



SACRAMENTO STATE

Program Proposal Form B

Vice 09-10 #12

Attachment D
Faculty Senate Agenda
March 25, 2010

Academic Group (College): HHS	Date of Submission to College Dean: 9-16-09
Academic Organization (Department): Kinesiology and Health Science	Requested Effective: Fall __, Spring X , 2010 __.
Department Chair: Fred Baldini	Contact if not Department Chair: Harry Theodorides

Title of the Program:
Personal Trainer/Strength and Conditioning Certificate

Type of Program Proposal:

- Modification in Existing Program:**
- Substantive Change**
 - Non-Substantive Change**
 - Deletion of Existing Program**

New Programs

- Initiation (Projection) of New Program on to Master Plan**
- New Degree Programs**
 - Regular Process**
 - Fast Track Process**
 - Pilot Process**
- New Minor, Concentration, Option, Specialization, Emphasis**
- New Certificate Program**

PLEASE NOTE: Form B is to be used only as a Cover Form. Additional information is requested for each of the above as noted in the corresponding procedure in the Policies and Procedures for Initiation, Modification, Review and Approval of Courses and Academic Programs found at <http://www.csus.edu/aca/uni/manual/index.htm>

Briefly describe the program proposal (new or change) and provide a justification.

Additional information to be added at the top of the program.

Description:

The catalog description will be changed to indicate that a minimum of C grade in all classes will be required. A suggested sequence of classes is given, and KINS 160 OR KINS 137 will replace KINS 139 which is no longer offered.

Justification:

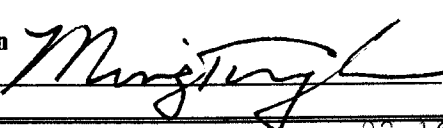
The purpose of the change is to provide guidance to the student taking courses to complete the certificate. This would provide students a suggested order to take the courses in and what would be an appropriate minimum grade for courses listed to complete the certificate.

Approvals:

Department Chair:  Date: **9-16-09**

College Dean:  Date: **10/21/09**

University Committee:  Date: **11/20/09**

Associate Vice President and Dean for Academic Affairs:  Date: **11/20/2009**

(CURRENT) Requirements • Personal Trainer/Strength and Conditioning Certificate			(CHANGE) Requirements • Personal Trainer/Strength and Conditioning Certificate		
Units required: 28			Units required: 28		
			The program includes a minimum of 28 units of specified coursework. All courses listed must be completed with a "C" or better. A suggested order of classes is listed below.		
Units			Units		
3	FACS 113	Nutrition and Metabolism (BIO 010 or BIO 020; CHEM 001A or CHEM 006A)	3	FACS 113	Nutrition and Metabolism (BIO 010 or BIO 020; CHEM 001A or CHEM 006A)
3	KINS 120	Scientific Bases of Physical Conditioning	3	KINS 120	Scientific Bases of Physical Conditioning
3	KINS 132	Planning, Designing and Managing a Fitness Center	3	KINS 132	Planning, Designing and Managing a Fitness Center
3	KINS 139	Leadership and Communication	3	KINS 139	Leadership and Communication
2	KINS 144	Analysis of Weight Training	3	KINS 137	Sociology of Sport OR
3	KINS 151	Kinesiology (BIO 022)		KINS 160	Sport and Exercise Psychology
3	KINS 152	Physiology of Exercise (BIO 131 or equivalent)	2	KINS 144	Analysis of Weight Training
3	KINS 153	Cardiovascular Testing and Exercise Prescription (KINS 152 or instructor	3	KINS 151	Kinesiology (BIO 022)
3	KINS 156	Care of Athletic Injuries	3	KINS 152	Physiology of Exercise (BIO 131 or equivalent)
2	KINS 194A	Assigned Field Experience in Kinesiology OR	3	KINS 153	Cardiovascular Testing and Exercise Prescription (KINS 152 or instructor permission)
	KINS195A	Directed Field Experience in Kinesiology	3	KINS 156	Care of Athletic Injuries
			2	KINS 194A	Assigned Field Experience in Kinesiology OR
				KINS195A	Directed Field Experience in Kinesiology



SACRAMENTO
STATE

Program Proposal Form B



Academic Group: <i>Natural Sciences & Mathematics</i>	Date of Submission to College Dean: October 14, 2009
Academic Organization: <i>Department of Physics & Astronomy</i>	Requested Effective: Spring 2010
Department Chair: <i>Hossein Partovi</i>	Contact if not Department Chair:
Title of the Program: Scientific Computing & Simulation	
Type of Program Proposal: New Certificate Program	
<p>I. BRIEF DESCRIPTION. This is a proposal for establishing a certificate program in Scientific Computing & Simulation (SCS). It requires 8 units of lower-division courses as basic science background, currently required of nearly all science and engineering majors, and two upper-division courses dealing with the basics of computing, simulation, and modeling. It is open to all students, and specifically intended for students in the Colleges of Natural Sciences & Mathematics and Engineering & Computer Science. This program may be characterized as providing the basics of electronic calculation, simulation, and modeling which supplement our traditional lower-division physics and mathematics education in the two colleges.</p> <p>II. JUSTIFICATION. Electronic simulation, modeling, and computing today encompass a broad range of applications, from the problems of production engineering to the simulation of new chemical compounds and materials, mapping genetic codes to models of self-producing molecules and life, the subatomic world of high energy to the cosmic realm of galaxies, intricate details of financial engineering to the abstract problems of mathematics and computer science, and in short, any question susceptible to quantitative formulation. As such, these skills lie at the core of STEM disciplines, and this proposal addresses a much needed programmatic focus that will prepare our students for today's industrial and academic careers by a combination of basic principles and practical training.</p>	
Approvals:	
Department Chair: <i>M. Hossein Partovi</i>	Date: <i>10/14/09</i>
College Dean: <i>Laurel Dufferen</i>	Date: <i>10/22/09</i>
University Committee: <i>[Signature]</i>	Date: <i>11/20/09</i>
Associate Vice President and Dean for Academic Affairs: <i>Margie Tingle</i>	Date: <i>11/20/2009</i>

2. Purpose of the certificate program & certificate guidelines

There are two primary objectives for the proposed *Scientific Computing and Simulation* (SCS) certificate program:

- Responding to current trends in academic and industrial career paths in STEM disciplines which increasingly emphasize extra-curricular experiences, especially general computational skills of simulation and modeling.
- Reorganizing the elective courses offered by the Physics & Astronomy Department with a view to making them better focused and more relevant to students' future careers, as well as achieving better resource efficiency by targeting a wider group of students.

The proposed program clearly meets the guidelines for certificate programs as it has a well-defined objective different from existing degree programs (as stated above), requires a sequence of degree credit course work (see item 5 below), and provides a specific competence widely sought by academic and industrial sectors.

3. Need for the Program

The two primary objectives stated under item 2 arise from (i) the need to provide our students with the skills and competencies widely sought, and in some cases required, by almost all future career paths in STEM areas, and (ii) the urgent need to redesign our elective course offerings in order to make them more relevant and marketable, as well as more resource-efficient and sustainable under current and future budgetary conditions.

4. Impact on other Academic Programs

The two upper-division courses comprising the core of this program, PHYS 162 and 163 (see item 5 below), have no equivalent on campus, so there will be no negative impact on other units. Examples of computationally oriented courses are CHEM 245 (Computational Chemistry) or BIO 224 (Genomics, Proteomics, and Bioinformatics), and a number of programming courses in the Computer Science Department. An inspection of these courses shows that they are different in content, objectives, prerequisites, and level of covered material. Generally speaking the two courses constituting the core of this proposal, namely PHYS 162 and 163, stand to the above-mentioned offerings as the general science and mathematics courses stand to the specialized courses in science and engineering departments. In other words, while these courses may in certain respects be considered introductory or complementary with respect to the more specialized ones such as the graduate courses named above, they are nevertheless quite different in both level and focus. In case of the courses offered by the ECS college, the proposed courses are focused on an altogether different area of application of computers, namely *scientific* computing. On the other hand, the proposed certificate program is expected to have a positive impact on other courses and programs focused on computer applications by virtue of providing the students with the relevant background as well fostering their interest in the subject. A perusal of similar offerings at other institutions supports the necessity of basic scientific

computing courses as background and support for specialized science or engineering style courses.

5. Requirements

The *Scientific Computing & Simulation* certificate program requires the completion of 14 credit units detailed below with an overall GPA of no less than 2.50.

Required Course work

5a. Background courses 8 units

All majors other than Mathematics:

PHYS 5A and 5B, or two of PHYS 11A, B, C

(These are existing lower-division physics requirements for nearly all NSM and ECS disciplines.)

Mathematics majors:

105A and 105B

5b. Scientific computing courses 6 units

PHYS 162 *Scientific Computing: Basic Methods* (3 units)

PHYS 163 *Scientific Computing: Modeling, Simulation, and Visualization* (3 units)

These upper-division courses are revised versions of our *Computational Physics* and *Mathematica workshop*; see the attached "Course Change Proposal Form A" for the revised courses. A typical schedule for completing the course requirements is:

Year	Fall Semester	Spring Semester
AY 1	PHYS 11A or 5A	PHYS 11B or 11C or 5B
AY 2	PHYS 162	PHYS 163

6. Department & Faculty

The primary unit responsible for the proposed program is Physics & Astronomy, and the faculty involved in implementation are

- **Hossein Partovi** (Professor and Chair, Physics & Astronomy)
- **Jerome Bürki** (Assistant Professor, Physics & Astronomy)

Other faculty in the department may be involved in teaching the above courses. An effort will be made to engage interested faculty in the NSM and ECS Colleges to mentor, supervise, or advise on capstone student projects in PHYS 163.

7. Duration

This program is being proposed without a termination date at this time and is expected to endure, subject to frequent evaluation and assessment.

8. Number and Background of Participants

All students in STEM disciplines, primarily from the Colleges of NSM and ECS, are considered potential participants. The number of participants is expected to be in the 12-24 range during the first few semesters, and grow thereafter.

9. Resource Considerations

As stated above, this program may be considered part of a plan to reorganize the elective offerings of the Physics & astronomy Department. An objective of this reorganization is to achieve better resource-efficiency by increasing enrollment. In recent years, the Department has taught PHYS 162, *Computational Physics* (3 units), as well as a PHYS 199, *Mathematica Workshop* (1-2 units, repeatable). Thus, considering the fact that as this program is phased in some of the other elective courses (e.g., the "old" PHYS 162, PHYS 186) will be phased out, it is clear that the expected net effect of the program will be to increase the resource efficiency of the elective offerings in the Department without requiring additional teaching unit outlays overall. With respect to other resources such as equipment (primarily computers in this case), the existing computers in the Department (e.g., instructional laptop computers) as well as software available to the Department and University will meet the needs of the required courses in the foreseeable future. The Department set up a *Linux* cluster of 9 desktop machines (University recycle units) in S08. In addition, one of its new faculty members (J. Bürki) has recently acquired two relatively powerful workstations (each with two Intel Xeon CPU's) using his startup funds. Thus, there is ample computing hardware capacity for large-scale computation as well.



SACRAMENTO STATE

Program Proposal Form B



Academic Group (College): Engineering and Computer Science	Date of Submission to College Dean:
Academic Organization (Department): Electrical and Electronic Engineering	Requested Effective: Fall __, Spring <u>X</u> , 2010.
Department Chair: Suresh Vadhva	Contact if not Department Chair: Perry L Heedley

Title of the Program (Please be specific; indicate minor, undergraduate or graduate degree, etc.):
Certificate Program in Mixed-Signal Integrated Circuit Design (graduate level)

Type of Program Proposal:

- Modification in Existing Program:
 Substantive Change
 Non-Substantive Change
 Deletion of Existing Program

 New Programs
 Initiation (Projection) of New Program on to Master Plan
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 Regular Process
 Fast Track Process
 Pilot Process
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Briefly describe the program proposal (new or change) and provide a justification.

Graduate students studying mixed-signal integrated circuit (IC) design take several courses focused in this area to become knowledgeable and proficient in the different skills this demanding field requires. This requires studying multiple subjects such as amplifier design, device physics and matching, analog layout techniques, and key mixed-signal building blocks. In addition, they need to learn the methods and tools used to design and layout ICs. This new certificate in mixed-signal integrated circuit design will recognize the commitment and accomplishments of graduate students studying in this area, and provide potential employers with evidence of the skills these students have developed. No additional fiscal or space resources are required.

Approvals:

Department Chair: Suresh Vadhva Date: 10/12/2009

College Dean: John Colaneri Date: 10/14/09

University Committee: [Signature] Date: 11/20/09

Associate Vice President and Dean for Academic Affairs: Ming Tang Date: 11/20/2009

Proposed Requirements for the Certificate Program in Mixed-Signal Integrated Circuit Design (graduate level)

Itemized list of required courses :

1. EEE 230 (3 units) Analog & Mixed-Signal Integrated Circuit Design
2. EEE 231 (3 units) Advanced Analog & Mixed Signal Integrated Circuit Design
3. EEE 232 (3 units) Key Mixed-Signal Integrated Circuit Building Blocks
4. EEE 236 (3 units) Advanced Semiconductor Devices
5. EEE 235 (1 units) Mixed-Signal Integrated Circuit Design Laboratory

Plus one of the following elective courses :

1. EEE 234 (3 units) Digital Integrated Circuit Design
2. EEE 238 (3 units) Advanced VLSI Design-For-Test I
3. EEE 239 (3 units) Advanced VLSI Design-For-Test II
4. EEE 110 (3 units) Advanced Analog Integrated Circuits

TOTAL = 16 units

Certificate Program in Mixed-Signal Integrated Circuit Design

This certificate in mixed-signal integrated circuit design will recognize the commitment and accomplishments of graduate students studying in this area, and provide potential employers with evidence of the skills students have developed. Graduate students studying mixed-signal integrated circuit (IC) design will become knowledgeable and proficient in the different skills this demanding field requires. This requires studying multiple subjects such as amplifier design, device physics and matching, analog layout techniques, and key mixed-signal building blocks. In addition, students will learn the methods and tools used to design and layout ICs.

NEW PROGRAM	OLD PROGRAM
A. Required Courses	
(13 units)	
EEE 230 (3 units)	+++++
Analog & Mixed-Signal Integrated Circuit Design	
EEE 231 (3 units)	+++++
Adv Analog & Mixed Signal Integrated Circuit Design	
EEE 232 (3 units)	+++++
Key Mixed-Signal Integrated Circuit Building Blocks	
EEE 236 (3 units)	+++++
Advanced Semiconductor Devices	

EEE 235 (1 unit)

+++++

Mixed-Signal Integrated Circuit Design Laboratory

B. Elective Courses

(select 1 from the following list)

EEE 234 (3 units)

+++++

Digital Integrated Circuit Design

EEE 238 (3 units)

+++++

Advanced VLSI Design-For-Test I

EEE 239 (3 units)

+++++

Advanced VLSI Design-For-Test II

EEE 110 (3 units)

+++++

Advanced Analog Integrated Circuits