



MEDI302

Renal and Alimentary 2

MED 3 2019

Medicine and Health Sciences Faculty level units

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General Information

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Credit points

3

Prerequisites

Admission to BClinSc and (12cp at 100 level) and (9cp at 200 level including MEDI202)

Corequisites

Co-badged status

Unit description

This unit builds on the content and practical skills covered in CBMS104, MEDI202, MEDI205 and MEDI209 to develop in-depth knowledge of the structure and function of the renal and alimentary systems, with a focus on biochemistry, enzyme biology, nutrition, metabolism, and dietary balance. In this unit students will study major metabolic pathways and examine the hormonal mechanisms that regulate food intake, homeostasis and metabolism in both healthy and diseased states. Students will engage in discussions of disease processes and how they impact on integrated functions of the renal and alimentary body system. Students will have opportunities to apply their problem solving skills in clinical scenarios. Students will also explore ways in which scientific advances translate into clinical practice and learn to become a research-informed practitioner through engaging with relevant medical and scientific literature.

Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at <https://www.mq.edu.au/study/calendar-of-dates>

Learning Outcomes

On successful completion of this unit, you will be able to:

Describe the structure of enzymes, enzyme kinetics and models of enzyme-substrate binding.

Describe the pathways (glycolysis, gluconeogenesis, Krebs cycle, oxidative phosphorylation, protein metabolism and fatty acid metabolism) involved in the metabolism of glucose, fatty acids and amino acids.

Explain the role of genetic, environmental and socioeconomic factors in obesity and starvation.

Describe the neuronal and hormonal mechanisms that regulate food intake, homeostasis, and metabolism.

Describe the normal anatomy and physiology of the renal and alimentary systems and explain anatomical and physiological changes that occur in common renal and gastrointestinal diseases.

Discuss case studies by organising and integrating knowledge of renal and gastrointestinal structures and functions (as well as concepts of pathophysiology) and by critically evaluating evidence from scientific and medical literature.

General Assessment Information

Grade descriptors and other information concerning grading are contained in Schedule 1 of the Macquarie University Assessment Policy, which is available at: <https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policies/assessment>.

Further details for each assessment task will be available on iLearn including marking rubrics.

All final grades in the Bachelor of Clinical Science are determined by a grading committee and are not the sole responsibility of the Unit Convenor.

Students will be awarded one of these grades plus a Standardised Numerical Grade (SNG). The SNG is not necessarily a summation of the individual assessment components. The final grade and SNG that are awarded reflect the corresponding grade descriptor in the Grading Policy.

To pass this unit, students must demonstrate sufficient evidence of achievement of the learning outcomes, attempt all assessment tasks, meet any ungraded requirements including professionalism and achieve an SNG of 50 or better.

Student Professionalism

In the Faculty of Medicine and Health Sciences, professionalism is a key capability embedded in all our courses. As part of developing professionalism, students are expected to attend all small group interactive sessions including tutorials, as well as clinical- and laboratory-based practical sessions.

Furthermore, lectures and seminars are key learning activities that you are expected to attend throughout completion of the B Clinical Science. While audio recordings and lecture slides may be made available following these large group sessions, it is important to recognise that such resources are a study aid - and should not be considered an alternative to lecture or seminar attendance.

Students are required to attend minimum of 80% of all small group interactive sessions. Students that do not meet this requirements may be deemed unable to meet expectations regarding professionalism and may be referred for disciplinary action (which may include exclusion from assessments and unit failure).

Similarly, as part of developing professionalism, students are expected to submit all work by the due date. Applications for assessment task extensions must be supported by appropriate evidence and submitted via www.ask.mq.edu.au. For further details please refer to the Special Consideration Policy available at <https://students.mq.edu.au/study/my-study-program/special-consideration>

Late Submission of Work

All assignments which are officially received after the due date, and where no extension has been granted by the course convenor or tutor, will incur a deduction of 10% for the first day, and 10% for each subsequent day including the actual day on which the work is received. Weekends and public holidays are included. For example:

Due date	Received	Days late	Deduction	Raw mark	Final mark
Friday 14th	Monday 17th	3	30%	75%	45%

Assessment Tasks

Name	Weighting	Hurdle	Due
AT1	30%	No	Week 4
AT2	20%	No	Week 5
AT3	50%	No	Week 5

AT1

Due: **Week 4**

Weighting: **30%**

Video Assessment

On successful completion you will be able to:

- Describe the structure of enzymes, enzyme kinetics and models of enzyme-substrate binding.
- Describe the pathways (glycolysis, gluconeogenesis, Krebs cycle, oxidative phosphorylation, protein metabolism and fatty acid metabolism) involved in the metabolism of glucose, fatty acids and amino acids.
- Explain the role of genetic, environmental and socioeconomic factors in obesity and starvation.
- Describe the neuronal and hormonal mechanisms that regulate food intake, homeostasis, and metabolism.
- Describe the normal anatomy and physiology of the renal and alimentary systems and explain anatomical and physiological changes that occur in common renal and gastrointestinal diseases.
- Discuss case studies by organising and integrating knowledge of renal and gastrointestinal structures and functions (as well as concepts of pathophysiology) and by critically evaluating evidence from scientific and medical literature.

AT2

Due: **Week 5**

Weighting: **20%**

Anatomy Test

On successful completion you will be able to:

- Describe the normal anatomy and physiology of the renal and alimentary systems and explain anatomical and physiological changes that occur in common renal and gastrointestinal diseases.

AT3

Due: **Week 5**

Weighting: **50%**

Final Exam

On successful completion you will be able to:

- Describe the structure of enzymes, enzyme kinetics and models of enzyme-substrate binding.
- Describe the pathways (glycolysis, gluconeogenesis, Krebs cycle, oxidative phosphorylation, protein metabolism and fatty acid metabolism) involved in the metabolism of glucose, fatty acids and amino acids.
- Explain the role of genetic, environmental and socioeconomic factors in obesity and starvation.
- Describe the neuronal and hormonal mechanisms that regulate food intake, homeostasis, and metabolism.
- Discuss case studies by organising and integrating knowledge of renal and gastrointestinal structures and functions (as well as concepts of pathophysiology) and by critically evaluating evidence from scientific and medical literature.

Delivery and Resources

In this unit students are required to attend:

2h lecture

2h team based learning type tutorial class

2h anatomy practical class

Required and Recommended Texts:

Fundamentals of Biochemistry : Life at the Molecular Level / Donald Voet, Judith G. Voet, Charlotte W. Pratt.

Guyton and Hall Textbook of Medical Physiology, 13th Edition (2015). Saunders. ISBN: 978-1-4557-7005-2

Moore KL and Dalley AF. 2014. Clinically Oriented Anatomy 7th ed. Lippincott Williams & Wilkins.

Ross MH and Pawlina W. 2006. Histology a Text and Atlas 5th ed. Lippincott Williams & Wilkins
Abrahams PH, Boon J, and Spratt JD. 2009.

McMinn's Clinical Atlas of Human Anatomy. 6th ed. Mosby/Saunders Elsevier.

Unit Schedule

Week	Topic	Lectures
1	Introduction to Metabolism	Macronutrients & Micronutrients Glucose metabolism
2	Metabolic Pathways	Fat and protein metabolism Hormonal regulation of food intake
3	Regulation & Dysregulation of the gastrointestinal system	Obesity Cognitive influences of food intake
4	Regulation & Dysregulation of the renal system	Glomerular filtration and tubular reabsorption, the role of kidneys in blood pressure control Polycystic kidney disease – an example of a chronic kidney disease - the effect on renal function
5	Unit Review	Acid-base regulation by kidneys Summary & Review

Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central \(https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central\)](https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central). Students should be aware of the following policies in particular with regard to Learning and Teaching:

- [Academic Appeals Policy](#)
- [Academic Integrity Policy](#)
- [Academic Progression Policy](#)
- [Assessment Policy](#)
- [Fitness to Practice Procedure](#)
- [Grade Appeal Policy](#)
- [Complaint Management Procedure for Students and Members of the Public](#)

- [Special Consideration Policy](#) (**Note:** The Special Consideration Policy is effective from 4 December 2017 and replaces the Disruption to Studies Policy.)

Undergraduate students seeking more policy resources can visit the [Student Policy Gateway](https://students.mq.edu.au/support/study/student-policy-gateway) (<https://students.mq.edu.au/support/study/student-policy-gateway>). It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.

If you would like to see all the policies relevant to Learning and Teaching visit [Policy Central](http://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central) (<http://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central>).

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: <https://students.mq.edu.au/study/getting-started/student-conduct>

Results

Results published on platform other than [eStudent](#), (eg. iLearn, Coursera etc.) or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in [eStudent](#). For more information visit ask.mq.edu.au or if you are a Global MBA student contact globalmba.support@mq.edu.au

Student Support

Macquarie University provides a range of support services for students. For details, visit <http://students.mq.edu.au/support/>

Learning Skills

Learning Skills (mq.edu.au/learningskills) provides academic writing resources and study strategies to improve your marks and take control of your study.

- [Workshops](#)
- [StudyWise](#)
- [Academic Integrity Module for Students](#)
- [Ask a Learning Adviser](#)

Student Services and Support

Students with a disability are encouraged to contact the [Disability Service](#) who can provide appropriate help with any issues that arise during their studies.

Student Enquiries

For all student enquiries, visit Student Connect at ask.mq.edu.au

If you are a Global MBA student contact globalmba.support@mq.edu.au

IT Help

For help with University computer systems and technology, visit http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/.

When using the University's IT, you must adhere to the [Acceptable Use of IT Resources Policy](#). The policy applies to all who connect to the MQ network including students.

Graduate Capabilities

Creative and Innovative

Our graduates will also be capable of creative thinking and of creating knowledge. They will be imaginative and open to experience and capable of innovation at work and in the community. We want them to be engaged in applying their critical, creative thinking.

This graduate capability is supported by:

Learning outcome

- Discuss case studies by organising and integrating knowledge of renal and gastrointestinal structures and functions (as well as concepts of pathophysiology) and by critically evaluating evidence from scientific and medical literature.

Assessment tasks

- AT1
- AT3

Capable of Professional and Personal Judgement and Initiative

We want our graduates to have emotional intelligence and sound interpersonal skills and to demonstrate discernment and common sense in their professional and personal judgement. They will exercise initiative as needed. They will be capable of risk assessment, and be able to handle ambiguity and complexity, enabling them to be adaptable in diverse and changing environments.

This graduate capability is supported by:

Learning outcomes

- Describe the structure of enzymes, enzyme kinetics and models of enzyme-substrate binding.
- Describe the pathways (glycolysis, gluconeogenesis, Krebs cycle, oxidative phosphorylation, protein metabolism and fatty acid metabolism) involved in the metabolism of glucose, fatty acids and amino acids.
- Explain the role of genetic, environmental and socioeconomic factors in obesity and starvation.

- Describe the neuronal and hormonal mechanisms that regulate food intake, homeostasis, and metabolism.
- Discuss case studies by organising and integrating knowledge of renal and gastrointestinal structures and functions (as well as concepts of pathophysiology) and by critically evaluating evidence from scientific and medical literature.

Assessment tasks

- AT1
- AT3

Commitment to Continuous Learning

Our graduates will have enquiring minds and a literate curiosity which will lead them to pursue knowledge for its own sake. They will continue to pursue learning in their careers and as they participate in the world. They will be capable of reflecting on their experiences and relationships with others and the environment, learning from them, and growing - personally, professionally and socially.

This graduate capability is supported by:

Learning outcomes

- Describe the structure of enzymes, enzyme kinetics and models of enzyme-substrate binding.
- Describe the pathways (glycolysis, gluconeogenesis, Krebs cycle, oxidative phosphorylation, protein metabolism and fatty acid metabolism) involved in the metabolism of glucose, fatty acids and amino acids.
- Explain the role of genetic, environmental and socioeconomic factors in obesity and starvation.
- Describe the neuronal and hormonal mechanisms that regulate food intake, homeostasis, and metabolism.
- Describe the normal anatomy and physiology of the renal and alimentary systems and explain anatomical and physiological changes that occur in common renal and gastrointestinal diseases.
- Discuss case studies by organising and integrating knowledge of renal and gastrointestinal structures and functions (as well as concepts of pathophysiology) and by critically evaluating evidence from scientific and medical literature.

Assessment tasks

- AT1
- AT2

- AT3

Discipline Specific Knowledge and Skills

Our graduates will take with them the intellectual development, depth and breadth of knowledge, scholarly understanding, and specific subject content in their chosen fields to make them competent and confident in their subject or profession. They will be able to demonstrate, where relevant, professional technical competence and meet professional standards. They will be able to articulate the structure of knowledge of their discipline, be able to adapt discipline-specific knowledge to novel situations, and be able to contribute from their discipline to inter-disciplinary solutions to problems.

This graduate capability is supported by:

Learning outcomes

- Describe the structure of enzymes, enzyme kinetics and models of enzyme-substrate binding.
- Describe the pathways (glycolysis, gluconeogenesis, Krebs cycle, oxidative phosphorylation, protein metabolism and fatty acid metabolism) involved in the metabolism of glucose, fatty acids and amino acids.
- Explain the role of genetic, environmental and socioeconomic factors in obesity and starvation.
- Describe the neuronal and hormonal mechanisms that regulate food intake, homeostasis, and metabolism.
- Describe the normal anatomy and physiology of the renal and alimentary systems and explain anatomical and physiological changes that occur in common renal and gastrointestinal diseases.
- Discuss case studies by organising and integrating knowledge of renal and gastrointestinal structures and functions (as well as concepts of pathophysiology) and by critically evaluating evidence from scientific and medical literature.

Assessment tasks

- AT1
- AT2
- AT3

Critical, Analytical and Integrative Thinking

We want our graduates to be capable of reasoning, questioning and analysing, and to integrate and synthesise learning and knowledge from a range of sources and environments; to be able to critique constraints, assumptions and limitations; to be able to think independently and systemically in relation to scholarly activity, in the workplace, and in the world. We want them to

have a level of scientific and information technology literacy.

This graduate capability is supported by:

Learning outcomes

- Describe the structure of enzymes, enzyme kinetics and models of enzyme-substrate binding.
- Describe the pathways (glycolysis, gluconeogenesis, Krebs cycle, oxidative phosphorylation, protein metabolism and fatty acid metabolism) involved in the metabolism of glucose, fatty acids and amino acids.
- Explain the role of genetic, environmental and socioeconomic factors in obesity and starvation.
- Describe the neuronal and hormonal mechanisms that regulate food intake, homeostasis, and metabolism.
- Describe the normal anatomy and physiology of the renal and alimentary systems and explain anatomical and physiological changes that occur in common renal and gastrointestinal diseases.
- Discuss case studies by organising and integrating knowledge of renal and gastrointestinal structures and functions (as well as concepts of pathophysiology) and by critically evaluating evidence from scientific and medical literature.

Assessment tasks

- AT1
- AT2
- AT3

Problem Solving and Research Capability

Our graduates should be capable of researching; of analysing, and interpreting and assessing data and information in various forms; of drawing connections across fields of knowledge; and they should be able to relate their knowledge to complex situations at work or in the world, in order to diagnose and solve problems. We want them to have the confidence to take the initiative in doing so, within an awareness of their own limitations.

This graduate capability is supported by:

Learning outcomes

- Describe the pathways (glycolysis, gluconeogenesis, Krebs cycle, oxidative phosphorylation, protein metabolism and fatty acid metabolism) involved in the metabolism of glucose, fatty acids and amino acids.
- Explain the role of genetic, environmental and socioeconomic factors in obesity and

starvation.

- Describe the neuronal and hormonal mechanisms that regulate food intake, homeostasis, and metabolism.
- Discuss case studies by organising and integrating knowledge of renal and gastrointestinal structures and functions (as well as concepts of pathophysiology) and by critically evaluating evidence from scientific and medical literature.

Assessment tasks

- AT1
- AT3

Effective Communication

We want to develop in our students the ability to communicate and convey their views in forms effective with different audiences. We want our graduates to take with them the capability to read, listen, question, gather and evaluate information resources in a variety of formats, assess, write clearly, speak effectively, and to use visual communication and communication technologies as appropriate.

This graduate capability is supported by:

Learning outcomes

- Describe the structure of enzymes, enzyme kinetics and models of enzyme-substrate binding.
- Describe the pathways (glycolysis, gluconeogenesis, Krebs cycle, oxidative phosphorylation, protein metabolism and fatty acid metabolism) involved in the metabolism of glucose, fatty acids and amino acids.
- Explain the role of genetic, environmental and socioeconomic factors in obesity and starvation.
- Describe the neuronal and hormonal mechanisms that regulate food intake, homeostasis, and metabolism.
- Describe the normal anatomy and physiology of the renal and alimentary systems and explain anatomical and physiological changes that occur in common renal and gastrointestinal diseases.
- Discuss case studies by organising and integrating knowledge of renal and gastrointestinal structures and functions (as well as concepts of pathophysiology) and by critically evaluating evidence from scientific and medical literature.

Assessment tasks

- AT1

- AT2
- AT3

Engaged and Ethical Local and Global citizens

As local citizens our graduates will be aware of indigenous perspectives and of the nation's historical context. They will be engaged with the challenges of contemporary society and with knowledge and ideas. We want our graduates to have respect for diversity, to be open-minded, sensitive to others and inclusive, and to be open to other cultures and perspectives: they should have a level of cultural literacy. Our graduates should be aware of disadvantage and social justice, and be willing to participate to help create a wiser and better society.

This graduate capability is supported by:

Learning outcomes

- Explain the role of genetic, environmental and socioeconomic factors in obesity and starvation.
- Describe the neuronal and hormonal mechanisms that regulate food intake, homeostasis, and metabolism.
- Describe the normal anatomy and physiology of the renal and alimentary systems and explain anatomical and physiological changes that occur in common renal and gastrointestinal diseases.
- Discuss case studies by organising and integrating knowledge of renal and gastrointestinal structures and functions (as well as concepts of pathophysiology) and by critically evaluating evidence from scientific and medical literature.

Assessment tasks

- AT1
- AT2
- AT3

Socially and Environmentally Active and Responsible

We want our graduates to be aware of and have respect for self and others; to be able to work with others as a leader and a team player; to have a sense of connectedness with others and country; and to have a sense of mutual obligation. Our graduates should be informed and active participants in moving society towards sustainability.

This graduate capability is supported by:

Learning outcomes

- Explain the role of genetic, environmental and socioeconomic factors in obesity and starvation.

- Describe the normal anatomy and physiology of the renal and alimentary systems and explain anatomical and physiological changes that occur in common renal and gastrointestinal diseases.
- Discuss case studies by organising and integrating knowledge of renal and gastrointestinal structures and functions (as well as concepts of pathophysiology) and by critically evaluating evidence from scientific and medical literature.

Assessment tasks

- AT1
- AT2
- AT3

Changes from Previous Offering

This is the second year offering of this unit.

No changes to the unit are required.