

## **Biodiversity Summer Programme 2024- Course Description**

### **LSM4263 Field Studies in Biodiversity**

Units: 4

Field studies are integral in the training of biologists. Experiential learning in the field provides valuable and irreplaceable opportunities for participants to hone their skills in critical thinking, teamwork, and problem solving. Over the past 30 years, the departments of botany and zoology at NUS, now known as the Department of Biological Sciences, have been conducting annual week-long field courses for Honours year students to emphasize the field component of biology. This gives even experimental and molecular biologists an opportunity to experience a key component of modern biology education that necessitates practical exposure beyond the confines of indoor spaces. It is well-established that the best way to study biodiversity in a diversity rich region like Southeast Asia is through field courses that enable immersive learning experiences within the natural environment. This experiential-mode of study is significant.

This course introduces students to field biology – the basic techniques and theories involved i.e. sampling design, data management, analysis, and synthesis. A series of six lectures will deliver concepts relevant to the practice of field biology. Through field practical sessions conducted in sites around Singapore, students will encounter tropical environs and habitats, namely coastal, mangrove, primary and secondary forest, and apply concepts into practice. Students will also be tasked with conducting basic independent literature review of local/regional biodiversity conservation issues and visit other local field sites of their choice, to enable student-directed learning to benefit their personal learning journeys. This course is aimed at helping students to gain a foundational understanding of the various field methods in biodiversity research, and to achieve an appreciation and a broader perspective on the types or sub-fields of biodiversity research and what they entail.

The field component introduces students to the practical aspects of field biology, taking the format of a week-long fieldwork in Pulau Tioman, Malaysia, an island off the east coast of Peninsular Malaysia with biomes of sufficient breadth and scale to accommodate the practical learning objectives of this course. Preparatory instructional time will be allocated in the form of a dedicated lecture and tutorial sessions preceding the field week; preparatory content will also be inherent features in lectures administered in LSM4263. Students will be divided into small groups of 5-8 and will conduct mini-projects in different habitat types pertaining to their project assignment, under the supervision of experienced teaching personnel. Students can expect to gain first-hand and hands-on experience in research formulation, sampling design, planning, management, execution, data analysis and synthesis, and effective communication of a field-based research project of their own. The duration of each working day for the students and staff will be 12 hours, including field work, data analysis, discussions, preparation, and daily group debriefs each evening. After returning from the trip, students will give presentations of the study they were assigned and defend their findings and conclusions, as an exercise in scientific communications. Students will finish the course with the final assessment task: a written report based on their group project to be undertaken and submitted individually.

## **LSM4254 Principles of Taxonomy and systematics**

Units: 4

This course introduces students to taxonomy and systematics, i.e., the science of grouping biodiversity into species, describing the species, and classifying this diversity into higher-level taxa that reflect evolutionary history. The course has two main goals: (1) It introduces the main concepts and goals of taxonomy and systematics. (2) It teaches the qualitative and quantitative techniques that are today used to describe/identify species and higher-level taxa based on the analysis of morphological and DNA sequence evidence. The aim is to equip environmental as well as other biologists with an understanding of taxonomic/systematic units and the tools needed for evaluating and quantifying diversity in samples of plant and animal specimens.