EVSC90020 Environmental Modelling

Credit Points:	12.5
Level:	9 (Graduate/Postgraduate)
Dates & Locations:	2016, Parkville This subject commences in the following study period/s: Semester 1, Parkville - Taught on campus.
Time Commitment:	Contact Hours: 2 x 1-hour lectures each week and 6 x 3-hour practical (computer laboratory) classes (42 hours in total) Total Time Commitment: 170 hours
Prerequisites:	600-615 Thinking and Reasoning with Data or equivalent statistical subject

Subject	Study Period Commencement:	Credit Points:
MAST90044 Thinking and Reasoning with Data	Semester 1	12.50

Corequisites:	None
Recommended Background Knowledge:	None
Non Allowed Subjects:	None
Core Participation Requirements:	It is University policy to take all reasonable steps to minimise the impact of disability upon academic study and reasonable steps will be made to enhance a student's participation in the University's programs. Students who feel their disability may impact upon their active and safe participation in a subject are encouraged to discuss this with the relevant subject coordinator and the Disability Liaison Unit.
Coordinator:	Prof Michael Mccarthy
Contact:	Dr Brendan Wintle b.wintle@unimelb.edu.au Dr Michael McCarthy mamcca@unimelb.edu.au
Subject Overview:	Modelling is a fundamental component of Environmental Science, being used for prediction, monitoring, auditing, evaluation, and assessment. This subject introduces students to a wide range of models used by environmental scientists including models of climate change, population dynamics, pollution, hydrology, habitat and species distributions. Both deterministic and stochastic models are used as examples. The subject explains how to develop conceptual models that can then be quantified and analysed using mathematical and statistical methods. Topics covered include development of the basic model structure, estimation of parameters and calibration, methods of analysis, sensitivity analysis, model evaluation and model refinement. The subject teaches students how to simplify apparently complex problems.
Learning Outcomes:	The subject aims to provide students with: # an appreciation for the role of modelling in environmental science; # an overview of the range of environmental models in use; # the skills required to model environmental systems and processes; # an introduction to the construction and mathematical analysis of environmental models; and # a high level of ability to analyse and evaluate environmental models.
Assessment:	one literature review or essay of up to 3000 words (30%) due mid semester; two reports on construction, analysis and/or evaluation of environmental models up to 3000 words in total

	(30% each), one due mid semester and one due at the end of semester; and one 15 minute oral presentation (10%) due towards the end of semester.
Prescribed Texts:	To be confirmed
Recommended Texts:	Environmental Modelling: Finding Simplicity in Complexity (Wainwright and Mulligan) Bayesian Methods for Ecology (McCarthy)
Breadth Options:	This subject is not available as a breadth subject.
Fees Information:	Subject EFTSL, Level, Discipline & Census Date, http://enrolment.unimelb.edu.au/fees
Generic Skills:	Generic skills gained from this subject include: # synthesis of information from a range of sources; # appropriate simplification of complex problems to make them amendable to analysis; # high level written communication and presentation skills; # high level oral communication and presentation skills; # the ability to exercise critical judgement, think rigorously and independently, account for decisions, and solve problems; and # application of advanced analytical methods.
Related Course(s):	Master of Science (Ecosystem Science)
Related Majors/Minors/ Specialisations:	Climate Change Climate Change Development Development Environmental Science Environmental Science Integrated Water Catchment Management Integrated Water Catchment Management Sustainable Forests Sustainable Forests Tailored Specialisation Tailored Specialisation