

MSES program student learning goals

The requirements for the M.S. degree in Environmental Science can be satisfied by one of three options:

- Plan A.** Thesis Option 24 credit hours (500 level or above) plus ESCI 699. A thesis will be based on original research. (Preferred by the environmental consulting industry)
- Plan B.** Project Option 27 credit hours (500 level or above) plus ESCI 698. A project will be based on library/field/laboratory research or classroom exercises demonstrating analysis and interpretation of scientific data.
- Plan C.** Coursework Option 30 credit hours (500 level or above) (Not recommended for students interested in doctoral degrees).

The non-thesis M.S. program has an emphasis on coursework, while the thesis-based/project-based degree has an emphasis on both coursework and original research. Thesis-based M.S. students will experience the excitement of performing guided research.

The learning goals are divided in to five parts including (1) Conceptual knowledge; (2) Communication skills; (3) Critical and independent thinking skills; and (4) Practical and/or professional skills.

(1) **Conceptual knowledge.** Understanding the underlying concepts and principles associated with environmental aspects of biology, chemistry and geology

- Ability to understand and apply underlying concepts and principles associated with the environmental aspects of biology
- Ability to understand and apply underlying concepts and principles associated with the environmental aspects of chemistry
- Ability to understand and apply underlying concepts and principles associated with the environmental aspects of geology

(2) **Communication skills.** Ability to acquire, present, and develop scientific ideas

- Ability to read, understand and use scientific information related to environmental issues
- Ability to effectively communicate scientific information orally
- Ability to effectively communicate scientific information in writing

(3) **Critical thinking and cognitive skills.**

- Ability to apply scientific method to evaluate environmental problems and propose solution
- Ability to use and apply knowledge and understanding of essential facts, concepts, principles and theories relating to environmental science
- Ability to evaluate information from a range of sources and to engage with some of the current developments in environmental science, including applications and the philosophical and ethical issues involved
- Ability to perform statistical and quantitative analyses

(4) **Practical and/or professional skills**

- Ability to conduct practical and investigative work in a responsible, safe and ethical manner, and be aware of risk assessment and relevant health and safety regulations
- Ability to initiate, design, conduct and report on investigations, which may involve primary or secondary data

- Ability to obtain, record, collate and analyze data derived from laboratory and/or field investigations, and interpret and report their significance in the light of underlying theory, practical issues and relevant information from other sources

Perform statistical and quantitative analyses	L	L				H	L		M					L	L	M		H		H	H	H	L	M	L	M	H	H	H	M	
Practical and/or professional skills																															
Conduct practical and investigative work in a responsible, safe and ethical manner	L	L				M	L		M				M		L	L		H	H					M	M	H	H	H	H	H	
Initiate, design, conduct and report on investigations, which may involve primary or secondary data	H	L	M			M	M		M		M		H	M	M	L		M	H	H	H	H		H	M	M	M	H	H	H	H
Obtain, record, collate, analyse and interpret data derived from laboratory and/or field investigations		L	H			M	L		M	L		L	H	H	H	L	H	H	H	H	H			M	M	M	H	H	H	M	

Scale:

H = Extensive coverage - this is one of the more-important courses that address this goal

M = Moderate coverage - course addresses goal, but emphasis is not as strong as for "H"-rated goals

L = Basic coverage - course addresses goal, but coverage is not as extensive as for "H" and "M"-rated goals

Blank = Little or no coverage