



EVP2013-05-6330  
P6-200

# THE FACULTY SENATE

May 28, 2013

## MEMORANDUM

**TO:** Dr. R. Bowen Loftin, President

**FROM:** John N. Stallone, Speaker *John N. Stallone*

**SUBJECT:** Approval of Undergraduate Curriculum Committee Items (**FS.30.160**)

At its regular meeting on May 13, 2013, the Faculty Senate approved the following items from the Undergraduate Curriculum Committee. The Faculty Senate submits for your approval. Attached is a copy of the material sent to our Senators.

**Special Consideration– April 12, 2013**  
 Dwight Look College of Engineering  
 Department of Industrial and Systems Engineering  
 Certificate in Engineering Systems Management  
 Request for a new certificate program

Thank you for your time and consideration. Please inform me of your action in this matter.

### Attachment

### FACULTY SENATE AGENDA ITEM REVIEW

cc: Karan Watson  
 Pamela Matthews  
 Michael Benedik  
 Sandra Williams  
 M. Katherine Banks

This item has been reviewed by the Office of the Provost (OP). Below are recommended action(s): RE: FS.30.160

Approved:       Reviewed:

<i>Presidential Action:</i> <input checked="" type="checkbox"/> Recommend Approval <input type="checkbox"/> Review Only	<i>OP Recommended Action</i> <input type="checkbox"/> Hold for Further Review <input type="checkbox"/> Hold Released _____ <input type="checkbox"/> System Review/Submission <input type="checkbox"/> BOR Approval <input type="checkbox"/> THECB Approval/Notification <input type="checkbox"/> SACSCOC Approval/Notification
---	--

*R. Bowen Loftin*  
 R. Bowen Loftin, President

7/1/13  
 Date

8. Special Consideration

**Dwight Look College of Engineering**

Department of Industrial and Systems Engineering  
Certificate in Engineering Systems Management  
Request for a new certificate program

## **SPECIAL CONSIDERATION**

# **SPECIAL CONSIDERATION**

**DWIGHT LOOK COLLEGE OF ENGINEERING**

DEPARTMENT OF INDUSTRIAL AND SYSTEMS ENGINEERING

CERTIFICATE IN ENGINEERING SYSTEMS MANAGEMENT

REQUEST FOR A NEW CERTIFICATE PROGRAM

# Texas A&M University

## New Certificate, Bachelors, Masters, or Doctoral Program

### ♦ Proposal Checklist ♦

Requested by the Department or Unit of : ISEN

**Program Type, Level, Designation, Title, Description, Hours**

Program Type             Certificate Program                              Degree Program   
 Program Level             Undergrad Certificate      Grad Certificate      Bachelor      Master      Doctoral   
 Degree Designation (*i.e., BS, BA, MA, MS, MAgr, Med, PhD, EdD, etc.*)                     \_\_\_\_\_

Title of proposed program:             Certificate of Engineering Systems Management  
 Proposed CIP Code (*if known*):             14.3501.00

Brief program description (*provide a catalog description for undergraduate and graduate certificates*):  
 In many areas of government and industry there is a significant need for undergraduate engineering students that possess the requisite knowledge and skill sets pertaining to engineering systems management in addition to their basic engineering discipline. With the rapid acceleration of technology through innovation on a global basis, industries recognize the need for young engineers who possess base line knowledge in areas of management and an understanding of the system level of complex engineered systems. This certificate program includes a set of courses to assure students develop this knowledge and skill set.

Minimum program semester credit hours (SCH)             Certificates - 12 hours\*             Bachelors - 120 hours             Masters - 30 hours

Proposed program hours:   12   \_\_\_\_\_   \_\_\_\_\_

*\*12 hours minimum to appear on transcript*

**Off-Campus or Distance Delivery**

% of Program a student can take off-campus or through Distance Education		<u>Program Start Date</u>	<u>SACS Approval**</u>	<u>When Provost needs to inform SACS</u>
<input type="checkbox"/>	25%	_____	Notification Only	-----
<input type="checkbox"/>	50%	_____	Approval Required	6 months before first day of program
<input type="checkbox"/>	80%	_____	Approval Required	6 months before first day of program
<input type="checkbox"/>	100%	_____	Approval Required	6 months before first day of program

*\*\*Notification letter arranged through the Vice Provost for Academic Affairs and sent by TAMU President.*

**Program Delivery Mode**

Location

On-campus                                     \_\_\_\_\_

Broadcast / TTVN                                     \_\_\_\_\_

Specific off-campus location\*\*\*             TAMU-Q

Distance Education / Internet             In-State      Out-of-State      Start Date \_\_\_\_\_

Out-of-Country             Will this program be offered with another institution?     Yes      No   
 If yes, contact the Vice Provost for Academic Affairs for additional reporting requirements.

\*\*\*Is this an approved SACS location?     Yes      No      If no, a program prospectus must be sent to SACS.  
 Approved locations as of March 2012: TAMU-Galveston, TAMU-Qatar, University Center-The Woodlands, CityCentre-Houston, Dubai and Saudi Arabia.

**Program Funding**

Has program funding been finalized at the department or college level?             Yes              No   
 If no, explain or attach budget: \_\_\_\_\_

Will new costs for the first five years of the program be under \$2 million?             Yes              No   
 If new costs exceed \$2 million, coordinating board approval is required.

**Submitted by (Contact Person):**

Andrew L Johnson PhD

ajohnson@tamu.edu

Name

Email

Associate Professor of Industrial and Systems Engineering

979-458-2356

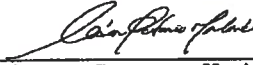
Title

Phone

**Certification Statement**

By signing below, the Dean of the College certifies the proposed program complies with coordinating board standards. If the program is delivered through Distance Education, the Dean of the College certifies that they are following the *Principles of Good Practice for Academic Degree and Certificate Programs and Credit Courses Offered Electronically*.

Use additional signature lines if program is between three or more departments or colleges.

 11-28-12  
Signature, Department Head or Interdisciplinary Program Chair Date  
César O. Malavé

Signature, Department Head or Interdisciplinary Program Chair (if joint program) Date

Typed or Printed Name

Typed or Printed Name

 2-27-13  
Chair, College Review Committee Date

Chair, College Review Committee Date

 2-27-13  
Dean of College Date

Dean of College Date

Chair, University Curriculum Committee or Graduate Council Date

Chair, University Curriculum Committee or Graduate Council Date

Additional Approvals Required: Faculty Senate and President.

## New Program Request Form for Certificate Programs, Bachelor's and Master's Degrees

**Directions:** An institution shall use this form to propose a new bachelor's or master's degree program. In completing the form, the institution should refer to the document *Standards for Bachelor's and Master's Programs*, which prescribes specific requirements for new degree programs. Note: This form requires signatures of (1) the Chief Executive Officer, certifying adequacy of funding for the new program; (2) a member of the Board of Regents (or designee), certifying Board approval, and (3) if applicable, a member of the Board of Regents or (designee), certifying that criteria have been met for staff-level approval. NOTE: Preliminary authority is required for all engineering programs. An institution that does not have preliminary authority for a proposed engineering program shall submit a separate request for preliminary authority prior to submitting the degree program request form. That request shall address criteria set in Coordinating Board rules Section 5.24 (a).

### Administrative Information

1. Institution: Texas A&M University

2. Program Name – Show how the program would appear on the Coordinating Board's program inventory (e.g., *Bachelor of Business Administration degree with a major in Accounting*):

Certificate of Engineering Systems Management

3. Proposed CIP Code:

4. Brief Program Description – Describe the program and the educational objectives:

In many areas of government and industry there is a significant need for undergraduate engineering students that possess the requisite knowledge and skill sets pertaining to engineering systems management in addition to their basic engineering discipline. With the rapid acceleration of technology through innovation on a global basis, industries recognize the need for young engineers who possess base line knowledge in areas of management and an understanding of the system level of complex engineered systems. Completion of this certificate requires completion of the following educational outcomes: 1) to know and apply principles of engineering management, 2) to understand the general principles of systems engineering and their applications to specific engineered systems, and 3) to be able to go beyond understanding concepts and demonstrate appropriate usage of systems engineering principles in a design context.

Number of Semester Credit Hours Required: 12 hours

5. Administrative Unit – Identify where the program would fit within the organizational structure of the university (e.g., *The Department of Electrical Engineering within the College of Engineering*):

College of Engineering

6. Proposed Implementation Date – Report the first semester and year that students would enter the program:

Summer of 2013

**7. Contact Person** – Provide contact information for the person who can answer specific questions about the program:

Name: Andrew L Johnson PhD

Title: Associate Professor of Industrial and Systems Engineering

E-mail: [ajohnson@tamu.edu](mailto:ajohnson@tamu.edu)

Phone: 979-458-2356

## Program Information

### I. Need

*Note: Complete I.A and I.B only if preliminary authority for the program was granted more than four years ago. This includes programs for which the institution was granted broad preliminary authority for the discipline.*

- A. **Job Market Need** – Provide short- and long-term evidence of the need for graduates in the job market.
- B. **Student Demand** – Provide short- and long-term evidence of demand for the program.
- C. **Enrollment Projections** – Use this table to show the estimated cumulative headcount and full-time student equivalent (FTSE) enrollment for the first five years of the program. *(Include majors only and consider attrition and graduation.)*

YEAR	1	2	3	4	5
Headcount	20	30	30	40	40
FTSE					



**II. Quality**

- A. Certificate and Degree Requirements – Use this table to show the certificate and degree requirements of the program. *(Modify the table as needed; if necessary, replicate the table for more than one option.)*

Category	Semester Credit Hours
General Education Core Curriculum <i>(bachelor's degree only)</i>	
Required Courses	6
Prescribed Electives	6
Free Electives	
Other <i>(Specify, e.g., internships, clinical work)</i>	<i>(if not included above)</i>
TOTAL	12

- B. Curriculum – Use these tables to identify the required courses and prescribed electives of the program, and curriculum as it will appear in the undergraduate and graduate catalog. Note with an asterisk (\*) courses that would be added if the program is approved. *(Add and delete rows as needed. If applicable, replicate the tables for different tracks/options as shown in the undergraduate catalog.)*

Prefix and Number	Required Courses	SCH
ISEN 411	Engineering Management Techniques	3
ISEN 489	Systems Thinking and Analysis	3

Prefix and Number	Prescribed Elective Courses	SCH
AERO 426	Space System Design	3
CHEN 461	Process Dynamics and Control	3
CVEN 402	Engineered Environmental Systems	3
ECEN 420	Linear Control Systems	3
ECEN 460	Power System Operation and Control	3
ISEN 303	Engineering Economic Analysis	3
ISEN 333	Project Management for Engineers	3
ISEN 414	Total Quality Engineering	3
MEEN 441	Design of Mechanical Components and Systems	3
PETE 325	Petroleum Production Systems	3
INFO 209	Business Information Systems Concepts	3
MGMT 209	Business, Government, and Society	3
MGMT 309	Survey of Management	3
ACCT 209	Survey of Accounting Principles	3
TOTAL SCH		

- C. Faculty – Use these tables to provide information about Core and Support faculty. Add an asterisk (\*) before the name of the individual who will have direct administrative responsibilities for the program. (Add and delete rows as needed.)

Name of Core Faculty and Faculty Rank	Highest Degree and Awarding Institution	Courses Assigned in Program	% Time Assigned To Program
Johnson, Andrew Associate Professor	PhD. in Industrial and Systems Engineering, Georgia Tech	ISEN 411; ISEN 303	15%
Ntaimo, Lewis Associate Professor	PhD. in Industrial and Systems Engineering, University of Arizona	ISEN 489 (Systems Engineering)	10%
Banerjee, Amarnath Associate Professor	PhD. Industrial Engineering and Operations Research, University of Illinois at Chicago	ISEN 489 (Systems Engineering); ISEN 411	10%
Smith, Don Associate Professor	PhD. Industrial Engineering, University of Arkansas	ISEN 411; ISEN 303	10%

Name of <u>Support</u> Faculty and Faculty Rank	Highest Degree and Awarding Institution	Courses Assigned in Program	% Time Assigned To Program

- D. Students – Describe general recruitment efforts and admission requirements. In accordance with the institution’s Uniform Recruitment and Retention Strategy, describe plans to recruit, retain, and graduate students from underrepresented groups for the program.

This program is open to students enrolled in graduate or undergraduate programs at TAMU. However, the courses are upper level engineering courses, and hence, students outside of engineering may have difficulty enrolling in certificate courses—approval of instructor is often needed for non engineering majors to take upper level engineering courses. This certificate program will be used by engineering departments to better recruit students who, during their careers, plan to work in the diverse area of systems engineering management.

- E. Library – Provide the library director’s assessment of library resources necessary for the program. Describe plans to build the library holdings to support the program.

Current holdings are sufficient.

- F. Facilities and Equipment – Describe the availability and adequacy of facilities and equipment to support the program. Describe plans for facility and equipment improvements/additions.

No new facilities or equipment required.

- G. Accreditation – If the discipline has a national accrediting body, describe plans to obtain accreditation or provide a rationale for not pursuing accreditation.

Certificate courses are already part of established engineering programs that are accredited by ABET.

H. Evaluation – Describe the evaluation process that will be used to assess the quality and effectiveness of the new degree program.

The primary objective of this certificate program is to provide students with exceptional, training in the management of the development of engineered systems. The best measures for effectiveness in meeting this objective is placement rates of graduates and employer surveys 1 year after placement.

III. **Costs and Funding**

Five-Year Costs and Funding Sources - Use this table to show five-year costs and sources of funding for the program.

Five-Year Costs		Five-Year Funding	
Personnel <sup>1</sup>	\$0	Reallocated Funds	\$0
Facilities and Equipment	\$0	Anticipated New Formula Funding <sup>3</sup>	\$0
Library, Supplies, and Materials	\$0	Special Item Funding	\$0
Other <sup>2</sup>	\$0	Other <sup>4</sup>	\$0
<b>Total Costs</b>	<b>\$0</b>	<b>Total Funding</b>	<b>\$0</b>

1. Report costs for new faculty hires, graduate assistants, and technical support personnel. For new faculty, prorate individual salaries as a percentage of the time assigned to the program. If existing faculty will contribute to program, include costs necessary to maintain existing programs (e.g., cost of adjunct to cover courses previously taught by faculty who would teach in new program).
2. Specify other costs here (e.g., administrative costs, travel).
3. Indicate formula funding for students new to the institution because of the program; formula funding should be included only for years three through five of the program and should reflect enrollment projections for years three through five.
4. Report other sources of funding here. In-hand grants, "likely" future grants, and designated tuition and fees can be included.

## Signature Page

1. Adequacy of Funding – The chief executive officer shall sign the following statement:

*I certify that the institution has adequate funds to cover the costs of the new program. Furthermore, the new program will not reduce the effectiveness or quality of existing programs at the institution.*

\_\_\_\_\_  
Chief Executive Officer

\_\_\_\_\_  
Date

2. Board of Regents or Designee Approval – A member of the Board of Regents or designee shall sign the following statement:

*On behalf of the Board of Regents, I approve the program.*

\_\_\_\_\_  
Board of Regents (Designee)

\_\_\_\_\_  
Date of Approval

3. Board of Regents Certification of Criteria for Commissioner of Assistant      Commissioner  
Approval – For a program to be approved by the Commissioner or  
the Assistant Commissioner for Academic Affairs and Research, the Board of  
Regents or designee must certify that the new program meets the eight criteria      under  
TAC Section 5.50 (b): The criteria stipulate that the program shall:

- (1) be within the institution's current Table of Programs;
- (2) have a curriculum, faculty, resources, support services, and other components of a degree program that are comparable to those of high quality programs in the same or similar disciplines at other institutions;
- (3) have sufficient clinical or in-service sites, if applicable, to support the program;
- (4) be consistent with the standards of the Commission of Colleges of the Southern Association of Colleges and Schools and, if applicable, with the standards or discipline-specific accrediting agencies and licensing agencies;
- (5) attract students on a long-term basis and produce graduates who would have opportunities for employment; or the program is appropriate for the development of a well-rounded array of basic baccalaureate degree programs at the institution;
- (6) not unnecessarily duplicate existing programs at other institutions;
- (7) not be dependent on future Special Item funding
- (8) have new five-year costs that would not exceed \$2 million.

*On behalf of the Board of Regents, I certify that the new program meets the criteria specified under TAC Section 5.50 (b).*

\_\_\_\_\_  
Board of Regents (Designee)

\_\_\_\_\_  
Date