Program Change Request

New Program Proposal

Date Submitted: 11/07/18 4:27 pm

Viewing: CERT-CU69 : Corrosion Science and Engineering - Certificate

Last edit: 11/12/18 8:59 am

Changes proposed by: jules.henry

Contact(s)

Name	E-mail	Phone
Jules Henry	jules.henry@tamu.edu	979-862-1089

Academic level	Undergraduate
Effective Term	2019-2020
Department	Materials Science & Engr
College	Engineering
Program type	Certificate
Associated Program	Not Applicable
With a certificate in	Corrosion Science and Engineering

Catalog Program Title

Corrosion Science and Engineering - Certificate

CIP and Fund code 1418010006

Rationale for Proposal

The certificate in corrosion science and engineering addresses the need to educate and train science and engineering students in developing methods and technologies in characterizing and assessing materials performance in extreme and corrosive environments to meet technological and scientific challenges in applications critical for the society. The program will help develop workforce in the State of Texas to address more than $1 trillion per year impact of corrosion on our global economy by providing an interdisciplinary education/ training framework that employs fundamental and applied science and engineering practical tools to the development of prevention and control of materials degradation and improvement of reliability. The program is designed in response to industry demand and national need for strategic sectors, such as infrastructure renewal, energy (extraction, conversion and transportation), utilities (in particular water), transportation, production and manufacturing.

This will be achieved through a holistic program that incorporates the following curriculum (i) cross-disciplinary components on materials science and engineering, thermodynamics, kinetics, and electrochemistry; (ii) interdisciplinary, integrative courses on the forms of corrosion, the electrochemical and degradation processes in extreme environments, and the control and mitigation strategies to prevent these processes in specific environments; and (iii) elective courses related to different engineering disciplines and applications as well as professional internships in industry and national laboratories.

The educational goals of the corrosion science and engineering certificate program are: to train the next generation of scientists and engineers who 1) will serve as advanced workforce for industry, academia, and government agencies with basic understanding of their environmental degradation assets to the need to optimize asset life, production efficiency, and worker safety; 2) are familiar with the technological and computational tools and methods for corrosion and material degradation evaluation, inspection, detection, and prevention; 3) have interdisciplinary teaming experience in materials preservation and degradation, with individuals from different science and engineering disciplines; 4) contribute to interdisciplinary efforts while developing a comprehensive understanding of the potentials and limitations of corrosion science and engineering ; and 5) acquire skills necessary to thrive in their chosen career path.

Program hours	15
Is this program eligible for financial aid?	Yes

In Workflow

1. **MSEN Department Head**
2. **Curricular Services Review**
3. **EN Committee Preparer UG**
4. **EN Committee Chair UG**
5. **EN College Dean UG**
6. **Provost**
7. **UCC Preparer**
8. **UCC Chair**
9. **Faculty Senate Preparer**
10. Faculty Senate
11. Provost II
12. President
13. Curricular Services

Approval Path

1. 11/07/18 11:31 pm Ibrahim Karaman (karaman): Approved for MSEN Department Head
2. 11/12/18 2:48 pm Angel Mario Carrizales (carri1214): Approved for Curricular Services Review
3. 11/17/18 8:22 am Eileen Hoy (ehoy): Approved for EN Committee Preparer UG
4. 11/18/18 11:34 am Prasad Enjeti (enjeti): Approved for EN Committee Chair UG
5. 11/18/18 12:02 pm Prasad Enjeti (enjeti): Approved for EN College Dean UG
6. 11/19/18 11:20 am Joe Pettibon (jpp2): Approved for Provost
7. 11/19/18 1:25 pm Sandra Williams (sandra-williams): Approved for UCC Preparer
8. 12/10/18 10:27 am Terra Bissett (t.bissett): Approved for UCC Chair

Certificate type	Stand-alone
Program delivery mode	On-campus

Catalog Program Requirements

Course List

Code	Title	Semester Credit Hours
MSEN 440	Materials Electrochemistry and Corrosion	3
MSEN 444	Corrosion and Electrochemistry Lab	3
MSEN 446	Corrosion Prevention and Control Methods	3
Select one of the following:		3
AERO 413	Aerospace Materials Science	
BMEN 344	Biological Responses to Medical Devices	
CHEN 322	Chemical Engineering Materials	
CVEN 306	Materials Engineering for Civil Engineers	
MMET 207	Metallic Materials	
MSEN 201	Fundamentals of Materials Science and Engineering	
MSEN 222/MEEN 222	Materials Science	
NUEN 265	Materials Science for Nuclear Energy Applications	
Select one of the following:		3
AERO 411	Applications of Fracture Mechanics to Aerospace Structures	
CHEM 466	Polymer Chemistry	
CHEM 470	Industrial Chemistry	
CHEN 430/SENG 430	Risk Analysis in Safety Engineering	
CHEN 457	Environmental Engineering	
MEEN 460	Corrosion Engineering	
NUEN 465	Nuclear Materials Engineering	
PETE 355	Drilling Engineering	
PETE 458	Energy and Sustainability	
Total Semester Credit Hours		15

Additional information

Required Proposal Forms	AERO Support_Corrosion and Engineering Certificate.pdf PETE Support_Corrosion and Engineering Certificate.pdf NUEN Support_Corrosion and Engineering Certificate.pdf MEEN Support_Corrosion & Engineering Certificate.pdf ETID Support_Corrosion and Engineering Certificate.pdf CVEN Support_Corrosion and Engineering Certificate.pdf CHEM Support_Corrosion and Engineering Certificate.pdf BMEN Support_Corrosion and Engineering Certificate.pdf UG_CorrosionCertificate_Final.docx
Reviewer Comments	**Sandra Williams (sandra-williams) (02/21/17 9:35 pm):** Edits made to certificate name/code and catalog program requirements. **Sandra Williams (sandra-williams) (02/21/17 9:38 pm):** Rollback: The form indicates undergraduate, however, the attached documentation indicates both graduate and undergraduate courses (one specifically states "for Graduate students only"). Is the intent to offer two separate certificates - one undergraduate and one graduate? If so, two separate proposals will be needed. Also, be sure to include letters of support as appropriate for courses outside your college. **Angel Mario Carrizales (carri1214) (11/12/18 2:47 pm):** Comment from 2/21/2018 has been addressed. **Mike Stephenson (mstephenson) (11/19/18 8:34 am):** A separate assessment plan will be required once this is approved through the curricular process. **Terra Bissett (t.bissett) (12/10/18 10:27 am):** UCC approved December 2018.

Key: 832

From: North, Simon W
To: Jules Henry
Subject: RE: Request for Support for Corrosion and Engineering Certificate
Date: Friday, January 26, 2018 2:38:58 PM

Jules,

I approve of the certificate.

Simon

Simon W. North
Professor and Head
Department of Chemistry
P.O. Box 30012
College Station, TX 77842
979-845-4947 (Research)
979-845-9829 (Head)

www.chem.tamu.edu/rgroup/north

From: Jules Henry
Sent: Friday, January 26, 2018 2:38 PM
To: North, Simon W <swnorth@exchange.tamu.edu>; Karaman, Ibrahim <ikaraman@tamu.edu>
Cc: Fawcett, Denise H <fawcett@chem.tamu.edu>
Subject: RE: Request for Support for Corrosion and Engineering Certificate

Dr. North,

Thank you for your support. To clarify, you "approve" of the certificate.

Best,

Jules Henry | *Program Specialist II*
Materials Science & Engineering| 239 RDMC
3003 TAMU | College Station, TX 77843-3003

From: North, Simon W
Sent: Friday, January 26, 2018 1:48 PM
To: Karaman, Ibrahim <ikaraman@tamu.edu>
Cc: Jules Henry <jules.henry@tamu.edu>; Fawcett, Denise H <fawcett@chem.tamu.edu>
Subject: RE: Request for Support for Corrosion and Engineering Certificate

Ibrahim,

My apologies, I thought that I had communicated our approval for this certificate. Good luck.

Simon

Simon W. North
Professor and Head
Department of Chemistry
P.O. Box 30012
College Station, TX 77842
979-845-4947 (Research)
979-845-9829 (Head)

www.chem.tamu.edu/rgroup/north

From: Karaman, Ibrahim
Sent: Thursday, January 25, 2018 11:17 PM
To: North, Simon W <swnorth@exchange.tamu.edu>
Cc: Jules Henry <jules.henry@tamu.edu>
Subject: FW: Request for Support for Corrosion and Engineering Certificate

Dear Simon

Do you think you can get back to us with your response on the request below? We would like to move forward. Please let me know if you need any further information.

Thanks

Ibrahim Karaman
Chevron Professor I and Head
Department of Materials Science and Engineering
Texas A&M University
3003 TAMU
College Station TX 77843-3003
Phone: 979-862-3923
Email: ikaraman@tamu.edu
http://engineering.tamu.edu/materials
http://mesam.tamu.edu

From: North, Simon W
Sent: Friday, January 5, 2018 11:05:17 AM (UTC-06:00) Central Time (US & Canada)
To: Department Head – Materials Science and Engineering
Subject: RE: Request for Support for Corrosion and Engineering Certificate

Ibrahim,

This looks very interesting. I have sent this request to the Undergraduate and Graduate Advisors in the department to do not foresee any issues. In fact, one has already responded positively. I hope to have an answer for you very soon. I would also like to talk to you about joint appointments and Emily Pentzer when you are available.

Simon

Simon W. North
Professor and Head
Department of Chemistry
P.O. Box 30012
College Station, TX 77842
979-845-4947 (Research)
979-845-9829 (Head)

www.chem.tamu.edu/rgroup/north

From: Department Head – Materials Science and Engineering
Sent: Friday, January 05, 2018 10:09 AM
To: North, Simon W <swnorth@exchange.tamu.edu>
Cc: Karaman, Ibrahim <ikaraman@tamu.edu>
Subject: Request for Support for Corrosion and Engineering Certificate

Hi Simon,

Happy New Year! As you may have heard before, we developed a new Corrosion and Engineering Certificate (at the Graduate and Undergraduate Levels) in MSEN.

We think that incorporating a few courses from CHEM into this certificate program will provide a benefit to your students. To be able to do this, we request your electronic approval to use **CHEM 466 (Polymer Chemistry)** and **CHEM 470 (Industrial Chemistry)** as 2 of 10 options for the prescribed elective for the undergraduate level certificate. We propose to use **CHEM 623 (Surface Chemistry)** as 1 of 17 options for the prescribed elective for the graduate level certificate.

Once the certificate is approved, we will be in communication to monitor course enrollments, offerings, and course content so that changes can be made in the future, as necessary, to make sure that the certificate students do not cause an extra burden in these courses.

Attached you will find the draft curriculum to see how the courses are included.

We plan to offer this certificate starting Fall 2019.
Please provide your response of "**Approve**" or "**Deny**" by **Friday, January 26,**

2018.

We look forward to working with you on this exciting, new certificate.

Please feel free to contact me with any questions you may have. Thank you in advance for your help.

Ibrahim Karaman
Chevron Professor I and Head
Department of Materials Science and Engineering
Texas A&M University
3003 TAMU
College Station TX 77843-3003
Phone: 979-862-3923
Email: ikaraman@tamu.edu
http://engineering.tamu.edu/materials
http://mesam.tamu.edu

From: Karaman, Ibrahim
To: Jules Henry
Subject: Fwd: Request for Support for Corrosion and Engineering Certificate
Date: Friday, January 26, 2018 6:59:18 AM

Sent from my iPhone

Begin forwarded message:

> **From:** "Autenrieth, Robin" <rautenrieth@civil.tamu.edu>
> **Date:** January 26, 2018 at 6:37:41 AM CST
> **To:** "Karaman, Ibrahim" <ikaraman@tamu.edu>
> **Cc:** "Robin Autenrieth (r-autenrieth@tamu.edu)" <r-autenrieth@tamu.edu>
> **Subject: Re: Request for Support for Corrosion and Engineering Certificate**
>
> Ibrahim,
> I am so sorry for missing the original email. Yes is approve including the CVEN course.
> Best,
> Robin
>
> Sent from my iPad
>
> On Jan 25, 2018, at 11:41 PM, Karaman, Ibrahim <ikaraman@tamu.edu> wrote:
>
> > Dear Robin
> >
> > Do you think you can get back to us with your response on the request below? We would like to move forward. Please let me know if you need any further information that we can provide.
> >
> > Thanks
> >
> > Ibrahim
> >
> > Ibrahim Karaman
> > Chevron Professor I and Head
> > Department of Materials Science and Engineering
> > Texas A&M University
> > 3003 TAMU
> > College Station TX 77843-3003
> > Phone: 979-862-3923
> > Email: ikaraman@tamu.edu

http://engineering.tamu.edu/materials
http://mesam.tamu.edu

From: Department Head – Materials Science and Engineering
Sent: Friday, January 05, 2018 10:09 AM
To: Autenrieth, Robin <rautenrieth@civil.tamu.edu>
Cc: Karaman, Ibrahim <ikaraman@tamu.edu>
Subject: Request for Support for Corrosion and Engineering Certificate

Hi Robin,

Happy New Year! As you may have heard before, we developed a new Corrosion and Engineering Certificate (at the Graduate and Undergraduate Levels) in MSEN.

We think that incorporating a course from CVEN into this certificate program will provide a benefit to your students. To be able to do this, we request your electronic approval to use **CVEN 306 (Materials Engineering for Civil Engineers)** as 1 of 9 options to serve as a core course for the undergraduate level certificate.

Once the certificate is approved, we will be in communication to monitor course enrollments, offerings, and course content so that changes can be made in the future, as necessary, to make sure that the certificate students do not cause an extra burden in this course.

Attached you will find the draft curriculum to see how the course is included.

We plan to offer this certificate starting Fall 2019.
Please provide your response of "**Approve**" or "**Deny**" by **Friday, January 26, 2018.**

We look forward to working with you on this exciting, new certificate.

Please feel free to contact me with any questions you may have. Thank you in advance for your help.

Ibrahim Karaman

Chevron Professor I and Head
Department of Materials Science and Engineering
Texas A&M University
3003 TAMU
College Station TX 77843-3003
Phone: 979-862-3923
Email: ikaraman@tamu.edu
http://engineering.tamu.edu/materials
http://mesam.tamu.edu

<Curriculum_CorrosionCertificate.pdf>

From: Karaman, Ibrahim
To: Jules Henry
Subject: FW: Request for Support for Corrosion and Engineering Certificate
Date: Monday, January 15, 2018 10:52:06 AM

From: Reza Langari
Sent: Monday, January 15, 2018 10:52 AM
To: Karaman, Ibrahim <ikaraman@tamu.edu>
Subject: Re: Request for Support for Corrosion and Engineering Certificate

Hi Ibrahim

We are supportive.

Best wishes,

Reza

From: Department Head – Materials Science and Engineering
Sent: Friday, January 5, 2018 10:09 AM
To: Reza Langari <rlangari@tamu.edu>
Cc: Karaman, Ibrahim <ikaraman@tamu.edu>
Subject: Request for Support for Corrosion and Engineering Certificate

Hi Reza,

Happy New Year! As you may have heard before, we developed a new Corrosion and Engineering Certificate (at the Graduate and Undergraduate Levels) in MSEN.

We think that incorporating a course from ETID into this certificate program will provide a benefit to your students. To be able to do this, we request your electronic approval to use **MMET 207 (Metallic Materials)** as 1 of 9 options to serve as a core course for the undergraduate level certificate.

Once the certificate is approved, we will be in communication to monitor course enrollments, offerings, and course content so that changes can be made in the future, as necessary, to make sure that the certificate students do not cause an extra burden in this course.

Attached you will find the draft curriculum to see how the course is included.

We plan to offer this certificate starting Fall 2019.
Please provide your response of "**Approve**" or "**Deny**" by **Friday, January 26, 2018.**

We look forward to working with you on this exciting, new certificate.

Please feel free to contact me with any questions you may have. Thank you in advance for your help.

Ibrahim Karaman
Chevron Professor I and Head
Department of Materials Science and Engineering
Texas A&M University
3003 TAMU
College Station TX 77843-3003
Phone: 979-862-3923
Email: ikaraman@tamu.edu
http://engineering.tamu.edu/materials
http://mesam.tamu.edu

From:	Karaman, Ibrahim
To:	Jules Henry
Subject:	FW: Request for Support for Corrosion and Engineering Certificate
Date:	Thursday, January 25, 2018 11:45:14 PM

From: Andreas Polycarpou
Sent: Thursday, January 25, 2018 11:44 PM
To: Karaman, Ibrahim <ikaraman@tamu.edu>
Cc: Kate Goodman <kate@tamu.edu>
Subject: Re: Request for Support for Corrosion and Engineering Certificate

The EDC approved it and I am endorsing their approval
Andeas

Sent from my iPhone

On Jan 26, 2018, at 8:26 AM, Karaman, Ibrahim <ikaraman@tamu.edu> wrote:

> Dear Andreas
>
> Do you think you can get back to us with your response on the request below? We would like to move forward. Please let me know if you need any further information that we can provide.
>
> Thanks
>
> Ibrahim Karaman
> Chevron Professor I and Head
> Department of Materials Science and Engineering
> Texas A&M University
> 3003 TAMU
> College Station TX 77843-3003
> Phone: 979-862-3923
> Email: ikaraman@tamu.edu
> http://engineering.tamu.edu/materials
> http://mesam.tamu.edu

> **From:** Andreas Polycarpou
> **Sent:** Friday, January 05, 2018 11:08 AM
> **To:** Department Head – Materials Science and Engineering <msenhead@tamu.edu>

Cc: Karaman, Ibrahim <ikaraman@tamu.edu>
Subject: Re: Request for Support for Corrosion and Engineering Certificate

I sent it to the appropriate committees and once I hear back, I will let you know

Andreas A. Polycarpou, Ph.D.
Department Head
James J. Cain Chair in Mechanical Engineering
Meinhard H. Kotzebue '14 Professor
Texas A&M University
Department of Mechanical Engineering
100 Mechanical Engineering Building, 3123 TAMU
College Station, TX 77843-3123
Tel (979) 458 - 4061; Fax (979) 845 – 3081
E-mail: apolycarpou@tamu.edu
Dept Web Site: http://www.mengr.tamu.edu

From: Department Head – Materials Science and Engineering <msenhead@tamu.edu>
Date: Friday, January 5, 2018 at 10:09 AM
To: "apolycarpou@tamu.edu" <apolycarpou@tamu.edu>
Cc: Ibrahim Karaman <ikaraman@tamu.edu>
Subject: Request for Support for Corrosion and Engineering Certificate

Hi Andreas,

Happy New Year! As you may have heard before, we developed a new Corrosion and Engineering Certificate (at the Graduate and Undergraduate Levels) in MSEN.

We think that incorporating a few courses from MEEN into this certificate program will provide a benefit to your students. To be able to do this, we request your electronic approval to use **MEEN/MSEN 222 (Materials Science)** as 1 of 9 options to serve as a core course for the undergraduate level certificate. We propose to use **MEEN 460 (Corrosion Engineering)** as 1 of 10 options for the prescribed elective for the undergraduate level certificate. **MEEN/MSEN 616 (Surface Science), MEEN/MSEN 620 (Kinetic Processes in Materials Science), MEEN/MSEN 625 (Mechanical Behavior of Materials), MEEN/MSEN 640 (Thermodynamics in Materials Science), and MEEN 660 (Corrosion Engineering)** will be 5 of 17 options for the prescribed elective for the graduate level certificate.

Once the certificate is approved, we will be in communication to monitor course enrollments, offerings, and course content so that changes can be made in the future, as necessary, to make sure that the certificate students do not cause an extra burden in these courses.

Attached you will find the draft curriculum to see how the courses are included.

We plan to offer this certificate starting Fall 2019.
Please provide your response of "**Approve**" or "**Deny**" by **Friday, January 26, 2018.**

We look forward to working with you on this exciting, new certificate.

Please feel free to contact me with any questions you may have. Thank you in advance for your help.

Ibrahim Karaman
Chevron Professor I and Head
Department of Materials Science and Engineering
Texas A&M University
3003 TAMU
College Station TX 77843-3003
Phone: 979-862-3923
Email: ikaraman@tamu.edu
http://engineering.tamu.edu/materials
http://mesam.tamu.edu

From:	Jules Henry
To:	Ande Burks
Cc:	Karaman, Ibrahim; Hassan, Yassin A
Subject:	RE: Request for Support for Corrosion and Engineering Certificate
Date:	Friday, January 26, 2018 9:44:00 AM

Good Morning Ande,

The responses provided by yourself and Dr. Hassan suffice.

Thank you,

Jules Henry | *Program Specialist II*
Materials Science & Engineering| 239 RDMC
3003 TAMU | College Station, TX 77843-3003

From: Ande Burks
Sent: Friday, January 26, 2018 9:11 AM
To: Karaman, Ibrahim <ikaraman@tamu.edu>
Cc: Hassan, Yassin A <y-hassan@tamu.edu>
Subject: FW: Request for Support for Corrosion and Engineering Certificate

Good morning Dr. Karaman,

Dr. Hassan approves the request below. Is there anything you need further?

Ande Burks **| Administrative Coordinator l**
Texas A&M Nuclear Engineering

From: Hassan, Yassin A
Sent: Friday, January 26, 2018 7:53 AM
To: Ande Burks <andeburks@tamu.edu>; Ibrahim Karaman (karaman@tamu.edu) <karaman@tamu.edu>
Subject: FW: Request for Support for Corrosion and Engineering Certificate

Ande,
Let us approve this one today.
Thanks.

From: Karaman, Ibrahim
Sent: Thursday, January 25, 2018 11:40 PM
To: Hassan, Yassin A <y-hassan@tamu.edu>
Subject: Request for Support for Corrosion and Engineering Certificate

Dear Yassin

Do you think you can get back to us with your response on the request below? We would like to move forward. Please let me know if you need any further information that we can provide.

Thanks

Ibrahim

Ibrahim Karaman
Chevron Professor I and Head
Department of Materials Science and Engineering
Texas A&M University
3003 TAMU
College Station TX 77843-3003
Phone: 979-862-3923
Email: ikaraman@tamu.edu
http://engineering.tamu.edu/materials
http://mesam.tamu.edu

From: Department Head – Materials Science and Engineering
Sent: Friday, January 05, 2018 10:09 AM
To: Hassan, Yassin A <y-hassan@tamu.edu>
Cc: Karaman, Ibrahim <ikaraman@tamu.edu>
Subject: Request for Support for Corrosion and Engineering Certificate

Hi Yassin,

Happy New Year! As you may have heard before, we developed a new Corrosion and Engineering Certificate (at the Graduate and Undergraduate Levels) in MSEN.

We think that incorporating a few courses from NUEN into this certificate program will provide a benefit to your students. To be able to do this, we request your electronic approval to use **NUEN 265 (Materials Science for Nuclear Energy Applications)** as 1 of 9 options to serve as a core course for the undergraduate level certificate. We propose to use **NUEN 465 (Nuclear Materials Engineering)** as 1 of 10 options for the prescribed elective for the undergraduate level certificate. **NUEN 662 (Nuclear Materials Under Extreme Conditions)** is 1 of 17 options for the prescribed elective for the graduate level certificate.

Once the certificate is approved, we will be in communication to monitor course

enrollments, offerings, and course content so that changes can be made in the future, as necessary, to make sure that the certificate students do not cause an extra burden in these courses.

Attached you will find the draft curriculum to see how the courses are included.

We plan to offer this certificate starting Fall 2019.
Please provide your response of "**Approve**" or "**Deny**" by **Friday, January 26, 2018.**

We look forward to working with you on this exciting, new certificate.

Please feel free to contact me with any questions you may have. Thank you in advance for your help.

Ibrahim Karaman
Chevron Professor I and Head
Department of Materials Science and Engineering
Texas A&M University
3003 TAMU
College Station TX 77843-3003
Phone: 979-862-3923
Email: ikaraman@tamu.edu
http://engineering.tamu.edu/materials
http://mesam.tamu.edu

From: Beladi, Kathy
To: Jules Henry; Karaman, Ibrahim
Cc: Spath, Jeffrey B
Subject: FW: Request for Support for Corrosion and Engineering Certificate
Date: Wednesday, May 23, 2018 11:25:14 AM

Please see below for approval from Dr. Spath.

Kathy Beladi | Senior Administrative Coordinator
Harold Vance Department of Petroleum Engineering | Texas A&M University
3116 TAMU | College Station, TX 77843-3116

ph: 979.845.2243 | 507 Richardson Building | k-beladi@tamu.edu
- -
http://engineering.tamu.edu/petroleum

From: Spath, Jeffrey B
Sent: Wednesday, May 23, 2018 11:21 AM
To: Beladi, Kathy <k-beladi@tamu.edu>
Subject: Re: Request for Support for Corrosion and Engineering Certificate

Don't recall if I replied but yes I approve. Please reply for me.

Sent via the Samsung Galaxy S8, an AT&T 4G LTE smartphone

-------- Original message --------
From: "Beladi, Kathy" <k-beladi@tamu.edu>
Date: 5/23/18 11:07 AM (GMT-06:00)
To: "Spath, Jeffrey B" <spath@tamu.edu>
Subject: FW: Request for Support for Corrosion and Engineering Certificate

Did you approve or deny this yet?

Kathy Beladi | Senior Administrative Coordinator
Harold Vance Department of Petroleum Engineering | Texas A&M University
3116 TAMU | College Station, TX 77843-3116

ph: 979.845.2243 | 507 Richardson Building | k-beladi@tamu.edu
- -
http://engineering.tamu.edu/petroleum

From: Jules Henry
Sent: Thursday, May 17, 2018 11:28 AM
To: Spath, Jeffrey <spath@tamu.edu>

Cc: Karaman, Ibrahim <ikaraman@tamu.edu>; Beladi, Kathy <k-beladi@tamu.edu>
Subject: Request for Support for Corrosion and Engineering Certificate
Importance: High

Howdy Dr. Spath—

As you may have heard, we developed a Corrosion and Engineering Certificate (at the Graduate and Undergraduate Levels) in MSEN.

We believe incorporating a few courses from PETE into this certificate program will provide a benefit to your students. To be able to do this, we request your electronic approval to use **PETE 355 (Drilling Engineering)** and **PETE 458 (Energy and Sustainability)** as 2 of 10 options for the prescribed elective for the undergraduate level certificate. We propose to use **PETE 643 (Oil Field Chemistry)** as 1 of 17 options for the prescribed elective for the graduate level certificate.

Once the certificate is approved, we will be in communication to monitor course enrollments, offerings, and course content so that changes can be made in the future, as necessary, to make sure that the certificate students do not cause an extra burden in these courses.

Attached you will find the draft curriculum to see how the courses are included.

We plan to offer this certificate starting Fall 2019.
Please provide your response of "**Approve**" or "**Deny**" by **Monday, May 28.**

We look forward to working with you on this exciting, new certificate.

Please feel free to contact me with any questions you may have. Thank you in advance for your help.

Best,

Jules

.....

Jules Henry | *Assistant Director, Advising*
Undergraduate and Graduate Programs
Materials Science & Engineering| 239 RDMC
3003 TAMU | College Station, TX 77843-3003

ph: 979.862.1089 | jules.henry@tamu.edu

New Program Request Form for Certificate Programs

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*):

Certification in Corrosion Science and Engineering

3. Proposed CIP Code: 14.1801.0006

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

The certificate in corrosion science and engineering addresses the need to educate and train science and engineering students in developing methods and technologies in characterizing and assessing materials performance in extreme and corrosive environments to meet technological and scientific challenges in applications critical for the society. The program will help develop workforce in the State of Texas to address more than $1 trillion per year impact of corrosion on our global economy by providing an interdisciplinary education/ training framework that employs fundamental and applied science and engineering practical tools to the development of prevention and control of materials degradation and improvement of reliability. The program is designed in response to industry demand and national need for strategic sectors, such as infrastructure renewal, energy (extraction, conversion and transportation), utilities (in particular water), transportation, production and manufacturing.

This will be achieved through a holistic program that incorporates the following curriculum (i) cross-disciplinary components on materials science and engineering, thermodynamics, kinetics, and electrochemistry; (ii) interdisciplinary, integrative courses on the forms of corrosion, the electrochemical and degradation processes in extreme environments, and the control and mitigation strategies to prevent these processes in specific environments; and (iii) elective courses related to different engineering disciplines and applications as well as professional internships in industry and national laboratories.

The educational goals of the corrosion science and engineering certificate program are: to train the next generation of scientists and engineers who 1) will serve as advanced workforce for industry, academia, and government agencies with basic understanding of their environmental degradation assets to the need

to optimize asset life, production efficiency, and worker safety; 2) are familiar with the technological and computational tools and methods for corrosion and material degradation evaluation, inspection, detection, and prevention; 3) have interdisciplinary teaming experience in materials preservation and degradation, with individuals from different science and engineering disciplines; 4) contribute to interdisciplinary efforts while developing a comprehensive understanding of the potentials and limitations of corrosion science and engineering ; and 5) acquire skills necessary to thrive in their chosen career path.

Number of Semester Credit Hours Required 15

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*):

The Department of Materials Science and Engineering within the Colleges of Engineering and Science

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

Fall 2019

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

Name: Ibrahim Karaman

Title: Chevron Professor and Head, Department of Materials Science and Engineering

E-mail: ikaraman@tamu.edu

Phone: 979 862 3923

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.

NACE International (formerly National Association of Corrosion Engineers) in the latest study on the economics of the Impact of Corrosion indicates "That in the next decade a significant transition and turnover will occur in the corrosion community. An age distribution of the NACE membership indicated that only approximately 20% of the membership is 40 years of age or younger and almost 50% are 51 or older…. Assuming that NACE International membership is representative of the overall workforce knowledge transfer and education (E&T) of our younger workforce is critical"

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

Short term evidence of demand of the program

Semester	Fall 15	Spring 16	Fall 16
MSEN 489/689: Materials Electrochemistry and Corrosion enrollment	19	17	20

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	10	15	20	25	25
FTSE	10	15	20	25	25

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 *(bachelor's degree only)*	
Required Courses	12
Prescribed Electives	3
Free Electives	
Other *(Specify, e.g., internships, clinical work)*	(if not included above)
TOTAL	15

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
MSEN 201 or MSEN 222 or AERO 413 or BMEN 344 or CHEN 322 or CVEN 306 or MEEN 222 or MMET 207 or NUEN 265	Fundamentals of Mater. Sci. and Eng. Materials Science Aerospace Materials Science Biological Responses to Medical Devices Chemical Engineering Materials Materials Engineering for Civil Engineers Materials Science Metallic Materials Materials Science for Nuclear Energy	3
MSEN 440	Materials Electrochemistry and Corrosion	3
MSEN 444	Corrosion Laboratory	3
MSEN 446	Corrosion Prevention and Control Methods	3

Prefix and Number	Prescribed Elective Courses	SCH
Select one of the prescribed electives below		
AERO 411	Applications of Fracture Mechanics to Aerospace Structures	3
CHEM 466	Polymer Chemistry	3
CHEM 470	Industrial Chemistry	3
CHEN/SENG 430	Risk Analysis in Safety Engineering	3
CHEN 457	Environmental Engineering	3
MEEN 460	Corrosion Engineering	3
NUEN 465	Nuclear Materials Engineering	3
PETE 355	Drilling Engineering	3
PETE 458	Energy and Sustainability	3

	TOTAL SCH	15

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**
Homero Castaneda* Associate Professor	Ph.D. in Materials Science and Engineering, Pennsylvania State University	MSEN 440 MSEN 444 MEEN 460	25%
Raymundo Case Professor of Practice	Ph.D. in Corrosion, University of Manchester	MSEN 446 MSEN 444	25%
Hong Liang Professor	Ph.D. in Materials Science & Engineering, Stevens Institute of Technology	MEEN 460	10%

Name of Support Faculty and Faculty Rank	**Highest Degree and Awarding Institution**	**Courses Assigned in Program**	**% Time Assigned To Program**
George Pharr, Professor	Ph. D. in Materials Science and Engineering, Stanford University	MSEN 201	5%
Patrick Shamberger, Assistant Professor	Ph.D. in Materials Science and Engineering, University of Washington	MEEN/MSEN 222	5%

D. Students – Describe general recruitment efforts and admission requirements. How will students be accepted into the program? 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.

Undergraduate students will be able to apply to the program following the successful completion of an introductory materials science course anytime during their enrollment at Texas A&M University. A holistic review process by an admission committee will be used that considers a student's academic achievements, technical background, willingness to commit to the interdisciplinary nature of the program, and alignment of the program with their research interests and career goals. Undergraduate students who are enrolled in College of Engineering and College of Science should be in good academic standing within major department and have a GPA of 2.5 or higher to be part of the certificate. Students will receive mentorship and guidance by designated advisors (forming the academic program) to bolster retention and help ensure successful graduation. The advisors will be designated by the core certification program faculty.

Recruitment: The certification program will reach out to the students through seminars and informational meetings organized by the National Corrosion and Materials Reliability Laboratory

to recruit undergraduate students. In these meetings, URM faculty, who constitute the majority (60%) of the new certificate program, will provide positive reinforcement to recruit URM students.

Core program faculty will collaborate with the College of Engineering's undergraduate recruitment events by actively participating and providing lab tours, presentations, talks, and seminars.

Retention: The corrosion science and engineering certificate program will encourage URM students to take part in AGEP mentoring/networking activities focused on building community and reducing isolation among URM STEM undergraduate students. All students will have faculty mentors and be encouraged to participate in national contests about corrosion and related topics, present at national conferences, and write scholarly articles related to their research and engineering case studies. The certificate will collaborate with the Texas A&M Engineering Innovation Center and TEES to create programs to help and cultivate creative ideas of students into useful solutions to apply to the community and industrial sector.

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.

The library needs for the corrosion science and engineering program are standard and do not require special resources. Current library holdings are adequate.

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.

Current classrooms, equipment, and facilities are adequate. The main laboratory facilities are currently housed in the National Corrosion and Materials Reliability Laboratory at RELLIS Campus (http://corrosioncenter.tamu.edu/)

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

NACE International Institute is widely recognized as the worldwide accepted accreditation program organization in corrosion science and engineering related topics. Steps will be taken to form a strategic association with NACE International to provide students with the possibility of applying for certification as Corrosion Technologist once the course completion has been achieved and an exam has been passed.

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

N/A.

I. Administration of Program – Describe how the program will be administered. Where will the program be administered (i.e., department, college)?

The certificate program will be administered by the Department of Materials Science and Engineering within the Colleges of Engineering and Science. A dedicated director will lead the program.

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]	$71,560	Reallocated Funds	$71,560
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	**$71,560**	**Total Funding**	**$71,560**

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

From: Karaman, Ibrahim
To: Jules Henry
Subject: FW: Request for Support for Corrosion and Engineering Certificate
Date: Monday, January 15, 2018 10:52:06 AM

From: Reza Langari
Sent: Monday, January 15, 2018 10:52 AM
To: Karaman, Ibrahim <ikaraman@tamu.edu>
Subject: Re: Request for Support for Corrosion and Engineering Certificate

Hi Ibrahim

We are supportive.

Best wishes,

Reza

From: Department Head – Materials Science and Engineering
Sent: Friday, January 5, 2018 10:09 AM
To: Reza Langari <rlangari@tamu.edu>
Cc: Karaman, Ibrahim <ikaraman@tamu.edu>
Subject: Request for Support for Corrosion and Engineering Certificate

Hi Reza,

Happy New Year! As you may have heard before, we developed a new Corrosion and Engineering Certificate (at the Graduate and Undergraduate Levels) in MSEN.

We think that incorporating a course from ETID into this certificate program will provide a benefit to your students. To be able to do this, we request your electronic approval to use **MMET 207 (Metallic Materials)** as 1 of 9 options to serve as a core course for the undergraduate level certificate.

Once the certificate is approved, we will be in communication to monitor course enrollments, offerings, and course content so that changes can be made in the future, as necessary, to make sure that the certificate students do not cause an extra burden in this course.

Attached you will find the draft curriculum to see how the course is included.

We plan to offer this certificate starting Fall 2019.
Please provide your response of "**Approve**" or "**Deny**" by **Friday, January 26, 2018.**

We look forward to working with you on this exciting, new certificate.

Please feel free to contact me with any questions you may have. Thank you in advance for your help.

Ibrahim Karaman
Chevron Professor I and Head
Department of Materials Science and Engineering
Texas A&M University
3003 TAMU
College Station TX 77843-3003
Phone: 979-862-3923
Email: ikaraman@tamu.edu
http://engineering.tamu.edu/materials
http://mesam.tamu.edu

From:	Karaman, Ibrahim
To:	Jules Henry
Subject:	FW: Request for Support for Corrosion and Engineering Certificate
Date:	Thursday, January 25, 2018 11:45:14 PM

From: Andreas Polycarpou
Sent: Thursday, January 25, 2018 11:44 PM
To: Karaman, Ibrahim <ikaraman@tamu.edu>
Cc: Kate Goodman <kate@tamu.edu>
Subject: Re: Request for Support for Corrosion and Engineering Certificate

The EDC approved it and I am endorsing their approval
Andeas

Sent from my iPhone

On Jan 26, 2018, at 8:26 AM, Karaman, Ibrahim <ikaraman@tamu.edu> wrote:

> Dear Andreas
>
> Do you think you can get back to us with your response on the request below? We would like to move forward. Please let me know if you need any further information that we can provide.
>
> Thanks
>
> Ibrahim Karaman
> Chevron Professor I and Head
> Department of Materials Science and Engineering
> Texas A&M University
> 3003 TAMU
> College Station TX 77843-3003
> Phone: 979-862-3923
> Email: ikaraman@tamu.edu
> http://engineering.tamu.edu/materials
> http://mesam.tamu.edu

> **From:** Andreas Polycarpou
> **Sent:** Friday, January 05, 2018 11:08 AM
> **To:** Department Head – Materials Science and Engineering <msenhead@tamu.edu>

Cc: Karaman, Ibrahim <ikaraman@tamu.edu>
Subject: Re: Request for Support for Corrosion and Engineering Certificate

I sent it to the appropriate committees and once I hear back, I will let you know

Andreas A. Polycarpou, Ph.D.
Department Head
James J. Cain Chair in Mechanical Engineering
Meinhard H. Kotzebue '14 Professor
Texas A&M University
Department of Mechanical Engineering
100 Mechanical Engineering Building, 3123 TAMU
College Station, TX 77843-3123
Tel (979) 458 - 4061; Fax (979) 845 – 3081
E-mail: apolycarpou@tamu.edu
Dept Web Site: http://www.mengr.tamu.edu

From: Department Head – Materials Science and Engineering <msenhead@tamu.edu>
Date: Friday, January 5, 2018 at 10:09 AM
To: "apolycarpou@tamu.edu" <apolycarpou@tamu.edu>
Cc: Ibrahim Karaman <ikaraman@tamu.edu>
Subject: Request for Support for Corrosion and Engineering Certificate

Hi Andreas,

Happy New Year! As you may have heard before, we developed a new Corrosion and Engineering Certificate (at the Graduate and Undergraduate Levels) in MSEN.

We think that incorporating a few courses from MEEN into this certificate program will provide a benefit to your students. To be able to do this, we request your electronic approval to use **MEEN/MSEN 222 (Materials Science)** as 1 of 9 options to serve as a core course for the undergraduate level certificate. We propose to use **MEEN 460 (Corrosion Engineering)** as 1 of 10 options for the prescribed elective for the undergraduate level certificate. **MEEN/MSEN 616 (Surface Science), MEEN/MSEN 620 (Kinetic Processes in Materials Science), MEEN/MSEN 625 (Mechanical Behavior of Materials), MEEN/MSEN 640 (Thermodynamics in Materials Science), and MEEN 660 (Corrosion Engineering)** will be 5 of 17 options for the prescribed elective for the graduate level certificate.

Once the certificate is approved, we will be in communication to monitor course enrollments, offerings, and course content so that changes can be made in the future, as necessary, to make sure that the certificate students do not cause an extra burden in these courses.

Attached you will find the draft curriculum to see how the courses are included.

We plan to offer this certificate starting Fall 2019.
Please provide your response of "**Approve**" or "**Deny**" by **Friday, January 26, 2018.**

We look forward to working with you on this exciting, new certificate.

Please feel free to contact me with any questions you may have. Thank you in advance for your help.

Ibrahim Karaman
Chevron Professor I and Head
Department of Materials Science and Engineering
Texas A&M University
3003 TAMU
College Station TX 77843-3003
Phone: 979-862-3923
Email: ikaraman@tamu.edu
http://engineering.tamu.edu/materials
http://mesam.tamu.edu

From:	Jules Henry
To:	Ande Burks
Cc:	Karaman, Ibrahim; Hassan, Yassin A
Subject:	RE: Request for Support for Corrosion and Engineering Certificate
Date:	Friday, January 26, 2018 9:44:00 AM

Good Morning Ande,

The responses provided by yourself and Dr. Hassan suffice.

Thank you,

Jules Henry | *Program Specialist II*
Materials Science & Engineering| 239 RDMC
3003 TAMU | College Station, TX 77843-3003

From: Ande Burks
Sent: Friday, January 26, 2018 9:11 AM
To: Karaman, Ibrahim <ikaraman@tamu.edu>
Cc: Hassan, Yassin A <y-hassan@tamu.edu>
Subject: FW: Request for Support for Corrosion and Engineering Certificate

Good morning Dr. Karaman,

Dr. Hassan approves the request below. Is there anything you need further?

Ande Burks **| Administrative Coordinator l**
Texas A&M Nuclear Engineering

From: Hassan, Yassin A
Sent: Friday, January 26, 2018 7:53 AM
To: Ande Burks <andeburks@tamu.edu>; Ibrahim Karaman (karaman@tamu.edu) <karaman@tamu.edu>
Subject: FW: Request for Support for Corrosion and Engineering Certificate

Ande,
Let us approve this one today.
Thanks.

From: Karaman, Ibrahim
Sent: Thursday, January 25, 2018 11:40 PM
To: Hassan, Yassin A <y-hassan@tamu.edu>
Subject: Request for Support for Corrosion and Engineering Certificate

Dear Yassin

Do you think you can get back to us with your response on the request below? We would like to move forward. Please let me know if you need any further information that we can provide.

Thanks

Ibrahim

Ibrahim Karaman
Chevron Professor I and Head
Department of Materials Science and Engineering
Texas A&M University
3003 TAMU
College Station TX 77843-3003
Phone: 979-862-3923
Email: ikaraman@tamu.edu
http://engineering.tamu.edu/materials
http://mesam.tamu.edu

From: Department Head – Materials Science and Engineering
Sent: Friday, January 05, 2018 10:09 AM
To: Hassan, Yassin A <y-hassan@tamu.edu>
Cc: Karaman, Ibrahim <ikaraman@tamu.edu>
Subject: Request for Support for Corrosion and Engineering Certificate

Hi Yassin,

Happy New Year! As you may have heard before, we developed a new Corrosion and Engineering Certificate (at the Graduate and Undergraduate Levels) in MSEN.

We think that incorporating a few courses from NUEN into this certificate program will provide a benefit to your students. To be able to do this, we request your electronic approval to use **NUEN 265 (Materials Science for Nuclear Energy Applications)** as 1 of 9 options to serve as a core course for the undergraduate level certificate. We propose to use **NUEN 465 (Nuclear Materials Engineering)** as 1 of 10 options for the prescribed elective for the undergraduate level certificate. **NUEN 662 (Nuclear Materials Under Extreme Conditions)** is 1 of 17 options for the prescribed elective for the graduate level certificate.

Once the certificate is approved, we will be in communication to monitor course

enrollments, offerings, and course content so that changes can be made in the future, as necessary, to make sure that the certificate students do not cause an extra burden in these courses.

Attached you will find the draft curriculum to see how the courses are included.

We plan to offer this certificate starting Fall 2019.
Please provide your response of "**Approve**" or "**Deny**" by **Friday, January 26, 2018.**

We look forward to working with you on this exciting, new certificate.

Please feel free to contact me with any questions you may have. Thank you in advance for your help.

Ibrahim Karaman
Chevron Professor I and Head
Department of Materials Science and Engineering
Texas A&M University
3003 TAMU
College Station TX 77843-3003
Phone: 979-862-3923
Email: ikaraman@tamu.edu
http://engineering.tamu.edu/materials
http://mesam.tamu.edu

From:	Beladi, Kathy
To:	Jules Henry; Karaman, Ibrahim
Cc:	Spath, Jeffrey B
Subject:	FW: Request for Support for Corrosion and Engineering Certificate
Date:	Wednesday, May 23, 2018 11:25:14 AM

Please see below for approval from Dr. Spath.

Kathy Beladi | Senior Administrative Coordinator
Harold Vance Department of Petroleum Engineering | Texas A&M University
3116 TAMU | College Station, TX 77843-3116

ph: 979.845.2243 | 507 Richardson Building | k-beladi@tamu.edu
- -
http://engineering.tamu.edu/petroleum

From: Spath, Jeffrey B
Sent: Wednesday, May 23, 2018 11:21 AM
To: Beladi, Kathy <k-beladi@tamu.edu>
Subject: Re: Request for Support for Corrosion and Engineering Certificate

Don't recall if I replied but yes I approve. Please reply for me.

Sent via the Samsung Galaxy S8, an AT&T 4G LTE smartphone

-------- Original message --------
From: "Beladi, Kathy" <k-beladi@tamu.edu>
Date: 5/23/18 11:07 AM (GMT-06:00)
To: "Spath, Jeffrey B" <spath@tamu.edu>
Subject: FW: Request for Support for Corrosion and Engineering Certificate

Did you approve or deny this yet?

Kathy Beladi | Senior Administrative Coordinator
Harold Vance Department of Petroleum Engineering | Texas A&M University
3116 TAMU | College Station, TX 77843-3116

ph: 979.845.2243 | 507 Richardson Building | k-beladi@tamu.edu
- -
http://engineering.tamu.edu/petroleum

From: Jules Henry
Sent: Thursday, May 17, 2018 11:28 AM
To: Spath, Jeffrey <spath@tamu.edu>

Cc: Karaman, Ibrahim <ikaraman@tamu.edu>; Beladi, Kathy <k-beladi@tamu.edu>
Subject: Request for Support for Corrosion and Engineering Certificate
Importance: High

Howdy Dr. Spath—

As you may have heard, we developed a Corrosion and Engineering Certificate (at the Graduate and Undergraduate Levels) in MSEN.

We believe incorporating a few courses from PETE into this certificate program will provide a benefit to your students. To be able to do this, we request your electronic approval to use **PETE 355 (Drilling Engineering)** and **PETE 458 (Energy and Sustainability)** as 2 of 10 options for the prescribed elective for the undergraduate level certificate. We propose to use **PETE 643 (Oil Field Chemistry)** as 1 of 17 options for the prescribed elective for the graduate level certificate.

Once the certificate is approved, we will be in communication to monitor course enrollments, offerings, and course content so that changes can be made in the future, as necessary, to make sure that the certificate students do not cause an extra burden in these courses.

Attached you will find the draft curriculum to see how the courses are included.

We plan to offer this certificate starting Fall 2019.
Please provide your response of "**Approve**" or "**Deny**" by **Monday, May 28.**

We look forward to working with you on this exciting, new certificate.

Please feel free to contact me with any questions you may have. Thank you in advance for your help.

Best,

Jules

.....

Jules Henry | *Assistant Director, Advising*
Undergraduate and Graduate Programs
Materials Science & Engineering| 239 RDMC
3003 TAMU | College Station, TX 77843-3003

ph: 979.862.1089 | jules.henry@tamu.edu

New Program Request Form for Certificate Programs

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*):

Certification in Corrosion Science and Engineering

3. Proposed CIP Code: 14.1801.0006

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

The certificate in corrosion science and engineering addresses the need to educate and train science and engineering students in developing methods and technologies in characterizing and assessing materials performance in extreme and corrosive environments to meet technological and scientific challenges in applications critical for the society. The program will help develop workforce in the State of Texas to address more than $1 trillion per year impact of corrosion on our global economy by providing an interdisciplinary education/ training framework that employs fundamental and applied science and engineering practical tools to the development of prevention and control of materials degradation and improvement of reliability. The program is designed in response to industry demand and national need for strategic sectors, such as infrastructure renewal, energy (extraction, conversion and transportation), utilities (in particular water), transportation, production and manufacturing.

This will be achieved through a holistic program that incorporates the following curriculum (i) cross-disciplinary components on materials science and engineering, thermodynamics, kinetics, and electrochemistry; (ii) interdisciplinary, integrative courses on the forms of corrosion, the electrochemical and degradation processes in extreme environments, and the control and mitigation strategies to prevent these processes in specific environments; and (iii) elective courses related to different engineering disciplines and applications as well as professional internships in industry and national laboratories.

The educational goals of the corrosion science and engineering certificate program are: to train the next generation of scientists and engineers who 1) will serve as advanced workforce for industry, academia, and government agencies with basic understanding of their environmental degradation assets to the need

to optimize asset life, production efficiency, and worker safety; 2) are familiar with the technological and computational tools and methods for corrosion and material degradation evaluation, inspection, detection, and prevention; 3) have interdisciplinary teaming experience in materials preservation and degradation, with individuals from different science and engineering disciplines; 4) contribute to interdisciplinary efforts while developing a comprehensive understanding of the potentials and limitations of corrosion science and engineering ; and 5) acquire skills necessary to thrive in their chosen career path.

Number of Semester Credit Hours Required 15

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*):

The Department of Materials Science and Engineering within the Colleges of Engineering and Science

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

Fall 2019

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

Name: Ibrahim Karaman

Title: Chevron Professor and Head, Department of Materials Science and Engineering

E-mail: ikaraman@tamu.edu

Phone: 979 862 3923

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.

NACE International (formerly National Association of Corrosion Engineers) in the latest study on the economics of the Impact of Corrosion indicates "That in the next decade a significant transition and turnover will occur in the corrosion community. An age distribution of the NACE membership indicated that only approximately 20% of the membership is 40 years of age or younger and almost 50% are 51 or older…. Assuming that NACE International membership is representative of the overall workforce knowledge transfer and education (E&T) of our younger workforce is critical"

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

Short term evidence of demand of the program

Semester	Fall 15	Spring 16	Fall 16
MSEN 489/689: Materials Electrochemistry and Corrosion enrollment	19	17	20

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	10	15	20	25	25
FTSE	10	15	20	25	25

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 *(bachelor's degree only)*	
Required Courses	12
Prescribed Electives	3
Free Electives	
Other *(Specify, e.g., internships, clinical work)*	(if not included above)
TOTAL	15

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
MSEN 201 or MSEN 222 or AERO 413 or BMEN 344 or CHEN 322 or CVEN 306 or MEEN 222 or MMET 207 or NUEN 265	Fundamentals of Mater. Sci. and Eng. Materials Science Aerospace Materials Science Biological Responses to Medical Devices Chemical Engineering Materials Materials Engineering for Civil Engineers Materials Science Metallic Materials Materials Science for Nuclear Energy	3
MSEN 440	Materials Electrochemistry and Corrosion	3
MSEN 444	Corrosion Laboratory	3
MSEN 446	Corrosion Prevention and Control Methods	3

Prefix and Number	Prescribed Elective Courses	SCH
Select one of the prescribed electives below		
AERO 411	Applications of Fracture Mechanics to Aerospace Structures	3
CHEM 466	Polymer Chemistry	3
CHEM 470	Industrial Chemistry	3
CHEN/SENG 430	Risk Analysis in Safety Engineering	3
CHEN 457	Environmental Engineering	3
MEEN 460	Corrosion Engineering	3
NUEN 465	Nuclear Materials Engineering	3
PETE 355	Drilling Engineering	3
PETE 458	Energy and Sustainability	3

	TOTAL SCH	15

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**
Homero Castaneda* Associate Professor	Ph.D. in Materials Science and Engineering, Pennsylvania State University	MSEN 440 MSEN 444 MEEN 460	25%
Raymundo Case Professor of Practice	Ph.D. in Corrosion, University of Manchester	MSEN 446 MSEN 444	25%
Hong Liang Professor	Ph.D. in Materials Science & Engineering, Stevens Institute of Technology	MEEN 460	10%

Name of Support Faculty and Faculty Rank	**Highest Degree and Awarding Institution**	**Courses Assigned in Program**	**% Time Assigned To Program**
George Pharr, Professor	Ph. D. in Materials Science and Engineering, Stanford University	MSEN 201	5%
Patrick Shamberger, Assistant Professor	Ph.D. in Materials Science and Engineering, University of Washington	MEEN/MSEN 222	5%

D. Students – Describe general recruitment efforts and admission requirements. How will students be accepted into the program? 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.

Undergraduate students will be able to apply to the program following the successful completion of an introductory materials science course anytime during their enrollment at Texas A&M University. A holistic review process by an admission committee will be used that considers a student's academic achievements, technical background, willingness to commit to the interdisciplinary nature of the program, and alignment of the program with their research interests and career goals. Undergraduate students who are enrolled in College of Engineering and College of Science should be in good academic standing within major department and have a GPA of 2.5 or higher to be part of the certificate. Students will receive mentorship and guidance by designated advisors (forming the academic program) to bolster retention and help ensure successful graduation. The advisors will be designated by the core certification program faculty.

Recruitment: The certification program will reach out to the students through seminars and informational meetings organized by the National Corrosion and Materials Reliability Laboratory

to recruit undergraduate students. In these meetings, URM faculty, who constitute the majority (60%) of the new certificate program, will provide positive reinforcement to recruit URM students.

Core program faculty will collaborate with the College of Engineering's undergraduate recruitment events by actively participating and providing lab tours, presentations, talks, and seminars.

Retention: The corrosion science and engineering certificate program will encourage URM students to take part in AGEP mentoring/networking activities focused on building community and reducing isolation among URM STEM undergraduate students. All students will have faculty mentors and be encouraged to participate in national contests about corrosion and related topics, present at national conferences, and write scholarly articles related to their research and engineering case studies. The certificate will collaborate with the Texas A&M Engineering Innovation Center and TEES to create programs to help and cultivate creative ideas of students into useful solutions to apply to the community and industrial sector.

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.

The library needs for the corrosion science and engineering program are standard and do not require special resources. Current library holdings are adequate.

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.

Current classrooms, equipment, and facilities are adequate. The main laboratory facilities are currently housed in the National Corrosion and Materials Reliability Laboratory at RELLIS Campus (http://corrosioncenter.tamu.edu/)

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

NACE International Institute is widely recognized as the worldwide accepted accreditation program organization in corrosion science and engineering related topics. Steps will be taken to form a strategic association with NACE International to provide students with the possibility of applying for certification as Corrosion Technologist once the course completion has been achieved and an exam has been passed.

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

N/A.

I. Administration of Program – Describe how the program will be administered. Where will the program be administered (i.e., department, college)?

The certificate program will be administered by the Department of Materials Science and Engineering within the Colleges of Engineering and Science. A dedicated director will lead the program.

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]	$71,560	Reallocated Funds	$71,560
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	**$71,560**	**Total Funding**	**$71,560**

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