KNES 689M – MOTOR CONTROL THEORY

DATE & TIME: Lectures -- Wednesdays 4-6 pm (CHE 2116)
CREDIT HOURS: 3
PREREQUISITES: None
INSTRUCTORS: Dr. John Jeka 2357 SPH jjeka@umd.edu
Dr. Tim Kiemel 2339 SPH kiemel@umd.edu
OFFICE HOURS: by appointment

COURSE DESCRIPTION
The course will review and discuss fundamental problems in motor control and neuroscience. The historical basis for these problems and most current thinking will be emphasized. Exemplary behaviors such as posture, locomotion and reaching will be used throughout to highlight concepts.

GOALS AND MEASURABLE OBJECTIVES
By the end of the course, students will be able to:
1. Compare and contrast theories of motor behavior.
2. Discuss specific research issues that have led to new theoretical developments.
3. Identify and debate current problems in motor control.
4. Motivate a research question that would test an important issue in motor behavior.

Readings - assigned on a weekly basis on Blackboard site.

WEEKLY SCHEDULE

2/2 INTRODUCTION
Topic 1: The Control problem

2/9 REFLEX


2/16 DIMENSIONAL REDUCTION

2/23 POSTURAL SYNERGIES


**3/2 UCM approach – guest lecture from Dr. John Scholz (U of Delaware).**


**3/9 AGAINST SYNERGIES**


**3/16 Midterm Exam**

**Topic 2: The Estimation/Planning Problem**

**3/30 ANTICIPATORY MOVEMENTS**


**4/6 MULTISENSORY FUSION**


**4/13 BAYESIAN CODING**


**Final Project Outline due!**

**4/20 INTERNAL MODELS**


**Short paper due!**

4/27 TBA

5/4 TBA

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**COURSE POLICIES**

**Grading Procedure**

**Discussion Board** (30%)
Each student must contribute to the Discussion Board each week by 5 pm on the Monday before each class. Students are expected to contribute their thinking about the topic, based upon readings and class discussions. Students can also add papers, results from their own work or results from other labs that are relevant to the topic.

**Short Papers.** (20%)
Each student must hand in a 2-3 page paper at the end of each topic which summarizes their thinking on the topic.

**Class Participation** (20%)

**Final Projects** (30%) can be either:
i) The final project is a paper based upon a topic of interest related to the course or an experiment. Each student is required to write a paper that pertains to one of the problems covered in the course and relate it to your own research interests. A Final Project Outline is due by April 13, containing the following sections:
a. 1-page introduction on the topic
b. framework of paper – breakdown of sections, logical flow of paper
c. list of major references (at least 10)

ii) Writeup of a experimental research (see Dr. Jeka to discuss details).
Class Participation
The University policy on attendance is available on http://www.testudo.umd.edu/soc/atedasse.html and in the Undergraduate Catalog. This policy includes information about overall class participation including: religious holidays, inclement weather, excused absences, makeup exam.

Email – The Official University Correspondence
Verify your email address by going to www.my.umd.edu.

All enrolled students are provided access to the University’s email system and an email account. All official University email communication will be sent to this email address (or an alternate address if provided by the student). Email has been adopted as the primary means for sending official communications to students, so email must be checked on a regular basis. Academic advisors, faculty, and campus administrative offices use email to communicate important and time-sensitive notices.

Students are responsible for keeping their email address up to date or for redirecting or forwarding email to another address. Failure to check email, errors in forwarding email, and returned email (from “full mailbox” or “unknown user” errors for example), will not excuse a student from missing University announcement, messages, deadlines, etc. Email addresses can be quickly and easily updated at www.my.umd.edu or in-person at the Student Service Counter on the first floor of the Mitchell Building.

For technical support for University email: www.helpdesk.umd.edu or call 301-405-1400.

Late work and Missed Exams / Assignments
Make-up Policy:
Without documentation of a University-excused absence, there will be no make-ups for ANY of the course requirements/assignments. This includes the examinations, discussion section activities, final project, and quizzes/in-class assignments. If a student does have a University-excused absence, the professor AND the appropriate teaching assistant must be notified twenty-four (24) hours prior to the date in question and alternate arrangements will be made.

Students are expected to attend each lecture and the appropriate discussion section. In addition to missing important material which will be the focus of the examinations, failure to attend will prevent the student from completing the in-class assignments or quizzes (see Make-up Policy above). Moreover, the student is expected to be on-time for the lecture to remain for the entire class period. In-class assignments may be given in the beginning, middle, or end of a lecture. If you miss an assignment due to tardiness or early departure, there will be no make-ups.

Students will be required to submit assignments via Blackboard. This includes weekly discussion assignments, components of the semester project, etc. Your TA will demonstrate how to do this during the first discussion section. However, there are two important guidelines for on-line submitting:

1) To avoid any potential problems or errors in formatting, we strongly recommend students to submit documents in PDF format. Many of the
computers on campus have Adobe software to convert into a PDF. If students cannot convert to a PDF, assignments **MUST** be submitted in the 2003 Microsoft Word (i.e., .doc) format. The 2007 Microsoft Word version (.docx) will absolutely **NOT** be accepted.

2) Students must submit assignments with the following naming convention:

   LastName_FirstName_Section#_AssignmentTitle

   Example: Jeka_John_0101_ASG1LitReview

If these guidelines are not followed, the assignment will not be graded and will automatically receive a grade of zero (0).

Students are expected to complete the assigned readings that are posted on the course website (see Course Schedule for a list of these readings). These readings will supplement the lectures as well as the discussion sections and the material covered in these readings will be included in the lecture examinations, in-class assignment/quizzes, and discussion section activities.

**Religious Observances**

The University System of Maryland policy provides that students should not be penalized because of observances of their religious beliefs; students shall be given an opportunity, whenever feasible, to make up within a reasonable time any academic assignment that is missed due to individual participation in religious observances. **It is the student’s responsibility to inform the instructor at the beginning of the semester or at least one week in advance of any intended absences for religious observance.**

The policy that includes information about Religious Observance is available on: http://www.president.umd.edu/policies/iii510a.html

**Special Accommodations / Disability Support Services**

If you have a documented disability and wish to discuss academic accommodations for test taking or other needs, you will need documentation from Disability Support Service (301-314-7682). If you are ill or encountering personal difficulties, please let the instructor know as soon as possible. You can also contact Learning Assistance Services (301-314-7693) and/or the Counseling Center (301-314-7651) for assistance. The University services for students with disabilities is available on: http://www.counseling.umd.edu/DSS/avail_services.html

**Academic Integrity**

The University’s code of academic integrity is designed to ensure that the principle of academic honesty is upheld. Any of the following acts, when committed by a student, constitutes academic dishonesty:

- **CHEATING**: intentionally using or attempting to use unauthorized materials, information, or study aids in an academic exercise.
- **FABRICATION**: intentional and unauthorized falsification or invention of any information or citation in an academic exercise.
- **FACILITATING ACADEMIC DISHONESTY**: intentionally or knowingly helping or attempting to help another to violate any provision of this code.
- **PLAGIARISM**: intentionally or knowingly representing the words or ideas of another as one’s own in any academic exercise.
The Honor Pledge is a statement undergraduate and graduate students should be asked to write by hand and sign on examinations, papers, or other academic assignments. The Pledge reads:

_I pledge on my honor that I have not given or received any unauthorized assistance on this assignment/examination._

The University of Maryland, College Park has a nationally recognized Code of Academic Integrity, administered by the Student Honor Council. This Code sets standards for academic integrity at Maryland for all undergraduate and graduate students. As a student you are responsible for upholding these standards for this course. It is very important for you to be aware of the consequences of cheating, fabrication, facilitation, and plagiarism. For more information on the Code of Academic Integrity or the Student Honor Council, please visit [http://www.shc.umd.edu](http://www.shc.umd.edu).

**Inclement Weather / University Closings**

In the event that the University is closed for an emergency or extended period of time, the instructor will communicate to students regarding schedule adjustments, including rescheduling of examinations and assignments due to inclement weather and campus emergencies. Official closures and delays are announced on the campus website ([http://www.umd.edu](http://www.umd.edu)) and snow phone line (301-405-SNOW), as well as local radio and TV stations.

**Early Warning Grades:** Early warning grades will be submitted for those undergraduate students who are newly enrolled at Maryland. These grades are an important component of our retention efforts as they provide timely feedback to those students who are unfamiliar with our academic expectations. A letter grade or “satisfactory/unsatisfactory” (S/U) marks may be submitted.

**Course evaluation:** Your participation in the evaluation of courses through CourseEvalUM is a responsibility you hold as a student member of our academic community. Your feedback is confidential and important to the improvement of teaching and learning at the University as well as to the tenure and promotion process. CourseEvalUM will be available online ([www.courseevalum.umd.edu](http://www.courseevalum.umd.edu)) for you to complete your courses evaluations. By completing all of your evaluations each semester, you will have the privilege of accessing the summary reports for thousands of courses online at Testudo.

**Available Support Services**

The University has a legal obligation to provide appropriate accommodations for students with special needs (permanent or temporary, physical or mental). If a student has a documented special need and wishes to discuss academic accommodations, please contact the instructor within one (1) week of the first day of class.