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COURSE TITLE: Bio-inspired Design in Veracruz			
Course Number (*)	ENGG 523		
Pre/Co-Requisites (*)	Third year standing		
Faculty / Department	SSE/Mechanical and Manufacturing Engineering		
Instructor Name (*)	Dr. Marjan Eggermont	Email (*)	meggermo@ucalgary.ca
Instructor Email Policy	Responds to emails within 24 hours on weekdays		
Office Location	MEB 515	Office Hours	n/a
Physical requirements	To be reasonably fit		
Class Dates (*)	Spring 2019: April 29-May 9		
Class Times (*)	Group Study: April 29-30 from 9 am to 12 noon, May 2-9		
Class Location (*)	U of C campus April 29-30, Veracruz Sate May 2-9		

COURSE INFORMATION/ DESCRIPTION OF THE COURSE
<p>Engineering can take inspiration from nature to develop new products, processes, and systems, or improve existing designs. Topics in this course include design by analogy, functional biology, principles and techniques of biomimicry and bio-inspired engineering methods. Students will gain experience and a working knowledge of ideation, concept development and will create a bio-inspired engineering project. This experience is designed for students as an intensive, interdisciplinary, and experiential service learning introduction to bio-inspired design in a natural setting as the main component of this group study program. Includes dialog, field trips and guided visits, and info sessions lead by the community.</p>
*LEARNING RESOURCES
<p>A list of materials will be posted on D2L.</p> <p>Technology Requirements A shell in D2L is set up for this course where materials will be posted to be used in group presentations, discussions, and assignment submission purposes. A laptop, desktop, or mobile device is required for D2L access and for the April 29 - 30 sessions.</p> <p>What students need to bring to the field (full list on D2L)</p> <ul style="list-style-type: none"> -Sleeping bag -Sleeping pad -Headlamp or flashlight -Prescription medications (if applicable) -Quick-dry towel -Water bottle -Sunscreen -Hiking boots or shoes & clothing suited suited for a variety of terrain -Health & Hygiene items such as toothbrush and toothpaste, menstrual pads etc.



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***COURSE LEARNING OUTCOMES** At the end of this course, students will be able to:

1. Describe how to incorporate bio-inspired design in their discipline and practice.
2. Propose solutions to problems through bio-inspired thinking and abstracting from nature to generate a model of a function, process or system.
3. Define and apply key concepts employed in bio-inspired design through the experience of creating novel biomimetic projects.
4. Understand and apply the design process using biomimicry principles, a living systems approach, and regensis development frameworks.
5. Observe, sketch, and research organisms and systems in nature for innovation in design.
6. Reflect on their experience in the field and articulate their learning and development.

***ASSESSMENT COMPONENTS**

Assessment Method	Description	Weight	Aligned Course Learning Outcome
Student field notebook (individual)	Students will keep detailed notes and sketches in class and in the field. These will be key in the success of the final project. Students are expected to keep their own thorough notes and take part in field observation sketching activities.	30%	1,2, 3, 4, 5
Field assignments (individual)	Students will be asked to do 3 'in field' assignments which may include short presentations.	15%	1,2,3,4,5
Participation	Field and class participation. See page 5 for group study expectations.	20%	1,2,3,4,5
Bio-inspired research project	Based on knowledge and experiences in the field students will work in small groups to propose digital or analog design solutions to challenges posed. This project is due two weeks after returning from the field.	35%	1,2,3



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***ASSESSMENT AND EVALUATION INFORMATION**

***ATTENDANCE AND PARTICIPATION EXPECTATIONS**

In class and field participation are key components for your final grade. Please refer to page 5.

***GUIDELINES FOR SUBMITTING ASSIGNMENTS**

All files (PDF) are to be uploaded to Dropbox in D2L (exceptions may be made by the instructor). The files must be readable so please review before sending. Additional formatting requirements will be discussed in class. **Note:** It is the student's responsibility to keep a copy of each submitted assignment and to ensure that the proper version is submitted. Including a version date in your file name may be useful.

***FINAL EXAMINATIONS**

No final exam.

***EXPECTATIONS FOR WRITING**

Department policy directs that all written assignments (including, to a lesser extent, written exam responses) will be assessed at least partly on writing skills. Writing skills include not only surface correctness (grammar, punctuation, sentence structure, etc.) but also general clarity and organization. Sources used in research papers must be properly documented. If you need help with your writing, you may use the writing support services in the Learning Commons. For further information, please refer to the official online University of Calgary Calendar, Academic Regulations,

E. Course Information, E.2: Writing Across the Curriculum:
<http://www.ucalgary.ca/pubs/calendar/current/e-2.html>

LATE ASSIGNMENTS

Assignments submitted after the deadline may be penalized with the loss of a grade (e.g.: A- to B+) for each day late.



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GRADING SYSTEM

Letter Grade	Total Mark (T)
A+	$T \geq 98.0\%$
A	$93.0\% \leq T < 98.0\%$
A-	$90.0\% \leq T < 93.0\%$
B+	$87.0\% \leq T < 90.0\%$
B	$83.0\% \leq T < 87.0\%$
B-	$80.0\% \leq T < 83.0\%$
C+	$77.0\% \leq T < 80.0\%$
C	$74.0\% \leq T < 77.0\%$
C-	$70.0\% \leq T < 74.0\%$
D+	$65.0\% \leq T < 70.0\%$
D	$55.0\% \leq T < 65.0\%$
F	$T < 55.0\%$



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Engg 523 Group Study has the following Standards/Expectations for Professional Student Behavior:

- Attendance and punctuality-- establishing and maintaining a regular schedule; following the group's operational schedule; arriving on time; being prepared to engage as a professional; providing prompt notification of (rare) tardiness or absences
- Respectful demeanor and interactions-- demonstrating respect and deference to instructors/clients/peers
- Professional language and communications-- demonstrating professional oral, graphical, and written (including electronic) communication skills; using discretion and appropriate professional language in addressing instructors/clients /peers; "filtering" language to limit emotional reactivity/content
- Appropriate effort and initiative-- collaborating with one's group to identify and complete work tasks; completing higher priority tasks before secondary tasks; following through on appointed tasks and activities; showing a genuine interest, initiative and engagement in the field experience; demonstrating intellectual and professional curiosity and insightfulness
- Accountability and integrity-- being accountable to the group's expectations; completing tasks and activities in a professional, high quality and timely manner; maintaining professional integrity and honesty in all activities/interactions
- Boundary maintenance and ethical practice-- maintaining strict personal-professional boundaries in the real and virtual class environment, especially in relation to social media (e.g. Facebook); sparing use of electronic devices
- Emotional self-regulation-- attending to one's emotional reactivity and triggers; taking responsibility for one's feelings/behavior and avoiding blame; avoiding the expression of raw emotions; being personally and professionally centered when engaging with instructors/peers; using appropriate professional language (spoken and written) to filter emotional content; demonstrating a willingness to resolve potential difficult relationships and modify one's behavior accordingly; not expecting special consideration or 'entitlement'
- Responsiveness to feedback-- demonstrating non-defensive receptivity to feedback and suggestion; showing a willingness to be self-reflective and self-corrective



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INTERNET AND ELECTRONIC COMMUNICATION DEVICE INFORMATION

The use of laptop and mobile devices is acceptable when used in a manner appropriate to the course and classroom activities. Students are to refrain from accessing websites that may be distracting for fellow learners (e.g. personal emails, Facebook, YouTube).

Students are responsible for being aware of the University's Internet and email use policy, which can be found at <https://www.ucalgary.ca/policies/files/policies/electronic-communications-policy.pdf>

*MEDIA IN LEARNING ENVIRONMENTS

Media recording for lesson capture

The instructor may use media recordings to capture the delivery of a lecture. These recordings are intended to be used for lecture capture only and will not be used for any other purpose. Although the recording device will be fixed on the Instructor, in the event that incidental student participation is recorded, the instructor will ensure that any identifiable content (video or audio) is masked, or will seek consent to include the identifiable student content to making the content available on University approved platforms.

Media recording for assessment of student learning

The instructor may use media recordings as part of the assessment of students. This may include but is not limited to classroom discussions, presentations, or other components that occur during the course. These recordings will be used for student assessment purposes only and will not be shared or used for any other purpose.



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*UNIVERSITY OF CALGARY POLICES AND SUPPORTS

*ACADEMIC ACCOMMODATION

Students seeking an accommodation based on disability or medical concerns should contact Student Accessibility Services; SAS will process the request and issue letters of accommodation to instructors. For additional information on support services and accommodations for students with disabilities, visit www.ucalgary.ca/access/. Students who require an accommodation in relation to their coursework based on a protected ground other than disability should communicate this need in writing to their Instructor. The full policy on Student Accommodations is available at <http://www.ucalgary.ca/policies/files/policies/student-accommodation-policy.pdf>.

*ACADEMIC MISCONDUCT

For information on academic misconduct and its consequences, please see the University of Calgary Calendar at <http://www.ucalgary.ca/pubs/calendar/current/k.html>

*FREEDOM OF INFORMATION AND PROTECTION OF PRIVACY

Student information will be collected in accordance with typical (or usual) classroom practice. Students' assignments will be accessible only by the authorized course faculty. Private information related to the individual student is treated with the utmost regard by the faculty at the University of Calgary

*Wellness and MENTAL HEALTH RESOURCES

"The University of Calgary recognizes the pivotal role that student mental health plays in physical health, social connectedness and academic success, and aspires to create a caring and supportive campus community where individuals can freely talk about mental health and receive support when needed. We encourage you to explore the excellent mental health resources available throughout the university community, such as counselling, self-help resources, peer-support or skills-building available through the SU Wellness Centre (Room 370, MacEwan Student Centre), <https://www.ucalgary.ca/wellnesscentre/services/mental-health-services> and the Campus Mental Health Strategy website <https://www.ucalgary.ca/mentalhealth/>"

*SUPPORTS FOR STUDENT LEARNING, SUCCESS, AND SAFETY

***Student Ombudsman:** The Student Ombuds' Office supports and provides a safe, neutral space for students. For more information, please visit www.ucalgary.ca/ombuds/ or email ombuds@ucalgary.ca

***Student Union:** The SU Vice-President Academic can be reached at (403) 220-3911 or suvpaca@ucalgary.ca; Information about the SU, including elected Faculty Representatives can be found here: <https://www.su.ucalgary.ca>

***Graduate Student's Association:** The GSA Vice-President Academic can be reached at (403) 220-5997 or gsa.vpa@ucalgary.ca; Information about the GSA can be found here: <https://gsa.ucalgary.ca>



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Student Success Centre: The Student Success Centre provides services and programs to ensure students can make the most of their time at the University of Calgary. Our advisors, learning support staff, and writing support staff assist students in enhancing their skills and achieving their academic goals. They provide tailored learning support and advising programs, as well as one-on-one services, free of charge to all undergraduate and graduate students. For more information visit:

<https://www.ucalgary.ca/student-services/student-success>

***EMERGENCY EVACUATIONS AND ASSEMBLY POINTS**

As part of the University of Calgary Emergency Evacuation plan, students, faculty, and staff should locate the closest Assembly Point in case of Fire Alarm. Safety signage is posted throughout the campus showing the locations and the possible route to these locations. All students, faculty, and staff are expected to promptly make their way to the nearest Assembly Point if the Fire Alarm is activated. No one is to return into campus facilities until an all clear is given to the warden in charge of the Assembly Area. For more information, see <http://www.ucalgary.ca/emergencyplan/node/55> <https://www.ucalgary.ca/emergencyplan/building-evacuation/assembly-points>

***SAFEWALK**

Campus security will escort individuals, day or night, anywhere on campus (including McMahon Stadium, Health Sciences Centre, Student Family Housing, the Alberta Children's Hospital and the University LRT station). Call 403-220-5333 or visit <http://www.ucalgary.ca/security/safewalk>. Use any campus phone, emergency phone or the yellow phone located at most parking lot pay booths. Please ensure your personal safety by taking advantage of this service.