1. **Call to Order**

2. **Approval of Minutes**

3. **Announcements and Information**
   - Faculty Teaching and Learning Center, R. Weller - Time Certain 10:05-10:20
   - Budget Forum – March 9, 2020 11:00 a.m. – 12:00 p.m. Student Union MPR
   - Handbook Error Log
   - Elections and Appointments

4. **Approval of Agenda**

5. **ASCSU Report**

6. **Provost Report**

7. **Committee and Report Requests**
   (Minutes from AAC, AS&SS, BPC and FAC are posted on the Academic Senate Webpage)
   a. Executive Committee (A. Hegde)
   b. Academic Affairs Committee (M. Danforth)
   c. Academic Support & Student Services Committee (D. Wilson)
   d. Faculty Affairs Committee (M. Rees)
   e. Budget & Planning Committee (B. Street)
   f. Staff Report (L. Lara)
   g. ASI Report (A. Wan)

8. **Resolutions** – **(Time Certain 10:45 a.m.)**
   a. Consent Agenda
   b. New Business
      i. RES 192011 Learning Management System Recommendation
      ii. RES 192012 Proposal for Energy and Power Engineering Emphasis within the B.S. degree in Electrical Engineering


10. **Adjournment**
1. Call to Order
   D. Boschini called the meeting to order.

2. Approval of Minutes
   M. Suleiman moved to approve the February 5, 2020 Minutes. J. Woods seconded.
   Approved.

3. Announcements and Information
   - Budget Forum – March 9, 11:00 a.m. – 12:00 p.m. It will be live streamed.
   - Report to the Academic Senate - President Zelezny – The Chancellor asked President Zelezny and other presidents to help him advocate for our budget. We need to keep the momentum to reach the goals of the Graduation Initiative (GI) 2025, expanding access, and for fair and competitive compensation for faculty and staff. She was pleased to take a team (Provost, CFO, and Associate Dean Academic Programs) for the final WSCUC accreditation meeting. There was a question about dis-aggregating our gateway courses. Typically, those are barriers for underrepresented students. She thanked V. Harper for handling that one. We must work on our equity gaps. There will be continuing conversations that are data driven. There was a question about program review compliance. We’re doing continuous improvement in all our disciplines and the university is giving support toward compliance. WSCUC noted
that financial aid had gone up with the tuition increase in recent years. She asked for all-hands-on-deck so WSCUC knows that we take the Lines of Inquiry seriously. CSUB will hear in a couple weeks what our review cycle will be. The good news is that CSUB will be re-accredited. President Zelezny thanked the Accreditation Team, particularly D. Jackson.

The President had a good meeting with the CFA on important issues: Workload, and the workload inequities. Her awareness comes from seeing all the RTPs. Some faculty pay a cultural taxation from the extra load they carry being a small representative number for underrepresented students to go to. We need to think about ways to be fair with student support. President Zelezny will be working with the Provost on the Winter and Summer session assignments. As a former Provost, the CSUF Psychology department had a policy whereby junior faculty had first choice of summer and winter session assignments. She asked Senators to be pro-active. She will ask for feedback on fairness and transparency in their departments. The President and the CFA discussed the shared responsibility of leadership and faculty to achieve a diverse faculty. The Senators need to be on the ground floor to make sure there are diverse candidates for faculty positions. 40 CSUB faculty members are taking a weeks-long training on best practice for hiring diversity. Workplace safety was discussed. The focus is on preparedness training. 85 faculty and staff members attended Active Shooter training last week. She heard and shared with D. Boschini to listen to all faculty regarding Canvas. Junior faculty and lecturers don’t feel they’re being heard on campus. She offered to pay for lunch to help support the unconscious bias training which is held on Fridays. There are other suggestions she will discuss with the Provost. She thanked D. Gove for the opportunity to work with the CFA and his leadership. February 28 is the deadline for the Ethnic Studies (ES) Response to reach the CO. There is a team working on it. She supports whatever gets submitted. We know we need to make changes and we’ll do reasonable changes at CSUB. She thanked the ES Response Team. The Provost Search is going well. She thanked those on the Search Committee for their
leadership. Good news: there is going to be an announcement of another gift to support Academic Affairs. It is a joy working behind the scenes on the silent campaign and to see the support for faculty. President Zelezny has two upcoming forums: The Budget Forum will be co-led by B. Street, Chair of the Budget and Planning Committee, and the Strategic Plan Open Forum in April. President Zelezny has an open forum scheduled every month as well as communicating through other modalities. Finally, we’re looking forward next month to the announcement on our new Chancellor. She opened the floor to questions. A. Lauer requested that sustainability be high on the agenda in discussion of the Strategic Plan. We need to lead the system as well as be an example to our students on how to do the right thing. President Zelezny said that sustainability is in the Strategic Plan. D. Boschini thanked the President for covering topics that many people have expressed were in need of attention. She also thanked CFA President, D. Gove, for information sharing and bringing the discussion of issues that the union advocates, and for being a member of the Senate. It makes an enormous difference to have him at the table. The President ended by congratulating A. Hegde for his transition into the Senate Chair role, thanking D. Boschini for her work over the years, and congratulating M. Danforth in her new role as the Vice-Chair of the Academic Senate.

- Enrollment Management Updates (handout)
  D. Cantrell reported on what he has learned and changed since conducting his listening tour as the new AVP of Enrollment Management (EM). There were a lot of questions about who is EM. The handout lists the departments in EM. It is on the EM website and questions can be directed to those units. D. Cantrell shared how enrollment is currently being managed. EM started making hard deadlines. Applications are closed for Fall 2020 since January 6th. It benefits the students because the later they apply, the less successful they are. It does them a disservice because acceptance, financial aid, and classes are late. Some student appeal. Extenuating circumstances are the exception. We are conforming to a national standard of May 1st deadline. Students are able to make their Statement of Intent to enroll online, thanks to IT. J. Stark
asked if the deadlines for enrollment apply to international students? D. Cantrell said the deadline for applications and enrollment for international students, veterans, and athletes roll due to the nature of those groups. J. Stark said the Business School historically has dealt with international students who show up the first day of class. Then they come to the Dean’s office to protest no room in classes even though money has been accepted by the school. He requested that any acceptance of international students beyond May 1 only be under consultation with their targeted programs to make sure there is room for them. D. Cantrell is aware that it occurred, and EM is working on a deadline for international students. They have sensitive deadlines due to visa status, and how long it takes to get one. EM is trying to sync all the systems on campus. He met with M. Danforth to discuss how a change in one area affects another. The goal is to have a near-seamless system. J. Tarjan reiterated that to serve international students, the school can’t hire faculty without notice. There must be a background check, etc. before we accept those students. He asked for a commitment; If we’re going to accept 100 students, do we get enough funding to serve those 100 students? It’s important to have the faculty already hired so the students will have courses to attend. V. Harper said the change in enrollment deadline was for first time students and he is sensitive to 1) matriculation cycle of international students 2) we want to maintain an open and welcoming institution. Enrollment of international students is complex. The schools will get the resources as we get closer to the fall. Every dean knows we have the resources to deploy to make sure students get the classes they need. As international students enroll, that information will be communicated to the deans more quickly. D. Cantrell said enrollment metrics will be available in Tableau next month so faculty will know where we are. Domestic students applications for Fall 2020 must be received by April 1 for all CSU campuses. There may be exceptions. Faculty will get numbers they can use for projections for classes, etc. During his listening tour, advising groups said they tried to register students but didn’t have transcripts, AP scores, etc. to get them adequately enrolled. Then, as the
information became available, class schedules had to be changed. Advisors recommended new registration dates to help improve the process. (see handout) Students can receive advising anytime. Transfer students register by June 15. First time freshman register by July 15. M. Danforth reiterated that if we end up with more freshman, and transfer students in upper division classes, that creates a very tight-turn around to bring on additional faculty and to add sections given the need for background checks for hiring. A. Hegde asked for orientation dates. D. Cantrell replied that orientation has a different process than registration. There’s another entity handling orientation. We want to see what impact the summer orientation has on registration. For Fall 2021, the deadline for new student application has been moved up from January to Nov 30th 2020. It is the new freshman deadline for all CSUs. The new Housing Policy states: California State University, Bakersfield entering freshman students enrolled in six or more units for the Fall Semester and residing more than 30 miles from CSUB are required to live on campus for their first academic year unless they are exempted. See Housing Policy FAQs (handout).

Certain commitments have been made to McFarland. Please direct questions to D. Cantrell. We are still working on synchronizing the process for readmitted students. The goal is to prevent those students from being a no-show on first day of class. L. Lara helped a BC transfer and it was a nice surprise to do everything online. M. Martinez – what is CSUB’s impacted number (maximum level of students)? D. Cantrell replied that we are obliged to accept all who are eligible. We accept 60% of all who apply. We’re not at a point of concern. The number of students who are admitted will be similar to the number admitted last year. The number of transfers is expected to be the same. D. Boschini said that to apply for impaction status is a huge process and it would be a couple of years to make a change. President Zelezny said that there would be broad consultation. Her heart says that it is not in our DNA. The number of freshman is down at CSUB. A change in some of our practices will change the numbers. There is a decrease in the number of high school graduates in the state. She does not advocate impacted status. J. Tarjan informed the President
that the campus has an impacted program. The Business school has more students that it can serve a quality education to. There are too many PT lecturers teaching at every level. Some faculty are teaching larger and larger sections. He requested her consideration of a pre-business program or pre-major program. The President responded that she would, along with leadership in Academic Affairs. R. Gearhart has heard that the rents students pay are based on market rates. Since students from Delano, Taft, etc. are mandated to stay in Student Housing, do students from those areas have reduced rents relative to lower costs in those outlying areas? D. Cantrell replied that it’s his understanding that cost of housing has been decreased to accommodate students. The Provost has offered support in the form of a grant whereby 100 students could receive $1000 each. The committee is working on delayed packages to mitigate the out-of-pocket expense, as well as other measures. All students pay a housing application fee and a deposit. Those required to be in Student Housing will not have to pay a deposit. The deposit would come out of their rent. J. Stark was on the committee for many years that set financial budgets. This move to Student Housing will be won or lost on the financial aid package and what we can do. Students don’t have the cash flow. Work with EM and the committee to increase the budget. If money doesn’t come from financial aid, the students won’t make it. There are limits to what we can do. D. Boschini thanked D. Cantrell and his good start at this campus. She thanked him for his layered communication which fostered a lot of important conversations on campus.

- Handbook Error Log (deferred)
- Elections and Appointments
  - Academic Senators elected:
    - Mark Martinez – ASCSU 2020-2023
    - Andes Sanchez – Antelope Valley 2020-2022
    - Mandy Rees – A&H 2020-2022
    - BPA pending election
    - Charles Collom – NSME 2020-2022
Jeanine Kraybill – SS&E 2020-2022

- Search Committee - Dean of the Library
  - Miriam Vivian – A&H
  - Ji Li - BPA
  - David Gove – NSME
  - Jeanine Kraybill – SS&E

- Assigned Time 20.37 Exceptional Service Application due March 9, 5:00 p.m.

4. **Approval of Agenda**

J. Stark moved to approve the Agenda. A. Wan seconded. Approved.

5. **ASCSU Report**

J. Tarjan informed the group that the interim meetings are being held at the Chancellor’s Office (CO) tomorrow. The January Stateside Senate Report to CSUB is on the [ASCSU webpage](#).

6. **Interim Provost Report**

V. Harper brought attention to two important events this weekend: The Alumni Hall of Fame Dinner on Friday, and Super Sunday where many administrators attend several places of worship to talk about CSUB in conjunction with Black History Month. Upon attending the Department Chair Leadership Committee (DCLC) he is addressing the faculty workload reduction. He sent a message to all the deans that the contracts will be extended in good faith, honoring those obligations to new faculty on their reduced workload in their first two years. D. Boschini defined the obligation as reassigned time that new tenure track faculty would get their first two years. It’s concerning because we don’t have reliable funding. It’s important to the recruitment process to have the Provost’s willingness, and encouraging for departments and candidates. V. Harper allocated money for training of eight faculty advisors. He will be meeting with that group of faculty advisors in the next couple of weeks. V. Harper and Dr. Wallace discussed ways to improve faculty and staff advisors working together. V. Harper thanked Dr. A. Rodriguez for her outstanding job in leading the Ethnic Studies (ES) Task Force and it confirms that she is the right person for the job. He thanked all faculty who
participated on the ES Task Force. V. Harper will take the document to the next Executive Committee meeting prior to submission to the Chancellor’s Office (CO).

7. Committee and Report Requests

(Minutes from AAC, AS&SS, BPC and FAC are posted on the Academic Senate Webpage)

a. Executive Committee (A. Hegde) At the February 11 meeting, the discussion focused on the information leading up to and during the All Faculty Meeting, and subsequent referrals. The All Faculty Meeting reservation form invited attendees to share their concerns. D. Boschini aggregated the comments. A top concern is workload. FAC has referral on workload. Some class sizes are extremely large and some are small. It’s a fairness and equity issue. The topic will come up at the Budget Forum on March 9. Because there is no budget increase, there is a need for advocacy to inform the legislature that we can’t serve the students the way we want to without more tenure-track lines. Many departments have a lot of part-time faculty. We rely on their availability for classes and adding students when full. It’s tied into workload. Another top concern is communication and that the lack of communication which can create a sense of unfairness in decision-making. There was discussion and subsequent referrals about RTP levels of review, and RTP language in the Handbook. The Space Management Committee is looking at classroom size and class utilization and how to relieve some stress on resources. More faculty is needed to accommodate the number and types of students and to spread out the schedule through the week. At some point EC will have a recommendation to go before the Senate. A survey was emailed to students regarding Wellbeing and Wellness. It identifies what issues students are dealing with. There is a big need for counselors to improve mental health. CSUB ranks at the low levels, yet how do we compare with similar areas that are not private universities and urban universities? D. Boschini expects that the Learning Management System (LMS) decision to come to Senate during March. It will move as a resolution with recommendation to the Interim Provost. Senators have been elected to represent their constituency. If one has not looked at Canvas yet, you
cannot participate in the resolution process. Go to LMS evaluation site. There is a list of FAQs. We don’t want Senators to ask the same basic questions while we are working through the resolution. She directed Senators to do their homework.

b. Academic Affairs Committee (M. Danforth) (deferred)

c. Academic Support & Student Services Committee (J. Millar) (deferred)

d. Faculty Affairs Committee (M. Rees) The committee finalized RES 192009.

e. Budget & Planning Committee (B. Street) The committee worked on the Spring 2022 calendar.

f. Staff Report (L. Lara) Nothing to report.

g. ASI Report (A. Wan) CSUB ASI is moving into election season. Suggestions for student candidates welcomed. A. Wan is happy to mentor any of the positions. ASI is working the Shark Tank model to present an idea, Bird Cage, April 22 6-9 to a panel of millionaires including J. P. Lake, and the Foundation Board Monterey Bay.

8. Resolutions – (Time Certain 10:45 a.m.)

a. Old Business
i. RES 192009 Faculty Membership on Search Committee for the Provost & VP of AA – Handbook Change – Second Reading. M. Rees presented the changes on behalf of the FAC. B. Frakes moved to strike Vice Provost. M. Slaughter seconded that Vice-Provost position be removed. J. Stark moved to edit 309.5 a. for order and clarity. J. Tarjan seconded the amendments. J. Woods moved to adopt the resolution as amended. M. Martinez seconded. Approved.

9. Open Forum Items (Time Certain 11:15)

Topic: University Affairs ASI – CSUB is leading the system in points. ASI VP University Affairs, K. Raynes, is interviewing for CSU Student Trustee position. A. Wan requested to please bring any type of support forward. She will be interviewed by Governor Newsom. It would be great leverage for CSUB to have her on the Board of Trustees.

Topic: Second Annual Techstars Startup Weekend - Friday, Feb. 21 through Sunday, Feb. 23. J. Woods said that 75 students, mostly CSUB and some BC and high school students, are signed up. Students pitch their ideas Friday, work all weekend, and then
pitch their business to local VC and business people. The top three teams to win up to $30,000 worth of services from local partners. All are welcome to observe. J. Woods thanked J. Self for her effective public relations work bringing in the community for the event, and to University Advancement for bringing Bank of America to sponsor the event.

Topic: Housing – M. Rees inquired whether there is a plan to assess the new housing policy after a year. V. Harper responded that he asked V. Lakhani to develop an instrument to be distributed to the students for their pre and post perception of the policy. D. Boschini requested that the Provost Office widely distribute information about the housing requirement. She asked A. Wan if the students weighed in. ASI responded positively, yet the general student perception is that students have to pay for housing. It’s critical they be aware of the data which shows that campus housing improves graduation rates. The goal is to graduate students, not just admit students. D. Boschini asked that the data be shared with faculty also.

D. Boschini encouraged her colleagues to submit nominations for the Senate At Large position, and do their Canvas homework.

10. **Adjournment**

   The meeting adjourned at 11:30.
California State University, Bakersfield
HOUSING POLICY
Frequently Asked Questions

What is the new Housing Policy?

California State University, Bakersfield entering freshman students enrolled in six or more units for the Fall semester and residing more than 30 miles from CSUB are required to live on campus for their first academic year unless they are exempted.

What constitutes 30 miles from CSUB?

The determination for this requirement is based on the driving distance from the CSUB campus to the student's designated city or town as indicated on the admissions application. This designation is based on the location of City Hall or center of town according to mapping analytics.

Are there any exemptions to this policy?

The following exemptions to the policy are:

- Sophomore status or higher before the first day of classes for the Fall semester
- Age 21 or older before the first day of classes for the Fall semester
- Independent status as defined by FAFSA or California Dream Application and verified through the Office of Financial Aid
- Current active United States military or veteran status and verified via written proof of current active military service or Form DD-214
- Married, domestic partner, or have legally dependent children and verified via marriage certificate, domestic partner agreement, dependent child's birth certificate and/or proof of child custody
- Medical or disability circumstance that cannot be accommodated
- Dependent of a current California State University, Bakersfield employee as verified through the Office of Human Resources
- Other special circumstances
  - The Housing Committee will define and document the exemption categories in consistency with the above exemptions, as may be further defined, and a

Revised 2/13/2020
process for reviewing student exemption requests.

- Reviews by the Housing Committee of student exemption requests will be on a case-by-case basis, with objective and unbiased criteria, and processed in a timely and consistent manner.

**What are the consequences for not adhering to this policy?**

Upon admission to the university, all first-time freshmen with a permanent address outside of 30 miles from CSUB will have an automatic Housing Requirement hold placed in the system. This automatic hold will not be applied to students who will be 21 years of age or older on the first day of the Fall semester, Veterans, or students who have independent status based on the FAFSA or the California Dream Application. This hold will be removed once students complete their housing contracts, or have an exemption approved by the Housing Committee. If the hold is not removed, students will be unable to register for classes.

**What about McFarland?**

Because McFarland is closer than 30 miles from CSUB, McFarland students are not required to live on campus. However, because of our relationship with that community, McFarland students will be given priority for housing as long as they apply by March 31, 2020. Beyond that date, accommodations will be made on a space-available basis.

**What if I still have questions?**

Questions can be directed to Dr. Dwayne Cantrell, Chair of the Housing Committee at dcantrell2@csub.edu.
### Academic Affairs Committee: Melissa Danforth/Chair, meets 10:00am in SCI III Room 100

**Dates:** Sept 5, Sept 19, Oct 3, Oct 17, Oct 31, Nov 14, Dec 12, Jan 30, Feb 13, Feb 27, Mar 12, Mar 26, Apr 9, April 30

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<tr>
<td>08/27/19</td>
<td>2018-2019 Referral 20 Continuous Enrollment Course</td>
<td>Withdrawn 8/27/19</td>
<td>AAC There won’t be anything for the Senate to act on until the subcommittee issues their report.</td>
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<td>08/27/19</td>
<td>2019-2020 Referral 01_Distributed Learning Note: two resolutions resulted</td>
<td>Pending President’s approval</td>
<td>AAC RES 192002 Distributed Learning Committee Handbook Change RES 192007 Online and Hybrid Courses Handbook Changes</td>
<td>10/24/19</td>
<td>11/01/19</td>
<td>11/04/19</td>
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<td>08/27/19</td>
<td>2019-2020 Referral 04 Proposal for a Master in Kinesiology</td>
<td>Complete</td>
<td>AAC, BPC Address the Program rationale, Existing support resources for the proposed program, and additional support resources required. RES 192006 Master in Kinesiology</td>
<td>12/05/19</td>
<td>12/13/19</td>
<td>12/17/19</td>
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<td>09/17/19</td>
<td>2019-2020 Referral 13 Response to Student Misconduct Task Force Report</td>
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<td>AAC, AS&amp;SS Proposed changes to policy and procedures, and implementation</td>
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<td>09/17/19</td>
<td>2019-2020 Referral 14 New Course Forms and Process</td>
<td>Complete</td>
<td>AAC New forms’ integration with curriculum review, catalog, PeopleSoft, degree audit, etc.</td>
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<td>09/17/19</td>
<td>2019-2020 Referral 15 Interdisciplinary Studies New Course Proposal</td>
<td>Complete Sent to GECCo</td>
<td>AAC Intro to Ethnic Studies, Intro to Latina/o Studies, and Latina/o – Chicanas/os and Popular Culture</td>
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<td>10/1/19</td>
<td>2019-2020 Referral 16 Program Review Process Improvement</td>
<td></td>
<td>AAC Streamline the process upon looking at minimum federal requirements and the current Academic Program Review template.</td>
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<td>10/15/19</td>
<td>2019-2020 Referral 17 Learning Management System – Canvas</td>
<td>First Reading 3/05/20</td>
<td>AAC, AS&amp;SS, BPC Identify the problem that needs to be solved and the decision-making process to result in best solution for users. Cost/benefit analysis. RES 192011 Learning Management System Recommendation</td>
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<td>10/15/19</td>
<td>2019-2020 Referral 18 Interdisciplinary BS Degree in Public Health Proposal</td>
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<td>AAC The demand, structure, and resources required to deliver effectively and efficiently</td>
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<tr>
<td>10/15/19</td>
<td>2019-2020 Referral 19 Winter Term Courses and Units Policy</td>
<td></td>
<td>AAC Purpose of Winter Term, potential overload jeopardizing student success, establish a policy for max courses &amp; units</td>
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**Academic Affairs Committee: Melissa Danforth/Chair, meets 10:00am in SCI III Room 100**

**Dates:** Sept 5, Sept 19, Oct 3, Oct 17, Oct 31, Nov 14, Dec 12, Jan 30, Feb 13, Feb 27, Mar 12, Mar 26, Apr 9, April 30

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<td>2019-2020 20 Referral Proposal for Energy and Power Engineering Emphasis within the B.S. degree in Electrical Engineering</td>
<td>First Reading 3/5/20</td>
<td>AAC BPC The demand, structure, and resources required to deliver effectively and efficiently RES 192012 Proposal for Energy and Power Engineering Emphasis within the B.S. degree in Electrical Engineering</td>
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<td>11/12/19</td>
<td>2019-2020 Referral 21 Minimum IELTS and TOEFL Scores for International Graduate Students</td>
<td>Pending President’s approval</td>
<td>AAC Address no IELTS score, and CSUB’s TOEFL iBT score of 79 RES 192010 Minimum IELTS and TOEFL Scores for International Graduate Students</td>
<td>2/06/20</td>
<td>2/14/20</td>
<td>2/20/2020</td>
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<td>02/06/20</td>
<td>2019-2020 Referral 22 Criteria for Dean’s List and Graduation with Honors</td>
<td>Identify what is the criteria and who establishes the criteria for the Dean’s List and Graduation with Honors in each school</td>
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### Academic Support and Student Services: Janet Millar/Chair, meets 10:00am in BPA 134

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<td>08/27/19</td>
<td>2018-2019 Referral 05 Canvas Pilot</td>
<td>Complete</td>
<td>AS&amp;SS Chair to request that Canvas Pilot Committee provide a report by Oct 1 referencing viability of adoption based on the result of compiling positive and negative factors and description of their decision process.</td>
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<td>08/27/19</td>
<td>2019-2020 Referral 03 ASI Executive Director as Ex-Officio Non-Voting Member of Academic Support and Student Services Committee (AS&amp;SS) - Bylaws Change</td>
<td>Complete</td>
<td>AS&amp;SS RES 192004 Addition of ASI Executive Director to Academic Support and Student Services Committee</td>
<td>11/7/19</td>
<td>11/15/19</td>
<td>11/21/19</td>
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<td>09/10/19</td>
<td>2019-2020 Referral 12– Graduate Student Grievance and Appeals Policy – Reporting Chain</td>
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<td>AS&amp;SS Policy alignment: University Handbook, and Catalog</td>
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<td>09/17/19</td>
<td>2019-2020 Referral 13 Response to Student Misconduct Task Force Report</td>
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<td>AAC, AS&amp;SS Proposed changes to policy and procedures, and implementation</td>
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<td>10/15/19</td>
<td>2019-2020 Referral 17 – Learning Management System – Canvas</td>
<td>First Reading 3/05/20</td>
<td>AAC, AS&amp;SS, BPC Identify the problem that needs to be solved and the decision-making process to result in best solution for users. Cost/benefit analysis. RES 192011 Learning Management System Recommendation</td>
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# Faculty Affairs Committee: Mandy Rees/Chair, meets 10:00am in SCI III Rm 235 Math Library

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<td>08/27/19</td>
<td>2019-2020 Referral 02 Faculty Workload – One WTU Defined</td>
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<td>2019-2020 Referral 09 Faculty Membership on Search Committee for the Provost &amp; VP of AA – Handbook Change</td>
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<td>FAC The qualification requirements of faculty members RES 192009 Faculty Membership on Search Committee Provost and VP AA</td>
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**Budget and Planning Committee: Brian Street/Chair, meets 10:00am in Student Health Center, Conference Room (HCCR)**

**Dates:** Sept 5, Sept 19, Oct 3, Oct 17, Oct 31, Nov 14, Dec 12, Jan 30, Feb 13, Feb 27, Mar 12, Mar 26, Apr 9, April 30

<table>
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<tr>
<th>Date</th>
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<td>2019-2020 Referral 04 Proposal for a Master in Kinesiology</td>
<td>Complete</td>
<td>AAC, BPC Address the Program rationale, Existing support resources for the proposed program, and additional support resources required. RES 192006 Master in Kinesiology</td>
<td>12/05/19</td>
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<td>2019-2020 Referral 07 Academic Calendar – Spring and Fall Semester Breaks</td>
<td>Complete</td>
<td>BPC RES 192008 Academic Calendars Fall 2020 Spring 2021 Summer 2021</td>
<td>12/05/19</td>
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<td>10/15/19</td>
<td>2019-2020 Referral 17 Learning Management System – Canvas</td>
<td>First Reading 3/05/20</td>
<td>AAC, AS&amp;SS, BPC Identify the problem that needs to be solved and the decision-making process to result in best solution for users. Cost/benefit analysis. RES 192011 Learning Management System Recommendation</td>
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<td>10/29/19</td>
<td>2019-2020 Referral Proposal for Energy and Power Engineering Emphasis within the B.S. degree in Electrical Engineering</td>
<td>First Reading 3/5/20</td>
<td>AAC BPC The demand, structure, and resources required to deliver effectively and efficiently RES 192012 Proposal for Energy and Power Engineering Emphasis within the B.S. degree in Electrical Engineering</td>
<td></td>
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</table>
RESOLVED: that the Academic Senate recommends the adoption of Canvas as the Learning Management System for California State University, Bakersfield, with appropriate support and resources to address the remaining faculty concerns, and be it further

RESOLVED: that a Canvas transition team composed of faculty members, students, Faculty Teaching Learning Center (FTLC) staff, and ITS staff should be established, charged with facilitating the smooth transition to Canvas for faculty and students.

RATIONALE: The selection of a Learning Management System (LMS) is an academic decision and should occur through normal processes of shared governance. Detailed information about the LMS evaluation process and related reports and documents are posted at https://its.csub.edu/lmseval. The contract with the campus’s current LMS, Blackboard (Bb), expires on June 30, 2020, and a decision must be made to either extend the Bb contract or select a new LMS. In the 2018-19 academic year, a process was begun to evaluate whether the campus should maintain Bb or consider an alternative LMS. Canvas was selected as a possible replacement for Bb, and a pilot program (over two semesters and two intersessions) was conducted starting in the Winter 2019 intersession through the Fall 2019 semester. Based on data collected through the pilot program (https://its.csub.edu/lmseval#learn), 159 faculty members took part, and 83 responded to the survey. Of this number, 90% of faculty who completed the survey would choose Canvas over Bb as the campus LMS, while 10% would choose Bb over Canvas. Similarly, a majority of students who took part in the pilot program, 6625 total students and 999 respondents, 70% reported they would choose Canvas over Bb as the campus LMS, while 30% would choose Bb over Canvas. Additionally, a majority (73%) of the faculty who participated in the Spring 2020 Canvas Open Forum support the transition to Canvas.
A Learning Management System is a tool that should aid in student success, and student success is a driving component of the CSU Graduation Initiative 2025 as well as CSUB’s strategic plan. To that end, the Associated Students Inc (ASI), in Fall 2019, confirmed their support (SB 101) to adopt Canvas as the campus LMS. The students and faculty referred to an important feature, a mobile app, for interacting with the LMS, increasing access and encouraging more involvement with course material, this feature does not exist with Bb. Further, with a large population of transfer students that enroll at CSUB from a California Community College (CCC), and the majority of campuses in the CCC system adopting Canvas, having Canvas as CSUB’s LMS creates familiarity and removes the hurdle for these students having to learn a new LMS. There is concern that the Bb LMS may not be a viable platform in the long-term. The majority of CCC and institutions in the University of California system, as well as nine California State University institutions, have adopted Canvas, moving away from Bb and other LMSs.

However, several areas of concern remain, as expressed in the Spring 2020 Canvas Open Forum and in senate subcommittee discussions about the adoption of Canvas. The major concerns include support staff, faculty training resources, LTI and API for third party solutions (e.g., Excel, Examity, etc.), as well as the time involved in transitioning all courses from Bb to Canvas. Many features, particularly features related to the grade book, do not automatically transition from Bb to Canvas. Significant time, training, and support will be required to move all courses to Canvas. Additionally, academic year faculty are not under contract in the Summer and Winter terms, so all training and transition work will need to occur in Fall and Spring semesters. It is highly likely that it will not be feasible to successfully move all courses by Spring 2021, and an extended transition plan through Fall 2021 will be needed to properly move all courses to Canvas. Therefore, full access to Bb must be maintained through to the end of the Fall 2021 term.

Another concern is the retention of submitted student work from Bb for purposes of student grievances, assessment, and specialty accreditation. It is unclear if the archive of courses after the expiration of the Bb license will contain submitted student work and the corresponding grading notes. This data is necessary to address student grievances, to complete assessment, and to provide data for some specialty accreditation entities. Lastly, several faculty members involved in the Canvas pilot have also raised academic integrity concerns about the default quiz module, as well as other concerns about specific features needed to support courses in their disciplines. An add-on or proctoring solution that adequately addresses the academic integrity concerns must be provided. Costs for this solution and
for other third party solutions necessary to support features required by specific disciplines must be supported by the campus to have a successful transition to Canvas.

**Distribution List:**
CALIFORNIA STATE UNIVERSITY, BAKERSFIELD

ACADEMIC SENATE

Proposal for Energy and Power Engineering Emphasis within the B.S. degree in Electrical Engineering

RES 192012

AAC & BPC

RESOLVED: that the Academic Senate recommends the approval of the Energy and Power Engineering Emphasis, offered within the B.S. degree in Electrical Engineering.

RATIONALE: the Academic Affairs Committee and the Budget and Planning Committee have both reviewed the proposal. They have found that this emphasis has the resources required to deliver the program effectively and efficiently and fulfills a need for both students and industry.
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: 4/23/2019

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,

[Signature]

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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Summary. The Department of Computer and Electrical Engineering and Computer Science (CEE/CS) has three programs, namely Computer Science, Computer Engineering and Electrical Engineering. The department has overseen the B.S in Electrical Engineering program since the Fall 2012. The Electrical Engineering core courses are designed following the state-wide and national established programs in Electrical Engineering. The program started to reflect regional industry needs and local student interest. Some of those local industries are in the area of Energy and Power. We are now proposing a new Emphasis in Energy and Power Engineering within the B.S. in Electrical Engineering program. We have already developed a similar emphasis in the Department of Physics and Engineering (P&E).

The development of the Electrical and Computer Engineering programs in the CEE/CS department and the associated facilities was funded initially by a $3.8M five-year grant from the US Department of Education that ran out in 2015. After the start of the Electrical Engineering program, the faculty of the CEE/CS department have been active in seeking external funding and secured external funding from several agencies for research, instruction, and equipment. Finally, in collaboration with the P&E department, we presently have a $3.6M Title V Department of Education grant to offer an Energy and Power Engineering track to our students. The grant is presently in its fourth year and ends September 30, 2020. The grant was also recently used to establish an emphasis similar to the one being proposed in this document in the P&E department.

We are not requesting any new resources from the university. The equipment required for the courses in this proposal has been (or will be) purchased fully using funds from the Title V grant. The courses which comprise the new emphasis are all from the P&E and CEE/CS departments, have been approved by the university, and students have started taking some of them. These courses already count towards the engineering electives requirement for the B.S. in Electrical Engineering. The existing faculty have the required expertise, and no new faculty are necessary to teach these courses. This emphasis is a cost-effective program in the sense that its comprising courses (and the associated resources) are already in place. In part because the proposed emphasis with similar courses already exists in the P&E department. We are just packaging them into an emphasis to give our students additional leverage in the work place.

This new program will generate and support new synergies with CSUB’s Center for Research Excellence in Science and Technology (CREST) and California Energy Research Center (CERC). Indeed, some of our faculty (in both CEE/CS and P&E) are already involved in both centers.

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 renewable (such as wind, hydro, geothermal and solar). The new emphasis will allow our
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.
Proposal

1) Program Identification

a) Full and exact degree designation and title: Bachelor of Science with a Major in Electrical Engineering with Emphasis in Energy and Power Engineering.

b) Term and academic year of intended implementation: Fall 2020.

c) Total number of units required for graduation: 120 units.

d) How this emphasis will support the campus mission and will not impede the successful operation and growth of existing academic programs.

The emphasis is being proposed in response to high demand in the region for engineers with expertise in the energy production and power distribution sectors. Thus, the new emphasis will support the economic development of the region, as well as advancing the opportunities available to students interested in this field. The emphasis will involve structuring existing elective courses within the Electrical Engineering, and Engineering Sciences programs. No new courses or laboratories will be required. The electives will be taught by full time faculty already in the two departments. This emphasis will be self-supporting, and will not adversely affect existing academic programs by diverting resources needed elsewhere. At the same time, the emphasis will provide our students access to a robust engineering education in fields that are especially marketable in the Southern San Joaquin Valley. Nevertheless, the skills provided by our curricula will enable our graduates to find engineering employment anywhere.

e) If students must apply directly to the concentration or emphasis (rather than the major), propose the Classification of Instructional Programs (CIP) Code and CSU Degree Program Code to be used.

Same as current Electrical Engineering program: 14.1001

2) Program Overview and Rationale

a) Rationale, including a brief description of the emphasis, its purpose and strengths, fit with institutional mission, and a justification for offering the emphasis at this time. The rationale may explain the relationship among the emphasis philosophy, design, target population, and any distinctive pedagogical methods.

There are a variety of reasons why it makes perfect sense to offer a formal emphasis in energy and power within our Electrical Engineering program at this time.
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.
b) Complete catalog description, including program description, units required for degree, degree requirements, and admission requirements.

The complete catalog copy is included below. Additions to the present 2020 catalog are indicated by red text and deletions by red strike-trough text. There are no special admission requirements for the program beyond the normal requirements for admission to the university.

Department of Computer and Electrical Engineering and Computer Science
School of Natural Sciences, Mathematics, and Engineering
Department Chair: Melissa Danforth
Program Office: Science Building III, 317
Telephone: (661) 654-3082
email: ceeecs@cs.csusbak.edu
Website: www.cs.csusbak.edu
Emeriti Faculty: T. Meyer, D. Meyers, M. Thomas, H. Wang

Program Description
Electrical Engineering is a large and expanding field which is concerned with the following fundamental areas: digital signal processing, semiconductor electronics, microprocessors and embedded systems, VLSI design, cyber-physical systems, data communications, energy systems and power electronics, transmission and distribution, RF and microwave, robotics and control system design, electromechanics and mechatronics, computer networks, digital design, image processing and computer vision. If computer science can be regarded to be on the information processing side of computer engineering, then electrical engineering can be regarded to be on the side which builds upon the fundamental physical properties of electricity and magnetism. Electrical engineers often work with other engineers, physical scientists, and computer scientists.

The Computer and Electrical Engineering and Computer Science Department moved into a new building in Fall 2008. The department administers its own local area network which includes multiple Unix/Linux servers, two software programming labs, a walk-in lab/tutoring center, one advanced workstation lab, an isolated network lab, an AI/visualization lab, a DSP/communications lab, one digital electronics hardware lab, a power systems/electronics lab, and a robotics/control systems lab. There is also a department library/major study room with computers available to students.

An important goal of the department is to enable students to work much more closely with faculty than they would be able to at larger universities. A detailed description of student learning goals and objectives can be found at https://www.cs.csusb.edu/abet/.

Requirements for the Bachelor of Science Degree in Electrical Engineering, accredited by the Engineering Accreditation Commission of ABET, www.abet.org

<table>
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<th>Total Units Required to Graduate</th>
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**General Education Requirements** 24 units

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<tr>
<td>LD Area B Natural Sciences</td>
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<td>LD Area C Arts and Humanities</td>
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<td>LD Area D Social and Behavioral Sciences</td>
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<td>American Institutions</td>
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<tr>
<td>SELF</td>
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<tr>
<td>Junior Year Diversity Requirement</td>
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<tr>
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<tr>
<td>Capstone</td>
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<tr>
<td>GWAR (Exam) or Class</td>
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**Additional Units** 42-6 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 – 58-60 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, 3370, 3340, 4910, 4928

3. **Upper Division Elective courses** (12 units) **OR Emphasis courses** (14 units)
   - Students with a declared emphasis must complete the upper division elective courses required for the emphasis (see below).
   - Students without a declared emphasis (Traditional students) must select 12 units of upper division 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, CMPS/ECE 4550
     - **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 2533 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.

Engineering majors have the following General Education Modifications (GEMs), which means they do not have to take courses to satisfy these GE requirements. These GEMs are specific to the three engineering majors (Computer Engineering, Electrical Engineering and Engineering Sciences). Students who change to another major will not keep the modifications:

- Foundational Skill A3 is embedded in PHYS 2210, 2220 and ECE/ENGR/PHYS 2070.
- LD Area B2 is embedded throughout the curriculum.
- 3 units of LD Area D is met through EAC/ABET outcomes 2 and 4.
- UD Thematic Area D is met through EAC/ABET outcomes 2 and 4.

**Requirements for the Major in Electrical Engineering with Energy and Power Engineering Emphasis**

The Energy and Power Emphasis is obtained by taking the courses required above for the BS degree in Electrical Engineering but choosing the following 14 units of Upper Division electives: ENGR 3110, ENGR 4610, ENGR 4620, ECE 4380, and ECE 4381. In addition, students pursuing this emphasis are encouraged to undertake a design project related to energy and power engineering, when available, in ECE 4910 and 4928.

**Lower Division**

**ECE/ENGR 1618 Introduction to Engineering I (2)**

This course will provide an introduction to the practice of engineering and the various areas within the engineering disciplines. Students will be informed of engineering curricula and career opportunities within the various engineering disciplines. This course will also introduce students to important topics for academic success, both at the major level and at the university level. Each week meets for 50 minutes of lecture and 100 minutes of activity.

**ECE/ENGR 1628 Introduction to Engineering II (2)**

This course builds on the foundational skills in engineering design and practices developed in ENGR/ECE 1618. Students will design, build, test, and present engineering projects designed to solve specified problems within given constraints. Additionally, the impact of engineering from a global, social, economic, and environmental perspective is presented through case studies. Each week meets for 50 minutes of lecture and 100 minutes of activity. Prerequisite: ENGR/ECE 1618. Completion of ECE/ENGR 1618 and 1628 satisfies general education requirement First-Year Seminar.
ECE/ENGR/PHYS 2070 Electric Circuits (4)
An introduction to the analysis of electrical circuits. Use of analytical techniques based on the application of circuit laws and network theorems. Analysis of DC and AC circuits containing resistors, capacitors, inductors, dependent sources and/or switches. Natural and forced responses of first and second order RLC circuits; the use of phasors; AC power calculations; power transfer; and energy concepts. Each week lecture meets for 150 minutes and lab meets for 150 minutes. Prerequisites: PHYS 2220 with a grade of C- or better, or permission of the instructor.

ECE 2600 High-speed Rail (4)
The course gives an overview of the high-speed rail (HSR) technology crossing electrical transmission and traction drive control systems, power supply technology, signal and communication systems, mechanical and civil engineering, and transportation scheduling, and provides an opportunity to learn a variety of software packages regarding the aerodynamics impact on a high-speed train, operating the high speed train and designing the train interior layout, and the passage service system. Each week lecture meets for 150 minutes and lab meets for 150 minutes. Prerequisites: MATH 1030 or 1040 or 1060 and basic computer skills.

ECE 2770 Special Topics in Engineering (1-3)
This course will be used to supplement regularly scheduled courses with additional material at the beginning level.

ECE 2771 Special Topics Laboratory (1)
Optional laboratory for the study of topics at the beginning level. Corequisite: ECE 2770.

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 Elvish 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.

**ECE 3340 Control Systems (4)**
Introduce control system analysis and design. Cover control system modeling, time response, reduction of multiple systems, stability analysis, steady-state errors, root locus technique, PID controller, and fuzzy controller. Each week lecture meets for 150 minutes and lab meets for 150 minutes. Prerequisite: ECE 3040 with a grade of C- or better.

**ECE 3370 Power Systems Fundamentals (4)**
This course is an introductory subject in the field of electric power systems. Electric power systems have become increasingly important as a way of transmitting and transforming energy in industrial, military and transportation uses. The course covers basic elements of power system, three-phase circuit analysis, transformers, transmission line configuration, the per unit system and power flow. Each week lecture meets for 150 minutes and lab meets for 150 minutes. Prerequisites: ECE/ENGR/PHYS 2070 or ENGR/PHYS 207 with a grade of C- or better.

**ECE 3380 Power Electronics and Electrical Drives (4)**
The course is an introduction to switched-mode power converters, electromechanical energy conversion systems, and electric drives. It provides a basic knowledge of circuitry for the control and conversion of electrical power with high efficiency. These converters can change and regulate the voltage, current, or power; dc-dc converters, ac-dc rectifiers,
dc-ac inverters, and ac-ac cycloconverters are in common use. Applications include electronic power supplies, aerospace and vehicular hybrid power systems, and renewable energy systems. Each week lecture meets for 150 minutes and lab meets for 150 minutes. Prerequisite: ECE 3070, 3320, 3370.

**ECE 3610 Intermediate High-Speed Rail (4)**
High Speed Rail (HSR) is an interdisciplinary subject crossing electrical engineering, including electrical transmission and traction drive control systems, power supply technology, and mechanical and civil engineering, including train structures and track construction. The class provides an opportunity to learn a variety of software packages regarding aerodynamic impact on a high-speed train, operating a high-speed train, and designing the interior layout. Students will use a physical HSR simulator for lab projects. Each week lecture meets for 150 minutes and lab meets for 150 minutes. Prerequisite: ECE 3040 and 3070.

**ECE 3770 Special Topics in Engineering (1-3)**
This course will be used to supplement regularly scheduled courses with additional material at the intermediate 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.

**ECE 3771 Special Topics Laboratory (1)**
Optional laboratory for the study of topics at the intermediate 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. Corequisite: ECE 3770.

**ECE 4220 Digital Signal Processing (4)**
This course provides an introduction to principles of Digital Signal Processing (DSP) including sampling theory, aliasing effects, frequency response, Finite Impulse Response filters, Infinite Impulse Response filters, spectrum analysis, Z transforms, Discrete Fourier Transform and Fast Fourier Transform. Overviews of modern DSP applications such as modems, speech processing, audio and video compression and expansion, and cellular protocols. 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 4240 Microprocessor System Design (4)**
Introduce microprocessor architecture and organization. Cover bus architectures, types and buffering techniques, Memory and I/O subsystems, organization, timing and interfacing, Peripheral controllers and programming. Design a microprocessor system. Each week lecture meets for 150 minutes and lab meets for 150 minutes. Prerequisite: ENGR/ECE/PHYS 2070 with a grade of C- or better and ECE 3200.

**ECE 4250 Wireless Communications (4)**
In this course analytical characterizations of mobile communications channels are developed. The main techniques for mitigating the mobile communication channel effects such as Equalization, Diversity, etc. are examined. Multiple access techniques used in wireless communications, such as FDMA as well as digital TDMA and CDMA techniques 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.

**CMPS/ECE 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).

**CMPS/ECE 4550 Applied Machine Learning (4)**
Students will learn the basics of machine learning including: supervised vs. unsupervised learning, regression, dimensionality reduction and reinforcement learning. Focus will be given to experimental setup including normalization, evaluation criteria and outlier detection. Experiments will be carried out with contemporary and classical methods on real world data sets in a wide range of applications. Each week lecture meets for 150 minutes and lab meets for 150 minutes. Prerequisite: MATH 3200.
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 4771 Special Topics Laboratory (1)
Optional laboratory for the study of topics 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. Corequisite:
ECE 4770. Prerequisite: Permission of the instructor.

ECE 4800 Undergraduate Research (1-4)
Independent study into a research topic under the supervision of a faculty member. Students will establish the research
goals and objectives with their faculty supervisor. 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 4860 Internship (1-4)
Internships may be arranged by the department with various agencies, businesses, or industries. The assignments and
coordination of work projects with conferences and reading, as well as course credits, evaluation, and grading are the
responsibility of the faculty liaison (or course instructor), working with the field supervisor. Offered on a credit, no-
credit basis only. The department will determine the number of credit units offered. 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 4870 Cooperative Education (1-4)
The Cooperative Education program offers a sponsored learning experience in a work setting, integrated with a field
analysis seminar. The field experience is contracted by the Cooperative Education office on an individual basis, subject
to approval by the department. The field experience, including the seminar and reading assignments, is supervised by
the cooperative education coordinator and the faculty liaison (or course instructor), working with the field supervisor.
Students are expected to enroll in the course for at least two semesters. Offered on a credit, no-credit basis only. The
department will determine the number of credit units offered. 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 4890 Experiential Prior Learning (1-4)
Majors in Computer and Electrical Engineering with significant prior experience in computers and/or electronics may
have some of their experience count for academic credit toward their degree. In order to be considered for experiential
learning credit the student must have completed CMPS 2010 and have the approval of the department. Only a
combined total of 4 units of ECE 377x, 477x, and 48xx may be used for elective credit towards the major requirements.
Prerequisite: CMPS 2010 with a grade of C- or better and permission of the instructor

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ECE 4910 Senior Project I (2)
After consultation with the faculty supervisor and investigation of relevant literature, the student(s) shall prepare a substantial project with significance in the designated area. The timeline, teamwork responsibilities, milestones, and presentation(s) will be scheduled. Prerequisite: At least 12 units of 3000- or 4000-level ECE and CMPS courses.

ECE 4928 Senior Project II (2)
This is the completion phase of the project. Students will present a project report to the entire class, explaining the nature of the work, the finished product, and its relationship to the field. Students will demonstrate proficiency in critical thinking, information literacy, written communication, and quantitative reasoning in their written project report. Additionally, students will demonstrate an understanding of their academic pursuits by reflecting on their studies of the arts, humanities, natural sciences, behavioral sciences, and social sciences. Prerequisite: ECE 4910 and completion of at least 90 units. Prerequisite or Corequisite: Completion of or concurrent enrollment in all GE course requirements for engineering majors. Satisfies general education requirement Capstone.

ECE 4960 Leadership in Engineering (1-2)
Leadership in computer and electrical engineering related activities that meet campus and/or community needs. 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 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.
- 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.
- 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.
- An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
- An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

b) Plans for assessing program goals and student learning outcomes.

The new emphasis will be assessed as a part of the assessment of the Electrical Engineering program. The current assessment plan is in Appendix A. Additional assessment will involve surveys of graduating students, alumni, and their employers.

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

The B.S. in Electrical Engineering program has no other concentrations or emphases. However, the proposed emphasis is coordinated with the P&E department and will be similar to the Energy and Power Engineering emphasis already developed in that department.
d) A list of all courses required for the program, specifying catalog number, title, units of credit, and prerequisites or co-requisites (ensuring that there are no “hidden” prerequisites that would drive the total units required to graduate beyond the total reported in 4c above). Include proposed catalog descriptions of all new courses.

The Energy and Power Engineering Emphasis is obtained by choosing the electives listed below. All listed prerequisites are required for the Electrical Engineering program, i.e. there are no additional, hidden, prerequisites. All courses listed have been approved and are already in the 2018-2020 University Catalog.

- ENGR 3110 Thermodynamics (4). Prerequisites: PHYS 2210, CHEM 1000.
- ENGR 4610 Conventional Energy Production (3). Prerequisite: ENGR 3110 Thermodynamics.
- ENGR 4620 Renewable Energy Production (3). Prerequisite: ENGR 3110 Thermodynamics.
- ECE 4380 Power System Operation with Renewable Energy Resources (3). Prerequisite: ECE 3370.
- ECE 4381 Power Systems with Renewable Energy Laboratory (1). Prerequisite: ECE 3370.

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 co-requisites. 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.
4) **Need for the Proposed Program**

a) **List of other California State University campuses currently offering similar programs; list of neighboring institutions, public and private, currently offering similar programs.**

Electrical Engineering is a traditional degree within engineering disciplines. Most CSU campuses offer a degree in Electrical Engineering. However, no CSU campus offers a BS in Energy Engineering. Also none offers an emphasis or concentration in Power Engineering. UC Berkeley offers a BS in Energy Engineering. Stanford University offers a BS in Energy Resources Engineering.

b) **List of any other curricula currently offered by the campus that are closely related to the proposed program.**

The only program similar to the proposed emphasis is the Energy and Power Engineering emphasis developed in the P&E department. In fact, the proposed emphasis in this document is the continuation of the emphasis in the P&E department offered to the students majored in the Electrical Engineering program.

c) **Community participation, if any, in the planning process. This may include prospective employers of graduates.**

We have consulted with the CSUB Engineering Industry Advisory Board, which has representatives from the major industries in the area, as well as government and alumni. They were very supportive of the new emphasis and contributed valuable suggestions during the planning stages.

d) **Applicable workforce demand projections and other relevant data.**

Specific employment projections data for such specific field as Energy and Power Engineering are not available from the usual sources (e.g. U. S. Bureau of Labor Statistics, State of California Employment Development Department, California Energy Commission, etc.) However, one can get a reasonably good picture of workforce demands by looking at energy production and consumption in the state and in the nation.

According to the U. S. Energy Information Administration (US EIA), California’s total energy demand is second only to Texas. There are 2,179 power plants, of all types, in our state (according to the California Energy Commission). We consumed 290,567 GWh in 2016 (29% from renewable sources), of which we import 92,341 GWh from other states. California is the country’s top producer of hydroelectric power (US EIA, California Profile Data, Reserves and Supply, updated September 8, 2016). Indeed, it became the first state in the nation to get more than 5% of its utility scale electricity generation from
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%
Hispanic, 23% Caucasian, 7% Black/African American, 7% Asian, 11% Other). Furthermore, we have around 25% female students. This is significantly less than the female representation across campus, which is around 62%. We did not specifically address diversity issues when planning this program, although we are trying to recruit and retain more female students by supporting the local student chapter of the Society of Women Engineers (SWE) and by assertively pursuing female applicants when any faculty positions open up.

c) For master’s degree proposals, the number of declared undergraduate majors in closely allied disciplines and the degree production over the preceding three years for the corresponding baccalaureate program(s), if they exist.

N/A

d) Professional uses of the proposed program.

Our graduates will perform technical and managerial engineering tasks. Our new emphasis focuses on technical needs of the energy production and power distribution industries. However, these students will still take the Electrical Engineering core courses, so they will have access to other engineering positions.

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

We use the rather conservative assumptions that we will get 8 freshmen and 8 transfer students from the community college for each of the next five years. (We are already doing grant-funded outreach to Bakersfield College and local high schools.) In addition, we assume 50% attrition rate over four years. This yields the estimates below.

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6) Existing Support Resources for the Proposed Program

a) Faculty who would teach in the program, indicating rank, appointment status, and highest degree earned. For master’s degrees, include faculty publications or curriculum vitae.

No new faculty will be hired specifically to teach in this new emphasis. The proposed
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 Salehpoor (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.
7) **Additional Support Resources Required** Note: If additional support resources will be needed to implement and maintain the program, a statement by the responsible administrator(s) should be attached to the proposal assuring that such resources will be provided.

   a) Any additional faculty or staff support positions needed to implement the proposed program.

      N/A

   b) 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 that will be required. If the space is under construction, what is the projected occupancy date? If the space is planned, indicate campus-wide priority of the facility, capital outlay program priority, and projected date of occupancy.

      N/A

   c) Any additional library resources needed. Indicate the commitment of the campus either to purchase or borrow through interlibrary loan these additional resources.

      No additional library resources beyond the existing resources will be needed.

   d) Additional academic technology, equipment, or specialized materials that will be (1) needed to implement the program and (2) needed during the first two years after initiation. Indicate the source of funds and priority to secure these resource needs.

      We have purchased the Training Systems mentioned above. Any more modules or equipment to support the emphasis will be purchased using funds from the Title V grant. The grant has a total of $626,708 allocated to equipment and $185,123 for supplies. We are presently in the fourth year of this five-year grant. These funds will be more than sufficient for the proposed program’s needs.
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.
5c) Meet deadlines and achieve project goals.

(6) *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*

6a) Design and set up experiments.
6b) Conduct experiments and perform measurements.
6c) Analyze data and interpret results.
6d) Use appropriate tools, simulation software, or hardware design tools to solve engineering problems.

(7) *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies*

7a) Carry out research on engineering topics by reading and reporting on papers in the technical literature.
7b) Involve oneself in professional activities (e.g. meeting, presentations, workshops).
7c) Identify and discuss emerging technologies related to computer and electrical engineering.
7d) Understand the relation of classical topics in engineering with their implementation in modern technologies.
**Electrical Engineering Proposed (Semester Conversion affected 3040 and 4910+4928)**

E = Even Years (2016/17, 2018/19, etc)  
O = Odd Years (2017/18, 2019/20, etc)  
A = All Years

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### Appendix B

**Sample roadmap for BS in Electrical Engineering with Emphasis in Energy and Power Engineering**

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<td>GE JYDR (3)</td>
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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
Appendix D

Catalog descriptions of ENGR courses required for the emphasis

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 (exergy), ideal vapor power cycles, ideal gas power cycles, and refrigeration and heat pump cycles. 150 minutes lecture/discussion and 150 minutes laboratory per week. Prerequisites: PHYS 2220, and CHEM 1000 both with a C- or better.

ENGR 4610 Conventional Energy Production (3)
Study of combustion of fossil fuels, thermal power plant and cogeneration, gas turbine power plant and cogeneration, combined gas turbine-thermal power plant, integrated gasification combined cycle (IGCC) power plants, nuclear power plants, and environmental impacts associated with conventional energy production methods. 150 minutes lecture/discussion. Prerequisite: ENGR 3110.

ENGR 4620 Renewable Energy Production (3)
Study of hydro energy systems, geothermal energy systems, wind energy systems, solar energy systems, fuel cells, thermoelastic power generator, biomass, carbon capturing and sequestration, energy storage, economic analysis of energy generating systems, and environmental impacts associated with renewable energy production methods. 150 minutes lecture/discussion. Prerequisite: ENGR 3110.