

CALIFORNIA STATE UNIVERSITY, BAKERSFIELD
ACADEMIC SENATE

PETROLEUM ENGINEERING CERTIFICATE PROGRAM

RES 141540

AAC/BPC

RESOLVED: That the Academic Senate of CSU, Bakersfield recommends to the President the approval of the Petroleum Engineering Certificate Program.

RATIONALE: All steps have been followed in the development of this certificate program.

Approved by the Academic Senate on May 14, 2015
Sent to the President for approval on May 26, 2015
Approved by the President on September 24, 2015



CSU Bakersfield

Office of the Provost and
Vice President for Academic Affairs

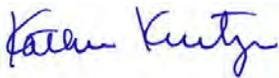
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(661) 654-2154
(661) 654-2131 FAX
www.csub.edu/provost

Memorandum

DATE: March 13, 2015

TO: Jacquelyn Kegley, Chair, Academic Senate
c: Horace Mitchell, President
Carl Kemnitz, Associate Vice President, Academic Programs
Anne Houtman, Dean, School of Natural Sciences, Mathematics, and Engineering
Mark Novak, Dean, Extended University
Melissa Danforth, Chair, NSME Curriculum Committee
Jorge Talamantes, Chair, Physics and Engineering

FROM: Kathleen M. Knutzen, Interim Vice President for Academic Affairs 

RE: Petroleum Engineering Certification Program Proposal

Please find attached the Petroleum Engineering Certificate Program Proposal for review and consideration by the Academic Senate. This request is a for a new academic credit certificated through Extended University has been approved by the Department Chair, the School Dean, and the School of Natural Sciences, Mathematics and Engineering Curriculum Committee. I also support this request and appreciate the Academic Senate's consideration. Please feel free to contact Dr. Jorge Talamantes or Dean Anne Houtman for questions or clarification.

PROPOSAL FOR A NEW ACADEMIC CREDIT CERTIFICATE

Proposals to add a new academic credit certificate must receive appropriate campus approval prior to implementation. All attachments are to be added to this cover sheet and remain with the proposal through the required steps of evaluation. Please consult with the Associate Vice President of Academic Programs for questions or assistance.

This new proposal is designed to be offered through:

- General-fund Support, "State-side," and/or
 Self Support

Title Petroleum Engineering Certificate Program effective (term): Fall 2015

Originating Department or Individual: Department of Physics & Engineering

If a department formally approved the attached proposal, attach the appropriate memorandum and approval date.

Signature:  date: Feb 11, 2015

Curriculum Committee(s): Interschool programs should attach comments or approval from relevant school or department curriculum committees before being submitted to the Academic Affairs Committee, acting as the University Curriculum Committee. A memorandum and approval date from the curriculum committee must be attached. If any revisions were required or agreed to, a revised copy of the proposal must be attached.

Chair Signature:  date: Feb. 13, 2015

Dean(s): Include the Dean of Extended University, where appropriate. I have reviewed this proposal and send it forward for university-wide review with my comments attached. These comments include my analysis of the resource commitments that must be made to support the program and the origin(s) of those resources.

Dean Signature:  date: 3/05/15

AVP of Academic Programs: I have reviewed this proposal and send it forward to the Provost.

AVP Signature:  date: 3/10/15

Date of Senate Approval: _____ Date of President Approval: _____

Please attach the final Academic Senate Resolution, as signed by the President and return to the Office of Academic Programs. A copy of this form and final electronic catalog copy must be sent to the Director of Academic Operations and Support.



CSU Bakersfield

School of Natural Sciences, Mathematics, and Engineering

Department of Computer and Electrical
Engineering and Computer Science

Mail Stop: 63 SCI
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Dr. Melissa Danforth
(661) 654-3180
(661) 654-6960 FAX
melissa@cs.csub.edu
www.cs.csub.edu/~melissa

February 13, 2015

To: Anne Houtman, Dean of NSME

CC: Jorge Talamantes, Chair of Physics and Engineering
Mark Novak, Dean of Extended University

Re: Certificate Program in Petroleum Engineering

The NSME Curriculum Committee discussed Physics and Engineering's request for the certificate in Petroleum Engineering through Extended University (see attached request).

The committee unanimously approved the request on February 13, 2015.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Melissa Danforth'.

Dr. Melissa Danforth
Associate Professor, Chair of CEE/CS
Chair of the NSME Curriculum Committee



CSU Bakersfield

School of Natural Sciences, Mathematics, and Engineering

Department of Physics and Engineering

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To: Melissa Danforth, Chair, NSME Curriculum Committee
From: Jorge Talamantes, Chair, Department of Physics and Engineering
Re: Certificate Program in Petroleum Engineering
Date: February 11, 2015

Jorge
Talama
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Digitally signed by Jorge Talamantes
DN: cn=Jorge Talamantes, o=CSU Bakersfield, ou=Department of Physics and Engineering, email=jtalamantes@csu.edu, c=US
Date: 2015.02.11 14:21:16 -08'00'

In Spring 2014, the department proposed the creation of three certificate programs to be handled through the Extended University Division (EUD). These were programs in Biosystems and Agricultural Engineering, Engineering Management, and Petroleum Engineering, i.e. we proposed to form certificate programs which were content-wise the same as the (optional) Engineering Sciences Emphases offered to our regular students. The NSME Curriculum Committee (CC) requested clarification on a number of issues before approval could be granted. After much deliberation, both internal as well as with the deans of NSME and EUD, and our stakeholders, we have decided to resubmit only the Petroleum Engineering Certificate proposal at this time.

Most importantly, the CC wanted to see that the program would have no budget impacts. Indeed, EUD will take responsibility for managing the certificate program, and all costs will be borne by those students. Please see the attached message from Dean Mark Novak. EUD students will take completely separate courses from our own students (although, again, the content of the certificate program will be the same as our Petroleum Engineering Emphasis). Thus, there will no adverse impacts on stateside budgets.

Furthermore, the CC needed statements about the following.

- 1. Budget impact/cost analysis, particularly with regard to splitting funding.** There will be no split funding. As stated by Dr. Novak, EUD will cover all costs associated with the program.
- 2. Community interest in certificates.** We have polled our own students (not pursuing a Petroleum Engineering Emphasis), alumni, and our Industry Advisory Board. The result is that, indeed, there is much interest in the community for a certificate program like the one we are

proposing. Furthermore, it is anticipated that this program will develop into one which attracts students from out of town, as the department develops ways to offer the courses online, and the laboratories over a short period (e.g. during the summer or winter break).

3. Indication that faculty would be willing to teach the courses through EUD. CSUB faculty will have the opportunity to teach these courses (and indeed there is significant interest in doing this), but otherwise the department will work with EUD to find local experts to teach the classes.

The NSME Curriculum Committee met again on January 16, 2015, and had the following additional comments.

1. Indicate in the proposal who is responsible for assessment.
2. Change the admission requirements to include BAs and MAs.
3. Indicate that the instructors must have a Master's degree.
4. Add the requirement that instructors must have departmental approval.
5. Add wording to the effect that students must meet the individual course prerequisites prior to being admitted into the program.

We have responded to all these comments within the proposal attached.

The department has approved the proposal attached.

Thank you for considering our request.

Proposal for a New Academic Credit Certificate in Petroleum Engineering

The San Joaquin Valley has a long history of oil and gas production. However there remains a need for technical professionals with training in petroleum engineering, particularly if they are native to the area. Leaders in the local oil industry are also concerned about the shortage of trained professionals in the near future due to the predicted retirement of aging experts. The shortage of trained petroleum engineers in the valley is further amplified by the fact that there are few opportunities available for formal petroleum engineering education in the state. In California, only Stanford University offers a B. S. in Petroleum Engineering (although it has been recently renamed Energy Resources Engineering); after that, the closest university is the New Mexico Institute of Mining and Technology, 800 miles to the east. Within California, only the University of Southern California (USC) offers a minor in petroleum engineering. Cal Poly San Luis Obispo does offer elective courses in petroleum engineering within the mechanical engineering undergraduate program (but Cal Poly does not offer a formal emphasis or certificate in petroleum engineering). However, these resources are insufficient to meet the expected demand of trained petroleum engineering professionals in the valley. For this reason, we propose to leverage existing petroleum engineering electives for the engineering sciences program to provide a post-baccalaureate certificate program in petroleum engineering.

A. Program Cost Analysis

No state-side cost will be associated with this new certificate. All costs will be borne by the Extended University Division and funded by EUD student fees. There will be no impact on state-side resources.

B. Criteria for Admission

Admission into the certificate program requires a Bachelor's or Master's degree in an engineering or science field from an accredited university. An individual with a Bachelor's degree in another field with four years of relevant work experience in an area appropriate to the petroleum engineering discipline such as drilling, production, completion, reservoir, and health, safety, and environment (HSE) will also be considered for admission. In addition, all students must satisfy the individual course prerequisites before being admitted into the certificate program.

C. Certificate Courses

The certificate program requires 23 units, in the following courses. Any of the courses included in the certificate program that has already been counted toward degree credit may be used by the interested student towards the completion of the certificate program. A minimum of 12 units out of the required 23 units must be earned at CSUB.

- ENGR 351, Fundamentals and Transport in Petroleum Engineering, (5 units). *Introduces fundamental concepts in petroleum engineering. Topics include the origin, migration and accumulation of petroleum, properties of reservoir rocks and fluids. Introduces petroleum exploration, reservoir engineering, drilling technology, well completion, and production engineering. Five hours lecture/discussion per week. Prerequisites: CHEM 211, PHYS 221, and MATH 202 or 232, or equivalent.*
- ENGR 452, Petroleum Production Engineering, (4 units). *Covers topics in modern petroleum production engineering, including production technologies, production equipment, equipment design and optimization, well completion, tubing design, well performance evaluation (productivity index), inflow performance relationships (IPR), artificial lift and surface facilities. Four hours lecture/discussion per week. Prerequisite: ENGR 351, or equivalent.*
- ENGR 453, Reservoir engineering (5 units). *Fundamental equations of fluid flow through porous media, reservoir material balances, aquifer influx, well testing, and decline curve analysis. Methods for forecasting reservoir performance are covered using analytical models. Five hours lecture/discussion per week. Prerequisites: MATH 203 or 233, and ENGR 351, or equivalent.*
- ENGR 454, Drilling Engineering and Completion Technology, (5 units). *Fundamentals of drilling equipment, engineering design calculations, wellbore diagrams, drilling fluids, cement calculations, and casing design. Additional topics such as directional drilling as well as completion technologies are covered using practical examples and field applications as applied in the oil and natural gas well drilling operations. Four hours lecture/discussion and one three-hour laboratory per week. Prerequisites: ENGR 244, and 351, or equivalent.*
- ENGR 426, Economics of Engineering Design (4 units). *Cost measurement and control in engineering studies. Basic accounting concepts, income measurement, and valuation problems. Manufacturing cost control and standard cost systems. Capital investment, engineering alternatives, and equipment replacement studies. Prerequisites: MATH 201 or MATH 231, or equivalent.*

D. Required Qualifications for Instructors

Instructors for these courses should have a PhD in engineering or in an area appropriate to the specific course. Alternatively, an instructor could have a Master's degree in engineering or in an area appropriate to the specific course and four years of relevant industry experience. The Department of Physics and Engineering will be responsible for the approval of individual instructors.

E. Relationship to Existing Degree Programs

All of the required (ENGR) courses are currently offered on a two-year schedule as electives for the B.S. degree in Engineering Sciences, and for the Petroleum Engineering emphasis within the Engineering Sciences program. The courses for the certificate, however, will be completely separate and offered through the EUD.

Even though these courses are offered through the EUD, course assessment will be done in accordance with ABET assessment standards. The course outcomes are the same as the state-side offerings, and the instructor of record will be responsible for their assessment. A designated department faculty member will review this process to ensure that course outcomes are met.

F. Sign-off Sheet – see graduation checklist for ENGR

Post-Baccalaureate Certificate in Petroleum Engineering

Checklist

Student name: _____ Student ID: _____

Course	Approved Substitute (if any)	Completion Quarter/Semester	Grade
ENGR 351, Fundamentals and Transport in Petroleum Engineering			
ENGR 452, Petroleum Production Engineering			
ENGR 453, Reservoir engineering			
ENGR 454, Drilling Engineering and Completion Technology			
ENGR 426, Economics of Engineering Design			

Advisor Signature: _____ Date: _____

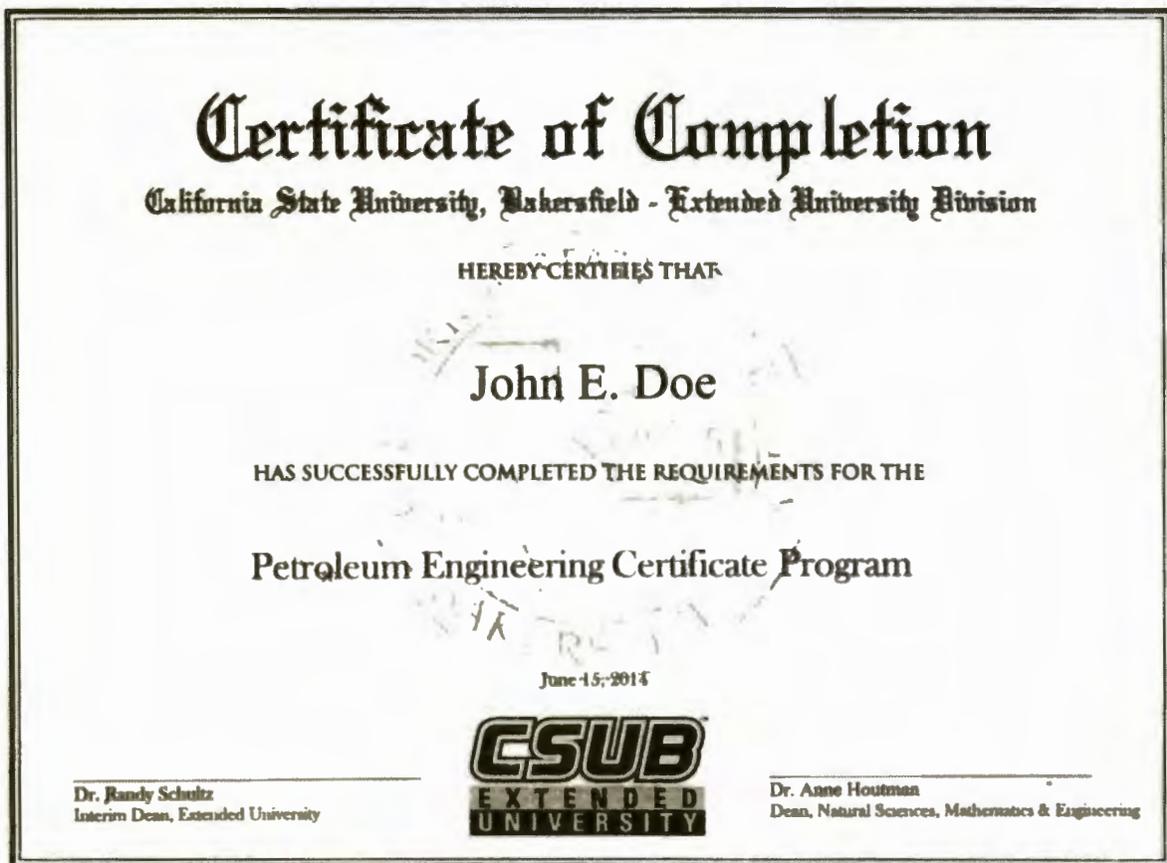
Department Chair Signature: _____ Date: _____

G. Proposed catalog copy

Post-baccalaureate Certificate in Petroleum Engineering

An individual with a baccalaureate or advanced degree in engineering or science may earn a certificate in petroleum engineering. An individual with a baccalaureate degree in any field and four years of relevant experience in an area appropriate to the petroleum engineering discipline such as drilling, production, completion, reservoir, and health, safety, and environment (HSE) will be considered for admission to the certificate program. Five courses are required for the certificate: ENGR 351, ENGR 352, ENGR 353, ENGR 354, and ENGR 426.

H. Certificate mock-up



From: Mark Novak 2 November 3, 2014 1:41:48 PM
Subject: Support for Engineering Certificates
To: Jorge Talamantes
Cc: Anne Houtman Tanya Snyder Kelly Mallon
Jennifer Patino Rhonda Dawson Vandana Kohli Dayanand
Saini

Hello Jorge:

I'm writing to you to confirm our discussion about the financial arrangements for the Certificate in Petroleum Engineering.

The program, when it is fully approved, will be offered as a Self-Support program through the Extended University Division (EUD). The EUD will work with your department and school to develop a budget for this program. The budget will include projected expenses and revenue.

It is expected that fees from the program will cover all costs (e.g. marketing, instructor salaries, etc.). EUD will provide the financial resources necessary in case revenue falls short of expenses.

I hope this answers your questions and those of your colleagues with respect to this program.

Best wishes.

Mark

Mark Novak, Ph.D.
Dean, Extended University Division
and Senior International Officer
California State University - Bakersfield
Bakersfield, CA 93311
408-607-7081