



**"ISMAIL QEMALI" UNIVERSITY, VLORE**  
**FACULTY OF TECHNICAL AND NATURAL SCIENCES**  
**DEPARTMENT OF BIOLOGY**

**APPROVED**  
**Head of the Biology Department**  
**Dr. Aurora BAKAJ**

**COURSE PROGRAM BIO 161 Invertebrate Zoology**

<b>SUBJECT:</b>	Invertebrate Zoology
<b>Head/Teacher of the subject:</b>	Prof. Assoc. Denada Sota
<b>Charge:</b>	3 lex / 1 sem / 1 lab
<b>Subject typology:</b>	Of the characteristic formation of the program
<b>Academic year/semester when it takes place:</b>	Spring 2022
<b>Subject type:</b>	Mandatory
<b>Study program:</b>	Bachelor
<b>Credits:</b>	8 credits
<b>Subject code:</b>	BIO 161
<b>E-mail address of the holder/pedagogue:</b>	<a href="mailto:kasemidenada@gmail.com">kasemidenada@gmail.com</a>

**summary AND LEARNING OUTCOMES:**

Invertebrate zoology has as its object of study vertebrate animals. It aims to give students basic knowledge about the diversity of the living world of invertebrate animals, starting from simple unicellular to the most evolved multicellular animals.

**BASIC CONCEPTS:**

- 1 Zoology as a system of sciences and principles of classification.
- 2 Transition to multicellular, pseudocolonial and colonial forms of unicellular.
- 3 Major classes of multicellular organisms
- 4 Evolution of invertebrates, their comparative anatomy.
- 5 General characteristics of each class.

**COURSE TOPICS:**

Topics to be covered in the lectures:

- Topic 1** Zoology as a system of sciences and principles of classification. Type of unicellular (Protozoa). Class Whipples, Sarcodines, Slugs, Rays, Ciliates, Sporozoans, Cnidosporids, Opalines.
- Topic 2** Protozoan ancestry. Multicellular. Transition to multicellular, pseudocolonial and colonial forms of unicellular. The most primitive multicellular.
- Topic 3** The type of sponges. Evolution within sponge phyla and phylogenetic relationships among different groups.
- Topic 4** Type of Cnidarians. The lineage of cnidarians. Evolutionary paths within cnidarian phyla and phylogenetic relationships between different groups.
- Topic 5** Type of Combs. Type of pinworms (Plathelminthes). General characteristics, Morphology, histology, reproduction and development.
- Topic 6** Class Turbellaria, Trematoda, Cestoda. The origin of pinworms. Type of Nemertines. General characteristics.
- Topic 7** The body cavity apparatus, a necessity for the further evolution of multicellularity. Type of Pseudocoelomates.
- Topic 8** Type of Nematodes. The position of nematodes among pseudocoelomates. Celomates. General characteristics.
- Topic 9** Obsessive schizocoelomates. Nonmetameric gliding schizocoelomates. Type of Shellfish (Mollusca).

**Topic 10** Phylogeny of Molluscs. Type of ringworms (Annelides). Phylogeny. The origin of ringworms.

**Topic 11** Type of Arthropoda (Arthropoda). Origin. Subgenus of Chelicerates. General characteristics. Morphology.

**Topic 12** Classification, reproduction and development of Chelicerates. Order of Spiders, Scorpions and Cockroaches. Subtype of Mandibles. Class of Insects (Insecta). general data,

**Topic 13** Deuterostomata. The origin of deuterostomes. The main types of deuterostomes, (echinodermata) their characteristics.

**Topics to be covered in the seminars:**

**Topic 1** Zoology as a system of sciences and principles of classification. Type of unicellular (Protozoa). Class Whipples, Sarcodines, Slugs, Rays, Ciliates, Sporozoans, Cnidospores, Opalines.

**Topic 2** Protozoan ancestry. Multicellular. Transition to multicellular, pseudocolonial and colonial forms of unicellular. The most primitive multicellular.

**Topic 3** The type of sponges. Evolution within sponge phyla and phylogenetic relationships among different groups.

**Topic 4** Type of Cnidarians. The lineage of cnidarians. Evolutionary paths within cnidarian phyla and phylogenetic relationships between different groups.

**Topic 5** Type of Combs. Type of pinworms (Plathelminthes). General characteristics, Morphology, histology, reproduction and development.

**Topic 6**

Class Turbellaria, Trematoda, Cestoda. The origin of pinworms. Type of Nemertines. General characteristics.

**Topic 7**

The body cavity apparatus, a necessity for the further evolution of multicellularity. Type of Pseudocoelomates.

**Topic 8** Type of Nematodes. The position of nematodes among pseudocoelomates. Celomates. General characteristics.

**Topic 9** Obsessive schizocoelomates. Nonmetameric gliding schizocoelomates. Type of Shellfish (Mollusca).

**Topic 10** Phylogeny of Molluscs. Type of ringworms (Annelides). Phylogeny. The origin of ringworms.

**Topic 11**

Type of Arthropoda (Arthropoda). Origin. Subgenus of Chelicerates. General characteristics. Morphology.

**Topic 12** Classification, reproduction and development of Chelicerates. Order of Spiders, Scorpions and Cockroaches. Subtype of Mandibles.

**Topic 13** Terrestrial mandibles, Class Myriapoda (Myriapoda). Class of Insects (Insecta). Deuterostomata. The origin of deuterostomes. The main types of deuterostomes, (echinodermata) their characteristics.

**Topics that will be covered in other obligations related to the course: laboratory work, practices, course assignments, etc.:**

**Topic 1** UNICELLULAR - Protozoa. Study of the GREEN EUGLENE. The study of TRYPANOSOMA. The study of OPALINE. The study of amoeba.

**Topic 2** SINGLE CELLS - The study of PARAMEC. STENTOR study. The study of STYLONIKES. Study of the VORTICELLA

**Topic 3**

SPONGES – Spongia. Study of the skeleton of the sponge SUBERITES. Study of the TOILET SPONGE skeleton.

**Topic 4** Cnidaria – Cnidaria. Study of HYDRA - Pelmatohydra oligactis.

**Topic 5** PRINTED WORMS – Plathelminthes. Study of PLANARIES - Dendrocoelum lacteum

**Topic 6** SHELLFISH - Mollusca. Study of the VINEYARD SNAIL. Study of the MAIN GENERA OF MARINE GASTROPODS.

**Topic 7** SHELLFISH – Mollusca. Mussel study -*Mytilus galloprovincialis* . Study of the PRINCIPAL GENERA OF MARINE LAMELLIBRANKS.

**Topic 8** Study of SEPIA-Sepia officinalis. Conducting cuttlefish dissection.

**Topic 9**

RINGWORMS-Annelides. Study of EARTHWORM-*Lumbricus* . The study of SHUSHUNJA-*Hirudo medicinalis* .

**Topic 10** Arthropods-Arthropoda. Study of the YELLOW SCORPION-*Buthus* . Study of the CROSS-CUT SPIDER-*Aranea diadema* .

**Topic 11**

Arthropods-Arthropoda. Study of the crab GAMARRUS. Study of crayfish. The study of the small shrimp.

**Topic 12** Arthropods-Arthropoda. Study of JULUS-Iulus. Study of SCOLOPENDRA-Scolopendra. Study of bakery morphology. The study of the types of the mouth apparatus of kandrass.

**Topic 13** Echinodermata - Echinodermata. The study of SEA URCHIN-*Paracentrotus lividus* . Study of the STAR OF THE SEA-*Tosia australis*.

### Field practices

- I. Vlora- Llogara - Vlora
- II. Vlorë - Divjakë - Karavasta (National Park) - Vlorë
- III. Vlorë - Orikum Lagoon - City of Orikum (old Orikum) - Fish tanks - Vlorë
- IV. Vlora - Puke
- V. Puke – Vahu i Deja – Valbona
- VI. Valbona - Vlora

### FORM OF KNOWLEDGE CONTROL

control	Percentage assessment
Control I	20%
Annual assessment Seminars, laboratories, and teaching practice	20%
Final check	60%

### ATTENDANCE:

The student, who results in less than 75% attendance for the period that belongs to each partial exam, the period for which he will be tested, will not be included in the relevant exam, will be evaluated with M.

If the student has attended the course, but does not appear in the next exam, he is assessed NP (Did Not Appear).

### COURSE FORMAT:

The subject will be evaluated on the basis of two partial exams, assignments and the final exam. Points earned will be cumulative. The exams will not be repeated, for any reason. If you miss an exam without any major reason, then you will lose points for that exam that you did not appear for.

### COMMUNICATION:

**Homework exercises, course assignments and any other announcements will be given in class or at the official address of the "Ismail Qemali" University of Vlora on the Internet:** [www.univlora.edu.al](http://www.univlora.edu.al) or to the teacher's e-mail [addressdenada.kasemi@univlora.edu.al](mailto:addressdenada.kasemi@univlora.edu.al)

**Email:** It is the duty of every student to check e-mail regularly. There will be tasks and notifications will be given only via e-mail.

### HONESTY CODE:

Students are encouraged to work in groups for the exercises and tasks that are given to them. Copying from one another in exams, course assignments, homework, etc. is not allowed. Violation of this rule will be accompanied by punitive measures up to the expulsion of the student from the university.

### LITERATURE

#### a)Mandatory basic literature:

Gjijknuri L., 2004: Zoology of Parruosaur(*reprint*), FSHN, UT, Tirana.

Gjijknuri L., 2004:*Guide to laboratory works of zoology of vertebrates (Invertebrates), (reprint)*, FSHN, UT, Tirana.

#### b) Recommended literature:

Balletto, E. 1999. Zoologia Evolutiva. Zanichelli. Bologna.

Barnes & Rupperts, 1994. Invertebrate Zoology. Saunders College Publishing. USA.

Clarkson, ENK 2001. Invertebrate Palaeontology and Evolution. Blackwell Science.

Jessop, NM 1995. Zoology: the animal kingdom. McGraw-Hill, Inc. New York.

Willmer, P. 1996. Invertebrate Relationships. Patterns in animal evolution. Cambridge Univ.

**FINAL REMARKS FROM THE SUBJECT TEACHER**

Homework exercises, coursework and any other notices will be given in class.

Students are also encouraged to work in groups for the homework exercises. Copying from one another in exams, coursework, homework, etc. is not allowed. Violation of this rule will be accompanied by punitive measures up to expulsion from the university.

The use of mobile phones and smoking in the auditorium is not allowed.

**lecturer**  
**Prof. Assoc. Denada TODAY**