



# Course Outline [Draft]

BABS1112/GENS1112

Genetics and Society

School of Biotechnology and Biomolecular  
Sciences

Faculty of Science

Summer Term, 2021

## 1. Staff

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Position	Name	Email	Consultation times and locations	Contact Details
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	A/Prof. Paul Adam	<a href="mailto:p.adam@unsw.edu.au">p.adam@unsw.edu.au</a>	By Appointment	BEES, UNSW

## 2. Course information

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Units of credit: 6 UOC

Pre-requisite(s): None

Teaching times and locations: This course is fully online. Study at your own pace before given deadlines for quizzes and assessment tasks.

### 2.1 Course summary

Since the release of the first human genome about two decades ago, our understanding of genetics has improved significantly. Facilitated by massive developments in DNA sequencing technologies, we now live in a society where genetics and genomics, and applications thereof, have become household terms. We hear about genetically modified food crops with extra nutrients or drought resistance, and personalised medicine offers new hope (or hype) in healthcare. Genetic tools are routinely used in forensics, and gene doping is a growing concern at sporting events. Synthetic biology promises new frontiers of technology, and the day we use DNA for data storage is not that far away.

What does this all mean? Is it ethical? Is it legal? What are the social implications that come with these applications?

This interactive, fully online course will introduce students to fundamental genetic concepts using real life applications and implications of genetics while providing an opportunity to get hands-on experience in analysing and interpreting genetic data. Students will be encouraged to critically evaluate the ethical, legal and social implications of genetic advances throughout the course. On completion, we anticipate the students will be better prepared to survive in the “genome generation” and participate in informed debate and decision making with regard to incorporating genetic interventions in everyday life.

## **2.2 Course aims**

This course aims to provide students with a sound background in essential genetic concepts and make them aware of the impact that genetic findings and applications have on everyday life. It discusses the ways in which genetics and genomics have affected many societal practices including medical diagnosis, food production, forensics and sports. The course will provide insights into what the future might hold and encourage reflection on the ethical, legal and social implications of genetic applications. We aim to equip students with the genetic literacy required for informed decision making and evidence-based discussion about real-life applications of genetics. We anticipate the course will instil intrinsic interest in the subject and inspire life-long learning, enabling students to stay up to date with this rapidly changing field.

## **2.3 Course learning outcomes (CLO)**

At the successful completion of this course you (the student) should be able to:

1. Identify and describe examples of genetic applications and interventions in everyday life
2. Describe basic scientific theories, concepts and techniques underlying genetic applications and interventions
3. Interpret and evaluate media representations of genetics and genomics
4. Apply the scientific method to perform basic analyses and interpretation of genomic data
5. Develop evidence-based arguments and participate in informed debate on ethical, legal and social implications surrounding genetic applications and interventions

## 2.4 Relationship between course and program learning outcomes and assessments

Course Learning Outcome (CLO)	LO Statement	Related Tasks & Assessment
CLO 1	Identify and describe examples of genetic applications and interventions in everyday life	Mini-lectures Online lessons Assessments 1 and 3
CLO 2	Describe basic scientific theories, concepts and techniques underlying genetic applications and interventions	Mini-lectures Online lessons Practical component Assessments 1, 2, 3 and 4
CLO 3	Interpret and evaluate media representations of genetics and genomics	Mini-lectures Online lessons Assessments 2 and 3
CLO 4	Apply the scientific method to perform basic analyses and interpretation of genomic data	Practical component Assessment 4
CLO 5	Develop evidence-based arguments and participate in informed debate on ethical, legal and social implications surrounding genetic applications and interventions	Mini-lectures Online lessons Assessment 3

## 3. Strategies and approaches to learning

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### 3.1 Learning and teaching activities

Each learning module consists of mini-lectures (pre-recorded) and online lessons introducing basic genetic concepts with examples drawn from everyday scenarios. The discussion forums encourage critical evaluation of ethical and social implications of routine genetic applications. All activities are designed to inspire and encourage self-directed learning and students are provided opportunities to test their understanding and ability to make informed decisions regarding genetic and genomic applications via short quizzes and other assessment tasks.

The course also includes an online practical component where students will get hand-on experience in analysing genetic data and learn how to apply the scientific method to solve a real-life problem.

## 3.2 Expectations of students

Students are expected to be comprehensive and punctual in completing all online learning and assessment activities including the online practical component. Any optional resources provided will be clearly specified.

If you have any course related questions, please use the general discussion forum on the course Moodle site which will be monitored regularly. If you have further inquiries or would like to request an appointment, please email the convenor using the course email address (TBC). Remember to state your name, student number and the course code (GENS1112 or BABS1112) in the subject. Weekly online drop-in sessions will also be scheduled where you will have the opportunity to ask any course related questions.

Please note that social media will not be used to share any formal course information or as a way to contact academics involved in this course.

## 4. Course schedule and structure

Week	Module	Practical	Assessment
<b>Week 1</b> (4 <sup>th</sup> January)	1. Genetics and you 2. Genetics and ancestry	<ul style="list-style-type: none"> <li>Scientific method</li> <li>DNA sequencing technologies and a virtual tour of the Ramaciotti Centre for genomics</li> </ul>	1. Contribute to <b>discussion forums</b> 2. <b>Quiz 1:</b> Friday 8 <sup>th</sup> January
<b>Week 2</b> (11 <sup>th</sup> January)	3. Genetics and epigenetics 4. Genetics and health	<ul style="list-style-type: none"> <li>Introduction to dog genetics</li> </ul>	1. Contribute to <b>discussion forums</b> 2. <b>Quiz 2:</b> Friday 15 <sup>th</sup> January
<b>Week 3</b> (18 <sup>th</sup> January)	5. Genetics and disease	<ul style="list-style-type: none"> <li>Introduction to genome-wide association studies</li> </ul>	1. Contribute to <b>discussion forums</b> 2. <b>Quiz 3:</b> Friday 22 <sup>nd</sup> January 3. <b>Critical review</b> task due (Date TBC)
<b>Week 4</b> (25 <sup>th</sup> January)	6. Genetics and nutrition 7. Genetics and sport	<ul style="list-style-type: none"> <li>Work on your own set of dog genotyping data to identify genes associated with characteristics such as coat colour and size</li> </ul>	1. Contribute to <b>discussion forums</b> 2. <b>Quiz 4:</b> Friday 29 <sup>th</sup> January
<b>Week 5</b> (1 <sup>st</sup> February)	8. Genetics and the environment 9. Genetics and your future	<ul style="list-style-type: none"> <li>Analyse the genotyping data of an individual dog to predict its characteristics using the gene-characteristic associations established in Week 4</li> </ul>	1. Contribute to <b>discussion forums</b> 2. <b>Quiz 5:</b> Friday 5 <sup>th</sup> February
<b>Exam period</b>			1. <b>Practical report</b> due (Date TBC)

## 5. Assessment

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### 5.1 Assessment tasks

You must complete and pass **ALL** the assessable components listed below to pass the course.

Assessment task	Description	Weight	Due date
<b>Assessment 1:</b> Weekly quizzes	<p>There will be five quizzes during the term consisting of multiple choice and short answer questions.</p> <p>These quizzes will cover the material taught in mini-lectures and online lessons each week.</p>	25%	Friday of each week
<b>Assessment 2:</b> Discussion forums	<p>Reflect on the ethical, legal and social implications of the genetic applications discussed in the module and contribute to the discussion forum throughout the week.</p> <p>The discussions will be facilitated to guide your arguments.</p> <p><u>Note:</u> You are expected create a minimum of two posts per each module. You will be marked on any five randomly picked posts at the end of the term.</p>	25%	Friday of the following week
<b>Assessment 3:</b> Critical review	<p>Critically evaluate a media representation of a genetic/genomic application based on a real-life scenario. Write a short review of the media article, backed by genetic concepts and theories you have learnt from the course.</p> <p>A short video may alternatively be submitted to present the critical evaluation.</p>	25%	Week 3 (Date TBC)
<b>Assessment 4:</b> Lab report	<p>Analyse the dog genotyping data provided and write a short report describing the predicted characteristics of an individual dog. The report should describe how the scientific method was applied to come to conclusions backed by interpreted results.</p>	25%	Exam period (TBC)

#### Further information:

UNSW grading system: <https://student.unsw.edu.au/grades>

UNSW assessment policy: <https://student.unsw.edu.au/assessment>

## 5.2 Assessment criteria and standards

The theory component of the course (covered in mini-lectures and online lessons) will be assessed via short quizzes (Assessment 1) and discussion forum posts (Assessment 2) at the end of each module.

The critical review (Assessment 3) assesses your ability to apply the content covered in Modules 1- 5 and the DNA sequencing technologies lesson from the practical component to interpret and critically evaluate a media representation of a real-life genetic/genomic application. The skills you develop by participating in the discussion forums will also help you with Assessment 3 to develop evidence-based arguments to support your evaluation. The practical component of the course is assessed through a written report (Assessment 4).

More details on the assessment tasks and how they will be graded will be provided during the course (online via Moodle).

## 5.3 Submission of assessment tasks

You must pass all four assessments to pass the course.

### **Assignment submission**

All assessments are to be submitted online via Moodle. More details on assignment submission and deadlines will be provided on Moodle.

Any assessment task that is submitted after the due date will have a late penalty applied to them. Late submissions will incur a 10% decrease in the overall mark per day. Any assessment handed in more than 7 days late will not be marked. Extensions required due to unforeseeable circumstances must be arranged at least 3-5 days prior to the due date.

### **Late Submissions of Assignments**

Instructions for Assessment tasks will be made available from the start of the Term via Moodle. You should plan to complete them prior to the deadlines. If you are unable to complete the assessment tasks by the due date and time, you must contact the course convenor at least 4 days prior to the due date and provide a medical certificate or other professional documentation that supports the reason for your inability to complete the Assignment. Note that a 10% penalty per day will ensue if you do not provide a satisfactory explanation. Please note that, if you ask for special consideration for a task that has been available for completion weeks in advance, the day before it is due, no consideration will be granted.

### **Special Consideration for missed Quizzes**

If you are unwell on the day of the quiz or were unable to attempt the quiz for a reason out of your control, you need to contact your course convenor within 2 days of the quiz with evidence for your absence. If you can provide supporting documentation for your absence, an alternate supplementary assessment will be provided within 2 weeks of the original quiz.

### **DSU Students**

If you are a student registered with the DSU, you may be eligible for some extensions for Assessment tasks 3 and 4. Please email your supporting letter by the end of Week 1 so we can discuss what options are available to you.

## 5.4. Feedback on assessment

Students will receive feedback on their performance in weekly quizzes as soon as the attempt is completed. Constructive feedback on other three assessment tasks will be provided in a timely manner (within 2 weeks after submissions as instructed in the UNSW assessment Policy). The delivery method of feedback may vary depending on the assessment and submission type. Full details will be provided on the course Moodle site.

## 6. Academic integrity, referencing and plagiarism

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**Referencing** is a way of acknowledging the sources of information that you use to research your assignments. You need to provide a reference whenever you draw on someone else's words, ideas or research. Not referencing other people's work can constitute plagiarism.

Further information about referencing styles can be located at <https://student.unsw.edu.au/referencing>

**Academic integrity** is fundamental to success at university. Academic integrity can be defined as a commitment to six fundamental values in academic pursuits: honesty, trust, fairness, respect, responsibility and courage.<sup>1</sup> At UNSW, this means that your work must be your own, and others' ideas should be appropriately acknowledged. If you don't follow these rules, plagiarism may be detected in your work.

Further information about academic integrity and **plagiarism** can be located at:

- The *Current Students* site <https://student.unsw.edu.au/plagiarism>, and
- The *ELISE* training site <http://subjectguides.library.unsw.edu.au/elise/presenting>

The *Conduct and Integrity Unit* provides further resources to assist you to understand your conduct obligations as a student: <https://student.unsw.edu.au/conduct>.

## 7. Readings and resources

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There are no prescribed textbooks for this course. All resources are online and will be provided via the online learning activities or as web links on Moodle.

## 8. Administrative matters

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Please submit your inquiries via [unsw.to/webforms](https://unsw.to/webforms)

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<sup>1</sup> International Center for Academic Integrity, 'The Fundamental Values of Academic Integrity', T. Fishman (ed), Clemson University, 2013.

## 9. Additional support for students

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- The Current Students Gateway: <https://student.unsw.edu.au/>
- Academic Skills and Support: <https://student.unsw.edu.au/academic-skills>
- Student Wellbeing, Health and Safety: <https://student.unsw.edu.au/wellbeing>
- Disability Support Services: <https://student.unsw.edu.au/disability-services>
- UNSW IT Service Centre: <https://www.it.unsw.edu.au/students/index.html>
- UNSW Academic Calendar Key Dates: <https://student.unsw.edu.au/dates>
- UNSW Handbook: <http://www.handbook.unsw.edu.au/2018/index.html>
- UNSW Learning Centre: <http://www.lc.unsw.edu.au/>
- UNSW Student Equity and Disabilities Unit: <https://student.unsw.edu.au/disability>
- Counselling and Support: <https://www.counselling.unsw.edu.au/>
- University Health Service: <http://www.healthservices.unsw.edu.au/>
- The Hub: <https://student.unsw.edu.au/hub>
- UNSW Careers and Employment Service: <http://www.careers.unsw.edu.au/>
- ARC- Student Life: <https://www.arc.unsw.edu.au/>
- UNSW Student Life: <https://www.unsw.edu.au/life>