**CIVL 200 - Take-Home Examination (10% of course grade) June 22 - 24, 2015**

*STEP ONE:*

*Put your full name in the header of this word file, answer the two questions below, then save this word file as lastname\_CIVL200.doc.*

*STEP TWO:*

*Upload the file into the CONNECT assignment box located on the TAKE HOME EXAM page of the CIVL 200 CONNECT site before 9am, JUNE 24.*

***Submit only your own work.***

**QUESTION 1 (6 marks)**

Member states of the United Nations have defined 11 Sustainable Development Goals (SDGs) for 2030, all aimed at providing guidance for both public and private policy as well as regulations. Goals 6, 11 and 12 are particularly relevant to engineering practice.

Go to the following website, where you will find a list of the SDGs and also each goal’s sub-goals.

<http://sustainabledevelopment.un.org/sdgsproposal.html>

Or, if you want to use an interactive site, go to this one:

<http://www.theguardian.com/global-development/ng-interactive/2015/jan/19/sustainable-development-goals-changing-world-17-steps-interactive>

Read through and review goals 6, 11, and 12, including each goal’s sub-goals.

***Name two UN Sustainable Development sub-goals that describe an adaptive challenge and, for each sub-goal you identify, explain why you think it requires adaptive leadership.***

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| In response to the question, it is first pivotal that the context is fundamentally defined so as to fully comprehend the essence and motivation behind each development goal. This, in effect, would pave the train of thought necessary to adequately classify an adaptive challenge, and the traits of adaptive leadership required in achieving effective results.  The United Nations first witnessed the introduction of Sustainable Development Goals through a formal outcome document delivered by Rio+20 at its 68th General Assembly. The mandate, in general, highlighted the urgent need to conceptualize and implement effective techniques that were ‘action oriented, global in nature and universally applicable’. These Sustainable Development Goals (SDGs), have since been integrated into the United Nation’s global agenda for development. The goals, in short, are heavily based on the noble notion of striving towards a world that is committed to sustainable economic, social and environmental development.  As abovementioned, the very concept of adaptation, in itself, requires defining of some sort. Adaptation, as illustrated by Marty Linsky’s TEDx talk on adaptive leadership, generally relates to the alteration in an entity’s structure or function so as to fit a changed environment. This adjustment, often revolves around the absolute need to give up existing, traditional methodologies in order to adopt more relevant strategies. When structured according to the context of this question, we can further infer adaptive challenges as situations requiring changes in values, ideologies, relationships and approaches to work. More importantly, they often require changes across multiple cross organizational boundaries. Adaptive challenges, inherently, are easy to recognize, but difficult to handle.  Hence, in essence, adaptive leadership exemplifies the economical distribution of losses (due to the need to adjust outdated techniques or ideologies), and how an individual can effectively incorporate large-scale progression while mitigating resistance due to these so-called ‘uncomfortable’ changes. In accordance to Module 8, we can further observe that adaptive leaders often structured process whereby they continuously perceive the given, volatile situation before making intellectual deductions. These deductions and inferences are then specifically utilized to implement long-term solutions that largely deal with the inherent nature of the problem.  With a diverse globe varying in ideologies and practices, adaptive challenges are a direct repercussion of implementing SDGs. The two sub-goals, in fact, that sufficiently demonstrate these problems are the need to promote sustainable public procurement practice in accordance with national policies and priorities (12.7), and the need to reduce waste generation through prevention, reduction, recycling and reuse (12.5)  Sustainable public procurement practices, in general, aims to provide a wide-ranging framework in defining the process of goods and service acquisition. A framework, in fact, that supersedes conventional cost-benefit analysis and incorporates environmental, economic and social impacts. This, in effect, requires an increased degree of collaboration and engagement between all parties in the supply and demand management.  Why then, is it an adaptive challenge? Diverting from the traditional norms of conventional procurement practices, it is easy to infer the adaptive challenges associated with this sub-goal. In terms of supply, industries are resistant to changes due to seemingly reliable methodologies that allow for reduced manufacturing and production costs. Employees, individually speaking, will generally prefer the old structured routine utilized to meet production quota. Besides, with production quota now affected, industries will then be forced to review business and production strategies. Intrinsically speaking, this changes the very identity of how a company operates. Extrinsically, cooperation and collaboration with other organizations may be deemed inefficient due to differing beliefs and methods. Lengthy negotiations bear the risk of failed compromises, and may amount nothing in return. This, in itself, requires a shift in an organization’s perspective in regard to dealing with other industries  In terms of demand, an individual of the public may initially reject the notion of rising product prices due to the subsequent need to change one’s spending habits and livelihood.  Adaptive leadership, therefore, is crucial in assessing and interpreting the aforementioned situations before applying specified strategies. On the aspect of supply, directors of their respective industries must first be persuaded on the necessity of sustainable practices (in correlation to national policies) through the use of case studies and firsthand experience. Examples include presenting detailed evidence and statistics from other companies who have adopted sustainable procurement technique, as seen in the paper ‘The Impacts of Sustainable Public Procurement’ published by UNEP. An adaptive leader must then take the proactive role in mapping out key strategies to restructure the work routine so as to inherently improve employees’ productivity even in a changing work environment. Lastly, an adaptive leader will initiate relationships with other external industries based on solid business practices and sustainable solutions.  On the aspect of demand, an adaptive leader will take the initiative in establishing campaigns so as to educate the public on the long-term perks of acquiring of products under sustainable procurement practices.  The second sub-goal deals largely with the inevitable need to pay special attention to adverse environmental impacts produced by cities. With the population of megacities postulated to the increase exponentially over the next few decades, there are bound to be many adaptive challenges accompanying this ambitious sub-goal to reduce waste generation. Megacities, in particular, often prioritize economic development over environmental issues, subsequently resulting in rapid commercial growth at the expense of massive amounts of generated waste. In addition, due to the multi-faceted aspects of megacities, residents often span across a large spectrum of living conditions, with an even boarder range in regards to awareness on reduction in waste production.  An adaptive leader, therefore, would firstly need to educate the residents on the health and social benefits of a city with minimal waste generation. Social campaigns and programs are necessary for this. In addition, incentives could be utilized to reward reduced waste production so as to eventually cultivate individual habits of recycling and reusing. Industries, within cities, must be given opportunity to explore other methods of waste disposal. Moreover, collaborations with other industries are required to allow the mutual sharing and usage of waste for other aspects of production. A key example of this is Kalundborg, Denmark. |

**QUESTION 2 (4 marks)**

Read Lesson 2 (which is entitled: “The socio-economic background and environmental responsibility”) in Chapter 1 (entitled “Introduction to environmental ethics”) of

Vromans et al (2012) *Environmental Ethics: An Introduction and Learning Guide*. Greenleaf Publishing, Sheffield.

i.e. read pages 17 to 21 of the following pdf:

<http://www.greenleaf-publishing.com/content/pdfs/enveth_ch1.pdf>

***2.a What three concepts have you learned from CIVL 202 that are relevant to Lesson 2?***

Write a bullet list.

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| 1. The concepts on systems thinking, and the incorporation of systems theory in evaluating how the world operates. 2. The versatile idea of scenario planning, and how it is necessary for the future. 3. The very notion of engineering for sustainability. More specifically, the inculcation of ethics in correlation to various codes of ethics. |

***2.b For each of the three concepts you identify in 2.a above, explain why/how it is relevant to Lesson 2.***

Write 2 or three sentences for each concept.

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| 1. The concept of systems thinking can immediately be identified through the author’s listing of various (seemingly different) categories in relation to how they link to the environment. By listing the distinct components, such as the spectrum of technology usage or the repercussions of an economic crisis, and how they relate to the environment, such as how artificially created life (through increased technology) can disturb ecosystems or the reduction of greenhouse gas emissions due to decrease consumer demand, we can recognized the incorporation of systems theory. As abovementioned, the relationship are seen, along with the context of the system (that is, the focus on environmental impacts) and the feedback information flow (this is aptly illustrated in how reduced consumerism in natural gases, while caused by increased awareness in climate change, is, at the same time, contributing an environmental impact). 2. Throughout the whole article, the author seeks to weigh out the possible environmental outcomes that may arise due to the several different categories of causations that range from technology usage to the environmental responsibility. The very notion of scenario planning encompasses the act of postulating the most plausible, alternative futures through the identification of relevant effects that might arise across a vast range of disastrous events. The article, in short, illustrates that by very briefly considering how certain broad categories, such as the economy or future technology usage, has the potential to affect environment in the same few relevant methods. 3. The idea that seems to resonate throughout the article, however, is how crucial ethics plays a role in ensuring the prolonged health of the environment. By illustrating the desperate need for the link between personal interest and protect of nature, the author presents the fundamental requirement for ethical individuals to feel morally responsible in positively impacting the environment. This, in essence, proves the relevance of engineering for sustainability, and how it is inherently the link between professional practice (through the APEGBC sustainability guidelines and code of ethics), personal interest, and long-term protection for the environment. |