TE WHARE WĀNANGA O TE ŪPOKO O TE IKA A MĀUI
VICTORIA UNIVERSITY OF WELLINGTON

FACULTY OF ARCHITECTURE & DESIGN
Te Wahanga Waihanga-Hoahoa

2013

Trimester 2

COURSE OUTLINE

BILD321

Sustainable Engineering Systems Design

GENERAL

Trimester Two; 15 points

ASSESSMENT

100% internal by assignment

School of Architecture

CLASS TIMES AND LOCATIONS

LECTURES & TUTORIALS:	Wednesdays and Fridays 13.40 to 15.30 Room: VS 2.21

COORDINATOR

Coordinator

Name: Prof George Baird
Room: VS 3.16
Phone: 463 6231
Office Hours: Immediately following the class sessions or by appointment
Email: George.Baird@vuw.ac.nz

Tutor details will be provided at start of course

COMMUNICATION OF ADDITIONAL INFORMATION

Any changes or additions to this Course Outline will be discussed and agreed with the class, and conveyed through Blackboard or via email to all students enrolled in the course.

PRESCRIPTION

The interaction between buildings and the environment in the achievement of comfort, performance and sustainability, and the design of appropriate sustainable engineering systems at the building scale.

COURSE CONTENT

Following on from consideration of conventional environmental engineering systems (in BILD 231), this course will explore the interaction between buildings and the environment in the achievement of comfort, performance and sustainability; and the design of appropriate sustainable engineering systems at the building scale.

This course will cover the theory and practice of sustainable engineering system design and provide opportunities for problem solving at the building and urban scale.

Sustainable design issues will be reviewed at a technical and building system scale.

Particular emphasis will be placed on passive design, energy efficiency, and renewable energy, in relation to Net Zero Energy Building solutions.

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Students will review current sustainable engineering systems and apply one or more of them in the course of a live project.

Topics to be covered include: passive design solutions such as thermal chimneys and advanced natural ventilation; efficiency options related to appliances and equipment such as HVAC and lighting systems; and renewable energy generation alternatives such as wind turbines and photovoltaic arrays.

COURSE LEARNING OBJECTIVES

The main aims of this course are for you:

1. To obtain **knowledge and comprehension** of:
    a. a range of basic sustainable engineering systems.
    b. the philosophies and strategies of sustainable engineering systems design.

2. To **develop your ability**:
    a. to understand the design of complex sustainable engineering installations.
    b. to apply your knowledge of sustainable engineering systems to the design of a medium-scale building in its broader context.

GRADUATE SKILLS

Graduate Skills	*Taught*	*Practised*	*Assessed*
Knowledge			
• Information literacy	✓	✓	✓
Creative and Critical Thinking			
• Problem solving	✓	✓	✓
• Critical evaluation	✓	✓	✓
• Work autonomously		✓	✓
• Creativity and innovation		✓	✓
Communication			
• Effective communication (written)	✓	✓	✓
• Effective communication (oral)	✓	✓	✓
• Effective communication (graphic)	✓	✓	✓
• Work effectively in a team setting		✓	
Leadership			
• Ethical behaviour in social / professional / work environments		✓	
• Responsible, effective citizenship		✓	
• Commitment to responsibilities under the Treaty of Waitangi		✓	

Knowledge

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By the end of the course you should be able to:

- Understand and describe the basic features of the main types of sustainable engineering systems.
- Understand the main strategies or approaches to the design of sustainable engineering systems.

Creative & Critical Thinking

By the end of the course, if you have passed, you will have learned to:

- Appraise the sustainable engineering installations of existing complex buildings.
- Understand the main issues, challenges and opportunities for the application of sustainable engineering systems in the built environment.

Communication

By the end of the course, students who have passed will have learned to:

- Write a concise description of a selected sustainable engineering system or systems, together with examples of their application in the built environment.
- Employ appropriate representational media and software applications to convey essential research findings and design outcomes in relation to the integration of sustainable engineering systems into the built environment.

Leadership

By the end of the course, students who have passed will have learned to:

- Conduct themselves appropriately and confidently while undertaking the design of the sustainable engineering systems for a medium-scale building and presenting their proposals to the client.

TEACHING FORMAT

Course delivery will be via lectures and seminars mainly, interspersed with tutorial sessions and class presentations.

The course has two 2-hour sessions per week.

The intention is to involve both in-house academics and external practitioners in the delivery of lectures/seminars focussing on their area of specialisation, together with the clients for the live project.

Students should anticipate spending a considerable amount of time working on their specific research and design tasks; and a significant amount of time in presentations and critiques. .

The VUW Blackboard site will be used for course resources – files, announcements, project briefs, course information, project discussion boards and the like.

MANDATORY COURSE REQUIREMENTS

In order to pass the course you must achieve an overall grade of C or better.
You must also satisfy the following mandatory course requirements:

- Attend and present your work for Project 1 at the scheduled sessions.
- Complete the revisions for your Project 1 report to the required standard.
- Attend and present your work for Project 2 at the scheduled sessions.
- Achieve a grade of 'D" or higher in both projects.

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WORKLOAD

Attendance and participation is an important aspect of the learning process, and you are expected to attend all the lectures and tutorials.

If extraordinary circumstances arises that require you to be absent from some class sessions, you should discuss the situation with the Course Coordinator as soon as possible.

You should expect to spend of around 150 hours on this course, including both scheduled class time and independent study. Typically this involves around 10 hours per week during the twelve teaching weeks, with the balance during the mid-trimester break.

http://www.victoria.ac.nz/home/about_victoria/avcacademic/publications/assessment-handbook.pdf

ASSESSMENT

Two assignments will be set for this course.

Project 1 (which relates to Aims 1a and 1b) is intended to develop and demonstrate your abilities to outline the principles and practice of a selected sustainable engineering system and to describe examples of its application in existing large-scale buildings (based on descriptions in the published literature). A report of approximately six A4 pages plus no more than eight power-point slides is anticipated. This will be assembled into a class resource and may form the basis for a textbook chapter.

Due date 16th August with Presentations to Class on 21st & 23rd Aug and mandatory revisions due 13th Sept.

Project 2 (which relates to Aims 2a and 2b) is intended to develop and demonstrate your understanding of sustainable engineering systems design and your abilities to apply such systems to a medium-scale building. You will work initially in three-person teams to develop an overall strategy for the building before developing your assigned specialist contribution to greater detail. A wall display equivalent to one A1 sheet is anticipated.

Due date 18th October, with Presentations to Client on 11th October.

In both instances, Appendices may be added for completeness (from your point of view) or to support your findings, but these may not be read and will not be assessed

While students will be expected to cooperate in the course of the second assignment, assessment will be based solely on their individual reports and presentations.

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BILD321 is internally assessed by the assignment work described above. Assignments are assessed and graded A+, A, A-, B+, B, B-, C+, C, D, E, (where C is a PASS). Grades only are issued to students. The final grade for the course is based on the aggregation of the percentage marks for each of the assignments, and a final grade of C or better is required to pass the course.

NOTE: In order to ensure equity, hand-in dates cannot be modified. A hand-in date cannot be changed without permission from the Head of School.

Projects 1 and 2 contribute 50% each towards the final course grade.

Your work will be reviewed on the basis of the degree to which it meets the assessment criteria described in the Project Outlines. The School has a long tradition of providing *critical review* of student work as it progresses especially in design projects. For further information, please refer to the Website below.
Critical Review: www.victoria.ac.nz/fad/faculty-administration/current-students/faqs#criticalreview
Although visitors may be involved in some of the reviews, only the course coordinator and tutors will conduct the assessment. The course coordinator is finally responsible for the grades issued.

All work submitted for assessment must be accompanied by an Assessment Declaration Form.

All grades posted during this course are only provisional results until confirmed by the School Examiners Committee which meets after the examination period.

SUBMISSION AND RETURN OF WORK

You are responsible for ensuring your work is submitted on time and in the required format.

All project work must be submitted to the Hand-in folder on the R-Drive. This is a School of Architecture requirement to ensure that student work is appropriately archived.

Work submitted after the cut-off date late (usually one week after the Hand-in date) must be submitted directly to the Course Coordinator.

Late submissions (i.e., those submitted after the Hand-in date) will be penalised as set out below, unless an extension is approved by the Course Coordinator.

EXTENSIONS

In the event of illness or other extraordinary circumstances that prevent you from submitting a piece of work on time, or that you feel adversely affect the quality of the work you submit, it is important that you discuss your circumstances with the Course Coordinator as soon as possible so that appropriate arrangements may be made. If possible, you should complete an Application for Extension form (available from the Faculty Office) for the Course Coordinator to approve before the hand-in date. You will also need to provide suitable evidence of your illness or other circumstances. In an emergency, or if you are unable to contact the Course Coordinator, you should advise the Faculty Office of your situation.

PENALTIES

For work that arrives late without an approved extension, the following penalty will be: 5% immediately, then 5% for every subsequent 24 hours including weekends.

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REQUIRED MATERIALS AND EQUIPMENT

Students will need to provide all materials and equipment as necessary for the completion of required work and be prepared to travel to local site visits. Please check the website link below for general requirements:

www.victoria.ac.nz/fad/faculty-administration/current-students/faqs#materialsandequipment

SET TEXTS

There are no Set Texts, but the following have been placed on Closed Reserve for the duration of the course:

Baird, G.,*The architectural expression of environmental control systems*, Spon Press, London, 2001
Baird, G., *Sustainable Buildings in Practice – what the users think*, Routledge, Oxon, 2010
Duran, SC and Herrero, JF, *The sourcebook of contemporary green architecture,* Collins Design, New York, 2010
Insight Media, Strata SE1: *The wind tubines* - (VUW DVD 11283), The architects' channel, Insight Media, New York,
Twidell J and Weir, T, *Renewable Energy Resources*, Taylor and Francis, Abingdon, 2006 (2nd Edn)
Winkler, G., Green Facilities: *Industrial and Commercial LEED certification*, McGraw Hill, New York, 2011
Yeang, K and Spector, A (Eds), *Green Design – from theory to practice*, Black Dog Publishing, London, 2011

RECOMMENDED READING

A full list of relevant books will be made available on Blackboard, most of which (other than those noted above) have been placed on three-day loan.

SCHEDULE OF SESSIONS – PROVISIONAL – 20 JULY 2013

Week Month	Day	Date	Item	Room	Time	Comments Trimester 2 Begins
Week 29 **July**	M	15				**Term 2 begins**
	TU	16				
	W	17	Course Introduction & Project 1 Brief	VS2.21	13.40-15.30	
	TH	18				
	F	19	Class session	VS2.21	13.40-15.30	
Week 30 **July**	M	22				
	TU	23				
	W	24	Class session	VS2.21	13.40-15.30	
	TH	25				
	F	26	Class session	VS2.21	13.40-15.30	Withdrawal with refund D/line
Week 31 **July/ August**	M	29				
	TU	30				
	W	31	Class session	VS2.21	13.40-15.30	
	TH	1				
	F	2	Class session	VS2.21	13.40-15.30	
Week 32 **August**	M	5				
	TU	6				
	W	7	Class session	VS2.21	13.40-15.30	
	TH	8				
	F	9	Class session	VS2.21	13.40-15.30	
Week 33 **August**	M	12				
	TU	13				
	W	14	Class session	VS2.21	13.40-15.30	
	TH	15				
	F	16	Class session	VS2.21	13.40-15.30	**Hand-in Project 1**
Week 34 **August**	M	19				
	TU	20				
	W	21	Class session	VS2.21	13.40-15.30	Project 1 presentations
	TH	22				
	F	23	Class session	VS2.21	13.40-15.30	Project 1 presentations (cont)
Week 35 **August**	M	26				**Mid-trimester break**
	TU	27				
	W	28				
	TH	29				
	F	30				
Week 36 **September**	M	2				
	TU	3				
	W	4				
	TH	5				
	F	6				**Mid-trimester break ends**

Week 37 September	M	9				
	TU	10				
	W	11	Class session	VS2.21	13.40-15.30	
	TH	12				
	F	13	Class session	VS2.21	13.40-15.30	Project 1 revisions due
Week 38 September	M	16				
	TU	17				
	W	18	Class session	VS2.21	13.40-15.30	
	TH	19				
	F	20	Class session	VS2.21	13.40-15.30	
Week 39 September	M	23				
	TU	24				
	W	25	Class session	VS2.21	13.40-15.30	
	TH	26				
	F	27	Class session	VS2.21	13.40-15.30	Need Dean permit to withdraw
Week 40 September/October	M	30				
	TU	1				
	W	2	Class session	VS2.21	13.40-15.30	
	TH	3				
	F	4	Class session	VS2.21	13.40-15.30	
Week 41 October	M	7				
	TU	8				
	W	9	Class session	VS2.21	13.40-15.30	
	TH	10				
	F	11	Class session	VS2.21	13.40-15.30	Project 2 presentations
Week 42 October	M	14				
	TU	15				
	W	16	Class session	VS2.21	13.40-15.30	
	TH	17				
	F	18	Class session	VS2.21	13.40-15.30	**Hand-in Project 2**
Week 43 October	M	21				**Study/Examination Period**
	TU	22				
	W	23				
	TH	24				
	F	25				**Examination Period**
Week 44 October/ November	M	28				**Labour Day – Public Holiday**
	TU	29				
	W	30				
	TH	31				
	F	1				
Week 45 November	M	4				
	TU	5				
	W	6				
	TH	7				
	F	8				
Week 46 November	M	11				
	TU	12				
	W	13				
	TH	14				
	F	15				
	S	16				**Examination Period ends**

CLASS REPRESENTATIVES

The Faculty of Architecture and Design operates a system of Class Representatives in 100-level courses, and Year Representatives in each of the professional disciplines. Student Representatives are elected during a class session in the first week of teaching. All Student Representatives will be listed on the STUDiO notice board in the Atrium, and the relevant Representatives are also listed on studio notice boards. Student Representatives have a role in liaising between staff and students to represent the interests of students to the academic staff, and also in providing students with a communication channel to STUDiO and the Student Representation organiser.

Class Rep name and contact details:

STUDENT FEEDBACK

The Course Coordinator will discuss feedback at an appropriate time during the course.

Student feedback on University courses may be found at www.cad.vuw.ac.nz/feedback/feedback_display.php.

OTHER IMPORTANT INFORMATION

The information above is specific to this course. There is other important information that students must familiarise themselves with, including:

- Aegrotats: www.victoria.ac.nz/home/about/avcacademic/publications2#aegrotats
- Academic Progress: www.victoria.ac.nz/home/study/academic-progress (including restrictions and non-engagement)
- Plagiarism: www.victoria.ac.nz/home/study/plagiarism
- Copyright: http://library.victoria.ac.nz/library/about/policies/copyright.html
- Dates and deadlines: www.victoria.ac.nz/home/study/dates
- Faculty Current Students Site: http://www.victoria.ac.nz/fad/faculty-administration/current-students
- Grades: www.victoria.ac.nz/home/study/exams-and-assessments/grades
- Resolving academic issues: www.victoria.ac.nz/home/about/avcacademic/publications2#grievances
- Special passes: www.victoria.ac.nz/home/about/avcacademic/publications2#specialpass
- Statutes and policies including the Student Conduct Statute: www.victoria.ac.nz/home/about/policy
- Student support: www.victoria.ac.nz/home/viclife/studentservice
- Students with disabilities: www.victoria.ac.nz/st_services/disability
- Student Charter: www.victoria.ac.nz/home/viclife/student-charter
- Student Contract: www.victoria.ac.nz/home/admisenrol/enrol/studentcontract
- Turnitin: www.cad.vuw.ac.nz/wiki/index.php/Turnitin
- University structure: www.victoria.ac.nz/home/about
- VUWSA: www.vuwsa.org.nz

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Work Submitted for Assessment

Declaration Form

Student's full name :

Course :

Assignment/project :
(number and title)

Date submitted :

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Refer to the information on Academic Integrity, Plagiarism and Copyright on the back of this form.
I confirm that:

- I have read and understood the University's information on academic integrity and plagiarism contained at www.victoria.ac.nz/home/study/plagiarism and outlined below:
- I have read and understood the general principles of copyright law as set out below:
- This project/assignment is entirely the result of my own work except where clearly acknowledged otherwise:
- Any use of material created by someone else is permitted by the copyright owner.

Signed:

Date:

Academic Integrity, Plagiarism and Copyright

ACADEMIC INTEGRITY

Academic integrity is important because it is the core value on which the University's learning, teaching and research activities are based. University staff and students are expected to treat academic, intellectual or creative work that has been done by other people with respect at all times. Victoria University's reputation for academic integrity adds value to your qualification.

Academic integrity is simply about being honest when you submit your academic work for assessment

- You must acknowledge any ideas and assistance you have had from other people.
- You must fully reference the source of those ideas and assistance.
- You must make clear which parts of the work you are submitting are based on other people's work.
- You must not lie about whose ideas you are submitting.
- When using work created by others either as a basis for your own work, or as an element within your own work, you must comply with copyright law

(Summarised from information on the University's Integrity and Plagiarism website:
www.victoria.ac.nz/home/study/plagiarism

PLAGIARISM

The University defines plagiarism as presenting someone else's work as if it were your own, whether you mean to or not. 'Someone else's work' means anything that is not your own idea. Even if it is presented in your own style, you must acknowledge your sources fully and appropriately. This includes:

- Material from books, journals or any other printed source
- The work of other students or staff
- Information from the internet
- Software programs and other electronic material
- Designs and ideas
- The organisation or structuring of any such material

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Find out more about plagiarism, how to avoid it and penalties, on the University's website:
www.victoria.ac.nz/home/study/plagiarism

COPYRIGHT

Copyright law regulates the use of the work of an author, artist, designer or other creator.

- Copyright applies to created work including designs, music, computer programs, artistic and literary work.
- The work can be in printed, digital, audio, video or other formats.
- Normally the author or creator of a work owns the copyright for their lifetime and for 50 years after their death, (although sometimes someone other than the creator of a work owns the copyright to the work, such as the creator's employer, or a person who commissions the creator's work).
- You must have permission from the copyright owner to copy, alter, display, distribute or otherwise use created work.
- If the creator has applied a Creative Commons licence to a work, this permits others to use the work but only in accordance with that licence.

Further copyright information is available on the Victoria University website:
http://library.victoria.ac.nz/library/about/policies/copyright.html