

BIOS 3038 METABOLISM

Credit Points 10

Coordinator Ming Wu ([https://directory.westernsydney.edu.au/search/name/Ming Wu/](https://directory.westernsydney.edu.au/search/name/Ming%20Wu/))

Description Humans ingest amino acids, carbohydrates, fats, vitamins, and minerals to generate cells and tissue for growth, maintenance and defence, along with energy. This subject will cover topics including: bioenergetics; the structures of key molecules; metabolic pathways in health and disease along with disease remediation by contextualising glycolysis, gluconeogenesis, glycogen synthesis and breakdown; fatty acid oxidation and synthesis; amino acid catabolism; urea synthesis; citric acid cycle, oxidative phosphorylation with the role of vitamins and minerals in metabolic pathways. Emphasis will be on the regulation and integration of these pathways, including their responses to hormonal regulation. The effects of metabolic disease altered dietary and hormonal status on metabolic pathways and their consequences will be addressed in the context of clinical case studies.

School Science

Discipline Biochemistry and Cell Biology

Student Contribution Band HECS Band 2 10cp

Check your fees via the Fees (https://www.westernsydney.edu.au/currentstudents/current_students/fees/) page.

Level Undergraduate Level 3 subject

Equivalent Subjects BIOS 2021

Restrictions

Must have successfully completed 60 credit points

Learning Outcomes

After successful completion of this Subject, students will be able to:

1. Articulate the molecular mechanisms by which dietary macromolecules (carbohydrates, lipids, proteins) are metabolised in humans.
2. Analyse the different roles of the major tissues in energy metabolism in relation to the general structural types and functional classifications of regulatory molecules such as hormones, growth factors, cytokines, neurotransmitters
3. Examine the ways disorders in metabolic pathways affect homeostasis and how detection and treatment can be implemented.
4. Acquire and interpret biochemical data in the research, diagnostic, treatment and policy sectors using standard biochemical techniques, graphical skills, biochemical calculations and professional databases.
5. Organise, present and interpret experimental observations, within the context of team/leadership roles, in timely, clear, concise written and oral form.

Subject Content

1. Amino Acid, Carbohydrate and Lipid metabolism, including pathways of glycolysis, gluconeogenesis, glycogen metabolism; their metabolic and hormonal regulation including the role of major micronutrients.
2. The citric acid cycle and oxidative phosphorylation, their role in energy metabolism and their regulation.

3. Integration of vitamins and minerals in carbohydrate, fat and amino acid metabolism; the different roles of individual tissues in metabolism along with their regulation in response to dietary and disease states.
4. Identification of the nature of specificity, sensitivity and reproducibility when selecting and using biochemical assays to diagnose metabolic disorders.
5. Interpretation of professional literature, including metabolic databases to diagnose and mitigate disease in the context of time management, organisation and communication through team/leadership responsibilities.

Assessment

The following table summarises the standard assessment tasks for this subject. Please note this is a guide only. Assessment tasks are regularly updated, where there is a difference your Learning Guide takes precedence.

Type	Length	Percent	Threshold	Individual/ Group Task	Mandatory
Report	1,500 words maximum	30	N	Group/ Individual	N
Quiz	5x20min	25	N	Individual	N
Case Study	2,000 words	45	N	Individual	N

Teaching Periods

Spring (2025)

Online

Online

Subject Contact Ming Wu ([https://directory.westernsydney.edu.au/search/name/Ming Wu/](https://directory.westernsydney.edu.au/search/name/Ming%20Wu/))

View timetable (https://classregistration.westernsydney.edu.au/odd/timetable/?subject_code=BIOS3038_25-SPR_ON_2#subjects)