Description: Genetics

<table>
<thead>
<tr>
<th>Subject</th>
<th>Cat-nbr</th>
<th>Class</th>
<th>Term</th>
<th>Mode</th>
<th>Units</th>
<th>Campus</th>
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<tr>
<td>BIO</td>
<td>2207</td>
<td>66869</td>
<td>2, 2007</td>
<td>ONC</td>
<td>1.00</td>
<td>Toowoomba</td>
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Academic group: FOSCI
Academic org: FOS002
Student contribution band: 2
ASCED code: 010909

STAFFING
Examiner: Ursula Kennedy
Moderator: John Dearnaley

REQUISITES
Pre-requisite: BIO2103 and STA2300

RATIONALE
Genetics is the study of inheritance. Not only is this study essential as a basic part of biology but an understanding of the principles of genetics is important for students whose future professions involve plant or animal breeding, genetic engineering, microbiology and related disciplines. Furthermore an understanding of genetics is necessary for an informed awareness of many human problems related to genetic dysfunction.

SYNOPSIS
The course presents the scientific basis of heredity. The principles of genetics play an increasingly important role in the modern world; in the breeding of improved crops and livestock, the conservation of endangered species and the genetic engineering of new products for agriculture or medicine. The course commences with an overview of Mendelian genetics and introduces concepts of importance to both plant and animal breeding. The theory and practice of manipulating and mapping the location of genes on chromosomes and the effects of mutations on gene expression are studied. The science of genetic engineering is briefly introduced. Changes in chromosome number and structure in plants (e.g. evolution of wheat) and animals (e.g. Downs Syndrome) are examined as are the important areas of population genetics, evolution and behavioural genetics.

OBJECTIVES
On completion of this course students will be able to:

1. demonstrate an understanding of the science of genetics and its relation to inheritance (Test; Exam);
2. demonstrate an appreciation of the implications of inheritance in human sociology (Test; Exam);
3. demonstrate an appreciation of the application of genetic principles to plant and animal breeding and genetic engineering (Test; Exam);
4. solve practical problems in genetics (Test; Exam);
5. generate and analyse genetic data in practical situations (Practical Reports).

**TOPICS**

<table>
<thead>
<tr>
<th>Description</th>
<th>Weighting (%)</th>
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<tbody>
<tr>
<td>1. Mendelian inheritance, Mitosis, Meiosis and DNA Geotype and Phenotype, Independent assortment.</td>
<td>10.00</td>
</tr>
<tr>
<td>2. Heredity: dominance, co-dominance, multiple alleles, Genetic symbols and pedigree analysis.</td>
<td>10.00</td>
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<tr>
<td>3. Genes and Chromosomes: Chromosome morphology and structure, The genetic basis of sex, non-disjunction.</td>
<td>6.00</td>
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<tr>
<td>4. Chromosome mapping and genetic linkage, Crossing over and recombination.</td>
<td>15.00</td>
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<tr>
<td>5. Variations in chromosome number, Aneuploidy, Euploidy, Prenatal diagnosis.</td>
<td>8.00</td>
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<td>6. Variations in chromosome structure, Duplications, deficiencies, inversions, translocations.</td>
<td>8.00</td>
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<td>7. Behavioural genetics - behaviours, explainable in terms of mendelian genetics.</td>
<td>6.00</td>
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<tr>
<td>8. Mutation - the determination of mutation rates. Mutagens including ionizing radiation and its effect on man.</td>
<td>8.00</td>
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<tr>
<td>10. Examples of qualitative and quantitative inheritance - grain colour in wheat, IQ in man.</td>
<td>7.00</td>
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<tr>
<td>11. Plant and animal breeding - an introduction</td>
<td>10.00</td>
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**TEXT and MATERIALS required to be PURCHASED or ACCESSED**

ALL textbooks and materials are available for purchase from USQ BOOKSHOP (unless otherwise stated). Orders may be placed via secure internet, free fax 1800642453, phone 07 46312742 (within Australia), or mail. Overseas students should fax +61 7 46311743, or phone +61 7 46312742. For costs, further details, and internet ordering, use the 'Textbook Search' facility at http://bookshop.usq.edu.au click 'Semester', then enter your 'Course Code' (no spaces).


**REFERENCE MATERIALS**

Reference materials are materials that, if accessed by students, may improve their knowledge and understanding of the material in the course and enrich their learning experience.


(ISBN 0 534 25279 6)


(ISBN 0521 639859)


(ISBN 0 7167 2285 2)


(ISBN 0-86542-353-9)


(ISBN 0-87893-495-2)


(ISBN 3-540-60290-9)

**STUDENT WORKLOAD REQUIREMENTS**

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>HOURS</th>
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<tbody>
<tr>
<td>Examinations</td>
<td>3.00</td>
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<tr>
<td>Laboratory or Practical Classes</td>
<td>30.00</td>
</tr>
<tr>
<td>Lectures</td>
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<tr>
<td>Private Study</td>
<td>71.00</td>
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<td>Report Writing</td>
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### ASSESSMENT DETAILS

<table>
<thead>
<tr>
<th>Description</th>
<th>Marks out of</th>
<th>Wtg(%)</th>
<th>Due date</th>
</tr>
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<tbody>
<tr>
<td>1 HR RESTRICTED TEST</td>
<td>20.00</td>
<td>20.00</td>
<td>23 Jul 2007 (see note 1)</td>
</tr>
<tr>
<td>PRACTICAL REPORT 1</td>
<td>15.00</td>
<td>15.00</td>
<td>23 Jul 2007 (see note 2)</td>
</tr>
<tr>
<td>PRACTICAL REPORT 2</td>
<td>15.00</td>
<td>15.00</td>
<td>23 Jul 2007 (see note 3)</td>
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<tr>
<td>2 HR RESTRICTED EXAM</td>
<td>50.00</td>
<td>50.00</td>
<td>END S2 (see note 4)</td>
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</table>

#### NOTES
1. Assessment item 2 (1hr Restricted Test) due in week 8, Examiner will provide correct date.
2. Assessment item 1 (Practical Report 1) due in week 7, Examiner will provide correct date.
3. Assessment item 3 (Practical Report 2) due in week 12, Examiner will provide correct date.
4. Assessment item 4 - examination dates will be available during the Semester. Please refer to the examination timetable when published.

### IMPORTANT ASSESSMENT INFORMATION

1. **Attendance requirements:**
   - It is the students' responsibility to attend and participate appropriately in all activities (such as lectures, tutorials, laboratories and practical work) scheduled for them, and to study all material provided to them or required to be accessed by them to maximise their chance of meeting the objectives of the course and to be informed of course-related activities and administration. To maximize their chances of satisfying the objectives of the practical component of the course, students should attend and actively participate in the laboratory sessions in the course.

2. **Requirements for students to complete each assessment item satisfactorily:**
   - To complete each of the assignments satisfactorily, students must obtain at least 50% of the marks available for each assignment. To complete the examination satisfactorily, students must obtain at least 50% of the marks available for the examination.

3. **Penalties for late submission of required work:**
   - If students submit assignments after the due date without prior approval then a penalty of 20% of the total marks gained by the student for the assignment will apply for each working day late.

4. **Requirements for student to be awarded a passing grade in the course:**
   - To be assured of receiving a passing grade a student must achieve at least 50% of the total weighted marks available for the course.

5. **Method used to combine assessment results to attain final grade:**
   - The final grades for students will be assigned on the basis of the weighted aggregate of the marks (or grades) obtained for each of the summative assessment items in the course.

6. **Examination information:**
   - In a Restricted Examination, candidates are allowed access to specific materials during the examination. The only materials that candidates may use in the restricted examination for this course are: writing materials (non-electronic and free from material which could
give the student an unfair advantage in the examination); calculators which cannot hold
textual information (students must indicate on their examination paper the make and model
of any calculator(s) they use during the examination; English translation dictionaries (but
not technical dictionaries); Translation dictionary. With the Examiner's approval, candidates
may, take an appropriate non-electronic translation dictionary into the examination. This
will be subject to perusal and, if it is found to contain annotations or markings that could
give the candidate an unfair advantage, it may be removed from the candidate's possession
until the appropriate disciplinary action is completed.

7 Examination period when Deferred/Supplementary examinations will be held:
Any Deferred or Supplementary examinations for this course will be held during the next
examination period.

8 University Regulations:
Students should read USQ Regulations 5.1 Definitions, 5.6. Assessment, and 5.10
Academic Misconduct for further information and to avoid actions which might contravene
University Regulations. These regulations can be found at the URL
http://www.usq.edu.au/corporateservices/calendar/part5.htm or in the current USQ
Handbook.

ASSESSMENT NOTES

9 The due date for an assignment is the date by which a student must despatch the assignment
to the USQ. The onus is on the student to provide proof of the despatch date, if requested
by the Examiner. Students must retain a copy of each item submitted for assessment. this
must be produced within five days if required by the Examiner.

10 Students who have undertaken all of the required assessments in a course but who have
failed to meet some of the specified objectives of a course within the normally prescribed
time may be awarded the temporary grade: IM (Incomplete - Make-up). An IM grade will
only be awarded when, in the opinion of the examiner, a student will be able to achieve
the remaining objectives of the course after a period of non directed personal study.
Students who, for medical, family/personal, or employment-related reasons, are unable
to complete an assignment or to sit for an examination at the scheduled time may apply
to defer an assessment in a course. Such a request must be accompanied by appropriate
supporting documentation. One of the following temporary grades may be awarded IDS
(Incomplete - Deferred Examination); IDM (Incomplete Deferred Make-up); IDB
(Incomplete - Both Deferred Examination and Deferred Make-up).