

SEDV 613: ENERGY SYSTEMS III: PLANNING AND ENERGY ECONOMICS

Assessment of foundations in economics and planning in the energy system. Financial principles and evaluation techniques, and their application to energy planning.

Instructor:

TBD

Course Objective:

The course covers basic macro-economic theory and concepts (from the international and national perspective), micro-economic theory and concepts (from the organizational, community and project perspective), and their relationship with sustainable development. The course specifically addresses the overlap of the economic, environmental and social dimensions to understand how to use economic concepts and tools to promote sustainable initiatives, policies, programs, investments, and projects.

- To acquire a basic understanding of mainstream economics and alternative economic perspectives of sustainable development (i.e., weak sustainability, strong sustainability, and human development).
- To be able to use the various tools and methods associated with each of the perspectives of sustainable development such as, environmental economics, ecological economics, and social choice.
- To acquire a basic understanding of the policy implications and trade-offs involved with each of the perspectives of sustainable development.
- To acquire a basic understanding of the use, creation, and maintenance of the five capitals: financial, built, human, social, and natural.
- To be able to read a balance sheet, income statement, and cash flow statement with some understanding of what information each contains and how each is useful for decisions regarding the five capitals.
- To be able to read an environmental, sustainability, or corporate responsibility report with some understanding of what information these reports contain, how they are prepared, and how they fulfill an organization's accountability to society.
- To apply tools of financial and managerial decision-making that can be used regarding strategic and operational activities to make sound sustainable decisions. These tools will include the following: fixed, variable costs and levelized costs of energy; breakeven analysis; payback period; and internal rate of return.

Topics Covered (Selected):

- Foundations of Finance: the time value of money, interest rates, exchange rates, annuities and perpetuities.
- Economics and sustainable development: inter-generational equity, intra-generational equity, discount rates, market failures, public goods, limits to growth, ecological footprint, ecosystem services
- Planning and sustainable development: corporate social responsibility, creating shared value, benefits corporation, circular economy, public relations, systems thinking and design, transition theory, risk management, sustainability principles, sustainable development goals
- Interactions between energy and the economy: energy and economic growth, demand analysis, supply analysis, macro versus sectoral models, energy scenarios, energy conservation and demand side management