solutions to applied issues in biolog | | | |
| **3. Group projects and presentations: (20%)**  **o** Purpose: To assess collaborative skills, application of knowledge and presentation skills.  **o** Relevant to: Assessing the development of practical approaches to knowledge management and the ability to work effectively in teams. | | | |
| **4. Research paper or assignment: (15%)**  **o** Purpose: To assess in-depth research-scientific skills and critical analysis.  **o** Important for: Allowing students to carry out detailed investigations in specific areas of Molecular Biology, demonstrating their ability to engage with complex material. | | | |
| **5. Journals or reflective notes: (10%)**  **o** Purpose: To assess personal reflection and self-awareness**.**  **o** Relevance to: Encouraging students to reflect on their learning journey, the challenges they faced and how they applied their knowledge in different contexts. | | | |
| **6. Class participation and discussions: (10%)**  **o** Purpose: To assess engagement, understanding of course material and ability to contribute thoughts to discussions.  **o** Important for: Assessing active participation and the ability to articulate thoughts and ideas related to knowledge management in biology and human genetics. | | | |
| **Total** | | | **100%** |
| **Course Resources** | **Means** | | | |
| **1. Textbooks and academic journals:**  **o** Purpose: To provide basic knowledge and current research findings.  **o** Examples: Standard textbooks on knowledge management, peer-reviewed journals from UBT peer-reviewed tests. | | | |
| **2. Case studies:**  **o** Purpose: To illustrate practical applications of theories in real-world scenarios.  **o** Examples: Case studies from the region we are surrounded by exchanging knowledge. | | | |
| **3. Online databases and research articles:**  **o** Purpose: Provide access to a wide range of academic research and industry reports.  **o** Examples: Access to databases such as molecular biology, genetics. | | | |
| **4. E-learning platforms and MOOCs:**  **o** Purpose: Provision of supplementary teaching materials and materials.  **o** Examples: Online materials and lectures from platforms such as Coursera, edX or Khan Academy covering relevant topics. | | | |
| **5. Technological tools and software:**  **o** Purpose: Acquaintance of students with the tools used in knowledge management.  **o** Examples: Introduction to software such as electronic health record systems, data analysis tools (eg, SPSS, Tableau), and collaborative platforms**.** | | | |
| **6.** **Guest speakers and seminars:**  **o** Purpose: Providing expert knowledge and practical perspectives.  **o** Examples: Inviting professionals or Nobel laureates in molecular biology, experts of academic levels to speak or to conduct seminars. | | | |
| **7. Interactive Discussion Forums:**  **o** Purpose: Facilitate peer learning and discussion.  **o** Examples: Online forums or platforms like Slack or Microsoft Teams where students can discuss course materials and share ideas | | | |
| **8.** **Group projects:**  **o** Purpose: Support collaborative learning and practical application of concepts.  **o** Examples: Access to collaborative tools (such as Google Workspace), project development guidelines and evaluation criteria. | | | |
| **9.** Simulation tools and role-playing activities:  **o** Purpose: Enable experiential learning in a controlled environment.  **o** Examples: Simulations of healthcare scenarios where knowledge management plays a key role, role exercises to practice decision making and strategy development. | | | |
| **10. Library resources:**  **o** Purpose: Provide a wide range of additional reading material.  **o** Examples: Access to physical and digital libraries of books, dissertations and theses on healthcare management and knowledge management. | | | |
| **ECTS Workload** | **Activity type** | |  |  |
| **1. The lecture** | | 26h | 22.0% |
| **2. Analysis of case studies** | | 30h | 25.0% |
| **3. Group discussions and seminars** | | 1h | 1% |
| **4. Project work** | | 1h | 1% |
| **5. Research paper or assignment** | | 60h | 50% |
| **6. Guest speakers and workshops** | | 1 | 1% |
| **Total** | | **120 h** | **100.0 %** |
| **Literature** | 1. Kamberi.N., Rizani.H.UBT-2019. Molecular cell biology with genetics. Pristina. 2. Kamberi.N; Rizani.H.Ubt-2020-Practicum Human Genetics With Cellular And Molecular Biology.Pristina. 3. Naser kamberi-GENEALOGICAL, GENETIC, BIOCHEMICAL ANALYSIS OF BAR’S BODY IN HEMOPHILIA TYPE A- Vol.25.NO.6-Issue 2021-Page: 2697-2702 https://www.annalsofrscb.ro/index.php/journal/article/view/5895?fbclid=IwAR1EVz8d4Qe7QdBdA1RUVb09ZVxzFhY7ODGlR1AzfucFzx2i0Bvymc0SbYQ 4. Nussbaum, R.L., McInnes, R.R., & Willard, H.F. (2004). Thompson & Thompson genetics 5. Rexha, T. (2010): Biologjia qelizore dhe molekulare, Shtëpia botuese “Libri Universitar” Tirane. | | | |
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**Pre-requirements for the course**

This course does not have pre-requirements

**Student competence assessment**

The student will be assessed in natural science work focusing on all aspects of assessments. The pass rate is 50%.

**Clinical work requirements:** Successful completion of all study activities.

**Student must attend at least 70% of laboratory and lecture sessions.**

**Rules and Regulations**

**Attendance**

The Department of Natural Sciences takes responsibility for training prospective Dental Technicians to the highest standards. One of these standards is to take responsibility for personal actions. If a student misses class especially in a laboratory and / or clinical session, the student has lost those laboratory instructions forever. They can never be repeated. When a student is late for class, the whole class is interrupted. Such interruptions will not be tolerated. Students have a responsibility and a contract to stay in class throughout the duration of the sessions, for each day. Students who leave sessions prematurely, even if they leave on leave, cause disciplinary problems for the department that will not be tolerated.

You made a contract with UBTs to be in the classroom and attentive throughout the learning process. Every student should be in every session, every day that is scheduled, throughout the semester. All teaching sessions start at their scheduled time in the lesson schedule.

All sessions start and end at their scheduled time in the lesson schedule. Any student who leaves the teaching session prematurely will be deemed to be absent.

**Electronic Devices**

It is unstable for everyone in the classroom when cell phones ring during class. This is even worse if it happens during a test or quiz. As this is a classroom and not a room to listen to and / or view electronic devices such as smartphones, personal laptops and / or other electronic devices, they will not be allowed.

The classroom, lab and presentations will be a cordless area. If you must bring a mobile phone to class, it must be turned off or formatted in vibration. It is unstable for a classroom for students to constantly answer cell phones during class. If you absolutely must answer the call, leave the classroom. A student who receives calls during class will be asked to leave class. Hearing aids will not be allowed in the classroom for any reason.

**Tests And Quizzes**

Tests and quizzes are usually scheduled at the beginning of the lesson. Tests and quizzes are one of the ways teachers measure a student's knowledge. Not participating in tests or quizzes interferes with this process. This department does not reward students who do not take their tests or quizzes on time; therefore, the teacher cannot allow students to take tests or quizzes after the deadline.

Tests and quizzes must be taken by each student, any student who seeks help or assists other students during a test or quiz will be removed from the test and will be assessed with zero for that test or quiz. It is the student's responsibility to prepare for tests and quizzes at all times. It is the student's responsibility to know when there are tests or quizzes to attend.

**Seminarsand Projects**

Seminars and projects have to be done on the student’s time not during class time.

Never let another student touch your seminars and projects.

Never touch another student’s seminars and projects.

**Due Dates**

One thing that all dentists must learn is to be on time with the work. Excuses do not make the doctor or patient feel better about wasting their time. An adequate amount of time is given to complete all class-work assignments. All class-work is due at the time the instructor has designated. **No late assignments will be accepted**.

**Proper Attire**

Dentists are professionals and should dress appropriately. Any student who does not dress appropriately during class will not be allowed to participate in clinical and laboratory activities. Long hair should be tied and away from the face for safety reasons. Long-sleeved shirts and blouses should be worn for safety.

Ties (collars) or scarves should be tucked inside the lab coat for safety reasons. A white long-sleeved lab coat is suitable for a student.

Visible toe shoes or sandals are not suitable shoes for dental laboratories and clinics. For the safety of UBT staff, patients, students, family members and the community, we require all staff in clinical and laboratory sessions to wear long pants.

**Conduct**

Students in department of prosthodontics must learn to work within groups, no matter what the group’s make up is.

Tolerance, courtesy, respect, and a calm environment are required in the classroom, dental laboratory, and dental clinic.

**Academic Dishonesty**

Violations of Academic Integrity include, but are not limited to, the following actions:

* Cheating on an exam.
* Plagiarism.
* Working together on an individual assignment, paper or project when the instructor has specifically stated students should not do so.
* Submitting the same term paper to more than one instructor or allowing another individual to assume one’s identity for the purpose of enhancing one’s grade.