

Taxonomy and Systematics — The Foundation of Life Sciences

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Taxonomy is the science of classifying, naming, and organizing living organisms into hierarchical categories based on their shared characteristics. Systematics, on the other hand, is concerned with studying diversity and evolutionary relationships among organisms. Together, these disciplines provide the framework for understanding and organizing the incredible diversity of life on Earth. As such, these fields deal with the processes and the products of evolution, aiming to gain better understanding and classification of evolutionary relationships. In essence, taxonomy and systematics are fundamental tools for scientists across various life science disciplines. They provide a common language and framework that enables researchers to explore, understand, and communicate the diversity and interconnectedness of life. Research in taxonomy and systematics is performed both in the field, from tropical ecosystems to the arctic, and in the lab, using traditional techniques alongside novel molecular and imaging tools. Whether one performs a comparative study regarding behavior, biochemistry, biogeography, or any other topic, it must have a strong base of knowledge regarding the identity and systematic relationships of the organisms being studied.

This course will combine theoretical knowledge with practical skills to provide a comprehensive exploration of the principles and practices of taxonomy and systematics as they are applied today to all groups of organisms. The focus on taxonomy and systematics is designed to introduce students to the science of classifying biodiversity into species and describing taxa while getting familiar with the main concepts, goals, challenges, and the qualitative and quantitative techniques that are used today in taxonomy and systematics. Because hands-on familiarity with organisms is an essential part of both taxonomy and systematics, the course includes lab exercises and projects focusing on several selected taxonomic groups. Students will delve into the theories, history, key concepts, classification, identification, and evolutionary relationships of organisms, gaining a deep understanding of the biodiversity on our planet. Some of the main topics will be species concepts, hypothesis testing about species boundaries and species delimitation, methodological approaches, and the formation and use of research collections and nomenclature.

Aims and objectives:

Students on this course will gain theoretical knowledge and practical skills while exploring the principles and practices of taxonomy and systematics as they are applied today to all groups of organisms, for a detailed understanding of the various uses and problems involved.

Admission prerequisites:

Advanced undergraduate (i.e., third year) and graduate students of all fields of life sciences.

Dates:

07-11/02/2027

The course consists of:

~25 hours of lectures

~15 hours of laboratory exercises

Credit points:

3

Final grade:

Final exam (70%)

Participation and engagement in lab projects (20%)

Participation and engagement in lectures and discussions (10%)