**COURSE OUTLINE**

1. **GENERAL**

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| **SCHOOL** | School of Health Sciences | | | | |
| **ACADEMIC UNIT** | Faculty of Medicine | | | | |
| **LEVEL OF STUDIES** | Undergraduate | | | | |
| **COURSE CODE** | **ΙΑΥ412** | **SEMESTER** | | **4**th | |
| **COURSE TITLE** | **Embryology II** | | | | |
| **INDEPENDENT TEACHING ACTIVITIES** *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits* | | | **WEEKLY TEACHING HOURS** | | **CREDITS** |
| Lectures (hours/ student) | | | **2** | | **2** |
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| *Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (4).* | | |  | |  |
| **COURSE TYPE**  *general background,  special background, specialised general knowledge, skills development* | GENERAL BACKGROUND | | | | |
| **PREREQUISITE COURSES:** |  | | | | |
| **LANGUAGE OF INSTRUCTION and EXAMINATIONS:** | GREEK | | | | |
| **IS THE COURSE OFFERED TO ERASMUS STUDENTS** | ΝΟ | | | | |
| **COURSE WEBSITE (URL)** | <https://ecourse.uoi.gr/course/view.php?id=1039> | | | | |

1. **LEARNING OUTCOMES**

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| **Learning outcomes** | |
| *The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.*  *Consult Appendix A*   * *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area* * *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B* * *Guidelines for writing Learning Outcomes* | |
| The purpose of the course Embryology II is the study of the foundation and development of the organs, of all organ systems in the human embryo. Also, the development of the human body cavities and the relevant transient embryonic structures, contributing to the formation of important adult structures (for instance, the pharyngeal apparatus, the pronephros, etc.) and their evolvement during the intrauterine development of the human being.  Also, the study of related congenital disorders (malformations, etc.) to provide elementary knowledge of their underlying causes and clinical manifestation. In addition, all this is enriched with elements on functional and inductive embryology, as well as the interaction of structures, cells, genes and signalling pathways, which play a crucial role in natural embryonic development or in embryonic malformation and organogenetic aberration. Upon successful completion of this course, the student will be able to:  - Know the embryological terminology  - Know the temporal sequence of appearance and development of transient structures,  body cavities and organs for each organ system  - Know the developmental mechanisms of organ and system formation  - Describe the origin and development of the organs of each system  - Know the relevant congenital anomalies in human development and their causes | |
| **General Competences** | |
| *Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?* | |
| *Search for, analysis and synthesis of data and information, with the use of the necessary technology*  *Adapting to new situations*  *Decision-making*  *Working independently*  *Team work*  *Working in an international environment*  *Working in an interdisciplinary environment*  *Production of new research ideas* | *Project planning and management*  *Respect for difference and multiculturalism*  *Respect for the natural environment*  *Showing social, professional and ethical responsibility and sensitivity to gender issues*  *Criticism and self-criticism*  *Production of free, creative and inductive thinking*  *……*  *Others…*  *…….* |
| - Autonomous (standalone) Work (Working independently)  - Group work  - Project planning  - Search for, analyze and synthesize data and information using the necessary technologies  - Exercise criticism and self-criticism | |

1. **SYLLABUS**

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| Following a brief review of General Embryology, the lectures of Embryology II are presented in detail, covering all human organ systems. Moreover, emphasis is placed on the emergence of significant but transient structures during the development (such as the pharyngeal apparatus, the pronephros, etc.), their evolution, and the resulting derivatives of these structures. In addition, the relevant congenital anomalies and associated clinical problems of each system separately, as follows:  I. A brief review of Embryology I & Introduction to Embryology II (the mechanisms of development and their regulation)  II. The development of the heart and circulatory system  III. Development of the nervous system & sensory organs (eye-eye)  IV. The development of the digestive system  V. Development of the respiratory system  VI. Development of the urogenital system  VII. The pharyngeal apparatus and facial development  VIII. Partitioning of the intra-embryonic cavity and the development of the body cavities  (pericardial, pleural, peritoneal)  IX. The development of the lymphatic vessels and the lymphatic system  X. Development of the endocrine gland system  XI. Development of the musculoskeletal system  XII. Development of the integumentary system |

1. **TEACHING and LEARNING METHODS - EVALUATION**

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| **DELIVERY** *Face-to-face, Distance learning, etc.* | I. Face-to-face (Lecturing) and online (modern and asynchronous e-learning)  II. Distance learning (exclusively): only in exceptional circumstances (e.g. confinement during Covid-19) |
| **USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY** *Use of ICT in teaching, laboratory education, communication with students* | Use of ICT in teaching, laboratory education, examinations and communication with students.  - Supporting the learning process, by using the e-course platform.  - Synchronous and asynchronous communication by using the e-course platform. Also, by email, video calls & video messages. |
| **TEACHING METHODS**  *The manner and methods of teaching are described in detail.*  *Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.*  *The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS* | |  |  | | --- | --- | | ***Activity*** | ***Workload of each students group*** | | Lectures | 26 | | Group work on a congenital anomaly (including a literature review of current views/data, writing the essay, preparing the presentation and presenting it in the classroom, mainly to fellow students of the year) | 15 | | Independent Study | 25 | | **Total Course**  (25 hours of workload per credit unit) | **66** | |  |  | |  |  | |
| **STUDENT PERFORMANCE EVALUATION**  *Description of the evaluation procedure*  *Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other*  *Specifically-defined evaluation criteria are given, and if and where they are accessible to students.* | Ι. **ONLINE final examination** (corresponding to the **60% of the final grade**) including:  - Short development & multiple choice, "true/false" and "place in correct order" questions, choosing from a set (e.g., the morphological features seen at different stages of lung development).  - Description of congenital abnormalities, their causes, clinical manifestations, methods of treatment, etc.  **II. Presentation of group work** (corresponding to the **40% of the final grade**)  - General Format & Content: 20%.  - Accuracy of data presented: 15%  - Presentation style (knowledge understanding - comfort of communication): 5% |

1. **ATTACHED BIBLIOGRAPHY**

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| *Teaching - study material*  **The material (lecture presentations, self-examination quizzes, notes, etc.) is posted on the e-course and is updated on an annual or biannual basis.**  **Ι. Greek Books and translations**  -Angelopoulou R (2010).Embryology, vol. I&II, Medical Publications P. Ch. P.P. Paschalidis, Athens, Greece.  -Carlson BM (2023).Human Embryology and Developmental Biology. Editor of the Greek Edition Gyftopoulos K, Lampropoulou M, Bravos V, Petrou-Papadaki E. Scientific Publications Parisianou S.A., Athens.  -Larsen WJ (1996). human embryology. Translation-Editor G.N. Antonakopoulos. Parisianos Scientific Publications, Maria Gr. Parisianos, Athens.  -Moore KL, Persaud TVN, Shiota K. (1997). color clinical embryology. Translation-editing C. Kittas, C. Transl. P.H. Medical Publications. Paschalidis, Athens.  -O' Rahilly R & Müller F (2000). Embryology and Human Teratology. Translation-Editing Karamanlidis A. - Siatitsas G., P.H. Paschalika P.H. Medical Publications. Paschalidis, Athens.  -Papadopoulos GX, Karagogeos D, Kouvelas H, Triarchou L (2011).THE EΓKEΦAΛOΣ ΣTO XPONO: Development and Plasticity of the Nervous System, Crete Universitarian Publications, Heraklion.  -Platzer W. (1985). Musculoskeletal System. In: Kahle W., Leonhardt H., Platzer W. "Handbook of human anatomy with color atlas". Volume 1. Translation and editing by N. Papadopoulos. Litsas Medical Publications. Athens.  **II. Foreign Language Books**  •Dudek RW, Fix JD. (1998). BRS Embryology. 2nd ed. Williams & Wilkins, Baltimore.  •Dudek RW. (2000). High-Yield Embryology. 2nd ed. Lippincott Williams & Wilkins, New York.  •Ferretti P., Copp A., Tickle C., Moore G. (eds). (2006). Embryos, Genes and Birth Defects. 2nd ed. John Wiley & Sons Ltd., Oxford, UK.  •Fix J.D. (1995). BRS Neuroanatomy. 2nd ed. Williams & Wilkins, Baltimore.  •Kierszenbaum A. (2007). Histology and Cell Biology: An Introduction to Pathology: With STUDENT CONSULT. 2nd ed, Mosby; New York.  •Le T. and Krause K (senior eds). (2009). “First aid for the basic sciences. Organ Systems”. McGraw- Hill Companies Inc., New York.  •Mills SE. (2007). Histology for pathologists. 3rd ed. Williams & Wilkins, New York.  •Sadler TW. (2004). Langman’s Medical Embryology. 9th ed. Lippincott Williams & Wilkins, New York.  •Seiden D. (2004). Anatomy. USMLE Step 1 Lecture Notes. vol.ΙΙ. Kaplan Medical, Kaplan Inc., New York.  •Steding G. (2008). The Anatomy of the Human Embryo: A Scanning Electron-Microscopic Atlas. Karger; New York.  **ΙΙΙ. Journals**  •American Journal of Obstetrics and Gynecology  •American Journal of Medical Genetics  •Current Topics in Developmental Biology  •Development (Cambridge, England)  •Developmental Biology  •Differentiation  •Early Human Development  •International Review of Cell and Molecular Biology (Προηγούμενος τίτλος: International Review of Cytology;  •Pediatrics & Neonatology  •Seminars in Cell & Developmental Biology (Προηγούμενος τίτλος: Seminars  in Cell Biology; που περιλάμβανε και το: Seminars in Developmental Biology)  •Seminars in Fetal and Neonatal Medicine  •Seminars in Perinatology  •Stem Cells and Development  •The Anatomical Record  •The Journal of Pediatrics  **Bio-Medical &Scientific Search Engines**: Pubmed, Science Direct |