



CERTIFICATE IN ANIMAL BREEDING AND GENETICS

courses4**me**

Would you like to speak to one of our
course advisors for further information?

info@courses4me.com.au
www.courses4me.com.au

1300 100 008



Certificate in Animal Breeding and Genetics

Join the Genetic Revolution

Whether you live in fascination or fear of the use or abuse of genetic data, genetics is at the forefront of advancements in science, medicine, and technology. The study of genetics has numerous practical applications in the fields of Diseases and Treatments, Human History, Forensics, Law, and Genetic Enhancements.

An understanding of genetics will be more important as we move into the future. But it can be a difficult subject to understand if you do not have a proper grasp of the fundamentals - Grasping those fundamentals is what this course is about!

Genetics is a big subject - you cannot learn everything in one course. But with this course as a foundation, you are better placed to understand what you encounter and continue your learning over the years that follow.

Did you know?

Animal breeding and genetics is the scientific study of genetic inheritance in animals and how it can be applied to improve animal populations. Through careful breeding, animal breeders aim to minimize the occurrence of undesirable traits.

About Us

Courses4me is the leader in online education with decades of experience in both public and private education. Our founders have a combined 30 years of expertise in education and training and have joined forces to deliver high-quality, low-cost education to anyone wishing to advance their career.



Accredited by  **ICOES**
International Accreditation

We are proud to announce that all our courses at Courses4Me are accredited by the International Council for Online Educational Standards (ICOES), a respected global organisation dedicated to ensuring the quality of online education. This prestigious accreditation signifies that Courses4Me has met the rigorous standards set by ICOES, solidifying our reputation for delivering excellence in online education worldwide. We are committed to providing high-quality courses and look forward to welcoming students from around the globe to our accredited programs.

Endorsement from  **IARC** | *Quality for Excellence in Education*

All online courses offered by Courses4me are fully endorsed by the International Approval and Registration Centre (IARC), a quality control system for education programs and courses in international education. Based in Queensland, Australia, the IARC's Committee Board of accomplished education professionals work to endorse quality education courses in the international market. The IARC endorsement ensures that Courses4me maintains a high level of respect in academic circles within a range of disciplines in Australia and beyond.

Course Overview



Duration / Study Method

The course will take approx. 200 hrs to complete.

The course is done completely online and from the comfort of your home. We offer self-paced learning and direct tutor support for each individual student



Payment Methods

Pay for the course upfront or set up a no-deposit and interest-free payment plan today from only \$25 per week.



Assessments

Includes case studies, quizzes and written assessments, that are marked with personalised feedback. Problem based learning projects working one on one with your tutor.



Support

All students have unlimited access to their very own professional tutor over the phone or via email.



Core Modules

Introduction to Genetics

- Scope, nature and history
- Darwin and Mendel
- Mendel's experiment
- Mendel's law of segregation
- Mendel's Law of Independent Assortment
- Advances since Mendel
- Important genetics terminology
- Set task
- Assignment

Interaction between Chromosomes

- Introduction
- Sex determination
- Sex chromosomes
- Sex-linked inheritance
- Haemophilia example
- Coloratura blindness example
- Linkage and crossing over
- Linked genes
- Genetic mapping
- Set task
- Assignment

Cells, Organelles and Cell Division

- Prokaryotes
- Eukaryotes
- Organelles in the cell
- Cell structure and function
- Organelles in plants -Cell wall, Vacuole,Plastids
- Organelles in plants and animals - plasma membrane, cytoplasm, ribosomes etc.
- Genetic structures and materials
- Nucleus
- Nuclear envelope
- Nucleolus
- DNA
- Cell division –meiosis and mitosis
- DNA replication
- Four stages of Mitosis
- Cytokinesis
- Gametogenesis
- Gametes
- Meiosis
- Meiosis 1
- Meiosis 2
- Gamete production in plants
- Set task
- Assignment

Core Modules

Interaction between Genes

- Introduction
- Traits and gene expression
- Polygenic inheritance
- Gene interactions
- Epistasis
- Enhancer genes
- Suppressor gene
- Incomplete dominance
- Codominance
- Lethal genes
- Cytoplasmic inheritance
- Gene expression
- Transcription
- Translation
- Set tasks
- Assignment

Genetic Chemistry

- Nucleic acids
- DNA (Deoxyribonucleic Acid)
Structure
- Double Stranded Helix
- Chromosomes
- Chromatin
- Chromatids
- Understanding the genetic code
- Role of proteins
- Transcription and translation
- Post translational modification
- Introns and exons
- Reading the code
- Set task
- Assignment

Core Modules

Mutations

- Introduction
- Chromosome mutations
- Insertion
- Inversion
- Duplication
- Translocation
- Nondisjunction
- Gene mutations
- Point mutations (single nucleotide polymorphism (SNP))
- Point substitution mutation
- Insertions
- Deletions
- Frameshift mutations
- Categories of gene mutations
- Silent mutations
- Missense mutations
- Nonsense mutations
- How do mutations occur
- Radiation
- Viruses or other microorganisms
- Chemicals
- Spontaneous mutations
- Effect of mutations
- Repair of mutations
- Set task
- Assignment

DNA Repair and Recombination

- Introduction
- Excision pathways
- Methyl-directed mismatch repair
- SOS repair
- Photoreactivation (Light dependent repair)
- Crossing over
- Recombination
- Set task
- Assignment

Developmental Genetics

- Introduction
- Genetics are instructions for structures
- Cellular organisation and differentiation
- Model organisms used in developmental genetics
- Why study developmental genetics
- The human genome project
- Birth defects
- Genetic advances in birth defects
- Gene therapy
- Gene therapy and cancer
- Set task
- Assignment

Core Modules

Population genetics

- What is population genetics
- Genetic variation within a population
- How do we measure genetic variation
- The Hardy-Weinberg law
- Evolutionary agents and their effect on population genetics
- Mutations
- Movement of individuals between
 - populations
 - Genetic drift
 - Non random mating
 - Natural selection
 - Polymorphism
 - Set tasks
 - Assignment

Applied Genetics

- Genetics in breeding animals
 - Farm animal breeding
 - Breeding pets
 - Genetics for breeding plants
 - Cloning plants
 - Cloning -somatic cell nuclear transfer
 - Modifying organisms genetically
 - Transgenic animals
 - Agricultural applications for transgenics
 - Medical applications for transgenics
 - Transgenics to modify DNA in plants
 - Genetics in human health science
- Disease understanding
- Diagnosis of disease
- Genetic screening
- Gene therapy
- Pharmacogenomics
- Set task
- Assignment

Core Modules

Introduction to Genetics

- Plant cells
- Animal cells
- Cell division - mitosis (asexual reproduction); meiosis (sexual reproduction)
- Genes - phenotype and genotype; homogenous and heterogenous
- Terminology
- The work of Mendel
- Sex determination

Genetics

- Gene mutations
- Lethal genes
- Effect of the environment
- Hybrid vigor
- Genetics in agriculture
- Heritability

Pure Breeding

- Inbreeding - close breeding and line breeding
- Genetic effects of inbreeding
- Advantages and disadvantages

Livestock Improvement

- Performance Testing
- Sib Testing
- Progeny testing
- Relative breeding Values (RBV)
- Artificial insemination
- Synchronized heats
- Ova transplants

Selection

- Animal breeding programs
- Agriculture
- Decide on your priorities
- Dual purpose animals
- Artificial selection
- Gene groups
- Regression
- Domestic animals - Dogs, cats etc.

Introduction to Cross Breeding

- The effects of cross-breeding in farm animals
- Genetic effects, phenotype effects, heterosis, and genotype effect
- Crossbreeding in sheep
- Crossbreeding in domestic animals

Cross Breeding

- Practical cross breeding
- Two-breed or single cross
- Back cross or crisscrossing
- Cyclical crossing
- Rotational crossing
- Advantages of cross-breeding
- Reciprocal recurrent selection
- Breed societies
- Grading up



Would you like to speak to one of our course advisors for further information?

Contact Us:

info@courses4me.com.au

www.courses4me.com.au

1300 100 008