

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	Genetika evkariotov
Course title:	Genetics of Eukaryotes

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Univerzitetni študijski program Biologija, 1. stopnja		3.; 3rd	5.; 5th
Undergraduate university programme Biology, 1st degree			

Vrsta predmeta / Course type Obvezni/Obligatory ali Izbirni/Elective

Univerzitetna koda predmeta / University course code:

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Lab. vaje Laboratory work	Terenske vaje Field work	Samost. delo Individ. work	ECTS
30			30		120	6

Nosilec predmeta / Lecturer: Metka Šiško

Jeziki /	Predavanja / Lectures:	slovenski / slovene
Languages:	Vaje / Tutorial:	slovenski / slovene

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	Prerequisites:
Jih ni.	No.

Vsebina:

Predmet obsega vsa ključna poglavja genetike (evkariotov):

- Molekulska genetika evkariotov - molekularna struktura in replikacija genetskega materiala, molekularne lastnosti in funkcija genov.
- Citogenetika in fizikalne osnove dednosti evkariotov - struktura in funkcija kromosomov, celična delitev, gametogeneza, oploditev.
- Kvalitativna genetika evkariotov – nevezani geni, Mendlova pravila, dednost

Content (Syllabus outline):

The subject includes all essential parts of genetics (of eukaryotes):

- Molecular genetics of eukaryotes – molecular structure and replication of the genetic material, molecular properties and function of genes.
- Cytogenetics and physical basis of heredity of eukaryotes chromosome structure and function, cell division, gametogenesis, fertilisation. Mendelian genetics – inheritance of qualitative traits, Mendelian rules, genetic linkage, polyploidy (euploidy,

kvalitativnih lastnosti, genske interakcije, poliploidija (evploidija, anevploidija), statistično testiranje segregacijskih razmerij, vezani geni, crossing-over, genetske mape, genetika spolnosti.

Populacijska genetika evkariotov -struktura populacij, populacijsko ravnotežje, migracije, mutacije, selekcija, inbreeding, incest.

Kvantitativna genetika evkariotov -srednje vrednosti in variance posameznih generacij, izračunavanje heritabilnosti. Izobraževalni proces (še posebej eksperimentiranje) bo upošteval vse veljavne moralno- etične omejitve.

aneuploidy), statistical testing of segregation ratios, genetic linkage, crossing-over, genetic maps, genetics of sex.

Population genetics of eukaryotes -structure of populations, population equilibrium, migrations, mutations, selection, inbreeding.

Quantitative genetics of eukaryotes – generation mean values and variances, estimation of heritability.

Teaching approach, especially practical experimentation, will consider all existing moral and ethical rules.

Temeljni literatura in viri / Readings:

- Brooker R. J. 2012. Genetics – analysis and principles. Fourth Edition. The McGraw-Hill Companies, Inc. New York.
- Pierce B. A. 2005. Genetics. A conceptual approach. Second Edition. W. H. Freeman and Company, New York.
- Griffiths, A. J. F., S. R. Wessler, R. C. Lewontin, W. M. Gelbart, D. T. Suzuki, J. H. Miller, 2005: Introduction to genetic analysis. Eight Edition. W. H. Freeman and Company, New York.
- Stansfield D.W. 1991. Theory and problems of Genetics. Schaum's Outlines series, McGraw-Hill, INC., New York.

Cilji in kompetence:

Osnovni cilj te učne enote je dati celovit in sistematičen pregled: molekulske genetike, citogenetike, kvalitativne in kvantitativne genetike evkariontov. Vključeni so teoretični in praktični problemi genetike rastlin, živali in ljudi.

Objectives and competences:

The main purpose of this study unit is to give a complete and systematic overview of: molecular genetics, cytogenetics, qualitative and quantitative genetics of eukaryotes. It will include theoretical and practical hereditary problems of plants, animals and humans.

Predvideni študijski rezultati:

Intended learning outcomes:

Znanje in razumevanje:
 Znanje in razumevanje, ki si ga študentje pridobijo obsega naslednjo problematiko:
 načine funkcioniranja genetskega materiala,
 načine dedovanja in
 genetsko strukturo ter procese v populacijah evkariontov.

Prenesljive/ključne spretnosti in drugi atributi:
 Oblikovanje generacijskega materiala za proučevanje dednosti in analiza segregacije v potomstvih.

Knowledge and understanding:
 It involves the following subjects:
 the function of the hereditary material,
 the most important ways of inheritance and
 the structure and processes within
 populations of eukaryotes.

Transferable/Key Skills and other attributes:
 Formation of generation material for inheritance studies, analysis of segregation within progenies.

Metode poučevanja in učenja:

Learning and teaching methods:

Predavanja
 Laboratorijske vaje

Lectures
 Laboratory practicals

Delež (v %) /

Načini ocenjevanja:

Weight (in %)

Assessment:

Pisni izpit

100

Written exam

Reference nosilca / Lecturer's references:

ŠIŠKO, Metka, JAVORNIK, Branka. Effectiveness of AFLP and SSR molecular markers in determination* of genetic relationship among pear (*Pyrus spp.*) genotypes. *Agricultura*, ISSN 1580-8432. [Print ed.], 2007, letn. 5, št. 1, str. 21-24. [COBISS.SI-ID2566188]

VRŠIČ, Stanko, IVANČIČ, Anton, ŠUŠEK, Andrej, ZAGRADIŠNIK, Boris, VALDHUBER, Janez, ŠIŠKO, Metka. The World's oldest living grapevine specimen and its genetic relationships. *Vitis*, ISSN 0042-7500, 2011, letn. 50, št. 4, str. 167-171. [COBISS.SI-ID3206956]

ŠIŠKO, Metka, JAVORNIK, Branka. Effectiveness of AFLP and SSR molecular markers in determination* of genetic relationship among pear (*Pyrus spp.*) genotypes. *Agricultura*, ISSN 1580-8432. [Print ed.], 2007, letn. 5, št. 1, str. 21-24. [COBISS.SI-ID2566188]