



Luiz de Queiroz College of Agriculture

Course Offerings

Degree codes:

- 11010 - Agriculture
- 11020 - Forestry
- 11040 - Licentiate Degree in Agriculture
- 11050 - Economics
- 11061 - Food Science
- 11070 - Biological Sciences (104 = Licentiate Degree; 4 = Bachelor Degree)
- 11080 - Environmental Management
- 11090 - Management

ID	Course Name	Professor	Course Content Summary	Total Course Hours	Semester	Degree code
LGN0114	Cell Biology	Maria Carolina Quecine Verdi	Prokaryotic and Eukaryotic Cells: Organization and Functions; Cell techniques and experimental procedures; Macromolecules: lipids, carbohydrates, proteins and nucleic acids. Structure of nucleic acids and the molecular basis of DNA duplication; Genes and genome composition; RNA transcription and processing; Protein biosynthesis; Nucleus, chromatin and chromosomes; Cell cycle: mitosis, meiosis; Karyotyping; Gametogenesis; Poliploidy; Cell compartmentalization and organelles; Protein Trafficking; Chloroplast and Mitochondria; Cellular Signaling.	75	1st	11020 11010
LGN0115	Cell Biology	Ricardo Antunes de Azevedo	Microscopy; Cell morphology; Extraction and electrophoresis of plant proteins; Structure of nucleic acids; Extraction of nucleic acids from plants; Chromosomes of plants and animals; Protein electrophoresis; DNA polymorphism and metabolic diseases; Mitosis and Meiosis.	60	1st	11061



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LGN0117	Cell Biology	Claudia Barros Monteiro Vitorello	Cell organization of Prokaryotic and Eukaryotic organisms. Study methods of cells I (Microscopy). Study methods of cells II (cell culture, cell fractionation, isolation of molecular compounds by chromatography, electrophoresis, etc). Cell macromolecules: carbohydrates, lipids, proteins and nucleic acids. Nucleic acids, nucleus and nucleolus structure. Plasmatic membrane: structure, signaling and transport. Endomembranes system. Secretion and cell traffic. Chloroplast and mitochondria (structure and functions). Cell signaling: signs, receptors and signaling pathways. Cell cycle. Mitosis. Meiosis.	90	1st	11070
LGN0215	Genetics	Gabriel Rodrigues Alves Margarido	The importance and objectives of Genetics. Transmission genetics: monogenic inheritance and independent distribution principles. Allelic and non-allelic interactions. Self-incompatibility alleles. Gene linkage: recombination; chromosome mapping. Mutation: gene and chromosome mutations. Spontaneous and induced mutations. Use of mutants in agriculture. Applications of Polyploidy. Polygenic inheritance and quantitative genetics: genetic basis of characters controlled by polygenes. Principles of quantitative genetics. Population genetics: Allelic and genotypic frequencies. Hardy-Weinberg's equilibrium. Fixation index. Factors that change allelic frequencies. Endogamy coefficient. Linkage disequilibrium. Molecular markers applications. Evolution: natural selection; evolution synthetic theory.	90	2nd	11020 11010



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LGN0217	General Genetics	Elizabeth Ann Veasey Flávio César Almeida Torres Maria Carolina Quecine Verdi	Introduction: the importance and objectives of Genetics; Breeding & Genetics as means for modifying nutritional and organoleptic features of plants, animals and microorganisms relevant to human nutrition; Transmission genetics: monogenic inheritance and independent distribution principles; Allelic and non-allelic interactions; Self incompatibility alleles; Endogamy coefficient; Gene Linkage: recombination, chromosome mapping, three point test; Double exchange; Interference; Extrachromosomal inheritance; Population genetics: Allelic and genotypic frequencies; Hardy-Weinberg's balance; Fixation index; Polygenic inheritance and quantitative genetics: Controlled characters of genetic basis by polygenes; Principles of quantitative genetics; Gene mutations and chromosomes number and structure variations: phenotype, inheritance and evolution consequences; Evolution: natural selection, evolution synthetic theory; Gene regulation; Prokaryotic and eukaryotic mechanisms; Genetics, biochemistry and nutrition: genes involved in methabolic paths affecting nutritional and organoleptic features of plants, animals and microorganisms relevant to human nutrition; Biotechnology: principles of genetics applied to biotechnological procedures; Restriction, gene cloning and new molecular analysis tools.	60	2nd	11061
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LGN0218	General Genetics	Maria Lucia Carneiro Vieira	The importance and objectives of Genetics. Transmission genetics: monogenic inheritance and independent distribution principles; allelic and non-allelic interactions; Self incompatibility alleles; Inbreeding coefficient. Gene linkage: recombination; chromosome mapping; three point test; crossing over; Interference. Extrachromosomal inheritance; Polygenic inheritance and Quantitative Genetics: genetic basis of caracteres controlled by polygenes; principles of Quantitative Genetics. Gene mutations: consequences for phenotype, for the inheritance and for the evolution. Introduction to Population Genetics.	60	2nd	11070
LGN0232	Molecular Genetics	Claudia Barros Monteiro Vitorello	DNA as genetic material; Gene isolation and cloning; Prokaryotes and eukaryotes gene structure; Mutations; Transcription and translation mechanisms; Gene expression regulation; Functional genomics.	30	1st	11020 11010
LGN0313	Plant Breeding	Roberto Fritsche Neto	Plant breeding importance and objectives; Gemoplasma; Phenotypic variation components; Heritability and genetic progress coefficient; Genotype interaction with environment; experiments in genetics and breeding; Reproductive systems; Vegetative propagation, autogamous and alogamous species breeding; Commercial hybrids.	60	1st	11020 11010



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LGN0320	Human Evolutionary Ecology	Silvia Maria Guerra Molina	<p>The Human Evolutionary Ecology course approaches: 1; Interdisciplinarity and areas of study related to Human Evolutionary Ecology; concept of Human Evolutionary Ecology; 2; Review of basic ecological concepts and processes; 3; Ecology of Human Populations I: human population biology and dynamics, reproductive effort and gene flow (human migrations); growth of human populations and increasing of per-capita human impact; 4; Ecology of Human Populations II: hominin evolution and the evolution of community; hominin evolution in seasonal environments; 5; Evolution, genes, and culture: novel socio-biological and anthropological approaches; cultural biology; transition between genes and culture, co-evolution; epigenesis; 6; Human population, adaptive responses and diversity I (central concept: human adaptability): foraging strategies; modes of production and models of subsistence, kinship and residence, territoriality; ethno-biology and ethno-ecology in human ecology researches, traditional knowledge and bio-diversity; 7; Human population, adaptive responses and diversity II (central concept: human adaptability): specific environments; genetic and cultural diversity, and the adaptive process of human species; 8; Interfaces among Human Ecology and other areas of scientific knowledge; 9; Ecology of Technologies (Media Ecology).</p>	90	1st	11061 11070 11020 11010
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LGN0321	Human Evolutionary Ecology	Silvia Maria Guerra Molina	<p>The Human Evolutionary Ecology course approaches: 1; Interdisciplinarity and areas of study related to Human Evolutionary Ecology; concept of Human Evolutionary Ecology; 2; Review of basic ecological concepts and processes; 3; Ecology of Human Populations I: human population biology and dynamics, reproductive effort and gene flow (human migrations); growth of human populations and increasing of per-capita human impact; 4; Ecology of Human Populations II: hominin evolution and the evolution of community; hominin evolution in seasonal environments; 5; Evolution, genes, and culture: novel socio-biological and anthropological approaches; cultural biology; transition between genes and culture, co-evolution; epigenesis; 6; Human population, adaptive responses and diversity I (central concept: human adaptability): foraging strategies; modes of production and models of subsistence, kinship and residence, territoriality; ethno-biology and ethno-ecology in human ecology researches, traditional knowledge and bio-diversity; 7; Human population, adaptive responses and diversity II (central concept: human adaptability): specific environments; genetic and cultural diversity, and the adaptive process of human species; 8; Interfaces among Human Ecology and other areas of scientific knowledge; 9; Ecology of Technologies (Media Ecology).</p>	90	1st	11061 11070 11080
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LGN0335	Evolution and Population Ecology	Giancarlo Conde Xavier Oliveira	Introduction to population studies; Population structure; Population dynamics I, II and III; Population interactions; Population distribution; History of the Evolutionary Theory; Evolution evidences; Evolution Synthetic Theory; Population genetic structures; Microevolutionary mechanisms; Mutation; Recombination; Genetic Drift; Migration; Hybridization; Natural Selection; Macroevolutionary mechanisms; Speciation; Phylogeny, classification and evolution.	120	2nd	11061 11070 11080
LGN0341	Cytogenomics and Epigenetics	Mateus Mondin	Introduction to Chromosome Biology with emphasis in cytogenetics; Molecular structure of the chromatin and chromosome organization; Nucleosome; Genome organization; Chromosomal and molecular comparative genomics; Cell cycle and mitosis; Meiosis, recombination and genetic variability; Polyploidy and aneuploidy; Chromosomal rearrangements; Applications for plant, animal and medical Sciences; Epigenetics: the history of Epigenetics; Mechanism of epigenetic inheritance; Mechanism of DNA modification; Post-translational modification of histones; Epigenetic code; Chromatin dynamics; Heterochromatin; Transcription in a chromatin environment; Concepts of imprinting, dosage compensation and cellular memory.	90	1st	11070 11020 11010



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LGN0478	Genetics and Socio-Environmental Issues	Silvia Maria Guerra Molina	Genetics and Socio-Environmental Issues course approaches: 1. The most relevant environmental problems to the human species; waste and tailings generated by humans: nature and composition; genetic, ecological and social consequences and impacts (introduction to the agro-industrial wastes and tailings issues); 2. Treatment and use of organic waste from crops, livestock, fishery, poultry, effluents from food industry, water and sewage – contributions of genetics; 3. Genetics and Natural Resources destruction or limits: 3.1. Natural habitats; wild genetic resources and genetics of natural population; 3.2. Soil, Energy, Fresh water, photosynthetic capacity; 4. Genetics and harmful substances produced or displaced by humans: 4.1. Toxic chemicals, atmospheric gases, eco-toxicology and gene-toxicity; environmental mutagenesis; 4.2. Exotic species and scientific approaches; 5. Biosafety and Bioethics; 6. Ecology of technologies and socio-environmental issues; 7. Projects and research on genetics and environmental issues and interfaces with the fields of specialization of undergraduate students enrolled in the course.	90	2nd	11070 11020 11010
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LGN0479	Genetics and Socio-environmental Issues	Silvia Maria Guerra Molina	Genetics and Socio-Environmental Issues course approaches: 1. The most relevant environmental problems to the human species; waste and tailings generated by humans: nature and composition; genetic, ecological and social consequences and impacts (introduction to the agro-industrial wastes and tailings issues); 2. Treatment and use of organic waste from crops, livestock, fishery, poultry, effluents from food industry, water and sewage – contributions of genetics; 3. Genetics and Natural Resources destruction or limits: 3.1. Natural habitats; wild genetic resources and genetics of natural population; 3.2. Soil, Energy, Fresh water, photosynthetic capacity; 4. Genetics and harmful substances produced or displaced by humans: 4.1. Toxic chemicals, atmospheric gases, eco-toxicology and gene-toxicity; environmental mutagenesis; 4.2. Exotic species and scientific approaches; 5. Biosafety and Bioethics; 6. Ecology of technologies and socio-environmental issues; 7. Projects and research on genetics and environmental issues and interfaces with the fields of specialization of undergraduate students enrolled in the course.	90	2nd	11070 11080 11061
LGN0615	Supervised Internship in Genetics I	Antonio Augusto Domingos Coelho	Plant mutagenesis and plant tissue culture; Microorganism and enzyme producer fungi genetic breedings, filament fungi cytogenetics, nitrogen fixing bacteria genetics, genetics and yeast breeding; Metabolic regulation, photosynthesis, respiration, nitrogen metabolism and plant molecular genetics; Plant genetics and breeding, quantitative genetics, corn and soy-bean breedings; Ecological genetics and evolution, evolution analysis in wild species (rice); Molecular and cell plant biology; Plant cytogenetics; Genetics and human ecology; Genetics and poultry breeding.	105	1st/2nd	11061 11070 11080 11020 11010



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LGN0622	Molecular Genetics Applied to Systems Biology	Carlos Alberto Labate	DNA as genetic material; Gene isolation and cloning; Gene structure of prokaryotes and eukaryotes; Transcription and translation mechanisms; Gene expression regulation; Molecular markers; Functional genomics; Systems biology.	60	2nd	11020 11010
LGN0623	Molecular Genetics Applied to Systems Biology	Carlos Alberto Labate	DNA as genetic material; Gene isolation and cloning; Gene structure of prokaryotes and eukaryotes; Transcription and translation mechanisms; Gene expression regulation; Molecular markers; Functional genomics; Systems biology.	60	2nd	11070 11080
LGN0635	Supervised Internship in Genetics II	Antonio Augusto Domingos Coelho	Plant mutagenesis and plant tissue culture; Microorganism and enzyme producer fungi genetic breedings, filament fungi cytogenetics, nitrogen fixing bacteria genetics, genetics and yeast breeding; Metabolic regulation, photosynthesis, respiration, nitrogen metabolism and plant molecular genetics; Plant genetics and breeding, quantitative genetics, corn and soy-bean breedings; Ecological genetics and evolution, evolution analysis in wild species (rice); Molecular and cell plant biology; Plant cytogenetics; Genetics and human ecology; Genetics and poultry breeding.	105	1st	11061 11070 11080 11020 11010