Outline of Materials for Final Exam in EEP101/ECON125

1. **Basic Definitions:**
   *Lecture slides 2*
   *Section notes 1*
   You should be able to define:
   - Pareto optimal
   - Perfect competition
   - Competitive equilibrium
   - Main theory of welfare economics

2. **Welfare Economics and Negative Externality:**
   *Lecture slides 2 to 7*
   *Section notes 2 to 4*
   1. Social welfare = CS + PS + GR - TEC where GR is the net government revenue and TEC is the total externality cost
   2. Equilibrium conditions: should be able to solve mathematically and graphically the equilibrium for each of the following:
      - Social optimum (MSC = MSB)
      - Competitive equilibrium (MPC = MPB)
      - Monopoly (MPC = MR)
      - Monopsony (MO = MB)
      - Middleman (MO = MR)
   3. Solve for welfare distribution: once you find the equilibrium, you should be able to derive the welfare distribution (CS, PS, and DWL) both mathematically and graphically under each of the different market conditions
   4. Solve for optimal tax/subsidy and standard and find welfare distribution (using equilibrium conditions)
   5. Coase Theorem (definition, graphical solution and welfare)
   6. Choice of taxes and standards, and tradable permits
   7. Weitzman model (intuition, graph and main results)
   8. Elasticity Effects on Magnitude of Externalities

3. **Technology Adoption:**
   *Lecture slides 8*
   *Section notes 5*
   1. Mathematically compute whether individuals would adopt a new technology. Using this framework, analyze how policies (i.e. affecting output price, input prices, pollution taxes, fixed adoption costs, research and development, etc.) would affect adoption.
   2. S-curve: heterogeneity of individuals, or imitation

4. **Public Goods:**
   *Lecture slides 9 and 10*
   *Section notes 6*
   1. Definition of public good and pure public good (also congestion costs)
   2. Homogeneous demand: solve for quantity provided, entry fee, and distribution of welfare under management by government, concessionaire, and monopolist.
   3. Heterogeneous demand: solve for quantity provided, entry fee, and distribution of welfare under management by government, concessionaire, and monopolist.

5. **Valuation of Environmental Benefit**
Lecture slides 11
Section notes 7
(1) Types of benefits: use and non-use benefits
(2) Methodologies to measure benefits (discuss methodology, advantages, and disadvantages)
   - Hedonic pricing
   - Travel cost
   - Contingent Valuation

6. Risk Population and the Environment:
Lecture slides 13
Section notes 7
(1) Risk assessment model and derivation of risk distribution
(2) Policy objective under risk consideration (precautionary principle)

7. Natural Resource Economics
Lecture slides 14 and 15
Section notes 8
(1) General understanding of discounting and investment decisions based on Net Present Value

8. International Economics and the Environmental Kuznets Curve (EKC)
Lecture Slides 16 and 17
Section notes 11
(1) Comparative advantage and gains from trade
(2) Heckscher Ohlin theorem and Stolper Samulson theorem
(3) Discussion of potential social and environmental effects of trade in this context
(4) Definition of EKC
(5) Policy implications of acceptance of EKC
(6) Criticisms
(7) Possible structural explanations

9. Environmental Services
Lecture slides 18
Section notes 12
(1) What are we referring to?
(2) Familiarity with major programs and some examples we discussed
(3) Discussion of environmental services and poverty alleviation

10. Climate Change
Lecture slides 19
(1) Effect on agricultural regions and winners or losers
(2) Adaptation by farmers and factors that will determine the success of adaptation
(3) Types of economic policies that can be used to slow climate change including basic knowledge about Kyoto protocol

11. Pesticide Economics
Lecture slides 20
Section notes 13
(1) Mathematical model of pest control:
   - Threshold model
   - Individual optimality conditions and optimal pesticide use
(2) Preventive versus responsive application
(3) Pros and Cons of pesticide use including discussion of resistance

12. Biotechnology
*Lecture slides 21*
(1) General understanding of issues
(2) Discussion of Potential environmental effects of usage and banning
(3) Precautionary principle in this context

13. Sustainable Water Use
*Lecture slides 22*
*Section notes 14*
(1) Changing market conditions
(2) Historical rights versus tradable water rights (including graphical illustration)
(3) Optimal price of water
(4) Technology adoption (see 3. Technology adoption)