

School / Faculty: Faculty of Science and Technology

Course Title: INORGANIC CHEMISTRY

Course ID: SCCHM1003

Credit Points: 15.00

Prerequisite(s): Nil

Co-requisite(s): Nil

Exclusion(s): Nil

ASCED Code: 010503

Grading Scheme: Graded (HD, D, C, etc.)

Program Level:

| AQF Level of Program | | | | | | |
|----------------------|---|---|---|---|---|----|
| | 5 | 6 | 7 | 8 | 9 | 10 |
| Level | | | | | | |
| Introductory | ■ | ■ | ✓ | ■ | ■ | ■ |
| Intermediate | ■ | ■ | ■ | ■ | ■ | ■ |
| Advanced | ■ | ■ | ■ | ■ | ■ | ■ |

Learning Outcomes:

This course is designed to introduce students to Inorganic Chemistry concepts which are an important part of understanding many geological, metallurgical and environmental processes.

Knowledge:

- K1.** Explain the structure of the Periodic Table through the concepts of general and inorganic chemistry.
- K2.** Discuss the features of atomic structure and identify the relationship of the atomic structure of elements, synthesized phases and minerals to their physical and chemical properties.
- K3.** Recognise main groups of elements as well as main groups of transition metals and identify physical and chemical properties.
- K4.** Explain the concept of a Nuclear reaction and identify different types of radioactive decay.
- K5.** Relate crystalline internal order and symmetry to external crystallographic form.

Skills:

- S1.** Identify and interrelate chemistry at symbolic, observational and molecular levels.
- S2.** Construct balanced chemical equations and use these to perform appropriate calculations.

Course Outline (Higher Education)

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- S3.** Demonstrate ability to conduct laboratory experiments in a safe and environmentally sound manner and report the outcomes in an appropriate form.
- S4.** Predict mineral properties using knowledge of crystal structures and make informed decisions on appropriate analytical methods.
- S5.** Integrate structure, physical and chemical properties in application to mineral behaviour in nature and in processing.

Application of knowledge and skills:

- A1.** Apply theoretical knowledge to solve problems and conduct laboratory exercises, communicating their finding in a variety of ways including reports and presentations.
- A2.** Apply appropriate problem-solving techniques to problems independently and within teams.
- A3.** Incorporate data collection and inference of its meaning to written reports.

Course Content:

The curriculum focuses on inorganic chemistry principles which will prepare students for further study in both chemistry and other scientific disciplines.

Topics may include:

- The Alkali Metals and Alkaline Earth Metals.
- Group 13 and 14 elements and their compounds.
- Group 15 and 16 elements and their compounds.
- Group 17 and 18 elements and their compounds.
- Transition elements and their compounds.
- Nuclear chemistry.
- Atomic structure.
- Stoichiometry.
- Lattice and crystal symmetry and classification, miller indices, crystal spatial information and space groups.
- Classification of minerals on chemical composition, physical and chemical properties measurement.

Values and Graduate Attributes:

Values:

- V1.** Appreciate the role and limitations of chemistry principles in the practical situations and the environment.
- V2.** Appreciate growing integration of chemistry with other science disciplines in order to recognise and solve scientific and technical problems.
- V3.** Recognise the importance of inorganic chemistry and its application in everyday life, including generation of chemicals, materials and energy sources.

Graduate Attributes:

FedUni graduate attributes statement. To have graduates with knowledge, skills and competence that enable them to stand out as critical, creative and enquiring learners who are capable, flexible and work ready, and responsible, ethical and engaged citizens.

Course Outline (Higher Education)

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| Attribute | Brief Description | Focus |
|---|---|--------|
| Knowledge, skills and competence | Skills to find and interpret information independently as it relates to inorganic chemistry. | High |
| Critical, creative and enquiring learners | Independent learning to enhance knowledge of inorganic chemistry. | Medium |
| Capable, flexible and work ready | Students are encouraged to consider the applications of Inorganic Chemistry concepts to industrial, environmental and everyday life contexts. | Medium |
| Responsible, ethical and engaged citizens | Ethical considerations involving chemistry. | Medium |

Learning Task and Assessment:

| Learning Outcomes Assessed | Assessment Task | Assessment Type | Weighting |
|-----------------------------|---------------------|--------------------------------|-----------|
| K1-K5, S1-S2, S4-S5 & A2-A3 | Assignment | Written response to problems | 10 - 20% |
| K1-K3, K5, S1-S5 & A1-A3 | Practical exercises | Reports on Practical exercises | 30 - 60% |
| K1-K5, S1-S2, S4-S5 & A1-A3 | Examination | Written response | 40 - 50% |

Adopted Reference Style:

Australian