

The name of the subject	Fisheries (Ichthyology)
Subject/module code	GA406
Semester(s) in which the subject is taught.	8-th semester
Responsible teacher	S. Kadirova, senior teacher
Language of instruction	Uzbek
Connect to the curriculum	Optional
Study hours (including contact hours, independent study)	Total hours - 180. Lecture hours - 40 Practical hours - 50 Independent study hours - 90
ECTS	6
Prerequisites/Relationship to disciplines	Zoology, biology.
Objectives/learning outcomes of the subject	<p>Ichthyology and hydrobiology, together with anatomy, physiology, biochemistry and other fundamental sciences, form the basis of zoology. In particular, in-depth study of ichthyology is important for future specialists in studying the histological structures of organisms.</p> <p>To provide students with knowledge about fish, to thoroughly study the systematics of species distributed in inland lakes and their nutritional and ecological processes.</p>
Course content (topics)	<p>I. Main theoretical part (lectures).</p> <p>Topic 1. Introduction, external structure and movement of fish</p> <p>Topic 2: Skin structure and scales of fish.</p> <p>Topic 3. Skeleton and muscles</p> <p>Topic 4. Digestive system of fish..</p> <p>Topic 5. Swim bladder of fish and its hydrostatic significance</p> <p>Topic 6. Respiratory system and circulatory system of fish.</p> <p>Topic 7. Features of the excretory system and salt requirement</p> <p>Topic 8. Reproductive system</p> <p>Topic 9. Nervous system</p> <p>Topic 10. Analyzer system</p> <p>Topic 11. Internal secretion system</p> <p>Topic 12 Class of ciliated fish</p> <p>Topic 13 Class of bony fish</p> <p>Topic 14 Migration of fish.</p> <p>Topic 15 Fish diseases</p> <p>Topic 16 Bacterial diseases of fish</p> <p>Topic 17 Fungal diseases of fish</p> <p>Topic 18 Viral diseases of fish</p> <p>Topic 19 The importance of the Jizzakh reservoir in fisheries</p> <p>Topic 20 Organization of fisheries complexes</p> <p>The main methodological document of the teacher in preparing and conducting a practical lesson is the methodological instructions.</p> <p>How much time should you spend checking homework?</p> <ul style="list-style-type: none"> - how much time should you spend on conducting a survey among students on the theory and what questions should you ask; - what examples and tasks should be solved on the board in what sequence; what should you pay attention to in a particular task; - how to arrange drawings and calculations for each task (test); - who should be interviewed on the theory and who should be called to the council to solve problems;- kengashga murojaat qilmasdan qanday vazifalarni joyida hal to offer to do;

- what tasks to offer to "strong" students;
- what tasks to set for independent solution at home.
The purpose of practical exercises is to perceive the theory, acquire the skills to consciously apply it in educational and professional activities, and to form the ability to confidently formulate one's own point of view.

II. Instructions and recommendations for practical training

- 1 Topic Introduction, external structure and movement of fish and adaptation to the aquatic environment.
2. Topic Skin structure and scales of fish
3. Topic Skeleton and muscles
4. Topic Digestive system of fish
5. Topic Swim bladder of fish and its hydrostatic significance
6. Topic Respiratory system and circulatory system of fish
7. Topic Excretory system and salt requirement
8. . Topic Nervous system. Analyzer system
9. Topic Fish reproduction and development
10. Topic Determining the length and age of fish
11. Topic The structure of representatives of the class of bony fish
12. Topic The structure of representatives of the class of ocelli
13. Topic Migration and dynamic population of fish
14. Topic Water properties and fish ecology
15. Topic Acclimatization of fish
16. Topic Fish diseases and their types
17. Topic Bacterial diseases of fish
18. Topic Fungal diseases of fish
19. Topic Viral diseases of fish
20. Topic The importance of the Jizzakh reservoir in the fishery
21. Topic Organization of fishery complexes
22. Topic Study of aquarium fish
23. Topic Breeding and development of fish fry
24. Topic Study of the structure of the class of bony fish
25. Topic Study the structure of the class of cephalopods

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III. Independent learning and independent work.

The competence of independent learning serves students' independent self-development and increases the effectiveness of professional activities. Students perform independent work on their own mobile devices, in traditional forms under the guidance of a teacher, and in electronic forms under the guidance of a teacher. Mustaqil ta'lim uchun tavsiya etiladigan mavzular:

1. Characteristic features of the structure of fish.
2. The main stages of fish development.
3. Ocean fish - representatives of a large order of sharks and rays.
4. The structure, systematics and main representatives of bony fish
5. Reproduction (spawning grounds) of fish.
6. Biology of fish caught in the water bodies of Uzbekistan.
7. List of fish that are on the verge of extinction and are in decline in Uzbekistan
- 8 Populations of fish that are declining and on the verge of extinction in Uzbekistan.
9. The importance of carp families in fisheries in the water bodies of Uzbekistan.
10. New fish species in Uzbekistan.

	11. Modern ichthyofauna of water bodies of Uzbekistan. 12. Migration of fish caught in water bodies of Uzbekistan. 13. About acclimatized fish (African mackerel) in Uzbekistan 14. Organization of fish farming complexes 15. The importance of the Jizzakh reservoir in the fishery 16. Viral diseases in fish 17. Migration and dynamic population of fish 18. Study of aquarium fish 19. Breeding and development of fish fry 20. Fungal diseases in fish 21. Determination of age and length of fish 22. Ichthyofauna of the Aydar Arnasay River 23. Biology of black fish 24. Study of the biology of white omurice 25. Biology of silverfish 26. Biology of gararufa fish 27. Study of the structure of the class of bony fish 28. Study of the structure of the class of cartilaginous fish 29. Representatives of the order of cyprinids 30. Sharks and rays order 31. Study of fish systematics 32. Acclimatization of fish 33. Reproduction and development of fish 34. Origin and development of fish 35. The excretory system of fish and salt requirement 36. Study of the shark order 37. Species of daminat fish found in the water bodies of Jizzakh region 38. Study of the biology of the wrasse
Exam form	<p>It is important to assess the theoretical and practical knowledge of students when conducting current, intermediate and final examinations in the subject.</p> <p>1. Current examination is aimed at assessing the activity shown by students during the lesson, their practical skills and ability to use software. The student's activity in daily lessons is assessed by mastering the course topics, as well as constructively interpreting and analyzing the educational material, developing module-specific skills, acquiring practical skills (in terms of quality and the specified number) and competencies, solving problem situations aimed at applying professional practical skills, working in a team, preparing presentations, etc. Forms of current examination: activity in lessons, preparation of educational materials, resources within the subject working with, using educational technologies, working in a team, preparing presentations, testing.</p> <p>2. Intermediate control. During the semester, lectures are held 2 times based on the number of hours of study. Intermediate control is evaluated with 20 points on a 100-point system. Students who score 60% of the points allocated for intermediate and current control are allowed to take the final control.</p> <p>3. Final control.</p> <p>The final control is carried out at the end of the course and is aimed at assessing the general knowledge and skills of students.</p> <p>The final type of control is carried out at the end of the semester to determine the level of mastering the student's theoretical knowledge and practical skills in the relevant subject. The final control ticket contains 5 questions, and the answers to each question are evaluated with a maximum of 10 points.</p>
Educational outcomes and exam requirements	Complete mastery of theoretical and methodological concepts on the subject, correct reflection of the results of the analysis, independent thinking about

	<p>the processes being studied, and completion of assignments in current and intermediate forms of assessment, as well as assignments for final assessment.</p> <p>The student must have passed the current control, intermediate control and independent learning assignments in the relevant subject within the established period.</p> <p>A student who has not passed the current control, intermediate control and independent learning assignments, as well as who has scored points in the range of "0-29.9" for these assignments and types of control, will not be included in the final type of control.</p> <p>Also, a student who has missed 25 or more percent of the classroom hours allocated to the subject without an excuse will be expelled from this subject, will not be admitted to the final exam and will be considered not to have mastered the relevant credits in this subject.</p> <p>A student who has not passed the final exam or who has not passed the final exam and has scored between "0-29.9" for this type of exam is considered to be in academic debt.</p>
Recommended readings	<p>1. Mirabdullayev I.M, Mirzaev U.T, Kuzmetov A.R, Kimsanov Z.O Fish identifier of Uzbekistan and neighboring regions Tashkent "Sano-standart" 2011. 100p.</p> <p>2. Wundsettel M. F Ichthyology pool reke Syrdari. Dimitrevo: Dimitrov Fill, AGTU, 2006. 294 st</p> <p>3.S. Q. Husenov, D. S. Niyazov, G. M. Sayfullayev "Basics of fishing" Bukhara 2010</p> <p style="text-align: center;">Additional literature:</p> <p>Electronic learning resources:</p> <p>www.bilim.uz-OUMTB</p> <p>www.tdpu.uz</p> <p>www.pedagog.uz.</p> <p>https://lib.jdpu.uz/library_manual/view/607</p> <p>https://lib.jdpu.uz/library_manual/view/582</p> <p>https://lib.jdpu.uz/library_manual/view/564</p>