Przedmiot z oferty “AMU-PIE - course offer for short time exchange students”

Module title

# Population genomics

General information

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| Language | EN |
| Module lecturer | prof. dr hab. Witold Wachowiak |
| Lecturer's email | witwac@amu.edu.pl |
| Lecturer position | profesor |
| Faculty | Faculty of Biology |
| Semester | 2021/2022 (winter) |
| Duration | 35 |
| ECTS | 4 |
| USOS code | Gen-Pop |

Timetable

Lectures - 10h
Computer classes 15h
Seminars 10h

Module aim (aims)

Development of next generation *omics* technology has revolutionized biological science providing access to large scale genomic data and a unique opportunity for in depth studies of processes that influence the patterns of genetic variation across populations and species. The course will highlight the importance of genomics in biodiversity research, will cover many case studies to explain terminology and methodology used in population genomics and will look at the practical application of such research in population history, evolutionary and conservation genetic studies and dissection of complex phenotypic traits. You will also familiarize yourself with analytical approaches and computer programs for genetic and genomic data analysis and critically evaluate the published population genomics studies to discuss further research directions.

Pre-requisites in terms of knowledge, skills and social competences (where relevant)

Syllabus

Population Genomics course will apply lectures, computer classes and discussion of case studies

Lectures (Week 1-5) will cover the following major topics:

The importance, role and applications of population genomics studies in biodiversity research
Factors and processes that influence genetic variation at the population and species level
Databases and software used in dissection of complex phenotypic traits, evolutionary assessments, conservation genetics and management of natural genomic resources
Model species, comparative genomics and practical applications of genomic research
Analytical approaches used in population history and evolutionary studies across the tree of life

Computer classes (Weeks 6-10) will include practical application of selected computer programs and analytical approaches in problem solving population genomics tasks and exercises.

Seminars (Weeks 6-10) will include discussion of the pre-selected research articles related to computer lab materials and lectures

Reading list

Those books maybe useful for you to familiarize with the topi

1) Arthur M. Lesk, Introduction to Genomics (Third Edition), Oxford University Press, Oxford, 2017
2) Dawn Field, Neil Davies. Biocode: The New Age of Genomics (1st Edition), Oxford University Press, Oxford, 2015