

# PROCESS AND RESOURCES ENG. (PROC)

## PROC 1002 Food Science 1 (10 Credit Points)

Subject Details (<https://hbook.westernsydney.edu.au/archives/2021-2022/subject-details/proc1002/>) **Legacy Code:** 300805  
Food provides sustenance to life, nutrition for good health, enjoyment and cultural identity. Students will gain an awareness of the history and cultural significance of food and its traditions in Australia and around the world. This unit introduces the basic principles for understanding the science behind food; its composition, chemical, physical and functional characteristics. Fruits and vegetables, cereal, meat and dairy products will be covered, how they are processed and impacts on food quality and nutrition. Current issues will be discussed, such as world food supply, food-borne disease, diet and health, and new trends in food.

**Level:** Undergraduate Level 1 subject

**Equivalent Subjects:** PROC 1001 - Food Science 1 LGYB 8736 - Food Science Technology Practicum 11

**Restrictions:** Please see the Subject Details page for any restrictions for this subject

## PROC 1003 Food Science 1 (WSTC) (10 Credit Points)

Subject Details (<https://hbook.westernsydney.edu.au/archives/2021-2022/subject-details/proc1003/>) **Legacy Code:** 700265  
Food provides sustenance to life, nutrition for good health, enjoyment and cultural identity. Students will gain an awareness of the history and cultural significance of food and its traditions in Australia and around the world. This unit introduces the basic principles for understanding the science behind food; its composition, chemical, physical and functional characteristics. Fruits and vegetables, cereal, meat and dairy products will be covered, how they are processed and impacts on food quality and nutrition. Current issues will be discussed, such as world food supply, food-borne disease, diet and health, and new trends in food. Students will need to attend the Hawkesbury Campus for Lectures and Practicals.

**Level:** Undergraduate Level 1 subject

**Equivalent Subjects:** PROC 1002 - Food Science 1 PROC 1001 - Food Science 1 LGYB 8736 - Food Science and Technology Practicum 11

**Restrictions:** Please see the Subject Details page for any restrictions for this subject

## PROC 1005 Introduction to Food Science (10 Credit Points)

Subject Details (<https://hbook.westernsydney.edu.au/archives/2021-2022/subject-details/proc1005/>) **Legacy Code:** 301444  
Food provides sustenance to life, nutrition for good health, enjoyment and cultural identity. Students will study the history and cultural significance of food and its traditions in Australia and around the world. This unit introduces the basic principles for understanding the science behind food; its composition, chemical, physical and functional characteristics. Fruits and vegetables, cereal, meat and dairy products will be covered, how they are processed and impacts on food quality and nutrition. Current issues will be discussed, such as world food supply, food-borne disease, diet and health, and new trends in food.

**Level:** Undergraduate Level 1 subject

**Equivalent Subjects:** PROC 1001 - Food Science 1 LGYB 8736 - Food Science Technology Practicum 11 PROC 1002 - Food Science 1 PROC 1003 - Food Science 1 (WSTC)

**Restrictions:** Please see the Subject Details page for any restrictions for this subject

## PROC 1006 Materials Engineering Fundamentals (10 Credit Points)

Subject Details (<https://hbook.westernsydney.edu.au/archives/2021-2022/subject-details/proc1006/>) **Legacy Code:** 301414  
This unit will introduce students to the foundations of chemistry, exploring the molecular nature of matter and change which is essential foundational knowledge for a career in materials engineering. From atomic structure and the understanding of the periodic properties of elements, students learn about the chemical bonds and intermolecular forces that are responsible for determining the structure and properties of materials. Students put theory into practice by conducting and reporting on laboratory experiments to test the principles of chemical equilibrium, chemical reactions involving acids/bases, electron transfer as well as thermodynamics and kinetics of chemical processes.

**Level:** Undergraduate Level 1 subject

**Restrictions:** Please see the Subject Details page for any restrictions for this subject

## PROC 1007 Introduction to Food Science (WSTC) (10 Credit Points)

Subject Details (<https://hbook.westernsydney.edu.au/archives/2021-2022/subject-details/proc1007/>) **Legacy Code:** 700334  
Food provides sustenance to life, nutrition for good health, enjoyment and cultural identity. Students will study the history and cultural significance of food and its traditions in Australia and around the world. This unit introduces the basic principles for understanding the science behind food; its composition, chemical, physical and functional characteristics. Fruits and vegetables, cereal, meat and dairy products will be covered, how they are processed and impacts on food quality and nutrition. Current issues will be discussed, such as world food supply, food-borne disease, diet and health, and new trends in food. Students will need to attend the Hawkesbury Campus for Lectures and Practicals.

**Level:** Undergraduate Level 1 subject

**Equivalent Subjects:** PROC 1002 Food Science 1 PROC 1001 Food Science 1 LGYB 8736 Food Science Technology Practicum 11 PROC 1003 Food Science 1

**Restrictions:** Please see the Subject Details page for any restrictions for this subject

## PROC 1008 Introduction to Materials Engineering (10 Credit Points)

Subject Details (<https://hbook.westernsydney.edu.au/archives/2021-2022/subject-details/proc1008/>) **Legacy Code:** 301421

**Level:** Undergraduate Level 1 subject

**Equivalent Subjects:** ENGR 1008 - Engineering Materials ENGR 1010 - Engineering Materials (WSTC)

**Restrictions:** Please see the Subject Details page for any restrictions for this subject

## PROC 2001 Food Science 2 (10 Credit Points)

Subject Details (<https://hbook.westernsydney.edu.au/archives/2021-2022/subject-details/proc2001/>) **Legacy Code:** 300842  
This unit introduces students to the principles of food preservation, including heat treatments, chilling, freezing, dehydration, pickles and fermentation. Factors affecting food quality are explored with respect to microbial, chemical and physical changes in food and their effects on food safety, nutritional value and sensory characteristics. The basic principles of good manufacturing practises, sanitation and Hazard Analysis Critical Control Point (HACCP) for control of food safety will be studied in relation to the design of safe food manufacturing processes. The application of the food preservation principles to the processing of food products is covered through hands-on practicals in the pilot plant.

**Level:** Undergraduate Level 2 subject

**Pre-requisite(s):** PROC 1002

**Equivalent Subjects:** LGYB 8737 - Food Science Technology Practicum 12 PROC 1004 - Food Science 2

**Restrictions:** Please see the Subject Details page for any restrictions for this subject

**PROC 2002 Innovative Foods (10 Credit Points)**

Subject Details (<https://hbook.westernsydney.edu.au/archives/2021-2022/subject-details/proc2002/>) **Legacy Code:** 301452

This unit introduces students to the principles of food preservation, including heat treatments, chilling, freezing, dehydration, pickles and fermentation. Factors affecting food quality are explored with respect to microbial, chemical and physical changes in food and their effects on food safety, nutritional value and sensory characteristics. The basic principles of good manufacturing practises, sanitation and Hazard Analysis Critical Control Point (HACCP) for control of food safety will be studied in relation to the design of safe food manufacturing processes. The application of the food preservation principles to the processing of food products is covered through hands-on practicals in the pilot plant.

**Level:** Undergraduate Level 2 subject

**Pre-requisite(s):** PROC 1002 OR PROC 1005

**Equivalent Subjects:** LGYB 8737 - Food Science Technology Practicum 12 PROC 1004 - Food Science 2 PROC 2001 - Food Science 2

**Restrictions:** Please see the Subject Details page for any restrictions for this subject

**PROC 2003 Materials Selection and Design (10 Credit Points)**

Subject Details (<https://hbook.westernsydney.edu.au/archives/2021-2022/subject-details/proc2003/>) **Legacy Code:** 301415

Materials are a critical point of consideration when designing a solution to a technical problem. However, materials can also be quite complex by themselves and can possess a range of properties which may only partially suit an intended solution. In this unit, students use real world scenarios to learn to make decisions concerning material selection under different circumstances, based upon technical requirements, and balanced against sustainability and cost.

**Level:** Undergraduate Level 2 subject

**Restrictions:** Please see the Subject Details page for any restrictions for this subject

**PROC 3002 Advanced Food Science and Technology (10 Credit Points)**

Subject Details (<https://hbook.westernsydney.edu.au/archives/2021-2022/subject-details/proc3002/>) **Legacy Code:** 300904

This unit will extend student understanding of current and emerging food processes and packaging technologies. Students will gain an appreciation of the physicochemical processes involved in food manufacture and their integration to produce safe, nutritious and palatable food. Students will become familiar with methods to monitor shelf life of foods, learn about packaging science and be able to select the most appropriate packaging solution for a range of food applications. The environmental impact of food processing and packaging will also be explored, along with the factors affecting the sustainability of food manufacture. Practical workshops will be conducted to produce and analyse food products, plus factory tours to food manufacturing and packaging sites.

**Level:** Undergraduate Level 3 subject

**Pre-requisite(s):** PROC 2001 AND NATS 3038

**Equivalent Subjects:** PROC 3001 - Advanced Food Science and Technology

**Incompatible Subjects:** NATS 2016 - Food Processing and Analysis PROC 3006 - Packaging Science and Technology

**Restrictions:** Please see the Subject Details page for any restrictions for this subject

**PROC 3003 Food Product Development (10 Credit Points)**

Subject Details (<https://hbook.westernsydney.edu.au/archives/2021-2022/subject-details/proc3003/>) **Legacy Code:** 300915

This unit is a final year capstone unit where students work in a team environment to apply the knowledge previously gained through their studies in nutrition and food science to develop a novel food product. The entire process of product development will be covered, including: idea generation; collating market, technical and consumer information; consumer surveying to establish the need/desire for a new product; product innovation development; quality testing and packaging. Students will develop specialised knowledge of the total product development system, including the ability to design, develop formulations and evaluation of sensory properties. Final product assessment includes nutritional composition, microbiological analysis, sensory evaluation and labelling compliant with regulations. The project is run in the simulated industry environment; team work among the members plays a key part of the unit.

**Level:** Undergraduate Level 3 subject

**Pre-requisite(s):** NATS 3038 AND NATS 3014

**Equivalent Subjects:** PROC 3004 - Food Product Development Practicum LGYB 8764 - Food Product Development Practicum

**Restrictions:** Please see the Subject Details page for any restrictions for this subject

**PROC 3007 Food Innovation and Technology (10 Credit Points)**

Subject Details (<https://hbook.westernsydney.edu.au/archives/2021-2022/subject-details/proc3007/>) **Legacy Code:** 301454

This unit will extend your understanding of current and emerging food processes and packaging technologies. You will gain an appreciation of the physicochemical processes involved in food manufacture and their integration to produce safe, nutritious and palatable food. You will become familiar with methods to monitor shelf life of foods, learn about packaging science and be able to select the most appropriate packaging solution for a range of food applications. The environmental impact of food processing and packaging will also be explored, along with the factors affecting the sustainability of food manufacture.

**Level:** Undergraduate Level 3 subject

**Equivalent Subjects:** PROC 3001 Advanced Food Science and Technology PROC 3002 Advanced Food Science and Technology

**Incompatible Subjects:** NATS 2016 Food Processing and Analysis PROC 3006 Packaging Science and Technology

**Restrictions:** Please see the Subject Details page for any restrictions for this subject

**PROC 3008 Materials Processing and Applications (10 Credit Points)**

Subject Details (<https://hbook.westernsydney.edu.au/archives/2021-2022/subject-details/proc3008/>) **Legacy Code:** 301411

This unit focuses on the materials aspects of advanced material processing with an emphasis on microstructures. This extends students' knowledge in advanced materials, their properties, processing technologies, potential applications and simulations. Students will gain skills and experience with commercial software packages to solve sophisticated problems associated with materials engineering as well as develop experimentation techniques for the validation of these problems.

**Level:** Undergraduate Level 3 subject

**Restrictions:** Please see the Subject Details page for any restrictions for this subject

**PROC 4001 Advanced Materials Topics (10 Credit Points)**

Subject Details (<https://hbook.westernsydney.edu.au/archives/2021-2022/subject-details/proc4001/>) **Legacy Code:** 301416

Advancements in materials have underpinned technological development since the earliest days of human civilisation. As the challenges of the 21st Century emerge, the development of advanced materials will undoubtedly prove crucial for achieving sustainable solutions. This unit is a research-led learning experience for students whereby advanced materials researchers from WSU and beyond will deliver a series of real-world case studies on their research. Students will be challenged to assess these different material contexts and respond to hypothetical problems by performing critical reviews, in-depth analyses and presenting expert recommendations.

**Level:** Undergraduate Level 4 subject

**Restrictions:** Please see the Subject Details page for any restrictions for this subject

**PROC 4002 Engineering Materials from Waste (10 Credit Points)**

Subject Details (<https://hbook.westernsydney.edu.au/archives/2021-2022/subject-details/proc4002/>) **Legacy Code:** 301417

Students will learn about the high potential of waste materials produced by continually growing rapid urbanisation and rising populations, which can be widely reused in engineering projects such as buildings, roads. The focus of this unit is the use of solid waste such as glass, tailings and demolished waste in engineering materials such as concrete, road base and asphalt. In addition, students will explore several recycling and recovery processes and investigate the performance of waste incorporated into engineering materials. Students report on real world state-of-the-art developments while integrating concepts of the circular economy, Australian standards and regulations to ensure the compliance of the developed materials. Work Integrated Learning (WIL) is a component of this unit.

**Level:** Undergraduate Level 4 subject

**Restrictions:** Please see the Subject Details page for any restrictions for this subject