Graduate School of Biomedical

UNSW Engineeri

# BIOM9420

## Clinical Laboratory Science

## Term 2, 2023

# Course Overview

## Staff Contact Details

### Convenors

| Name | Email | Availability | Location | Phone |
|---|---|---|---|---|
| Kang Liang | kang.liang@unsw.edu.au | Email confirmation prior face-to-face consultation | Sat Bon E8 | |

## School Contact Information

Student Services can be contacted via unsw.to/ask

# Course Details

## Units of Credit 6

## Summary of the Course

BIOM9420 explores the science behind clinical diagnostics covering ar
haematology, immunology, imaging and clinical biomechanics as well a
systems. In each of the areas the underlying principles in the measure
parameters will be covered and how they have been used to engineer c

## Course Aims

Course Objectives
BIOM9420 Clinical Laboratory Science has been designed to provide s
some of the many different aspects of clinical medicine where Biomedi

- Identify the underlying scientific and engineering principles of a diagnostic systems

# Assessment

Assignments must be submitted via Moodle by the designated date and
Non Plagiarism Declaration Cover Sheet

Late submissions will be penalised 5% of the mark for each calendar d
hours), after which a student cannot submit and assessment, and no p
problem in meeting the nominated submission date, please contact the

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The Online Mid-term Quiz is designed to reflect on the learning of the
review of the course content up to the mid-term flexible week. It will a
of questions and how these are run on Moodle in preparation for the fi

## Assessment 3: Rapid antigen test strip design report

Due date: Friday, Week 8

Rapid antigen test strip design report (10%) is a group task designed
in relevant topics and apply the knowledge in timely clinical and diagn

## Assessment 4: Major Group Report

Due date: Friday, Week 10

Major Group Report is completed as a group-based literature review ta
opportunity for team-work and independent literature searching on diff
relevant to the non-invasive diagnostics in a clinical setting.

## Assessment 5: Group video presentation

Due date: Sunday, Week 9

Group video presentation is a group-based activity designed to consol
and tutorials and bring it all together in a team environment to produc
video presentation.

## Assessment 6: Final Exam

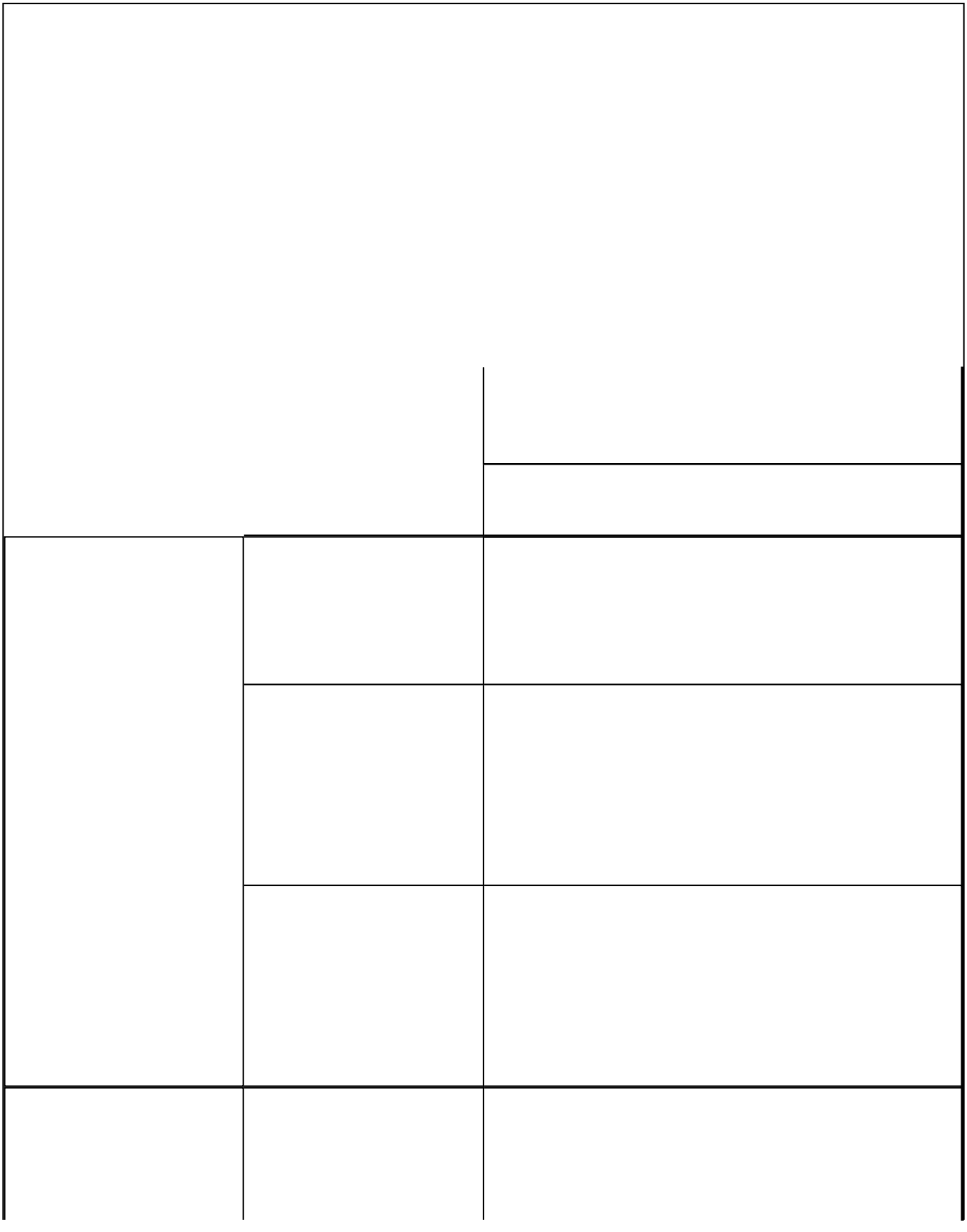
The Final Exam includes two parts- (1) Final Online Quiz (similar to th
limited, open-book, long-answer questions (requires Moodle upload, 25

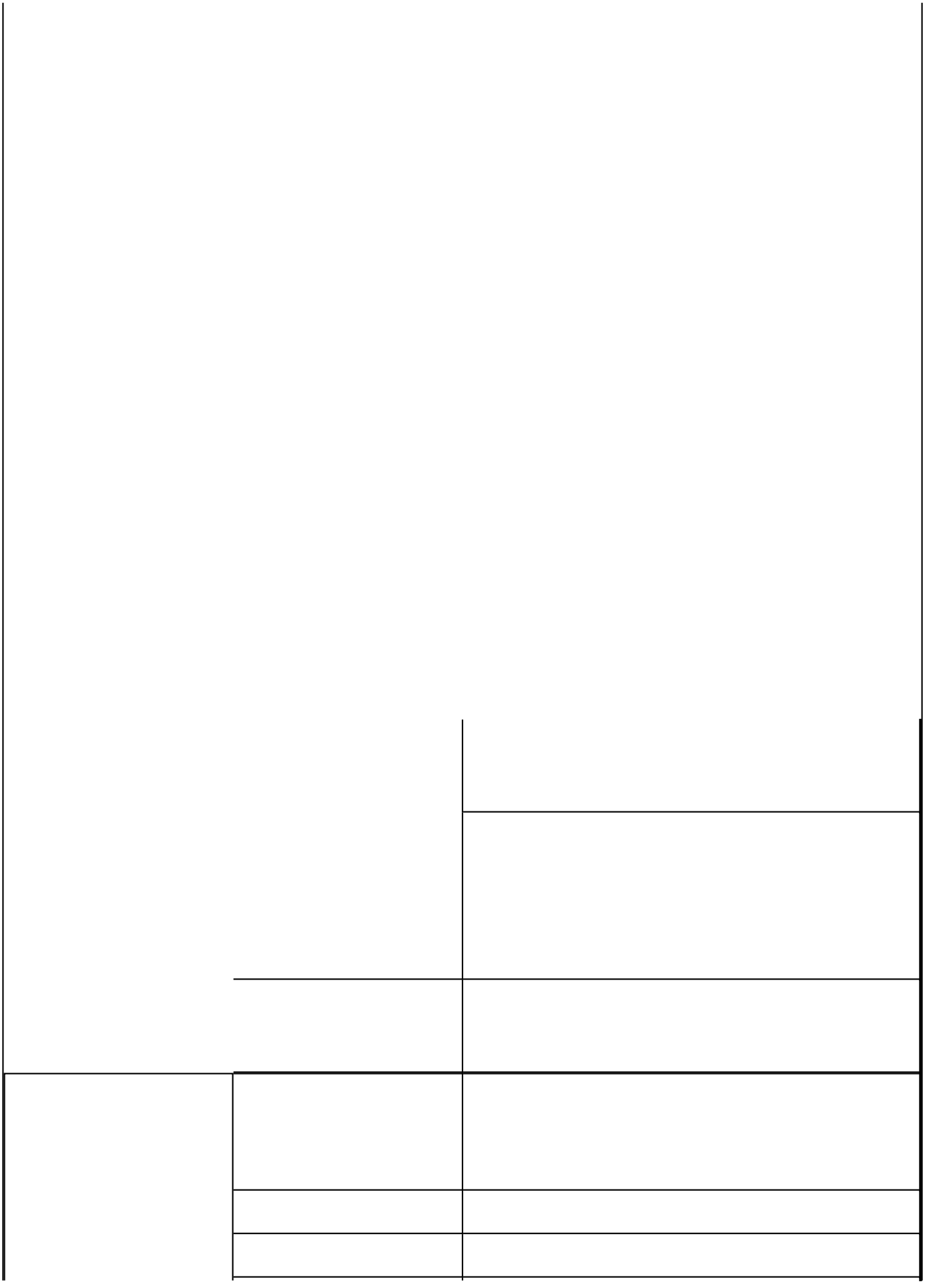
# Course Schedule

| Week | Date | Live Event Lecture | Online Resources | Tutorial | Assessment Due |
|---|---|---|---|---|---|
| 1 | 29 May | Diagnostic Engineering 1<br><br>Course introduction<br><br>Biomedical Engineering and Diagnostics | 1. MATLAB introduction Onramp course<br>1. Background to group major report - Glucose Biosensors<br>1. Cell & DNA background for week 3<br>1. Cell cycle video<br>1. Exercise on cell cycle<br>1. Review Enzyme Kinetics Activity Risk Assessment | Workshop 1<br><br>Complete MATLAB Onramp course | Append MATLAB Course Completion Certificate to th Enzyme activity report in week 5 |
| 2 | 5 Jun | Diagnostic Engineering 2<br><br>Blood Diagnostics<br><br>Antibody-based Diagnostics | | Workshop 2<br><br>Group discussion on sources of scientific literature. Compare reviews, journals & scientific reports<br><br>Write an abstract | |

| | | | |
|---|---|---|---|
| | | | & Quiz<br>2. Introduction to diagnostics - enzymes<br>1. PCR virtual lab |
| 3 | 12 Jun | Diagnostic Engineering 3<br><br>(Public Holiday, no F2F lecture) | 1. Chromosomal disorders |
| | | DNA, Genetics & PCR Diagnostics | 1. Single gene Inheritance |
| | | | 1. |

| | | | | | |
|---|---|---|---|---|---|
| | | | 1. Diagnosis of type 2 diabetes | Group discussion on how to write a literature review | |
| 6 | | Flexible Week | Group video and major report Q&A | | |
| | | | 1. Gait video practice | | |
| 7 | 10 Jul | Diagnostic Engineering 7 | | Quiz 1 on (open book) | Quiz 1 Due at end of tutorial time |
| | | Clinical Gait Analysis (online module, no F2F lecture) | | | |
| | | | 1. Imaging tutorial questions | | |
| 8 | 17 Jul | Diagnostic Engineering 8 | | Workshop 8 | Rapid antigen test strip design report |
| | | Imaging Modalities | | Group discussion & presentation on imaging tutorial question | Due on Friday Week 8 |
| | | | | Group video and major report Q&A | |
| 9 | 24 Jul | | | | |





# Resources

## Recommended Resources

## RELEVANT RESOURCES Useful Books

- Introduction to Biomedical Engineering (3rd edition) by John Ende
  Publisher: Elsevier/Academic Press, 2011, ISBN: 9780123749796

Digital available at: https://unswbookshop.vitalsource.com/products/-v97800809

- An Introduction to Clinical Laboratory Science by Connie Mahon,
  Burns. Publisher: Elsevier Health Sciences, 1988, ISBN10 072164

## Course Evaluation and Development

Student feedback has helped to shape and develop this course, includ
line evaluations as part of UNSW s myExperience process. Changes to
revision to the course content by refocusing on the lecture content an
sciences and maths. This course is now designed to run on-line in dis

## Submission of Assessment Tasks

Laboratory reports and major assignments will require a Non-Plagiarism Declaration Cover S

Assignments should be submitted on time. A daily penalty of 5% of the assignment will apply for work received after the due date. Any assign be accepted. The only exemption will be when prior permission for late the Course coordinator. Extensions will be granted only on medical or extreme circumstances.

# Academic Honesty and Plagiarism

## PLAGIARISM

# Academic Information

## COURSE EVALUATION AND DEVELOPMENT

Student feedback has helped to shape and develop this course, includ
line evaluations as part of UNSW s as part of UNSW s myExperience p
encouraged to complete such an on-line evaluation toward the end of
provided will be important in improving the course for future students.

## DATES TO NOTE

Refer to MyUNSW for Important Dates, available at:
https://my.unsw.edu.au/student/resources/KeyDates.html

## ACADEMIC ADVICE

For information about:

- Notes on assessments and plagiarism,
- Special Considerations,
- School Student Ethics Officer, and
- BESS

refer to the School website available at
http://www.engineering.unsw.edu.au/biomedical-engineering/

Supplementary Examinations:

Supplementary Examinations for Term 2 2023 will be held on (TBC) sh

This course outline sets out description of classes at the date the Cou
nature of classes may change during the Term after the Course Outlin
consulted for the up to date class descriptions. If there is any incons
activities between the University timetable and the Course Outline (as
description in the Course Outline/Moodle applies.

# Image Credit

Synergies in Sound 2016

# CRICOS

CRICOS Provider Code: 00098G

# Acknowledgement of Country

We acknowledge the Bedegal people who are the traditional custodians
Kensington campus is located.