

APS1009 COURSE: Natural Resources Projects & Management -2019

INSTRUCTOR: Prof. Eduardo Fernandez

Overview:

Natural Resources and Natural Resources Sustainable Projects provide mankind with important ecosystem services such as Clean Water, Sustainable Clean Environment, Energy, Energy Renewables and Energy Non-Renewables, Minerals and Biological resources from terrestrial and marine ecosystems, which are essential for the survival and development of mankind. And for new urban development, special mention to new and smart cities, and rural development. However, the increasing demands for these natural resources, due to the growth of the human population, International Geo-Political Strategy, high demand of minerals for the manufacture of IT and new technology devices for all different fields and applications, including ecommerce, Manufacturing, New industrial innovations and processes, new technologies, Health care new devices, Transportation advancement and automation, for power generation and distribution and rapidly global urban development (e.g. China and India), combined with the slow decrease in availability of these finite resources, and the current accelerated effects of Climate Change worldwide, All this new realities, bring about an urgent calls for new sustainable management on projects related to Natural Resources (2019) and the application of new best Management practices with much more efficient usages of Natural Resources, and the implication on Natural resources projects and project management, 2019, for fixing the ill linear economy we are all living transforming It into a real Sustainable New Circular Economy: Reuse, Recycle, Repair, Redesign for sustainability and Conservation of Natural Resources.

Course Description:

This course aims to help students develop the necessary Management capabilities required of engineers working in Sustainable Natural Resources Projects and Natural Resources Public and Private enterprises and/or Joint Ventures related to Natural Resource Projects, offering a unique view of the interdisciplinary challenges that are present today in 2019, on this field and provides the knowledge to identify and develop sustainable solutions. Learning the necessary management tools, like analysis of the role of the different Stakeholders for the project, Project Finance-Non Recourse Financing, P3 Public Private Partnership, economical and international geo-political and political conditions and environment, Project Social considerations including The Social Benefit of the project and also The Triple Bottom Line :People-Planet-Profit, Sustainable Project Risk analysis and life cycle considerations in the project (Projects on Water, Environment, Energy, New Energy sources, Mining, Fishing, Rivers, lakes, Forest, Local climate change projects are areas of Natural Resources projects in this course)

We will analyze real case studies based on the management of Natural Resources Projects, on Public sector, private sector, P3 Public Private Partnership, and also public enterprises that are in charge of planning and developing national resources not only in Canada but also internationally in Develop countries and developing countries. We will have guest speakers with experience in different Natural Resource Projects no only in Canada but also Internationally. Students will be evaluated as follows:

- 25 % participation in class, case studies and assignments
- 40 % group or individual project
- 35 % final test ----- During the course there will be tutorials by appointments.

Course Content:

- 1) Introduction
 - 1.1) Natural Resources and Management, -2019- The water Crisis. Energy. Sustainability and the new Circular Economy-Reuse-Recycle-Re-Design
 - 1.2) Natural Resources: People and Planet, economical aspects. China & India
 - 1.3) The need for Natural Resources Management and related Enterprises
 - 1.4) Natural Resources Planning Issues, Fiscal Deficits and Natural Resources
 - 1.5) Improving Public Enterprise for Natural Resource Management
 - 1.6) Performance measurement within the Public Enterprise
 - 1.7) Natural Resources in Canada
 - 1.8) The Present: Development and the extractive Industries
- 2) Management Objective-Managing Tools on Natural resources Projects
 - 2.1) Benefits / Costs Analysis in Natural Resources Management
 - 2.2) Policy, Planning, Organization and Administration as a Management System
 - 2.3) Public Enterprise, Private Enterprises, PPP and Advocacy System
 - 2.4) Planning Process and Stakeholders
 - 2.5) Examples of Agency Planning
 - 2.6) Water Management Project: Public Enterprise and Management
- 3) Natural Resources Enterprises Business and Coordination
- 4) Natural Resource Project and Enterprises Management
 - 4.1) Management Tools
 - 4.2) Benefit Cost Analysis
 - 4.3) Financial Management:
 - 4.3.1 Capex & Opex
 - 4.3.2 Project Finance: issuing bonds and Cash Flow forecast
 - 4.4) Project Management within the Public Enterprise
 - 4.5) Process Management, KPI and KGI
 - 4.6) Team oriented organization within the Public Enterprise
- 5) National Funds managing Natural Resources proceeds, Investing Internationally
 - 5.1) Example to follow: The Government National Pension Fund of Norway
- 6) International Contracts and Investment in Natural Resources Management.
 - 6.1) P3
 - 6.2) Type of Contracts
 - 6.3) Concerns dealing with Expropriation
- 7) Case Studies and Lessons Learned
 - 7.1) Nuclear Energy Project in Canada
 - 7.2) Water Project Management
 - 7.3) A Canadian Company developing an Energy Project in Colombia
 - 7.4) Risk Management in Natural Resource Projects

- 8) Sustainable Energy, Projects and Management. Renewables & non Renewables
 - 8.1) Managing the Need for Natural Resources as Energy Sources
 - 8.2) Current effects of international geo-political environment.
 - Trade war China-USA- Other players on natural resources: Russia
 - 8.3) Minerals Project Management and Risks
- 9) The present 2019: Discussion on AI, ML and Blockchain: innovation on natural resource management & projects, AI, The New Economy, Big Data, Blockchain, ML. The big race for 5G. Strategies and international projects on Natural Resources.

The Future: Natural Resources Projects and Management, an Optimistic Approach

Academic references for this course:

Required:

- New Course Pack 2019 for APS1009H * U. of T., Prof. Eduardo Fernandez
- Harvard Business Publication and Stanford University Case Studies (TBA)
- No Textbook is required

Suggested text for additional relevant learning:

- Dunlap, Richard. Sustainable Energy. Cengage Learning.
- Natural Resource Management and The Circular Economy-2019
- Environmental Sustainability for Engineers and Applied Scientist-2019

Day to Day Calendar-DRAFT

Start Date: Wednesday, September 11th

End Date: Wednesday, December 4th

Week #	Date	Topics	Reading & Assignment
1	09/11/19	Introduction to Sustainable Projects on Natural Resources Management and Enterprise. Project Description. Sustainability and the new economy. Developing Countries: Usages of Natural Resources Planning, Policy, Management and Administration. Fiscal deficits. Commodities Price LME Management Tools: SWOT Analysis in NR	Sustainability Climate Change/effect on Natural Resources (TBA)
2	09/18/19	Business responds to Sustainability-Investment. Issues on Public Natural Resources Enterprises. Business Overview on Natural Resources, PPP, Benefit-Cost Analysis International Natural Resources projects The Stakeholder Management Process	Harvard Business /Water Issues Water Crisis in India TBA
3	09/25/19	Financial Management, CAPEX & OPEX, Cash Flow Forecast, Cash Flow & Country Risk Process Management, BPM & BPT, Natural resources Management in Canada	The Resource Gap/Canada
4	10/02/19	National Funds managing Natural Resources proceeds. Development Agencies. International Contracts and Investment/ Natural Resources. PPP- Public Private Partnership	Harvard B/TBA Natural Res. Contract Renegotiations
5	10/09/19	International Natural Resources Management Case Studies, Lessons Learned Water Project Management Rethinking Institutions for Natural Resource Management. (3*), Performance Measurement	Water Crisis – Article and Case.
6	10/16/19	Sustainable Energy and Natural resources	TBA
7	10/23/19	International Business Cases in Natural resources Nuclear Energy Project in Canada Guest Speaker	TBA
8	10/30/19	Improving Public Enterprise Performance in Management of Natural Resources. KPI and KGI	The TNK-BP joint venture
9	11/06/19	Sustainability- Environmental Impact and Health concern with Natural resources development-CSR -Conflict Minerals- ----- Guest Speaker	Sino Iron in Australia
10	11/13/19	A Canadian Company developing Energy Project in Colombia- Guest Speaker Risk Management in Natural Resource Projects	The Galore Creek Project.
11	11/20/19	Management Tools, Coordination, The Future, Natural Resources Enterprise Optimistic Approach, Group Project Presentations	Paper Due.
12	11/27/19	Group Final Team Project Presentations	FINAL EXAM TBA
13	12/04/19	Group Final Project Presentation -Final Exam TBA	

Some of The Management tools to be learned in this course of Natural Resources Projects and Management for your learning process and the team final project:

The Sustainable Project and Strategy

Project Finance in Natural Resource Development and projects

Stakeholder mapping and initial analysis

SWOT Analysis

Life Cycle consideration on the Project and after

Business Process Management

Canvas Business Model

CAPEX-OPEX

Cash Flow Forecast

Benefit-Cost Analysis

Business Process Analysis

Factors on Project Risk Analysis

The Concept of Project Finance as non-recourse financing. P3. The participants and their roles

Managing Stakeholders and Coordination within the Enterprise and/or within the Project

Lessons to be learned from The Instructor's experience plus 3 experienced guest speakers.

The New Circular Economy consideration.

Board of Director's role and best practices
