[A-3]COURSE SYLLABUS

1. Course Description (Approximately 100 words)

The main objective of the course is to explore the principles and methods by which the mammalian organism maintains stable, efficient and "near-optimal" performance and homeostasisin the face of external and internal perturbations. The distinct biological systems responsible for this overall task range from the large scale physiological (nervous, endocrine, immune, circulatory, respiratory, etc) to the cellular (growth and proliferation regulation, DNA damage repair, etc) and the sub-cellular (gene expression, protein synthesis, metabolite regulation, etc). The course presents a control engineering perspective of the function, organization, and coordination of these multi-scale biological systems and the control mechanisms that enable them to carry out their functions effectively. Presented in modules, the course will cover background material on the physiology of endogenous biological control systems (physiological, cellular and molecular

2. Course Goals and Objectives (Approximately 100 words)

In this course, students will:
1. learn the ecological and evolutionary principles behind biological control programs
2. develop the ability to critically evaluate the success or failure of extant plant and insect pest bio-control programs.
3. develop written and oral communication skills through the written evaluation of current bio-control programs and oral presentation of these arguments

3. Textbook (Title, Author, Publisher, Year of Publication, etc.)

Biological Control Systems Analysis, 1966 by john milsum (Author)

Feedback Control in Systems Biology 1st Edition by Carlo Cosentino (Author), Declan Bates (Author)

4. Reference

Feedback Control in Systems Biology 1st Edition by Carlo Cosentino (Author), Declan Bates (Author)

5. Course Requirements and Grades

EXAMINATION = 70%
CONTINUOS ASSESSMENT TESTS (2) = 20%
ASSIGNMENTS = 10%

TOTAL = 100%

6. Course Calendar

Week	Main Content
1	TYPES OF SYSTEMS
2	SIGNAL FLOW
3	TIME RESPONSE ANALYSIS OF CONTROL SYSTEM
4	TIME DOMAIN SPECIALIZATION
5	THE CONCEPT OF STABILITY
6	ROUTH STABILITY CRITERION
7	C.A.T.
8	CONSTRUCTION OF ROOT LOCI
9	FREQUENCY RESPONSE ANALYSIS
10	NYQUIST STABILITY CRITERION
11	DIFFERENTIAL EQUATIONS
12	CARDIOVASCULAR CONTROL SYSTEM
13	PUPIL CONTROL SYSTEM:
14	EXAMINATION