ACADEMIC SENATE EXECUTIVE COMMITTEE

Agenda
Tuesday, October 29, 2019
10:00 a.m. – 11:30 a.m.
SCI III Rm 100

1. CALL TO ORDER

2. ANNOUNCEMENTS AND INFORMATION

3. APPROVAL OF MINUTES
   October 22, 2019 Minutes

4. APPROVAL OF AGENDA

5. CONTINUED ITEMS
   a. Online SOCI software
   b. AS Log (handout)
      i. AAC (M. Danforth)
         ▪ Referral 04 Proposal for a Masters in Kinesiology
         ▪ Referral 13 Response to Student Misconduct Task Force Report
         ▪ Referral 14 New Course Forms and Process
         ▪ Referral 15 Interdisciplinary Studies New Course Proposals
         ▪ Referral 16 Program Review Process Improvement
         ▪ Referral 17 Learning Management System – Canvas
         ▪ Referral 18 Interdisciplinary BS Degree in Public Health Proposal
         ▪ Referral 19 Winter Term Courses and Units Policy
      ii. AS&SS (J. Millar)
         ▪ Referral 05 Canvas Pilot
         ▪ Referral 12– Graduate Student Grievance and Appeals Policy – Reporting Chain
         ▪ Referral 13 Response to Student Misconduct Task Force Report
         ▪ Referral 17 Learning Management System – Canvas
      iii. FAC (M. Rees)
         ▪ Referral 02 Faculty Workload – One WTU Defined
         ▪ Referral 08 Honorary Doctorate-Handbook Change
- Referral 09 Faculty Membership on Search Committee for the Provost & VP of AA – Handbook Change
- Referral 11– New Regulations on Consensual Relationship - Handbook Change
  iv. BPC (B. Street)
    - Referral 04 Proposal for a Masters in Kinesiology
    - Referral 07 Academic Calendar – Spring and Fall Semester Breaks
    - Referral 17 Learning Management System – Canvas
- Interim Provost Update
- Searches - Update
  i. AVP Academic Programs
  ii. Dean SS&E
  iii. Associate Dean SS&E
  iv. Faculty Director of Interdisciplinary Studies
  v. Faculty Director of the Teaching and Learning Center
  vi. Faculty Ombudsperson
  vii. Faculty Coordinator for Sustainability
- Financial and strategic planning transparency and faculty participation
- Handbook Error Log

6. NEW DISCUSSION ITEMS
   a. Energy and Power Engineering within the degree of B.S. in Electrical Engineering (handout)
   b. Wang Award - FHAC’s recommendation

7. AGENDA ITEMS FOR SENATE MEETING November 7, 2019 (Time Certain 11:00 a.m.)
   - Announcements
   - Consent Agenda
   - New Business
     RES 192004 Academic Support and Student Services Additional Member ASI Executive Director First Reading
   - Old Business
     RES 192005 Academic Master Plan 2020-21 through 2030-31 - Second Reading

8. COMMENTS FROM THE FLOOR
ACADEMIC SENATE EXECUTIVE COMMITTEE
Minutes
Tuesday, October 22, 2019
10:00 a.m. – 11:30 a.m.
SCI III Rm 100

Absent: D. Boschini, J. Millar

1. CALL TO ORDER
   A. Hegde called the meeting to order.

2. ANNOUNCEMENTS AND INFORMATION
   Trustee Wenda Fong is meeting with the Academic Senate members October 24,
   1:10-2:10 Location: SCI III Rm 100.
   Provost Search Committee- The first meeting is Friday, October 25.
   Summary of GI 2025 Symposium: A. Hegde represented D. Boschini as Senate Chair.
   He had an opportunity to talk with Senate Chairs from other CSU campuses. We have it
   better here than other campuses when it comes to Provost Search. It’s common to have
   only one elected faculty representative, and the President appoints the rest of the
   members. The keynote speakers from San Diego State had student stories similar to
   ours (first generation, immigrant, etc.) Each student had one person who made a
   difference when they were lost and confused. That person was the reason they
   continued with their education. A. Hegde said, in our day-to-day challenges, some of us
   forget that those around us have extreme struggles. Our job is to remove barriers. The
   President of Paul Quinn College spoke of the need to meet students where they are.
   President Zelezny has said this, too. Teach the students we have instead of the students
   we wish we had. The new Student Success dashboard was demonstrated. Then,
   Governor Newsom made the point that he approved $660M to the CSU. Chancellor
   White made his presentation. For A. Hegde it was an eye opener. He wishes more
   faculty could attend. It was designed for administrators and each campus had a limited
   number of spots and President Zelezny asked for two more. A. Hegde expressed his
   gratitude for the opportunity to attend. V. Harper said that the Chancellor did a
   marvelous job talking about the time we live in. It was V. Harper’s third GI Symposium.
   There was a lot of skepticism at first, and now there isn’t. Cultural change is in progress.
   He will ask the President to open more spots to attend. There is more value in the social
   opportunities than the actual sessions. The social time was not on state funds. He did
   enjoy the sessions and presentations. A. Hegde was in the same session on data
analytics as the President of the California State Student Association (CSSA). The student leader made the point that some ideas are great but not for everyone. For example, San Diego State students outside the service area have to spend the first two years in the dorms. It creates a problem for some. They have to scramble during summer for housing. Some students get lost when they come to the university. It’s important that students make connections with somebody – counselor, staff, or faculty. CSUB’s First Year Seminar is so important to help our students stay. J. Tarjan made reference to high impact practices such as student research, cohorting, and study abroad. There is strong support for study abroad because it increases graduation rates the highest. Yet, people from upper class families who study abroad would graduate whether they study abroad or not. Sometimes things are more complex. He compiled 10 years of longitude data on business majors to study the gap between the ethnic groups and the genders. The study controlled for A grades. All differences disappear. If one does a multivariate analysis to demonstrate that we don’t discriminate based on gender or race, be sure to control for Pell eligibility or something else. He suspects that the gaps will be even smaller than they are now. It starts with research design. By simply taking a sample of wealthy students and a sample of low-income students, one can’t conclude that that there is a gap between those two groups. Most of the problems we have with research is that they are done as binary research. Examples: 1) lung cancer is strongly correlated to beer drinking. So, don’t drink beer. 2) Women are graduating at much higher levels than men. The implication is that we are mistreating men. A. Hegde informed the EC that the President planned to give her report on the GI Symposium at Senate on October 24, 2019 but she had another appointment. Everyone is focused on closing those equity gaps. V. Harper will give a report to Senate.

3. APPROVAL OF MINUTES
   M. Danforth motion to approve the October 15, 2019 Minutes over email. B. Street seconded. Approved.

4. APPROVAL OF AGENDA
   M. Danforth moved to approve the Agenda. B. Street seconded. Approved.

5. CONTINUED ITEMS
   c. AS Log (handout)
      i. AAC (M. Danforth) She will be at the Chancellor’s Office (CO) October 29-31. She will ask R. Gearhart to chair the next meeting.
         ▪ Referral 04 Proposal for a Masters in Kinesiology – AAC had joint meeting with BPC. K. Grappendorf/Kinesiology Chair and R. Dawson/EEGO
Director of Academic Programs attended. Everyone was satisfied with the Q&A. A joint resolution is forthcoming.

- Referral 10– Ethnic Studies as a GE Requirement – The committee looked at the original Task Force Report 2016, the Response to the Report 2017, the letter to Senator Pan, the response to Senator Pan and then distilled what was time sensitive: which junior courses address diversity, in what category, what are the requirements for that category. Ethnic studies can be found throughout CSUB’s GE program. The committee discussed that diversity is broader than ethnic studies. AAC is working with L. Paris to get the report fleshed out. J. Tarjan stressed the importance of having a process so that faculty members who are interested have a voice to respond to Senate request for feedback. There is a strong feeling that diversity is not the same as ethnic studies. The Task Force report was trying to increase the number of people teaching ethnic studies and the number of students taking those courses. We need to make sure people who have opinions have a chance to weigh in. That was the goal of the author of this bill, AB 1460 CSU Graduation Requirement Ethnic Studies. As a campus, CSUB did weigh in to say we want more of a diversity requirement. There is going to be push-back that diversity is not ethnic studies. J. Tarjan said he is willing to get people together who teach these courses. A. Hegde will ask L. Paris to hold an open forum on Monday. It would be useful to have copies of AAC and GECCo’s reports available at the meeting. There are several courses that touch on aspects of human diversity. J. Tarjan said that the process is very important. He recommended a general call to attend. Senator Pan asks for campuses to weigh in. ASCSU Chair Catherine Nelson asks how do you want to handle this? For example, a more flexible environment, ethnic studies imbedded in GE, etc. A. Hegde stated that the deadline for the Senate Chairs to submit their input to the ASCSU is November 1.

- Referral 13 Response to Student Misconduct Task Force Report – since AS&SS is inviting members of the Task Force, R. Alvarez and BJ Moore, to their meeting, AAC tabled the topic until they got minutes from AS&SS.
- Referral 14 New Course Forms and Process - deferred
- Referral 15 Interdisciplinary Studies New Course Proposals - everyone was happy with the revisions. The referral will move over to GECCo.
- Referral 16 Program Review Process Improvement - deferred
- Referral 17 Learning Management System – Copies of the Canvas Pilot Report were distributed as homework.
▪ Referral 18 Interdisciplinary BS Degree in Public Health Proposal – Certain forms are needed. J. Tarjan suggested to ask whether graduates are hirable upon attaining a masters degree in health, and bachelor degrees in health. M. Danforth will be sending the proposal out to the various Curriculum Committee (CC) Chairs for their feedback. AAC acts as the CC for Interdisciplinary Studies programs. A. Hegde said that it is normal practice for the CC of INST to contact the chairs of the departments as a courtesy. ECON is offered every year but it’s not on the proposal – it’s important for the Economics Chair to estimate the number of students projected to enroll.

▪ Referral 19 Winter Term Courses and Units Policy

ii. AS&SS (J. Millar) (deferred)

▪ Referral 05 Canvas Pilot -

▪ Referral 03 ASI Executive Director as Ex-Officio Non-Voting Member of Academic Support and Student Services Committee (AS&SS) - Bylaws Change

▪ Referral 12– Graduate Student Grievance and Appeals Policy – Reporting Chain

▪ Referral 13 Response to Student Misconduct Task Force Report

▪ Referral 17 Learning Management System – Canvas

iii. FAC (M. Rees)

▪ Referral 02 Faculty Workload – One WTU Defined. The committee reviewed comments from the DCLC and focused on what was needed for the Provost’s Office.

▪ Referral 08 Honorary Doctorate-Handbook Change – She reached out to the President’s Office about their parts of the process.

▪ Referral 09 Faculty Membership on Search Committee for the Provost & VP of AA – Handbook Change – The committee discussed the benefits of having TT, T, FT and what constituencies are involved, and who would be reviewing these positions. D. Schecter is in the process of revising the faculty search committee membership. M. Danforth has a search committee with two TT because she doesn’t have enough T people. The exceptions are still the norm, especially for smaller departments.

▪ Referral 11– New Regulations on Consensual Relationship - Handbook Change - deferred

iv. BPC (B. Street) – K. Krishnan provided profile #4 from IRPA. The committee is looking for the actual headcount for fall 2019. Tenure density will be part of the discussion at the next meeting.
Referral 04  Proposal for a Masters in Kinesiology – see AAC’s update.
Referral 07 Academic Calendar – Spring and Fall Semester Breaks – B. Street has been in discussion with D. Cantrell. BPC is expecting the Calendar Committee to present drafts of 2021-2022 and the 2022-2023 calendars at its November 14 meeting. It will be an opportunity for discussion on how they the Calendar Committee’s decision making process on Spring break, going forward. B. Street talked to D. Cantrell, requesting that the Commencement Committee make the decisions on the Commencement dates, and to consider including a member of the Commencement Committee on the Calendar Committee. The Calendar Committee will be presenting three different calendars based on the three proposed mechanisms for instituting a Fall Break.
Referral 17 Learning Management System – Canvas - the committee held its initial discussion. It’s a big referral. The feedback from the three committees is to work on items specific to the committees’ role. A. Hegde said that the committees have their charge. The chair can say, this is not our charge. Recall that the Provost said that there isn’t a deadline. If committees need to discuss a topic, have the discussion until satisfied.
c. Interim Provost Update (handout)

- The memo from the CO on TT hiring was distributed. It shows comparison to where we are on hiring in this Fall 2020 cycle: the total number of recruits and positions approved, how we compare to the rest of the system, and what we need for our size. CSUB’s TT expansion is more than comparable to other institutions. We can start estimating budget, TT hires for the Fall 2021 hiring cycle. We are attempting to add more data to each additional cycle and make it more empirical to provide information and faculty lines to departments within a certain growth rate. There are a number of programs coming off the Academic Master Plan (AMP) that are going to be approved for Fall 2021. We want to make sure we are staffing them. We want to be as open and transparent as possible. We have 14 expansion hires for the fall 2020 cycle. V. Harper discussed with D. Schecter the importance of a 100% placement rate for CSUB’s tenure-density. See the total allocation $1.7M. With benefits, it’s $1.8M million, which is significantly more than 50% of the $3M that was available in this particular transfer fund. M. Rees asked about FT Lecturer hiring. Some departments have so many PT instructors and it would be better for the instructors and the students to have FT instructors. M. Danforth commented that some departments need the PT because of
pedagogic issues. There are some people working full time who come here to teach. Nursing did a what-if analysis. Would they save the campus money if they consolidated X number of positions with benefits into one FT? They found a net savings by consolidating the PT positions. M. Rees commented that it would be a savings and an investment. V. Harper said that typically the deans will bring a proposal to consolidate. The deans have to show, within their lecture pool, the efficiencies of hiring a FT Lecturer and that they can support that person. Sometimes the Provost Office has to put some funding there for the deans to reach their goals. M. Rees asked if the dean’s reasoning could be accurate if they have five PT versus one FT. V. Harper responded that it depends on department and schools. That’s why it’s important for the deans to do the analysis. The cost/benefit depends on the school. M. Danforth – there is a certain threshold when PT get benefits. If one had only a single class per year, they would not get benefits. V. Harper said that the Deans have authority and responsibility to say how we do this. FT versus PT is a school management issue. TT is where the Provost Office makes the broad allocations. J. Tarjan said that one of the resolutions at ASCSU this fall concerned notifying lecturers and contingent faculty of open positions. It’s an expedited process, and cheaper to convert lecturers. A campus can fill positions without a full-blown search. V. Harper isn’t aware of any systemwide information on that. It’s a touchy subject, especially for faculty who were hired to come in as tenure-track. M. Danforth cautions on that approach. It’s better for a lecture on a visa that they be part of a national search. Several years ago, a list of lectures who have Ph.D. revealed that they prefer to stay at the Lecturer level because they are not active in research and/or service, and thus wouldn’t be competitive for a TT position. Any kind of expedited process for a lecturer conversion to TT would require release time for lecturers’ research. A. Hegde said that there are a lot of issues tied into this item.

- The Academic Master Plan (AMP) is a list of newly proposed courses to be sent to the CO after its approval by the Senate. Earlier this semester, the Provost Office sent an announcement asking for new proposals to be included. Each program approved by the CO to proceed then works through its development at the department level, going through their school’s CC to then be approved by the university. The AMP is sent back to the CO for approval of degree. It takes between one to three years from the time a proposal is included in the AMP to the time a class is
offered. A. Hegde said inclusion on the AMP is not a guarantee that the program will happen. It’s just an option to pursue. V. Harper said if there is already a degree program in place, one can do a concentration elevation to a degree program without going through the AMP process. Although he doesn’t recommend that. It still does have to be approved by the CO. Currently, there are two degrees going through the AMP that are being discussed by the schools. M. Danforth has a proposal that was first introduced in 2008 that may start in Fall 21. A. Hegde said that the Senate puts forth a resolution to approve the AMP. He asked whether the five programs added to the AMP were initiated by faculty. V. Harper said that faculty signatures are on the proposals. A. Hegde said that since faculty has initiated the five programs, he does not see a need to refer the AMP to committees. *RES 192005 Academic Master Plan 2020-21 through 2030-31* can be on the next Senate draft Agenda. The Interim Provost will explain the AMP to the Senate.

- V. Harper encourages faculty to participate in the mid-point campaign. We are at 15% faculty participation. The goal is 40%. The backend of the process has been revised. The change is in what the professional advisors do. They have intervention of students with poor performance mid-term. He emphasized that there isn’t anything faculty could do that is more important than communicating to a student mid-term. A. Hegde suggested that a way to improve participation could be a report to faculty that shows X% of students went to the workshop. It lets faculty know that their input means something. V. Harper said it’s a multi-term, multi-year effort to prevent students from going into probation. Once a student gets in probation, they’re likely to leave. A. Hegde said that one of the points made at the GI 2025 Symposium was that the more touch points students have, the better they perform. V. Harper said that $100,000 to go out to the schools next week for their graduation retention plans.

c. Searches - Update
   i. AVP Academic Programs – no change.
   ii. Dean SS&E – The consultation will start this week. He’ll attend the chairs meetings.
   iii. Associate Dean SS&E - same as above.
   iv. Faculty Director of Interdisciplinary Studies - The call has closed off.
   v. Faculty Director of the Teaching and Learning Center – The call will launch after he has a couple conversations.
vi. Faculty Ombudsperson – The call will go out at the same time as Faculty Coordinator for Sustainability.

vii. Faculty Coordinator for Sustainability – he is waiting for a draft call.

c. Financial and strategic planning transparency and faculty participation - Yesterday’s Fall Budget Forum was an improvement over prior years’ content and discussion. There doesn’t appear to be a place where one can find the details of University grants. The CO could not provide an explanation. Position Control is another area that is not visible. There needs to be a fact sheet to explain what Position Control is. No one knows what goes in or what comes out again. Last year, M. Rees said a group started to track Instructionally Related Activities (IRA) student funds from referendum to her department. They went through multiple years. The best they could understand it was that the President had initiatives and it was sweep into some roll-over fund. We lost tens of thousands of dollars; money that was in our account is gone. V. Harper said there may be a reason that the monies are not there. J. Tarjan suggested that M. Rees ask for the money back. If they were student funds that were not subject to the general university account, request that they be returned.

6. NEW DISCUSSION ITEMS

c. SOCI Replacement Tool – Currently, SOCI’s are administered in IT. A. Hegde received a request from F. Gorham to have faculty consider using software that has the capability of replacing the home-grown online SOCI, and face-to-face SOCIs. The software is not changing the SOCI questions. M. Danforth inquired whether the software has a time restriction when faculty can look at the report. Faculty should not be accessing reports before grades are due. Do chairs get the reports automatically? Those features need to be in the online tool. She will send a message to F. Gorham. M. Rees commented that if it’s more efficient and allows IT Analyst/Programmer to handle other needs, OK. V. Harper said the cost of the online SOCI tool is $13,000 annually. The additional costs are S. Miller’s time to process and Deans’ time to transfer SOCIs to Chairs. J. Tarjan doesn’t feel that it needs to go to committee.

c. Annual Catalog Deadline Fall 2020 – M. Danforth has heard that since the draft was sent last week that there isn’t enough time for departments to deliberate to make the December 1st deadline. M. Danforth suggested to Academic Programs that December 1 be a soft deadline. In the future, send the catalog draft out during University Week. V. Harper will request that it be a soft deadline. M. Danforth suggested that it be a topic at DCLC and to check where the chairs of the CC are in their process. It takes a minimum of two meetings to approve
anything. It needs to get through the CC on their schedule. V. Harper will send an email to the Chairs. J. Tarjan asked for an editor. M. Rees said that the lack of a template for Q to S conversion created inconsistencies in formatting from department to department, and course numbers between schools.

b. Committee list in Handbook – J. Millar and A. Hegde agreed to look at it this summer. M. Rees offered to help with proof reading. J. Tarjan said for all of the Senate Committees, everyone should have access to committee charge, membership, how often they meet, and their terms. He’s not certain whether it should be in the Handbook. It could have a description in the Handbook. He prefers a RTP handbook, a search and screening handbook. A committee list doesn’t belong there. The Students Grievance Policy doesn’t belong in the Handbook. M. Danforth suggests a continuing item, called Handbook Error Log where we can begin accumulating all these issues. J. Tarjan said if it doesn’t change policy or major practice, the EC can make the changes quickly on behalf of the Senate. A. Hegde- if it’s editorial, we’ll make note of that. J. Tarjan requested a repository for binding policy and procedures. For example, how are grievances for graduate students handled? It’s in the catalog, but not in the Handbook. It says “all students”. V. Harper is working on having a Policy Portal. Send Handbook edit requests to the ASC Academic Senate.

7. **AGENDA ITEMS FOR SENATE MEETING October 24, 2019** (Time Certain 11:00 a.m.)
   Announcements
   Trustee Wenda Fong meeting October 24, 2019 1:10-2:10 Location: SCI III Rm 100
   Recognition of the Cabinet members for greeting the BC students
   Consent Agenda
   New Business
   RES 192005 Academic Master Plan 2020-21 through 2030-31 – First Reading
   Old Business
   RES 192002 Distributed Learning Committee Handbook Changes - Second Reading
   RES 192003 SOCIs for Summer and Winter Courses - Second Reading

8. **COMMENTS FROM THE FLOOR**
   Many faculty are unaware of the Working Personal Action File (WPAF), and that there is a permanent file in the Dean’s Office. The TLC used to host an annual RTP Workshop for new faculty. It would be helpful to have them again. It goes back to reforming the TLC. V. Harper will reach out to the Faculty Fellow to do the workshop. Candidates like that there is junior faculty on the faculty search committee.
   Chancellor White just announced his retirement, June 30, 2020.
   Invite Trustee Fong to Thursday’s Senate meeting.
PROPOSAL FOR A NEW MINOR, CONCENTRATION or EMPHASIS

Proposals to add a new minor, concentration or emphasis must receive appropriate campus approval prior to implementation. In addition, the Chancellor’s Office must be notified of the 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 a (check one):

☐ Minor - Is this minor available to all undergraduate students? ☐ Yes ☐ No, only in __________

☐ Concentration ☑ Emphasis within the degree of B.S. in Electrical Engineering

Title: Energy and Power Engineering effective (term): Fall 2020

☐ Use the following degree code ____________ instead of the major degree code for reporting (note the necessary criteria and degree codes)

Originating Department or Individual: CEE/CS Dr. Melissa Danforth

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

Signature: ___________________________ date: 4/12/2019

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: 12th April 2019

School Dean(s): 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: 4/13/2019

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

AVP Signature: ___________________________ date: 10/23/19

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, which will notify the Chancellor’s Office and the appropriate campus departments. A copy of this form and final electronic catalog copy must be sent to the Director of Academic Operations and Support.
PROPOSAL FOR A NEW MINOR, CONCENTRATION or EMPHASIS

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School Dean(s): 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: 4/13/2019

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

AVP Signature: ___________________________ date: __________________

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, which will notify the Chancellor’s Office and the appropriate campus departments. A copy of this form and final electronic catalog copy must be sent to the Director of Academic Operations and Support.
Date: 26th of April, 2019

To: Kathleen Madden, Dean, NSM&E  
   cc: Melissa Danforth, Chair, CEECS

From: F. Javier Trigos-Arrieta, Chair, Curriculum Committee NSM&E

Subject: Proposal for Energy and Power Engineering Emphasis

At its meeting of the 26th of April, 2019, the Curriculum Committee approved the emphasis in “Energy and Power Engineering” within the Bachelor of Science in Electrical Engineering.
April 12, 2019

To: NSME Curriculum Committee
Re: Proposal for Electrical Engineering Emphasis in Energy and Power Engineering

1. Approval
The proposed emphasis was approved by the CEE/CS Department at the department meeting on February 14, 2019.

2. Proposed Changes
See attached proposal.

3. Resource Implications
See attached proposal.

4. Curriculum Impacts
See attached proposal.

5. Rationale
As part of the new Title V grant activities, curriculum is being developed in the area of energy and power. A subcommittee of faculty from both departments are developing the curriculum. This curriculum is designed to be accessible to both Electrical Engineering and Engineering Science students, so students interested in energy and power can take the same set of courses in both departments. The attached proposal represents the Electrical Engineering component of the grant activities.

Sincerely,

Dr. Melissa Danforth
Chair of CEE/CS
To: Dr. Javier Trigos, Chair, NSME Curriculum Committee

From: Melissa Danforth, Department Chair

Date: January 9, 2019

Re: Proposal for a new Energy and Power Engineering Emphasis within the B. S. in Electrical Engineering

The department of Computer and Electrical Engineering and Computer Science has approved the attached proposal for a new Emphasis in Energy and Power Engineering. The emphasis is optional within the B. S. in Electrical Engineering.

The new emphasis requires three upper-division ENGR courses. We have consulted with the Department of Physics and Engineering, and secured their support. A memo from Dr. Alexander Dzyubenko, Chair of that Department is attached here as evidence of such support.

We are requesting the institutional review and approval of this proposal. Thanks for considering our request.
Proposal for a new emphasis in Energy and Power Engineering within the B. S. in Electrical Engineering

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Renewable (such as wind, hydro, geothermal and solar). The new emphasis will allow our
energy production and power distribution play a central role in the economy. This will always
be true, whether the energy sources are conventional (such as gas and petroleum) or
indeed, some of our faculty (in both CEE/CS and PGE) are already involved in both centers.

Excellence in Science and Technology (CREST) and California Energy Research Center (CERC).

This new program will generate and support new synergies within CSUB’s Center for Research
packaging them into an emphasis to give our students additional leverage in the work place.

proposals/curricula and the associated resources are already in place. In part because the
existing faculty have the required expertise and no new faculty are necessary.

In Electrical Engineering the existing faculty have the required expertise and no new faculty are necessary.

Courses already count towards the Electrical Engineering requirement for the B.S. in Electrical
have been approved by the university, and students have started taking some of them. These
courses will be offered in the fall of 2012.

The grant was to establish an emphasis similar to the one being proposed in this document.

Students. The grant is presently in its fourth year and ends September 30, 2020. The grant was
funded externally through a grant from the National Science Foundation. The project started December 5, 1999.

Since the Electrical and Computer Engineering program was approved by the University of California, it
is not necessary to implement the Electrical and Computer Engineering program.

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is not necessary to implement the Electrical and Computer Engineering program.

The electrical and computer engineering program.

The electrical and computer engineering program.

The electrical and computer engineering program.

The electrical and computer engineering program.

The electrical and computer engineering program.

The electrical and computer engineering program.
students to be more marketable in this sector, and will allow our department to more
effectively perform outreach and recruit students, as well as serve the needs of the community.

Our proposed new emphasis requires three courses from the P&E department. We have consulted with our colleagues in that department and we include a letter of support in Appendix C. The catalog descriptions for those three courses are included in Appendix D.
There are a variety of reasons why it makes perfect sense to offer a formal emphasis in
population and any distinctive pedagogical methods. rationale may explain the relationship among the emphases philosophy, design, target
with instructional mission, and a justification for offering the emphasis at this time. The
rationale, including a brief description of the emphasis, its purpose and strengths, is

(2) Program Overview and Rationale

N/A

code to be used:

proposes the classification of institutional programs (CIP) code and CSU degree program
if students must apply directly to the concentration or emphasis (rather than the major),

enables our graduates to find engineering employment anywhere.

Southern San Joaquin Valley. Nevertheless, the skills provided by our curriculum will
access to robust engineering education in fields that are especially marketable in the
resources needed somewhere. At the same time, the emphasis will provide our students
supporting, and will not adversely affect existing academic programs. By diverting
be taught by full-time faculty already in the two departments. This emphasis will be self-
science programs, no new courses or laboratories will be required. The emphasis will
structuring existing engineering courses within the electrical engineering, and electrical
opportunities available to students interested in this field. The emphasis will involve
emphasize will support the economic development of the region, as well as advancing the
will not include in the study program. This emphasis is being proposed in response to high demand in the region for engineers
operation and growth of existing academic programs.

(c) How this emphasis will support the campus mission and will not impair the successful

(d) Total number of units required for graduation: 120 units.

(e) Term and academic year of intended implementation: Fall 2019.

Full and exact degree designation and title: Bachelor of Science with a Major in

(3) Program Identification

Proposal
The proposed emphasis focuses on the engineering aspects of energy production and power distribution. It complements our existing engineering programs, and similarly builds on background already provided by the curriculum for the B.S. in Electrical Engineering. Furthermore, the new emphasis avails of existing engineering expertise in the P&E department. The emphasis utilizes only existing courses.

Clearly, oil production is and will continue to be a very important part of our area’s economy. However, our students would be well served by understanding how one takes this energy source, as well as others (such as natural gas, biomass, wind, solar, hydro, geothermal, etc.), and extract the energy to transform it to electricity, and how we go about distributing it for its consumption. California produces and consumes enormous amounts of energy, and it is of course one of the leading states in the field. Energy availability, especially from environmentally-friendly sources and processes will always be important.

All the courses which will be required for the emphasis are already offered as part of the similar emphasis in the P&E department. Many of the students in the CEE/CS department have expressed an interest in Energy and Power Engineering.

The California Energy Research Center (CERC) will offer many opportunities for research and collaboration with industry. Our students will be well-positioned to take advantage of opportunities for synergies arising from the center. Research activities will be structured to complement the curricular activities and contribute to ABET’s (the engineering accreditation agency) Student Outcomes in the non-traditional areas, such as contemporary issues, economics, societal impact, health and safety, professional, global issues, multidisciplinary team work, manufacturability, sustainability, environmental, ethical, political, and life-long learning. Furthermore, collaboration with CERC will help attainment of the Electrical Engineering Program Educational Objectives.

We have a Department of Education Title V $3.6M five-year grant that has allowed us to set up the infrastructure required to establish this program. The Physics and Engineering department has already used the resources from that grant to start an Energy and Power Engineering emphasis (We are presently in grant year four). The expenses supported by the grant include acquisition of sophisticated equipment, as well as outreach to Bakersfield College and local High Schools. Having a formal emphasis in energy and power engineering within our Electrical Engineering program will allow us to advertise and do outreach to the community and continue to make the case that we are addressing its needs.

The proposed Emphasis in Energy and Power Engineering would offer students an opportunity to pursue a formal program that is relevant to our community and the state. It can also offer to local industry a source of well-educated engineers who are ready for the field, and who are also native to the Bakersfield area.
**Academic Requirements for the Bachelor of Science Degree in Electrical Engineering, accredited by the Engineering Accreditation Commission of the ABET, www.abet.org.**

Enrollment in the department's program must include a minimum of 120 semester hours of coursework, which includes multiple internship credits. Two semesters of Computer Science are required in addition to Electrical Engineering and Computer Science.

The Electrical Engineering and Computer Science Department moved into a new building in Fall 2008. The department occupies offices and classrooms in the new building, which is located on the west side of campus, adjacent to the electrical engineering and computer science buildings.

**Program Description**

**Electrical Engineering**

Department: Electronic and Computer Engineering

Program Office: Science Building III, Room 317

Contact: Dr. James R. Smith

Phone: (615) 348-3082

**Admission Requirements**

The complete catalog copy is included below. Admissions to the present 2016-2017 catalog are

(Continued)
Junior Year Diversity Requirement 3
UD Thematic Areas C and D 0*
Capstone 0*
GWAR (Exam) or Class 0**

Additional Units 4-6 units**

*The following required major courses also meet general education requirements: ECE/ENGR 1618 and 1628 meet First-year Seminar, MATH 2310 or 2510 meets Foundational Skill A4, PHYS 2210 meets LD Area B1, PHIL 3318 meets UD Thematic Area C, and CMPS 4928 meets Capstone. Engineering majors have the following GE modifications: Foundational Skill A3, LD Area B2, 3 units of LD Area D, and UD Thematic Area D.

**The SELF requirement can be met by selecting another General Education course with a SELF overlay or by taking a stand-alone course. The GWAR may be satisfied by taking the GWAR exam, by taking another General Education course with a GWAR overlay, or by taking a stand-alone course. If a student opts to take a stand-alone course for either or both of these requirements, the course(s) will add additional units to that student’s general education pathway.

***Additional Units are required to meet the 120-unit requirement for graduation. Any accepted university units may be used to meet this requirement, including stand-alone courses for SELF and GWAR.

SB1440 units required - 58 units*

*Units required for graduation after completion of the Engineering (Electrical Engineering focus) model curriculum and lower-division general education at a California community college.

Note: One (1) semester unit of credit normally represents one hour of in-class work and 2-3 hours of outside study per week.

Requirements for the Major in Electrical Engineering

1. Lower Division (12 units)
   ECE/ENGR 1618, 1628, ENGR/ECE/PHYS 2070, CMPS 2010
2. Upper Division (32 units)
   ECE 3040, 3070, 3200, 3230, 3320, 3340, 3370, 4910, 4928
3. Upper Division Elective courses (12 units)
   Select 12 units of elective courses from the following. At least one course must be at the 4000-level:
   Digital Design and Embedded Systems
   ECE 3220, 3250, 4240
   Digital Communication and Digital Signal Processing
   ECE 4220, 4250, 4260
   Control Systems and Robotics
   ECE 3280, 3610, 4570
   Power Systems and Power Electronics
   ECE 3380, 4330, 4370, 4380+4381*
   * Students must take both ECE 4380 and 4381 to receive elective credit for the Electrical Engineering degree.
   Image Processing and Computer Vision
   ECE 4460, 4470
   Special Topics and Independent Study
   ECE 3770, 3771, 4770, 4771, 4800, 4860, 4870, 4890
   Only a combined total of 4 units of ECE 377x, 477x, 48xx may be used for elective credit.

4. Required Cognate courses (34-36 units)
   MATH 2510 or 2310, MATH 2520 or 2320, MATH 2530 or 2330 or both MATH 2531 and 2532, MATH 2610, 3200, CHEM 1000, PHYS 2210, 2220, PHIL 3318

5. General Education Courses and Notes
   Some of the courses required for the Electrical Engineering major also satisfy General Education requirements. Students who complete each of these courses with the appropriate grade will also satisfy the GE requirement, even if they were to change majors:
   • ECE/ENGR 1618 and 1628 satisfy the First-Year Seminar requirement.
   • ECE 4928 satisfies the Capstone requirement.
   • PHIL 3318 satisfies UD Thematic Area C and the Electrical Engineering Ethics requirement.
   • PHYS 2210 satisfies LD Area B1.
   • MATH 2510 or 2310 with a grade of C- or better satisfies Foundational Skill A4.
Optional Laboratory for the study of topics at the beginning level. Corequisite: ECE 2770.

ECE 2771 Special Topics in Electromechanics (1-3)

This course will be used to supplement regular scheduled courses with additional material at the beginning level.

ECE 2770 Special Topics in Engineering Science (1-

Pre-requisites: MATH 114 or MATH 116 and basic computer skills.

The course gives an overview of the high-speed and high-power electronics (HiP) and electrical transmission and reception.

ECE 2600 High-Speed Rail (4)

150 minutes. Pre-requisites: PHYS 2220 with a grade of C or better. This course provides an introduction to high-speed rail systems. The course covers various aspects of high-speed rail systems, including the design, construction, and operation of high-speed rail systems. Students will learn about the technical and economic challenges associated with developing and implementing high-speed rail systems. The course includes case studies of successful high-speed rail systems around the world.

ENGR/PHYS 2271 Elective Credits (4)

Seminars

ENGR/PHYS 148/149 Introduction to Engineering II (2)

ENGR/PHYS 149/150 Introduction to Engineering I (2)

Lower Division

Electrical Engineering: Design and Cany the ECE Penta

Note: All courses in Electrical Engineering and Computer Engineering courses are listed under the Computer

ECE 490 and 492: In addition, students pursuing the Electrical Engineering and Computer Engineering concentrations are required to complete a design project. This project will be chosen and developed by the student in consultation with an instructor.

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Note: All courses in Electrical Engineering and Computer Engineering are listed under the Computer

ECE 490 and 492: In addition, students pursuing the Electrical Engineering and Computer Engineering concentrations are required to complete a design project. This project will be chosen and developed by the student in consultation with an instructor.
Upper Division

ECE 3040 Signals and Systems (4)
Time and frequency domain techniques for signal and system analysis. Fourier series and transforms, and Laplace transforms. Topics in differential equations and probability. Use of a numerical computing environment such as MATLAB. Each week lecture meets for 150 minutes and lab meets for 150 minutes. Prerequisites: MATH 2320 or 2520 with a grade of C- or better and ENGR/ECE/PHYS 2070 with a grade of C- or better.

ECE 3070 Analog Circuits (4)
Design, construction, and debugging of analog electronic circuits. Diodes, filters, oscillators, transistors, JFETs, op-amps, and basic analog circuit design. Broadband applications in networking and communications. Each week lecture meets for 150 minutes and lab meets for 150 minutes. Prerequisites: MATH 2320 or 2520 with a grade of C- or better, MATH 2610, and ENGR/ECE/PHYS 2070 with a grade of C- or better.

ECE 3200 Digital Circuits (4)
Introduce combinational logic and sequential logic designs, and microprocessors. Cover digital concepts, number systems, operations, and codes, logic gates, Boolean algebra and logic simplification, combinational logic and its functions, flip-flops and related devices, counters, shift registers, memory and storage, concepts of microprocessors, assembly language, computers, and buses. Each week lecture meets for 150 minutes and lab meets for 150 minutes. Prerequisites: ENGR/ECE/PHYS 2070 with a grade of C- or better.

ECE 3220 Digital Design with VHDL (4)
Introduces logic system design using a hardware description language (VHDL). Covers the VHDL language in depth and explains how to use it to describe complex combinational and sequential logic circuits. Include a weekly lab where students will get hands-on experience implementing digital systems on Field Programmable Gate Arrays. Each week lecture meets for 150 minutes and lab meets for 150 minutes. Prerequisites: ENGR/ECE/PHYS 2070 with a grade of C- or better and ECE 3200.

ECE 3230 Digital Communications (4)
This course focuses on the representation of signals and noise, Gaussian processes, correlation functions and power spectra, linear systems and random processes, performance analysis and design of coherent and non-coherent communication systems, phase-shift-keying, frequency-shift-keying, and M-ary communication systems, optimum receivers and signal space concepts, information and its measure, source encoding, channel capacity, and error correcting coding. Each week lecture meets for 150 minutes and lab meets for 150 minutes. Prerequisites: MATH 2320 or 2520 with a grade of C- or better, ENGR/ECE/PHYS 2070 with a grade of C- or better, ECE 3040 with a grade of C- or better.

ECE 3250 Embedded Systems (4)
Introduce embedded systems. Cover embedded concepts, NI sbRIO embedded system devices, LabVIEW RT and FPGA modules, combinational and sequential logic circuits design, finite state machines, memory and storage, sensor and motor interface. Each week lecture meets for 150 minutes and lab meets for 150 minutes. Prerequisites: ECE 3070 and 3200.

ECE 3280 Instrumentation, Control, and Data Acquisition (4)
Introduction to LabVIEW and NI Elvii board. Students learn how to use NI virtual instruments, such as function generators, oscilloscopes, etc., design a variety of projects on analog and digital inputs, outputs, and signal generations, and use both simulation and hardware test-beds to verify their projects and performance. Each week lecture meets for 150 minutes and lab meets for 150 minutes. Prerequisites: ECE 3200 or consent of the instructor.

ECE 3320 Fields and Waves (4)
This course focuses on the fundamentals of electromagnetics. Students are expected to acquire expertise in vector analysis, electrostatic and magnetic fields, Maxwell's equations, plane waves, reflection, attenuation, and impedance. Knowledge of circuit theory, Matlab, differential equations, and calculus are required to successfully complete the course. Each week lecture meets for 150 minutes and lab meets for 150 minutes. Prerequisites: MATH 2320 or 2520 with a grade of C- or better and ENGR/ECE/PHYS 2070 with a grade of C- or better.
Introduction to Digital Signal Processing

EC 370

Optional topics for study of operations in the intermediate level course is recommended, but only a introductory level

EC 371

Special Topics in Engineering

EC 380

Introduction to High-Speed Systems

EC 382

Principles of Electrical and Electronic Devices

EC 390

Power System Fundamentals
are presented. Each week lecture meets for 150 minutes and lab meets for 150 minutes. Prerequisites: MATH 2320 or 2520 with a grade of C- or better, ENGR/ECE/PHYS 2070 with a grade of C- or better, ECE 3040 with a grade of C- or better.

ECE 4260 Wireless Networks (4)
This course focuses on wireless data communications including wireless internet. The students acquire knowledge into the current and future state-of-the-art of technology in the field of wireless communications. Another goal of the course is to ensure student(s) can explain the impact of commercial, political, and regulatory factors on the design of wireless systems. The course will treat current relevant technologies, and the exact content may change from year to year. Each week lecture meets for 150 minutes and lab meets for 150 minutes. Prerequisite: MATH 2320 or 2520 with a grade of C- or better.

ECE 4330 Mechatronics (4)
Intelligent electro-mechanical systems. Topics include electronics (A/D, D/A converters, op-amps, filters, power devices), software program design (event-driven programming, state machine-based design), DC and stepper motors, basic sensing and basic mechanical design. Each week lecture meets for 150 minutes and lab meets for 150 minutes. Prerequisites: CMPS 2020 with a grade of C- or better, ECE 3070, and 3200.

ECE 4370 Power Systems Analysis (4)
This course follows the discussions from the first course in power systems. This course focuses on power flow, symmetrical components, faulted system analysis, and protection schemes. Each week lecture meets for 150 minutes and lab meets for 150 minutes. Prerequisite: ECE 3370.

ECE 4380 Power System Operation with Renewable Energy Resources (3)
Renewable energy, distributed generation, impacts of renewable energy-based generation on power system operation, electrical energy markets, deregulated power system, hybrid power generation. Each week meets for 150 minutes of lecture. Prerequisite: ECE 3370.

ECE 4381 Power System Operation with Renewable Energy Resources Laboratory (1)
Laboratory in power system operations with renewable energy-based generation. Completion of the laboratory component is required for Electrical Engineering majors to get elective credit for this course. Each week meets for 150 minutes of laboratory. Prerequisite or corequisite: ECE 4380.

ECE 4460 Image Processing (4)
This course covers the following: digital image acquisition, image enhancement and restoration, image compression, spatial and frequency-based image filtering, color processing, low level image segmentation and feature extraction. Each week lecture meets for 150 minutes and lab meets for 150 minutes. Prerequisite: ECE 3040 with a grade of C- or better.

ECE/CMPS 4470 Computer Vision (4)
This course covers the following: Image formation, early vision, image morphology, image segmentation, object/feature representation and an introduction to supervised and unsupervised learning with an emphasis on image understanding. Each week lecture meets for 150 minutes and lab meets for 150 minutes. Prerequisite: MATH 2320 or 2520 with a grade of C- or better and (CMPS 3120 with a grade of C- or better or ECE 3040 with a grade of C- or better).

ECE 4570 Robotics (4)
Introduce robotic systems. Cover Mindstorms NXT, motion control, target steering and trajectory planning, obstacle avoidance, line tracking, and multiple sensor fusion. Each week lecture meets for 150 minutes and lab meets for 150 minutes. Prerequisites: ENGR/ECE/PHYS 2070 with a grade of C- or better and ECE 3040 with a grade of C- or better.

ECE 4770 Special Topics in Engineering (1-3)
This course will often be used to supplement other courses with additional work at a more advanced level. Course is repeatable, but only a combined total of 4 units of ECE 377x, 477x, and 48xx may be used for elective credit towards the major requirements. Prerequisite: Permission of the instructor.
ECE 4970 Service Learning in Engineering (1-2)
Service learning in computer and electrical engineering related activities that meet campus and/or community needs. Students will design and/or implement a service learning project in consultation with their faculty supervisor and, if applicable, community partners. Offered on a credit, no-credit basis only. Course is repeatable. Course credits cannot be used as elective credit towards the major requirements but can be used as additional university units. Prerequisite: Permission of the instructor.

ECE 4980 Teaching in Engineering (1-2)
Experience supporting teaching activities in department courses, providing tutoring in the department tutoring center, leading problem-solving sessions, and/or supporting other instructional activities in the department. Offered on a credit, no-credit basis only. Course is repeatable. Course credits cannot be used as elective credit towards the major requirements but can be used as additional university units. Prerequisite: Permission of the instructor.

3) Curriculum
   a) Goals for the (1) program and (2) student learning outcomes. Program goals are very broad statements about what the program is intended to achieve, including what kinds of graduates will be produced. Student learning outcomes are more specific statements that are related to the program goals but that more narrowly identify what students will know and be able to do upon successful completion of the program.

The Energy and Power Engineering Emphasis will be integrated with the B.S. in Electrical Engineering program, and so will share the same goals (Program Educational Objectives) and will support the program Student Learning Outcomes.

The Program Educational Objectives are to produce graduates who will, after 3-5 years after graduation:

- Engage in the productive practice of electrical engineering to identify and solve significant real-world problems across a broad range of application areas.
- Ethically apply their electrical engineering knowledge and skills with an understanding of realistic constraints for the overall benefit of a diverse society.
- Enhance the economic well-being of both Kern County and the State of California through a combination of technical expertise, social responsibility, leadership, and entrepreneurship.
- Effectively define, lead, and manage electrical engineering projects to deliver timely results.

Student Outcomes for the Electrical Engineering program are the following. Upon finishing the B.S. degree, a graduate in Electrical Engineering should demonstrate:

- An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
- An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
- An ability to communicate effectively with a range of audiences.
EE 438 Power Systems with Renewable Energy Laboratory (1), Pre requisites: ECE 3370.


ENER 4620 Conventional Energy Production (3), Pre requisites: ENGR 3110 Thermodynamics.

ENGR 3110 Thermodynamics (4), Pre requisites: PHYS 2210, CHEM 1000.

The Energy and Power Engineering Emphasis is offered by choosing the electives reported in ac above, including proposed catalog descriptions of all new courses.

A list of all courses required for the program, specifying catalog number, title, units of credit, and pre requisites or co-requisites (ensuring that there are no "hidden"
courses.

(a) Energy and Power Engineering.

(b) Electrical Engineering.

(c) Other concentrations or emphases and how their curriculums overlaps that proposed.

(d) Plans for assessing program goals and student learning outcomes.

Learning strategies.

An ability to acquire and apply new knowledge as needed, using appropriate
intermediate data, and use engineering judgment to draw conclusions.

An ability to develop and conduct appropriate experimentation, analyze and
tests, and meet objectives.

Leadership, create a collaborative and inclusive environment, establish goals, plan
An ability to function effectively on a team whose members together provide
engineering solutions in global, economic, environmental, and societal contexts.

An ability to recognize ethical and professional responsibilities in engineering.
e) List of elective courses that can be used to satisfy requirements for the program, specifying catalog number, title, units of credit, and prerequisites or corequisites. Include proposed catalog descriptions and course approval sheets for all new courses. For graduate program proposals, identify whether each course is a graduate or undergraduate offering.

None

f) List of any new courses that are: (1) needed to initiate the program and (2) needed during the first two years after implementation. Only include proposed catalog descriptions for new courses. For graduate program proposals, identify whether each course is a graduate-level or undergraduate-level offering.

N/A

g) For undergraduate programs, planned provisions for articulation of the proposed program with community college programs. In particular, designate the proposed program as similar or dissimilar to any transfer model curricula developed for compliance with SB 1440 (the STAR Act).

N/A

h) Advising “roadmaps” that have been developed.

A student intending to fulfill the requirements for the emphasis will need to start taking the relevant elective courses in the fall semester of her/his junior year. The representative roadmap we have developed is included in Appendix B.

i) Provision for meeting accreditation requirements, if applicable, and anticipated date of accreditation request (including the WASC Substantive Change process).

The relevant accrediting agency is ABET (formerly known as Accreditation Board for Engineering and Technology). The Electrical Engineering program has recently received the accreditation. The relevant ABET requirement is that the program contain a minimum of 45 units of engineering topics. The core Electrical Engineering courses add up well above this limit. As a result, this condition is met with the proposed elective courses. Thus, the ABET requirement is satisfied.
First state in the nation to get more than 50% of its utility scale electricity generation from solar photovoltaic energy. Also, its renewable energy capacity is one of the highest in the country. California is the nation's top producer of hydraulic power (U.S. Energy Information Administration). In 2016, California generated 29.6 TWh from renewable energy sources, of which we import 9.4% from other states (according to the California Energy Commission). We consumed 29.6 TWh of electricity in California, the second highest demand in the nation, according to the U.S. Energy Information Administration. (U.S. Energy Information Administration).

According to the U.S. Energy Information Administration, the nation's top producer of energy, production and consumption in the state and in the nation.

Specific employment projections data for such specific fields as energy and power applicable workforce demand projections and other relevant data.

Suggestions during the planning stages:

We have consulted with the CalTech Energy Employment Development Council and the California Energy Commission. We have consulted with the CalTech Energy Employment Development Council and the California Energy Commission.

We have consulted with the CalTech Energy Employment Development Council and the California Energy Commission.

Employers of graduates:

The students major in the electrical engineering program.

In this document, the emphasis of the panel is the need for more faculty members with a Ph.D. in engineering and the proposed emphasis is the energy and power.

The only problem similar to the proposed emphasis is the energy and power.

The list of any other curricula currently offered by the campuses that are closely related to the proposed program:

List of any other curricula currently offered by the campuses that are closely related to the proposed program:

BS in Energy Resources Engineering

UC Berkeley offers a BS in Energy Resources Engineering. Stanford University offers a BS in Energy Engineering. Also, note offers an emphasis on concentration in power and energy efficiency. However, no CU campus offers a BS in Electrical Engineering. Most CSU campuses offer a degree in Electrical Engineering. However, no CU campus offers a BS in Electrical Engineering. Most CSU campuses offer a degree in Electrical Engineering. However, no CU campus offers a BS in Electrical Engineering.

List of other California State Universities currently offering similar programs:
its solar resource (US EIA, "California first state to generate more than 5% of electricity from utility-scale solar," Today in Energy, March 24, 2015). California’s official goal is to obtain 50% of its electricity from renewable sources by 2030. A proposal being considered by the legislature would increase this goal to 60% by 2030 and phase out fossil fuels by 2045 (LA Times “California’s goal: an electricity grid moving only clean energy” August 31, 2017).

The production and distribution of these enormous amounts of energy require thousands of engineers. Most of them are Mechanical and Electrical Engineers, although some have engineering degrees in Energy, Renewable Energy, or other related disciplines. The electives in the proposed emphasis will further prepare the student to pursue careers in the energy production and power distribution sectors.

In 2010, NSM&E hired an outside firm (Jacquelyn S. Jans Marketing & Corporate Image Consultant) to conduct a needs assessment study in connection with energy engineering (and also computer engineering). They found that over half of the potential employers surveyed believe that graduates of the proposed program will actually be “more employable than traditional engineering programs”.

As the energy landscape in California and the United States continues to develop there will be new opportunities for employment in a variety of energy-related fields. These areas include: oil and gas, energy storage (batteries), solar, wind, hydroelectric, hydrogen, and perhaps even nuclear.

e) If the program was proposed to meet society’s need for the advancement of knowledge, please specify the need and explain how the program meets that need.

N/A

5) Student Demand It may be helpful to address the following areas:

a) Evidence of student interest in enrolling in the proposed program.

Our students are eager to pursue programs which are interesting and will prepare them for jobs in industry, especially those located in the California. The recent implementation of the proposed emphasis in the P&E department has been successful. The number of students choosing the Energy and Power Engineering emphasis in the P&E department is increasing. This demonstrates the interest among CSUB engineering students.

b) Issues of diversity and access to the university considered when planning this program.

Our engineering program has 52% Hispanic students, 23% Caucasian, 7% Asian, and 3% Black/African American, 15% Other. This is comparable to CSUB’s demographics (52%
Exisiting Support Resources for the Proposed Program

<table>
<thead>
<tr>
<th>Emphasis Graduates</th>
<th>Emphasis Students</th>
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<tr>
<td>E &amp; P Engineering</td>
<td></td>
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<tr>
<td>10</td>
<td>6</td>
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<tr>
<td>37</td>
<td>33</td>
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<tr>
<td>16</td>
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<tr>
<td>2023-2024</td>
<td>2021-2020</td>
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We assume 50% attrition rate over four years. This yields the estimates below.

during grant-funded outreach to designated colleges and local high schools. In addition, students from the community college for each of the next five years. We are already transfers to bachelor’s degree programs that we will admit, transfer.

and five years thereafter. The expected number of graduates in the year of initiation, and five years thereafter. The expected number of students in the program in the year of initiation and three years thereafter.

Our graduates will perform technical and managerial engineering tasks. Our new courses, so they will have access to other engineering positions.

industries. However, these students will still take the electrical engineering core emphasis focuses on technical needs of the energy production and power distribution sector.

Corresponding bachelor’s programs, if they exist.

correlation and the degree of emphasis over the preceding three years for the faculty positions open up.

of women engineers (SWE) and by actively pursuing female applicants when any and retain more female students by supporting the local student chapter of the society address diversity issues when planning this program. Although we are trying to recruit female representation across campus, which is around 62%, we did not specifically.

Furthermore, we have around 25% female students. This is significantly less than the Hispanic 23% Caucasian, 7% Black/African American, 7% Asian, 12% Other.
emphasis contains courses offered in the Electrical Engineering (ECE) and Engineering Sciences (ENGR) programs. The necessary ECE courses can be taught by Dr. Saeed Jafarzadeh (Associate Professor), or Dr. Ehsan Reihani (Assistant Professor). The necessary ENGR courses can be taught by Dr. Karim Salehpour (Full Time Lecturer), Dr. Travis Moore (Assistant Professor), or Dr. Tathagata Acharya (Assistant Professor).

The new emphasis electives will be offered on a two-year rotation basis. ECE 3370 is a core course required for the BS in Electrical Engineering and is offered once a year. ENGR 3110 is a core course required for the BS in Engineering Sciences program and is offered once a year by the P&E department. The schedule for the necessary electives is as follows:

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We will not need to cancel any other courses in order to offer these classes. We have sufficient faculty to staff them. These are existing courses that are already being offered as part of the Energy and Power Engineering emphasis in the P&E department.

b) Describe special space, facilities, library resources, equipment, academic technology, or special materials that would be used in support of the proposed program.

These are mostly lecture courses. The only exception is ECE 3370, which has a lab component, and is taught in Engineering Complex 201. Any additional sections of that lab (due to either growth in Electrical Engineering or the E&P Emphasis) will be held there as well. As to the lecture component of these courses, we do not anticipate them being larger than about 24 so we do not foresee any space problems (beyond those we already have).

The equipment required for the ECE 3370 laboratory has been purchased already with grant funds. We use modules called Electromechanical Training Systems to perform power systems experiments. Any additional modules will also be purchased from grant funds.

The only library resources needed for the emphasis is the IEEE journals subscription that we already have in connection with the Electrical Engineering program.
more than sufficient for the proposed program's needs. We are presently in the fourth year of this five-year grant. These funds will be supplemented by a total of $562,708 allocated to equipment and $185,723 for equipment to support the emphasis on the purchase of equipment, training systems, and the above. Any more modules of equipment, academic technology, equipment, or specialized materials that will be purchased are mentioned above.

We have purchased the training systems mentioned above. No additional library resources beyond the existing resources will be needed.

Any additional library resources needed, indicate the commitment of the campus to purchase or borrow through interlibrary loan these additional resources.

N/A

Program priorities and projected date of occupancy.

If the space is planned, indicate campus-wide priority of the faculty, capital outlay that will be required. If the space is under construction, what is the projected occupancy date? The amount of additional lecture and/or laboratory space required to initiate and to sustain the program over the next five years, indicate any additional special facilities should be attached to the proposal assuming that such resources will be provided.

Any additional support resources, if additional support resources will be needed.
Appendix A
Bachelor of Science in Electrical Engineering
Assessment Plan

Electrical Engineering Performance Indicators

(1) an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics

1a) Apply and perform the correct mathematical analysis.
2a) Prepare and solve the appropriate physical model of the problem.
3a) Utilize appropriate engineering principles for computer and electrical engineering.

(2) an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors

2a) Follow systematic and logical design procedures and define specifications to meet project requirements.
2b) Adhere to realistic constraints such as environmental, social, political, ethical, health and safety, and sustainability.
2c) Consider alternative designs and choose the optimal solution.
2d) Consider a variety of available options in engineering design and make a proper choice based on their impact.

(3) an ability to communicate effectively with a range of audiences

3a) Write technical reports.
3b) Prepare and deliver oral presentations.

(4) an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts

4a) Recognize ethical issues involved in a professional setting.
4b) Recognize and cope with professional and ethical issues related to safety and sustainability in engineering problems.
4c) Understand the impact of engineering solutions on society and the environment in a global economic context.
4d) Understand and explain non-technical issues related to global, economic, environmental, and societal contexts.

(5) an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives

5a) Fulfill team duties and share in the work of the team.
5b) Listen and communicate with other team members.
7c) Identify and discuss emerging technologies related to computer and electrical engineering.

7d) Involve oneself in professional activities (e.g., meeting, presentations, workshops).

7e) Literature.

7f) Carry out research on engineering topics by reading and reporting on papers in the technical literature.

7g) Ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

7h) Problems.

6d) Use appropriate tools, simulation software, or hardware design tools to solve engineering problems.

6e) Analyze data and interpret results.

6f) Conduct experiments and perform measurements.

6g) Design and set up experiments.

Engineering judgment to draw conclusions.

6h) Ability to develop and conduct appropriate experimentation, analyze and interpret data, and use

5c) Meet deadlines and achieve project goals.
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BS in Electrical Engineering with Emphasis in Energy and Power Engineering

Sample Roadmap for

Appendix b
Appendix C

Letter of Support – Physics and Engineering Department Chair

March 29, 2019

Re: Letter of Support for Energy and Power emphasis in Electrical Engineering

The Physics and Engineering (P&E) Department supports the proposed Energy and Power Emphasis in Electrical Engineering. The proposed curriculum was developed in consultation with faculty in the P&E Department and multiple faculty members from the department have been involved with the Title V Energy and Power grant. This emphasis provides many opportunities for interdisciplinary collaborations between the P&E and Computer and Electrical Engineering and Computer Science departments in the areas of energy and power, along with opportunities to collaborate with the California Energy Research Center (CERC) and community partners.

The proposed emphasis will require three ENGR courses in the areas of Thermodynamics and Energy Production. The department has designed the three required ENGR courses to be accessible to Electrical Engineering students who are following this emphasis. The courses are also part of our own department’s Energy and Power Emphasis, so we are committed to offering them on a regular basis. Additionally, existing faculty have the expertise to teach these courses.

The P&E Department has committed to offering the three required ENGR courses in the following rotation:

- ENGR 3110 Thermodynamics will be offered every Fall semester. This course is also a core course for Engineering Sciences students.
- ENGR 4610 Conventional Energy Production is currently offered every other Spring semester. This course is also an elective course for Engineering Sciences students.
- ENGR 4620 Renewable Energy Production is currently offered every other Spring semester. This course is also an elective course for Engineering Sciences students.

Sincerely,

[Signature]

Alexander Dzyubenko
Department Chair
ENGR 3110 Renewable Energy Production (3)
Study of hydro energy systems, geothermal energy systems, wind energy systems, solar energy systems, fuel cells, thermoelectric power generation, biomass, carbon capture and sequestration, and environmental impacts. 150 minutes lecture/discussion.

Prerequisite: ENGR 3110.

ENGR 4620 Combined Cycle Power Plants (3)
Study of combined cycle power plants, nuclear power plants, and environmental impacts associated with conventional energy production methods. 150 minutes lecture/discussion.

Prerequisite: ENGR 3110.

ENGR 4610 Convener Energy Production (3)
Study of hydroelectric, thermal power plants, and cogeneration combined gas turbine-thermal power plant. 150 minutes lecture/discussion.

Prerequisite: ENGR 3110.

Chem 2220 and Phys 2220, 1000 clock hours, laboratory per week. 135 minutes lecture/discussion and 150 minutes laboratory.

Prerequisite: ENGR 3110 Thermodynamics (4)
Study of the first law of thermodynamics, properties of pure substances, entropy, the second law of thermodynamics, reversible and irreversible processes, availability concept. 150 minutes lecture/discussion.
DATE: October 23, 2019

TO: Dr. Aaron Hegde, Vice Chair of the Academic Senate

FROM: Mandy Rees, Chair of the Faculty Honors and Awards Committee

CC: Beth Bywaters, Academic Senate Administrative Support Coordinator

SUBJECT: Wang Award Recommendation

The Faculty Honors and Awards Committee met on October 23, 2019 to make recommendations for the Wang Award. The Committee carefully reviewed the candidates to see if they met the criteria of the particular Wang Award for which they were nominated.

After this review, the Committee would like to put forth one nominee:

Outstanding Faculty Innovator in Student Success: Dr. Isabel Sumaya