NAVOI STATE UNIVERSITY

BIG1106 BIOGEOGRAPHY — COURSE SYLLABUS

Faculty of Natural Sciences & Medicine | Department of Biology | Program: 60520200 Ecology & Environmental Protection

COURSE PASSPORT & ACADEMIC METADATA

Course Title: Biogeography

Course Code: BIG1106

Course Type: Mandatory

Field of Study: 500000 Natural Sciences / 520000 Environment

Program: 60520200 Ecology & Environmental Protection

Academic Year: 2026–2027

Semester: 1

Form of Education: Full-time

Language: Uzbek / English

Total Workload Allocation: 90 Hours Contact (Lectures, Practical) + Independent Study

Assessment: Examination

Aligned UN SDGs: SDG 15 (Life on Land), SDG 13 (Climate Action)





1. Course Description & Geographic Scope

Biogeography studies the spatial distribution of organisms, biological communities, and biomes across the Earth's surface in geological time and geographic space. Students analyze ecological factors, speciation, endemism, relict species, floristic/faunistic realms, and biome conservation.

In alignment with SDG 15 (Life on Land) and SDG 13 (Climate Action), the course explores biogeographical foundations of biodiversity preservation, biological invasions, climate change adaptations, and Red Data Book conservation strategies.

2. Course Aims & Professional Competencies

Course Aim: To develop scientific competency in geographic distribution patterns of flora and fauna, biotic realm mapping, ecosystem zonation, and biological invasion risk management.

- Knowledge: Understand phytogeographic and zoogeographic realms, biomes (tundra, taiga, temperate forests, steppes, deserts, tropical rainforests), island biogeography, endemics, and relicts.
- Analytical Skills: Conduct floristic and faunistic analysis, interpret biogeographical maps, evaluate species limiting factors, and track bio-invasions.
- Conservation Applications: Apply biogeographic principles to establish protected areas (IUCN categories, national parks, biosphere reserves) and protect endangered endemics.
- SDG Competencies: Contribute to Convention on Biological Diversity (CBD) goals and regional ecosystem management (SDG 15).

3. Prerequisites

Prerequisites: General Ecology, General Botany, Zoogeography, Physical Geography.

4. Course Structure & Workload Allocation

Activity Type	Curriculum Focus	Total Hours Allocation
Lectures	Biogeographic Realms & Biome Dynamics	Contact Hours
Practical Classes	Floristic/Faunistic Mapping & Analysis	Contact Hours
Independent Study	Regional Biome Mapping & Case Studies	Self-Directed Hours
Total Workload	Full Academic Module	90 Hours Contact + Self-Study

5. Detailed Course Curriculum Outline

5.1 Lecture Syllabus Outline

• **L1: Introduction to Biogeography & Geographic Shell:** Subject, history, research principles, structure of the biosphere and biogeosphere.

• **L2: Ecological Factors & Species Ranges:** Climatic, edaphic, orographic, and biotic drivers of organism distribution; range types.

• **L3: Island Biogeography, Endemism & Relicts:** MacArthur-Wilson model, island speciation, endemic taxa, relict flora/fauna, Red Data Books.

• **L4: Floristic & Faunistic Realms of the World:** Holarctic, Paleotropical, Neotropical, Australian, Antarctic, and Capensis phytogeographic realms.

• **L5: Terrestrial Biomes & Ecosystem Zonation:** Zonal, intrazonal, and azonal ecosystems; latitudinal and altitudinal vegetation belts.

• **L6: Biogeographical Foundations of Biodiversity Conservation:** Species-area relationships, protected area network design, and ecosystem restoration.

• **L7: Biological Invasions & Climate Adaptation:** Invasive alien species, range shifts under climate change, and Convention on Biological Diversity (CBD).

5.2 Practical & Laboratory Outline

- Mapping global floristic and zoogeographic realms using GIS and physical maps.
- Floristic analysis: Calculating endemic and cosmopolitan indices for regional flora.
- Faunistic analysis: Comparing vertebrate species richness across continental biomes.
- Evaluating species distribution range maps and identifying limiting ecological boundaries.
- Analyzing altitudinal vegetation zonation in Central Asian mountain systems (Tien Shan, Pamir-Alay).
- Mapping desert biome adaptations: Turan desert flora/fauna ecological traits.
- Assessing invasive species risks in Uzbekistan (e.g., Ambrosia, Myna) and management protocols.

5.3 Independent Study & Case Study Tasks

- Preparing a research report on endemic plant and animal species of the Kyzylkum Desert.
- Comparative biogeographical analysis of Holarctic vs. Paleotropical floristic realms.
- Case study on climate change-induced range shifts in Central Asian alpine species.
- Mapping Uzbekistan's protected area network (zapovedniks, national parks) for Red Book species conservation.

6. Recommended Literature & Information Sources

- Hasanov N. Biogeography (Course Materials). Navoi State University, 2026.
- Boyirov Z.R. Ecological Management & Engineering Ecology. Qarshi, 2024.
- Yormatova D.Yo. Ecology and Nature Protection. Tashkent: Fan va Texnologiya, 2018.
- Hufnagel L. (Ed.) Community and Global Ecology of Deserts. Academic Press.