CHEN90027 Carbon Capture and Storage

Credit Points:	12.50
Level:	9 (Graduate/Postgraduate)
Dates & Locations:	This subject is not offered in 2011.
Time Commitment:	Contact Hours: 40 hours Total Time Commitment: 120 hours
Prerequisites:	Prerequisites for this subject are:

Subject	Study Period Commencement:	Credit Points:
CHEN30001 Reactor Engineering	Semester 1	12.50
CHEN30005 Heat and Mass Transport Processes	Semester 1	12.50

Corequisites:	None
Recommended Background Knowledge:	None
Non Allowed Subjects:	None
Core Participation Requirements:	For the purposes of considering request for Reasonable Adjustments under the Disability Standards for Education (Cwth 2005), and Students Experiencing Academic Disadvantage Policy, academic requirements for this subject are articulated in the Subject Description, Subject Objectives, Generic Skills and Assessment Requirements of this entry. The University is dedicated to provide support to those with special requirements. Further details on the disability support scheme can be found at the Disability Liaison Unit website: http://www.services.unimelb.edu.au/disability/
Contact:	A/Prof. Sandra Kentish Email: **sandraek@unimelb.edu.au (mailto:sandraek@unimelb.edu.au)**
Subject Overview:	This subject will give an overview of the drivers for carbon capture and storage, the technology and the economics. Specific topics will include: # Climate Change and Emissions Reduction Measures # Fuel types (coal, oil, gas). Coal chemistry. # Other emission sources (natural gas sweetening, cement, iron and steel production). # Combustion – conventional pulverized coal, supercritical boilers, IGCC and gasifier design, oxyfuel processes. # Coal to liquid fuel processes # Carbon capture using solvent absorption. Other technologies including membranes, adsorbents, chemical looping, cryogenics and gas hydrate technology. # Carbon dioxide compression and pipeline transport # Geological Storage – Site selection (containment, capacity, injectivity). Reservoir modeling (static and dynamic), storage in coal seams, enhanced coal bed methane recovery, storage in depleted gas reservoirs and saline formations, enhanced oil recovery. Long term closure and remediation.Economics – levelised cost of electricity, carbon accounting, the economics of CCS. # Health and Safety, Risk Assessment and management, legal issues
Objectives:	On completion of this subject students should be able to: # Discuss the impacts of climate change and the range of measures that can be taken to reduce emission # Describe the operation of a coal fired power station and the integration of carbon capture and storage into this operation # Describe the opportunities for developing liquid fuels and chemicals from coal as oil reserves decline

	# Estimate the cost of carbon capture and storage and its impact on the levelised cost of electricit
Assessment:	Laboratory-based assignment (10%)Computer-based assignment (10%)Exam (80%)
Prescribed Texts:	TBA
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:	On completion of this subject students should be able to demonstrate an: # In-depth technical competence in at least one engineering discipline; # Ability to use a systems approach to design and operational performance. # Understanding of the social, cultural, global and environmental responsibilities of the professional engineer and the need for sustainable development # Understanding of the principles of sustainable design and development
Related Majors/Minors/ Specialisations:	Master of Engineering (Biomolecular) Master of Engineering (Chemical)