



EVP 2013-10-7825

THE FACULTY SENATE

October 21, 2013

MEMORANDUM

TO: Dr. R. Bowen Loftin, President

FROM: Walter Daugherty, Speaker *Walter Daugherty*

SUBJECT: Undergraduate Curriculum Committee items (**FS.31.70**)

At its regular meeting on October 14, 2013, the Faculty Senate approved the following items from the Undergraduate Curriculum Committee items. The Faculty Senate submits for your approval. Attached is a copy of the material sent to our Senators.

Special Consideration

Dwight Look College of Engineering
 Department of Industrial and Systems Engineering
 Data Center Operations Engineering Certificate

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

Attachment

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

FACULTY SENATE AGENDA ITEM REVIEW

This item has been reviewed by the Office of the Provost (OP). Below are recommended action(s): RE: **FS.31.70**

<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
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Approved: Reviewed:

R. Bowen Loftin, President

11/20/13

Date

6. Special Consideration

Dwight Look College of Engineering

Department of Industrial and Systems Engineering
Data Center Operations Engineering Certificate
Request for a new certificate program

SPECIAL CONSIDERATION

SPECIAL CONSIDERATION

DWIGHT LOOK COLLEGE OF ENGINEERING
DEPARTMENT OF INDUSTRIAL AND SYSTEMS ENGINEERING
DATA CENTER OPERATIONS ENGINEERING CERTIFICATE
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: Dwight Look College of Engineering

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, MAg, Med, PhD, EdD, etc.) _____
 Title of proposed program: Data Center Operations Engineering Certificate
 Proposed CIP Code (if known): 1427010600

Brief program description (provide a catalog description for undergraduate and graduate certificates):
 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 data system management and an understanding of the system level of complex data center processing systems. In both government and industry there is a growing need for undergraduate engineering students that possess the requisite knowledge and skill sets pertaining to data systems management and 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: 13 _____ _____
 *12 hours minimum to appear on transcript

Off-Campus or Distance Delivery

% of Program a student can take off-campus or through Distance Education	Program Start Date	SACS Approval**	When Provost needs to inform SACS
<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 Texas A&M University
 Broadcast / TTVN _____
 Specific off-campus location*** _____
 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, City Centre-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):

Natarajan Gautam

gautam@tamu.edu

Name

Email

Associate Professor, Industrial & Electrical Engineering

979-458-2345


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.


Signature, Department Head or Interdisciplinary Program Chair
Valerie Taylor

Date

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

Date

Typed or Printed Name

Typed or Printed Name


Chair, College Review Committee

Date

Chair, College Review Committee

Date


Dean of College

7/29/13

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.

RECEIVED

JUL 29 2013

ESSAP

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*):
Data Center Operations Engineering Certificate

3. **Proposed CIP Code:** 1427010600

4. **Brief Program Description** – Describe the program and the educational objectives:
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 data system management and an understanding of the system level of complex data center processing systems. In both government and industry there is a growing need for undergraduate engineering students that possess the requisite knowledge and skill sets pertaining to complex data systems management and this certificate program includes a set of courses to assure students develop this knowledge and skill set. Completion of this certificate requires completion of the following educational outcomes: 1) to know and apply principles of engineering management, 2) to understand principles of systems level engineering and their application to specific data center system operations, 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

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*):

Industrial and Systems Engineering Department, College of Engineering

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

Fall 2014

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

Name: Natarajan Gautam

Title: Associate Professor, Industrial & Electrical Engineering

E-mail: gautam@tamu.edu

Phone: 979-458-2345

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.

n/a

B. **Student Demand** – Provide short- and long-term evidence of demand for the program.

n/a

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	20	25	30	35
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	7
Prescribed Electives	6
Free Electives	
Other <i>(Specify, e.g., internships, clinical work)</i>	
TOTAL	13

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 489	Systems Thinking and Analysis	3
CSCE	Choose one: CSCE 110: Programming I CSCE 111: Intro to Computer Science Concepts & Programming CSCE 206: Structured Programming in C	4

Prefix and Number	Prescribed Elective Courses	SCH
CSCE 444	Structures of Interactive Information	3
CSCE 470	Information Storage and Retrieval	3
CSCE	Distributed Objects Programming	3

438		
ECEN 455	Digital Communications	4
MEEN 461	Heat Transfer	3
MEEN 421	Thermal-Fluids Analysis and Design	3
MEEN 436	Principles of Heating, Ventilating and Air Conditioning	3
ISEN 314	Statistical Control of Quality	3
ISEN 413	* Engineering Data Analysis	3
ISEN 421	Operations Research II	3
ISEN 411	Engineering Management Techniques	3
ISEN 414	Total Quality Engineering	3
ISEN 489	* Energy-efficient Operations of Engineering Systems	3

	TOTAL SCH	46 13
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- 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
e.g.: Robertson, David Asst. Professor	Ph.D. in Molecular Genetics Univ. of Texas at Dallas	MG200, MG285 MG324 (Lab Only)	50%
*Natarajan Gautam Associate Professor	Ph.D. in Operations Research UNC – Chapel Hill	ISEN 489	10%
Cèsar Malavè Professor & Dept. Head	Ph.D. in Industrial Engineering University of South Florida	ISEN 489	5%
Frank Shipman Professor	Ph.D. in Computer Science Univ. of Colorado, Boulder	CSCE 206	5%
New Faculty in Year __	n/a		
New Faculty in Year __	n/a		

- 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 undergraduate programs at TAMU. However, these 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 data systems operations management. The Industrial & Systems Engineering Department will administer the program. Students will be identified through faculty/student academic interaction and be encouraged to enroll in the program.

- 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 are needed

- 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 data center operations and 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 ¹	\$0	Reallocated Funds	\$0
Facilities and Equipment	\$0	Anticipated New Formula Funding ³	\$0
Library, Supplies, and Materials	\$0	Special Item Funding	\$0
Other ²	\$0	Other ⁴	\$0
Total Costs	\$0	Total Funding	\$0

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