A. **Course Objectives:** Review of sources and differences in economic growth experiences of nations; sustainability of economic growth; convergence in economic growth rates; sources of technical change, including endogenous or induced technical change and rise of institutionalized research and invention; technical innovations and industrial change; the role of physical sciences, including chemistry and information science and technology, and biological sciences, including agriculture and biotechnology, in modern economic growth; economics of adoption, diffusion and technology transfer; interrelationships between public and private sectors; economics of science and technology policy, including intellectual property rights, universities of science and technology, sources of funding and funding mechanisms, and organization of science and technology.

B. **Grading:**

1. Exams: Midterm                                                    35%
   Final                                                           45%

2. Short paper on any topic of course: 4 pages (Undergraduates)   20%
   10 pages (Graduates)

C. Course Outline and Reading list (see separate sheets)
Econ 486X
Science and Technology and Economic Growth
Outline

I. Introduction

II. Theories of Economic Growth

III. The Sources of Technical Change
   A. Discovery, Invention, and Innovation
   B. Technical and Institutional Innovation
   C. Technology Adoption, Diffusion, and Transfer

IV. Technical Innovation and Industrial Change
   A. Physical Sciences
      1. Chemicals
      2. Semi-Conductors
   B. Biological Sciences
      1. Agriculture
      2. Biotechnology

V. Science and Technology Policy

Required Text:
Science and Technology and Economic Growth

I. Introduction

II. Theories of Economic Growth

III. The Sources of Technical Change
A. Discovery, Invention, and Innovation

B. Technical and Institutional Innovation

C. Technology Adoption, Diffusion, and Transfer

IV. Technical Innovation and Industrial Change
A. Physical Sciences
1. Chemicals
   a. Ruttan, V.W. “Technical Change in the Chemical Industry,” in
Technology, Growth, and Development, pp. 286-315.

2. **Semi-conductors**

B. **Biological Sciences**

1. **Agriculture**

2. Biotechnology
Economics, Iowa State University, July 2003.


V. Science and Technology Policy


Science and Technology and Economic Growth

I. Introduction

II. Theories of Economic Growth

III. The Sources of Technical Change
A. Discovery, Invention, and Innovation


B. Technical and Institutional Innovation


C. Technology Adoption, Diffusion, and Transfer


IV. Technical Innovation and Industrial Change

A. Physical Sciences

1. Chemicals

2. Semi-conductors

B. Biological Sciences

1. Agriculture


2. **Biotechnology**


V. Science and Technology Policy


