



# ACADEMIC SENATE

## CSU BAKERSFIELD

### Academic Master Plan 2024-25 through 2033-34

**RES 242512**

AAC and BPC

**RESOLVED:** That the Academic Senate approve the addition of the BS Degree in Mechanical Engineering to the Academic Master Plan.

**RESOLVED:** That the Academic Senate approve the removal of the MS degree in Applied Analytics from the Academic Master Plan.

**RESOLVED:** That the Academic Senate approve the removal of the MS degree in Accounting from the Academic Master Plan.

**RESOLVED:** That the Academic Senate approve the suspension of the BS degree in Natural Science.

**RESOLVED:** That the Academic Senate approve the attached Academic Master Plan.

**RATIONALE:** Major changes include the addition of the BS in Mechanical Engineering and the removals of the MS in Accounting and the MS in Applied Analytics. In addition, the Academic Master Plan was updated to include the addition of the most recently completed program review dates and updates to the dates for the next scheduled program review for several programs.

**Attachments:**

CSU Bakersfield AMP 2024-25 through 2033-34 clean  
CSU Bakersfield AMP 2024-25 through 2033-34 tracked  
BSME Program Projection

**Distribution List:**

President  
Provost and VP for Academic Affairs  
VP Student Affairs  
AVP Faculty Affairs  
AVP Academic Affairs and Dean of Academic Programs

**Academic Senate**

California State University, Bakersfield  
9001 Stockdale Hwy. • 22 EDUC • Bakersfield, CA 93311

School Deans  
Dean of Libraries  
Dean of Antelope Valley  
Dean of Extended University and Global Outreach  
Department Chairs  
General Faculty

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Approved by the Academic Senate: December 5, 2024

Sent to the President: December 17, 2024

President Approved: December 19, 2024

**CAMPUS ACADEMIC PLAN**  
**Existing and Projected Degree Programs**  
**2025-26 through 2034-35**  
**California State University, Bakersfield**

**CAMPUS ACADEMIC PLAN**  
**Existing and Projected Degree Programs**  
**2024-25 through 2033-34**  
**California State University, Bakersfield**  
**(continued)**

College or Division and Degree Program Title	Existing Degree Type				Projected Program and Originally Approved Implementation Year	Academic Year of Most Recently Completed Program Review	Academic Year of Scheduled Program Review
	Bachelor's	Master's	Doctoral	Other			
Biochemistry	BS					2020-21	2027-28
Biology	BS	MS				2020-21	2026-27
Chemistry	BS					2020-21	2027-28
<u>Computer Engineering</u>	<u>BS</u>					2018-19	2025-26
Computer Science	BS	MS				2019-20	2025-26
<u>Electrical Engineering</u>	<u>BS</u>					2018-19	2025-26
Engineering	BS					2018-19	2025-26
Environmental Sciences					BS 2021		
Geology	BA, BS	MS				2021-22	2026-27
Human Biological Sciences	BA					2020-21	2026-27
Mathematics	BS	MAT*				2021-22	2026-27
Mechanical Engineering					BS 2026		
Natural Sciences	BA*, BS*					2023-24	2030-31
<u>Nursing</u>	<u>BS</u>	<u>MS</u>	DNP			2022-23	2028-29
Physics	BS					2022-23	2027-28
Public Health	BS						2027-28
<b>College of Social Sciences and Education</b>							
Anthropology	BA*	MA*				2022-23	2027-28
Behavioral Neuroscience					MS^ 2024		
Child Adolescent and Family Studies	BA					2018-19	2024-25

\* Suspended program

^ Offered only through self-support

^^ Offered through both state-support and self-support

@ Online program

Note: Underlined programs are nationally accredited subject areas

**CAMPUS ACADEMIC PLAN**  
**Existing and Projected Degree Programs**  
**2024-25 through 2033-34**  
**California State University, Bakersfield**  
**(continued)**

College or Division and Degree Program Title	Existing Degree Type				Projected Program and Originally Approved Implementation Year	Academic Year of Most Recently Completed Program Review	Academic Year of Scheduled Program Review
	Bachelor's	Master's	Doctoral	Other			
Counseling		MS				2015-16	2022-23
Counseling Psychology		MS				2019-20	2025-26
Criminal Justice	BA					2016-17	2022-23
<u>Education</u>		<u>MA</u> <sup>@</sup>				2018-19	2022-23
<u>Educational Administration</u>		<u>MA</u>				2016-17	2022-23
<u>Educational Leadership</u>			<u>EdD</u>				2022-23
Kinesiology	BS	MS <sup>@</sup>				2018-19	2023-24
Latina/o/x and Chicana/o/x Studies					BA 2019		
Liberal Studies	BA					2022-23	2027-28
Political Science	BA					2013-14	2018-19
Psychology	BA					2019-20	2025-26
<u>Social Work</u>		<u>MSW</u> <sup>^^</sup>				2023-24	2028-29
Sociology	BA <sup>^^@</sup>	MA*				2021-22	2027-28
<u>Special Education</u>		<u>MA</u>				2015-16	2022-23
<b>Interdisciplinary and Other</b>							
General Education						2020-21	2027-28
Honors						2023-24	2028-29
Interdisciplinary Studies	BA	MA*				2023-24	2027-28

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**CAMPUS ACADEMIC PLAN**  
**Existing and Projected Degree Programs**  
**2024-25 through 2033-34**  
**California State University, Bakersfield**  
**(continued)**

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**CAMPUS ACADEMIC PLAN**  
**Existing and Projected Degree Programs**  
**202~~54~~-~~65~~ through 203~~43~~-~~54~~**  
**California State University, Bakersfield**

<u>College</u> <del>School</del> or Division and Degree Program Title	Existing Degree Type				Projected Program and Originally Approved Implementation Year	Academic Year of Most Recently Completed Program Review	Academic Year of Scheduled Program Review
	Bachelor's	Master's	Doctoral	Other			
<b><u>College</u><del>School</del> of Arts and Humanities</b>							
Art	BA					2017-18	202 <del>4-25</del> <del>3-24</del>
Communications	BA <sup>^^@</sup>					2022-23	2027-28
English	BA	MA				2017-18	202 <del>3-24</del> <del>2-23</del>
History	BA	MA				2015-16	2021-22
Mass Communication		MA			MA 2026		
<u>Music</u>	BA				BM 2022	2019-20	2026-27
Philosophy	BA					2022-23	2027-28
Religious Studies	BA					2021-22	2026-27
Spanish	BA	MA				2011-12	2018-19
Theatre	BA					2018-19	202 <del>4-25</del> <del>2-23</del>
<b><u>College</u><del>School</del> of Business and Public Administration</b>							
<u>Business Administration</u>	BS	MBA				2014-15	2021-22
<u>Economics</u>	BS					2019-20	2026-27
Environmental Resource Management	BS					2021-22	2026-27
Health Care Administration		MS				2011-12	2018-19
<u>Public Administration</u>	BA	MPA				2017-18	2023-24
Agricultural Business	BS					2018-19	2025-26
<u>Accounting</u>					MS 2020		
<u>Applied Analytics</u>					MS 2019		
<b><u>College</u><del>School</del> of Natural Sciences, Mathematics, and Engineering</b>							

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**CAMPUS ACADEMIC PLAN**  
**Existing and Projected Degree Programs**  
**2024-25 through 2033-34**  
**California State University, Bakersfield**  
**(continued)**

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Biology	BS	MS				2020-21	2026-27
Chemistry	BS					2020-21	2027-28
<u>Computer Engineering</u>	<u>BS</u>					2018-19	<u>2025-264-25</u>
Computer Science	BS	MS				2019-20	2025-26
<u>Electrical Engineering</u>	<u>BS</u>					2018-19	<u>2025-264-25</u>
Engineering	BS					2018-19	<u>2025-264-25</u>
Environmental Sciences					BS 2021		
Geology	BA, BS	MS				2021-22	2026-27
Human Biological Sciences	BA					2020-21	2026-27
Mathematics	BS	MAT*				2021-22	2026-27
<u>Mechanical Engineering</u>					<u>BS 2026</u>		
Natural Sciences	<u>BA*</u> , <u>BS*</u>					2023-24	2030-31
<u>Nursing</u>	<u>BS</u>	<u>MS</u>	<u>DNP</u>		<u>DNP-2023</u>	2022-23	2028-29
Physics	BS					2022-23	2027-28
Public Health	BS						2027-28
<b><u>School</u><u>College</u> of Social Sciences and Education</b>							
Anthropology	<u>BA*</u>	MA*				2022-23	2027-28
Behavioral Neuroscience					MS^ 2024		
Child Adolescent and Family Studies	BA					2018-19	<u>2024-253-24</u>

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Counseling		MS				2015-16	2022-23
Counseling Psychology		MS				2019-20	2025-26
Criminal Justice	BA					2016-17	2022-23
<u>Education</u>		MA <sup>®</sup>				2018-19	2022-23
<u>Educational Administration</u>		MA				2016-17	2022-23
<u>Educational Leadership</u>			EdD				2022-23
Kinesiology	BS	MS <sup>®</sup>				2018-19	2023-24
Latina/o/x and Chicana/o/x Studies					BA 2019		
Liberal Studies	BA					2022-23	2027-28
Political Science	BA					2013-14	2018-19
Psychology	BA					2019-20	2025-26
<u>Social Work</u>		MSW <sup>^^</sup>				2023-24 <del>15-16</del>	2028-29 <del>22-23</del>
Sociology	BA <sup>^^®</sup>	MA*				2021-22	2027-28
<u>Special Education</u>		MA				2015-16	2022-23
<b>Interdisciplinary and Other</b>							
General Education						2020-21	2027-28
Honors						2023-24 <del>17-18</del>	2028-29 <del>23-24</del>
Interdisciplinary Studies	BA	MA*				2023-24	2027-28

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## DEVELOP A NEW PROGRAM

### Projected Degree Proposal Template

Title of Projected Degree	<b>Mechanical Engineering</b>
Degree Designation (e.g., BS)	<b>BS</b>
Projected Implementation Date	<b>Fall 2026</b>
Campus	<b>CSU Bakersfield</b>
College	<b>Natural Sciences, Mathematics, and Engineering</b>
Department	Physics and Engineering
Contact Name(s) and Email(s)	Zhongzhe Liu (zliu3@csub.edu)

**1. Delivery mode of program:** Face-to-Face   Hybrid      Online  
Face-to-Face

**2. Support Mode:** State-Support      Self-Support  
State-Support

**3. A brief summary of the purpose for and description of the projected degree:**

The department of Physics and Engineering at CSU Bakersfield proposes to develop a Bachelor of Science (BS) in Mechanical Engineering (BSME) program to meet the increasing workforce demand for local engineers in Kern County. Mechanical engineering is a cornerstone of modern engineering, encompassing the design, analysis, and optimization of mechanical systems, machinery, materials, and devices. This program will offer students a solid foundation in mathematics, science, and engineering principles, with emphasis on practical applications and hands-on design/fabrication experiences. Graduates of the proposed BSME program will be equipped with the knowledge, skills, and experiences necessary for successful careers in a wide range of industries, including energy, aerospace, automation, agriculture, and manufacturing sectors, which are of critical importance to the economy of Kern County.

The BSME curriculum will have 120 semester units and will be designed to meet ABET program criteria for Mechanical Engineering. The key components of the major program include: 1) a minimum of 30 semester credit hours of a combination of college-level mathematics and basic sciences including multivariate calculus and differential equations; 2) a minimum of 45 semester credit hours of engineering topics on modeling, analysis, design, and realization of physical systems, components or processes related to both thermal and

mechanical systems; 3) a culminating major engineering design experience that incorporates appropriate engineering standards defined by ASME and multiple technical and non-technical constraints. The educational goals of the proposed BSME program will be achieved through coursework and design projects supervised by faculty members in the Department of Physics and Engineering. The degree program will be available to both first-time freshmen as well as transfer students from Community Colleges. The department plans to seek ABET accreditation for the proposed BSME program, which will provide the opportunity for the students to receive Engineer in Training (E.I.T.) certification, and eventually obtain PE (Professional Engineer) license.

#### **4. List the projected program learning objectives:**

The objectives of the proposed BSME program are to produce graduates who will, 3-5 years after graduation:

1. Succeed in an engineering profession through technical competence, effective communication, teamwork and leadership.
2. Maintain a lifelong interest in learning for personal and professional development.
3. Practice engineering in a manner that is ethically responsible and consistent with regulatory and social concerns.

In accordance with ABET requirements, the students in the BSME program will attain the following learning outcomes by the time of graduation:

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
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.
3. an ability to communicate effectively with a range of audiences.
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.
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.
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

#### **5. Proposed CIP code: 14.1901**

6. For new degree programs that are not already offered in the CSU, **provide a compelling rationale** explaining how the proposed subject areas constitute a coherent, integrated degree program that

has potential value to students and that meets CSU requirements for an academic program at the undergraduate or graduate level.

There are currently 14 BS degree programs in Mechanical Engineering in the CSU system as reported on the CSU website [1]. However, CSU Bakersfield is the only public 4-year university within a 100 mile radius. The closest CSU campus with Mechanical Engineering is Fresno State and its ME program is impacted. The population in Kern County has increased a lot in the past 10 years, and there is a strong workforce demand for mechanical engineers in the local region. The fact that no Mechanical Engineering program is available in the only 4-year institution in Kern County has imposed a problem for the local communities.

[1] <https://www.calstate.edu/attend/degrees-certificates-credentials/Pages/search-degrees-results.aspx?campuses=&k=Mechanical%20Engineering&#page-1>

## 7. The projected program's fit and relevance within the scope of campus strategic academic planning:

As a federally designated Minority-serving institution, CSU Bakersfield has a historic commitment and record of service in meeting the educational needs of the Greater Bakersfield's culturally diverse communities. The School of Natural Sciences, Mathematics, and Engineering provides unique educational pathway for youth from local communities to become STEM Professionals, which are in great shortage in Kern County. The proposed BS in Mechanical Engineering aligns seamlessly with CSUB's strategic plan by addressing several key priorities:

- **Recognize and Address Regional Needs:** Kern Economic Development Foundation reports more than 10% of high skilled STEM jobs in the region go unfilled due to an insufficient number of qualified candidates. The proposed program directly responds to the growing demand for mechanical engineers in the region, ensuring that CSUB continues to produce graduates who are well-equipped to meet the needs of local industries, including agriculture, energy, manufacturing, and aerospace.
- **Develop and Sustain High-Quality and Innovative Academic Programs:** The proposed program not only enhances CSUB's STEM offerings but also bridges the gap between theoretical knowledge and practical applications, fostering innovation and creativity among students. The program is designed to meet ABET criteria to ensure a high quality education.
- **Enhance Student Employability:** According to Kern Market Overview 2022, aerospace, energy and natural resources, transportation, and advanced manufacturing are among Kern's top five target industries [2]. These industries impose a high demand of talents in Mechanical Engineering. Labor market projections show a 21% increase with an estimated annual need of over 200 skilled workers in automation in the local region. The proposed BSME program will prepare students with knowledge and skills to be employed in this fast-growing workforce.

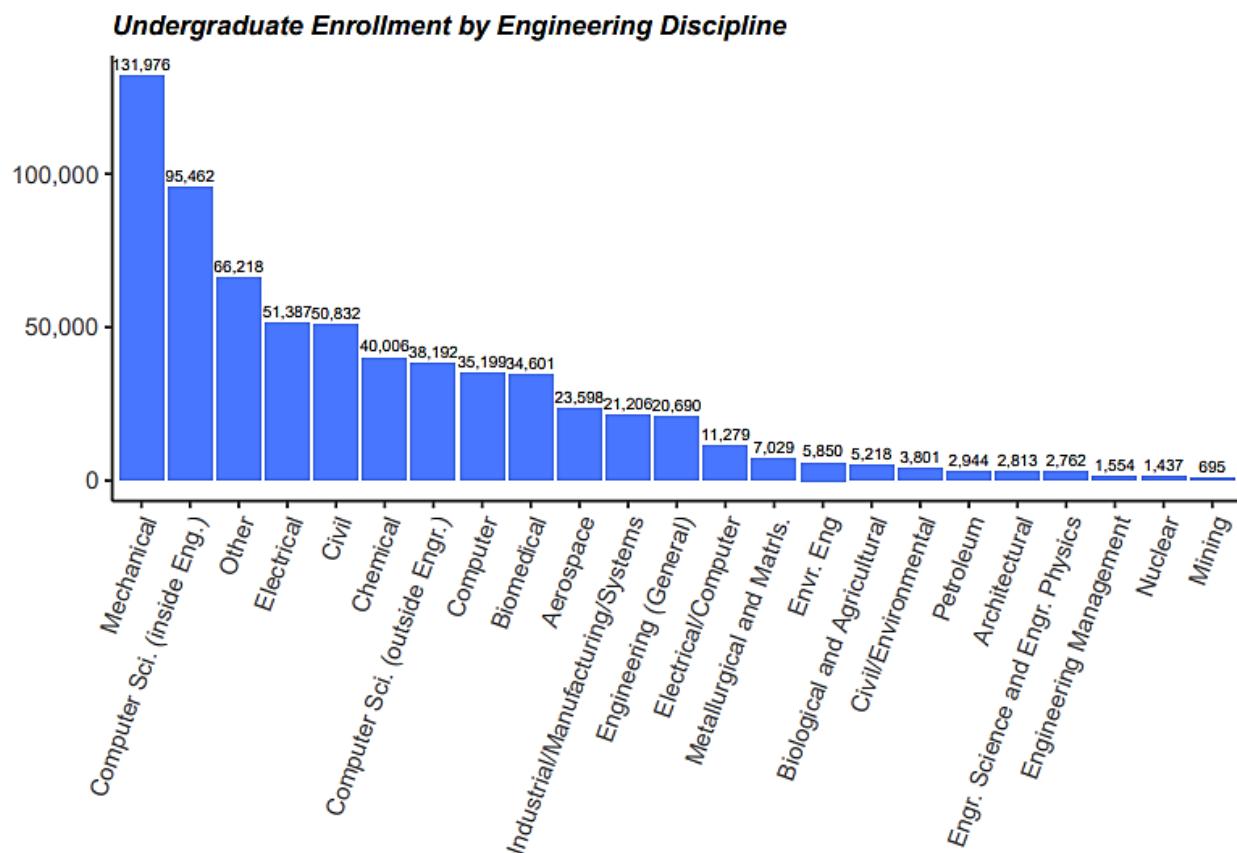
[2] <https://kernedc.com/wp-content/uploads/2022/07/2022-Kern-EDC-Market-Overview-Member-Directory.pdf>

**8. Anticipated student demand:** Provide projections in the table below and identify the evidence you have used to make these projections (e.g., US Bureau of Labor Statistics).

	At Initiation	After 3 Years	After 5 Years
Number of Majors (Annual)	40	120	250
Number of Graduates (Cumulative)		30	100

a. Evidence:

Mechanical Engineering is a major with high student demand in the nation. The figure below (from the American Society for Engineering Education) shows that the enrollment of Mechanical Engineering is much higher than any other engineering discipline. In our interaction with local high school and community colleges, many students have expressed strong interest in pursuing ME degrees. In recent years, NSME receives a large number of inquiries from local community members, K-12 educators, and parents regarding when a Mechanical Engineering degree will be established to meet the student demand.



The demand for a BS in Mechanical Engineering program at CSUB is expected to be significant for several reasons:

- **Regional Demand:** The Central Valley of California has a strong industrial presence, with numerous companies in need of mechanical engineers. Many students in the region are interested in pursuing engineering degrees.
- **Access to High-Quality Education:** As the only 4-year institution in the region, our capacity to offer an ME degree, which can be ABET accredited, at an affordable cost makes it an attractive option for prospective students seeking a mechanical engineering degree.
- **Diverse Student Population:** CSUB serves a diverse student population, and the inclusion of a Mechanical Engineering program will further diversify the academic offerings, attracting students from various backgrounds and demographics.
- **Community Collaboration:** CSUB's strong ties to local industries and long-time collaboration with community colleges and local K-12 schools will attract students interested in applied learning and practical experiences.

b. For undergraduate programs with expected numbers of majors less than 10, and master's programs with expected numbers of majors less than 5, include a statement of commitment from the Provost demonstrating support for the sustainability of the program.  
N/A

**9. Workforce demands and employment opportunities for graduates:** Describe the demands and opportunities, as well as the evidence you have used to make these claims.

According to the data reported by the US Bureau of Labor Statistics [3], “employment of mechanical engineers is projected to grow 10 percent from 2022 to 2032, much faster than the average for all occupations.” Graduates of the proposed BS in Mechanical Engineering program at CSUB can be employed by a wide range of employers, including but not limited to:

- **Manufacturing:** Mechanical engineers are in high demand in manufacturing industries, where they contribute to the design, production, and optimization of machinery and processes.
- **Aerospace and Defense:** The aerospace and defense sectors are prominent in East Kern, offering opportunities for mechanical engineers to work on areas such as aircraft design and defense systems.
- **Energy and Environmental Sustainability:** With a focus on sustainable practices and renewable energy, mechanical engineers are essential in developing energy-efficient systems and environmental technologies. Students in this area will be in high demand in the energy industry in Kern County.

- **Agriculture and Automation:** Agriculture is a prime industry in Kern, which relies on mechanical engineering expertise to develop innovative equipment and automation solutions for increased efficiency and productivity.
- **Automotive and Transportation:** Mechanical engineers play a vital role in designing and improving vehicles, addressing the growing demand for environmentally friendly transportation options.

In conclusion, the proposed BS in Mechanical Engineering program aligns with CSUB's strategic areas, meets the demands of regional industries, and offers students a promising pathway to diverse and rewarding career opportunities. This program will contribute to the growth and prosperity of both CSUB and the broader community by producing highly skilled and marketable graduates to drive the economic development in Kern County.

[3] [Mechanical Engineers : Occupational Outlook Handbook: : U.S. Bureau of Labor Statistics \(bls.gov\)](http://www.bls.gov)

## **10. Other relevant societal needs:**

The closest CSU campuses with ME programs are more than 110 miles away from Bakersfield. In addition, all of these campuses (CSU Fresno and Cal Poly SLO) have declared impaction in engineering. The proposed BSME program at CSU Bakersfield provides a valuable educational opportunity to the diverse students in Kern County, many of whom are from low income families and are the first generation with higher education in their families.

## **11. An assessment of the required resources and the campus commitment to allocating those resources:**

Provide a narrative description of resources that will be needed at initiation, after three years, and after five years. **Note:** Approval of this proposal by campus entities represents the campus commitment to allocating these resources.

The infrastructure in the School of Natural Sciences, Mathematics, and Engineering is adequate to initiate the proposed degree program. The instructional labs established for the currently offered BS in Engineering program include Circuits, Materials Science, Thermodynamics, Fluid Mechanics, and Heat Transfer, all of which can be used to support the lab requirements in the ME curriculum. Most of the core upper and lower division required courses of the BS in Engineering degree will also be core requirements of the proposed ME degree which will minimize extra instructional costs.

The Department currently has five faculty members with Ph.D. degrees in Mechanical Engineering. A faculty search will be underway for an additional tenure track faculty in a related area to further enhance the department's capacity to meet the needs of instruction, student mentoring, and career preparation. There are also qualified part-time faculty members with relevant industry experience who can instruct some specific subjects.

**Academic Programs, Innovations and Faculty Development**  
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[www.calstate.edu/app](http://www.calstate.edu/app)

The State of California has provided \$83M to establish an Energy Innovation Building, which will provide additional space for instructional labs, faculty offices, and research labs for the Department of Physics and Engineering. In addition, Chevron has made a pledge of \$1M donation to establish a Machine Shop to support the proposed ME program. The new building is expected to be completed in 3-4 years to support the space needs of the growing student population.

The strong collaboration between NSME and local industry provides great opportunities to offer professional training to develop future leaders in engineering companies and public sectors. The School of NSME is fully committed to the success of this proposed BSME degree.

#### **12.a. Description of Campus Approval Process**

The proposal will be reviewed and approved by the NSME Curriculum Committee, the Academic Affairs Committee, and the Academic Senate.

#### **b. Approval Signatures**