Course Request and Maintenance System

Course Approval Form
(Approved)

Coll./Schl./Div.: College of Engineering
Dept./Comm./Prog.: Electrical Engineering
Action: NEW
Course Level: Graduate Course
Course Type: Standard Course
Effective: Summer 2010
Offered once only: No
Offered summer sessions only: No
Quarter(s) Offered: Summer
Last Approved Form (Submitted: )
Notes:

Proposed

Course Number: EE 270

Renumbered From:

Course Title: Introduction to Video Bioinformatics

E-Z Segment Title:

Units: 3

Activity(ies): Lecture, 3 hours per week (group activity)

Prerequisite(s): graduate standing or consent of instructor

Description: An introduction to video bioinformatics. Includes microscopic techniques, live imaging, video computing, structure and function of cells, spatiotemporal dynamics, multi-scale analysis, disk and data storage, indexing and queries, image and video databases, and medical imaging and analysis techniques.

Grading
Type: Letter Grade or petition for Satisfactory/No Credit (S/NC)
In Progress: No
Statement: May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and graduate advisor
Repeatable: No

Maximum

Units:

Statement:

Cross-listed With:

Credit Statement:

If repeatable, may be taken more than once per quarter: No

Breadth Statement:

Instructor(s): Professor Bir Bhanu

Justification:
The Video Bioinformatics IGERT program is interdisciplinary. It develops new techniques and analytical tools for video bioinformatics. This summer course will ensure that all students in the IGERT program have minimum basics in the broad areas of engineering, computer science and life sciences. The aim is to introduce students with diverse backgrounds to some of the fundamental in imaging, biology and video computing.

Correspondence:

Overlaps/Duplicates Other Courses: No

Affects Programs: No

Affects Prerequisites/Descriptions: No

Syllabus:

EE 270
Introduction to Video Bioinformatics

The course format includes presentation by the instructors and discussion in class. The course is geared for IGERT or other students who may be interested in Video Bioinformatics. Based on homework assignments and a final exam students will receive 3 units of credit or S/NC.

Instructors

Bir Bhanu (EE)
Vassilis Tsotras (CSE)
Victor Rodgers (Bioengineering)
Prue Talbot (Cell Biology and Neuroscience)
Zhenbiao Yang (Botany and Plant Sciences)
Andy Obenaus (Adjunct Professor at UCR, Loma Linda Univ. Medical Center)
Bahram Parvin (LBNL, Adjunct Prof. in EE at UCR)

Lecture notes and supplemental material consisting of papers and references will be put on iLearn for this graduate level course. Home works will also be put on iLearn. Students will spend approximately 6 hours per week outside of the class in reading all the lecture notes, supplemental material and doing the home work. Note the lecture notes will also have web links associated with them.

Lecture Schedule (Total 30 hours)

Topic, Instructor (hours)
- Video Bioinformatics Overview, Bhanu (2)
- The structure and function of cells from all major groups of organisms, Talbot (2)
- Overview of microscopic techniques used to study cells, Talbot (1)
- Live imaging, confocal microscopy, spatiotemporal dynamics, cellular structures, green fluorescence proteins, the cytoskeleton, Yang (4)
- Stem Cells, Talbot (1)
- Image and Video Computing, Bhanu (3)
- Multi-scale analysis and dynamic cellular response to action potential, Rodgers (4)
- Analysis of microscopic and genomic data, biology of cancer, Parvin (4)
- Relational database systems; relational model; disks and data storage; query languages; indexing and hashing; query processing, Tsotras (4)
- Image and video databases, Bhanu (1)
- Computed tomography and positron emission tomography: overview, Obenaus (1)
- Magnetic Resonance Imaging -fundamentals, applications and opportunities, Obenaus (3)

Grading:
75% Comprehensive Final Exam
25% Homework assignments
100%

Approvals:
Department/Committee/Program Faculty:
Submitted by Department/Committee/Program Chair: Roger Lake 10/26/2009
Reviewed by Courses Specialist: C. Spina 04/30/2010
Reviewed by Dean of

https://crms.ucr.edu/crms/printForm.print_course?p_sCourse_id=1000012180&p_sRev... 11/29/2012
College/School/Division: Reza Abbaschian 05/03/2010

Executive Committee
College of Engineering:
College of Humanities, Arts, and Social Sciences:
College of Natural and Agricultural Sciences:
Division of Biomedical Sciences:
Graduate School of Education:
Graduate School of Management:
University Honors Program:

Dean of the Graduate Division: Alan E. Williams 05/04/2010
Graduate Council: Alan E. Williams 05/04/2010
Committee on Courses: THEDA SHAPIRO 05/04/2010