Departmental Audit-College of Engineering

Audit Report # 19-119
August 16, 2019

The University of Texas at El Paso

Office of Auditing and Consulting

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August 16, 2019

Dr. Heather Wilson
President, The University of Texas at El Paso
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Dear Dr. Wilson:

The Office of Auditing and Consulting Services has completed a limited- scope Departmental Audit of the College of Engineering. During the audit, we identified opportunities for improvement and offered the corresponding recommendations in the audit report. The recommendations are intended to assist the department in strengthening controls and help ensure that the University's mission, goals and objectives are achieved.

We appreciate the cooperation and assistance provided by The College of Engineering staff during our audit.

Sincerely,

Lori Wertz
Chief Audit Executive

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Dr. Theresa Maldonado, Dean, College of Engineering
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EXECUTIVE SUMMARY

The Office of Auditing and Consulting Services has completed a limited scope Departmental Audit of The College of Engineering. The objectives of this audit were to determine if the College of Engineering is in alignment with the Accreditation Board of Engineering and Technology (ABET) accrediting criteria for curriculum and faculty, University policies and procedures for facilities access control, international student travel: global programs, and maintenance and operational expenditures (M&O), specifically international (foreign) travel and authorized personal services (APS). The results of the APS testing are documented in a separate memorandum dated August 16, 2019.

During the audit, we noted the following:

- ABET Accreditation
  - One prior ABET review curriculum issue remains unresolved;
  - Faculty currency and expertise in field could not be determined in all cases;

- Facilities Access Controls
  - Key access records are not maintained;

- International Travel
  - Travelers are not always in compliance with University foreign travel policies and procedures;

- International Student Travel: Global Programs
  - No exceptions: The CoEng has a well-prepared Global Program Manager in place to oversee and prepare students for international travel.

With the exceptions noted above, we conclude that the College of Engineering's processes are generally effective; however, we did identify opportunities for improvement.

BACKGROUND

The mission of the College is to provide access and excellence through innovative educational programs, high-impact research programs, implementation and commercialization of knowledge and technologies, and active partnerships and collaborations with educational, government, non-profit, and commercial organizations.

Fall 2018 Academic departments (programs), student enrollment, and faculty include:

College of Engineering by Department	Undergraduate Students	Masters Students	PhD Students	Total Student Enrollment	**Faculty (FTE)	**Faculty (HeadCount)	Students/Faculty Ratio
Civil Engineering	576	109	23	708	16	23	31
College of Engineering (Dean's Office)	2	0	*35	37	1	4	9
Computer Science	934	76	0	1010	16	22	46
Dept. of Engineering Education and Leadership	123	7	0	130	5	5	26
Electrical & Computer Engineering	661	36	29	726	23	31	23
Industrial, Manufacturing, and Systems Engineering	305	84	0	389	9	13	30
Mechanical Engineering	1253	67	42	1362	20	28	49
Metallurgical, Material, & Biomedical Engineering	138	31	28	197	8	13	15
College Totals	3992	410	157	4559	98	139	33

Source: Information provided by CEIRP for Fall 2018

*Computer Science PhD students. Updated department code change effective 9/1/2019.

**Includes Tenure, Tenure Track, Non-Tenure Track. Does not include students who teach a course.

Five of the seven Bachelor of Science programs are accredited by the Engineering Accreditation Commission (EAC) and Computer Science is accredited by the Computing Accreditation Commission (CAC) of the Accreditation Board of Engineering and Technology (ABET). A comprehensive accreditation program review must be conducted for each accredited program at intervals no longer than six years for continuous accreditation, and the next review is due in FY2020. ABET faculty and curriculum were tested in preparation for the upcoming ABET review in October 2019.

Additionally, the CoEng provides student opportunities through global faculty-led and research abroad programs in various countries. The program objectives are to enhance student personal and professional skills, which equips them with a competitive advantage upon graduation. These experiences also align with the UTEP Edge initiative. Global programs were evaluated to determine compliance with University policies and procedures.

AUDIT OBJECTIVES

The objectives of the departmental operational and financial audit were to determine if the College of Engineering is in alignment with the following:

- ABET accreditation regarding curriculum and faculty criteria;
- UTEP's Campus Wide Facility Access Control for restricted labs/classrooms;
- University international travel policies and procedures for Engineering Global Programs; and
- University policies and procedures regarding maintenance and operational (M&O) expenditures to ensure the college's financial objectives.

SCOPE AND METHODOLOGY

The audit was conducted in accordance with the *International Standards for the Professional Practice of Internal Auditing* and the authoritative guidelines of the *International Professional Practice Framework* issued by the Institute of Internal Auditors.

Audit procedures included performing a risk analysis, interviewing key personnel, reviewing applicable regulations, institutional policies and procedures and verifying the existence of appropriate support documentation using data analytics.

The scope of the audit includes transactions processed by the College of Engineering: September 1, 2017 to August 31, 2018; however, the ABET and facilities scope includes transactions through April 2019.

The audit scope was limited to:

- ABET Accreditation Review (See Appendix A)
  - Criterion 5: Curriculum
  - Criterion 6: Faculty
- Facilities Access Control
  - Restricted labs and/or classrooms
- M&O Expenditures
  - International Travel (Foreign Travel)
  - Authorized Personal Services (APS)

RANKING CRITERIA

All findings in this report are ranked based on an assessment of applicable qualitative, operational control and quantitative risk factors, as well as the probability of a negative outcome occurring if the risk is not adequately mitigated. The criteria for the rankings are as follows:

Priority - an issue identified by an internal audit that, if not addressed timely, could directly impact achievement of a strategic or important operational objective of a UT institution or the UT System as a whole.

High – A finding identified by internal audit that is considered to have a medium to high probability of adverse effects to the UT institution either as a whole or to a significant college/school/unit level.

Medium – A finding identified by internal audit that is considered to have a low to medium probability of adverse effects to the UT institution either as a whole or to a college/school/unit level.

Low – A finding identified by internal audit that is considered to have minimal probability of adverse effects to the UT institution either as a whole or to a college/school/unit level.

AUDIT RESULTS

A. ABET Accreditation

Criterion 5: Curriculum

ABET has general and program specific curriculum requirements for the six programs being accredited (Appendix A). The University Course Catalog, course descriptions, and syllabi were reviewed to determine if each program curriculum meets ABET general and program specific criteria. The following exception was noted:

A.1. Prior ABET Review Curriculum Issue Remains Unresolved

One course identified as a weakness in the previous ABET review was not updated in the University Course Catalog.

ABET reviewers recommended updates to the identified course, and while modifications were made to the course syllabus, management did not follow up to ensure its inclusion in the University Course Catalog to complete the recommendation. Not updating the catalog may result in a weakness identification for the curriculum portion of the next ABET review, which may affect the overall accreditation outcome.

Recommendation:

The University course catalog for the program should reflect the level of math and science taught for the course to match the course's individual syllabi. It is recommended to monitor all engineering programs' courses and update the catalog for the course identified.

Level: This finding is considered **MEDIUM,** due to the fact that previously identified weaknesses will be subject to review and incomplete recommendations may affect the overall accreditation outcome, resulting in reputational and financial risk to the University.

Management Response:

Undergraduate program directors closely monitor course entries in the catalog and request changes to the Provost's Office as needed, following institutional policies, with the catalog updated on a yearly basis. Verification of the identified course was conducted with the Provost's Office to ensure that prerequisite courses are listed on the University Course Catalog and can be traced back to the required math and/or science courses. Management expects the issue to be resolved with the next ABET review.

Responsible Party:

Virginia Granda, Academic Affairs Coordinator

Implementation Date:

September 1, 2019

Criterion 6: Faculty

ABET requires that faculty meet general and program specific criteria. All six programs were reviewed for general requirements, while four of the six accredited programs required compliance to additional program specific criteria (Appendix A).

A sample of 29 out of 139 faculty members were randomly selected for testing. Professional currency, or involvement, was based on levels of activity to include current professional licenses, certifications, organizations, service, and professional development. Professional publications on the subject matter were used to determine expertise. Information was obtained from University resources: Digital Measures, The Center for Institutional Evaluation, Research and Planning, Expertise Connector, PeopleSoft, and faculty curriculum vitae (CV).

The following exception was noted:

A.2. Faculty Professional Currency and Expertise in Field Could Not Be Determined

- Four out of twenty Engineering faculty members' professional currency and expertise in respective professional areas could not be determined due to lack of information on UTEP provided resources.

- One faculty member's Professional Engineer License could not be confirmed in the Texas Board of Professional Engineers roster with either an active or an inactive license. Both Digital Measures and the CV indicate the professional license on the qualifications listing.

Licenses/Certifications, if any, expertise, and levels of activity were not updated in the provided resources. Incomplete information on UTEP provided resources may lead to failure of the accreditation process if requirements cannot be determined or confirmed in a timely manner.

Recommendation:

Management should monitor and ensure faculty complete and maintain their professional currency and expertise in a centralized database. Digital Measures organizes and builds reports on teaching, research and service activities. It enables faculty to keep track of their experience and levels of activity information in one location and enables University staff to utilize various information for internal and external reporting purposes.

Level: This finding is considered **MEDIUM** due to the fact that inability to verify credentialing requirements may result in loss of program accreditation resulting in reputational and financial risk to the University.

Management Response:

This item will be discussed in our next Engineering Leadership Council (ELC) to seek our department chair's assistance in having all faculty members update their professional certifications/licenses in Digital Measures. This is to centralize faculty academic, research, and service information in one location. Furthermore, it will enable us to build reports for accreditation purposes, promotion and tenure, faculty evaluations and accomplishments.

Responsible Party:

Dr. Theresa Maldonado, Dean

Implementation Date:

September 1, 2019

B. Facilities Access Control

Eighty-nine restricted labs and classrooms are located in the CoEng. A sample of 19 rooms were chosen to determine whether Engineering facilities access records align with UTEP's Campus Wide Facility Access Control policies. A total of 198 key holders[1], some with access to multiple rooms, were tested for authorization and existence. The following was determined:

B.1. Access Control Records Are Not Maintained

- **Access Authorizations Could Not Be Confirmed**
  The College of Engineering does not keep internal access records. They depend on Facility Services' new electronic database to provide current records of authorized key holders, including records of exception memos authorizing access to actively enrolled students without a PeopleSoft appointment.
- **Separated Employees and Students Found on Facilities' Access Listing**
  Forty-one out of 198 (21%) key holders sampled were found to be separated employees and/or inactive students from the University. Three of the 41 key holder's identities could not be determined due to incomplete and/or invalid identification information on record.
- **Non-Appointed Students Found on Facilities' Access Listing**
  Thirty out of 198 (15%) key holders sampled were found to be active students but were not appointed in PeopleSoft as an Assistant Instructor, Teaching Assistant, or Research Assistant. Twenty-eight students had no appointment, while two students with appointments were classified as Undergraduate Work Studies.

UTEP Business Process Guidelines (BPG) Campus Wide Facility Access Control 3.8: Record Keeping states, *"Department Access Coordinators are responsible for maintaining key records for their building and/or departments"*. Additionally, BPG 3.3: Granting Access states *"Access may not be granted to a student unless the student has a University appointment as an Assistant Instructor, Teaching Assistant or Research Assistant, or the University Department or Office requesting the facility access for a student requests an exception."*

[1] Key holders are defined as individuals with brass key, electronic, or keypad access

Management depends on Facilities to provide current access records; however, Facilities depends on management to authorize and maintain those records. The inability to determine if access is authorized leads to incomplete record keeping and lack of accountability. Additionally, unauthorized key holders may have access to University property, increasing the risk of misused or missing property, which could impose additional safety and financial risk to the University.

Recommendation:

The College of Engineering is in the process of reviewing and updating the data provided by Facilities. As the current policies regarding access control are inconsistent, it is recommended that the College keep their own set of documents to verify against Facility's database. Additionally, Management should continuously monitor, maintain, and communicate any changes to Facilities.

Level: This finding is considered **MEDIUM** due to the fact that lack of monitoring facility access increases safety and financial risk to the University.

Management Response:

Upon preliminary review, inconsistencies in the access control policies posted on the University's web site have been identified. There is evidently lack of alignment between Human Resources, Facilities Management, and the College regarding up-to-date records. The College of Engineering will review the recommendation and develop a plan moving forward in coordination with Human Resources and Facilities Management.[2]

Responsible Party:

Theresa A. Maldonado, Dean of Engineering

Implementation Date:

December 31, 2019

[2] The College of Engineering will develop a plan. However, Human Resources and Facilities Management, both of which are under the Vice President for Business Affairs, should review these policies and address the inconsistencies.

C. International Student Travel: Global Programs

Global Programs were reviewed for program policies and procedures, and proper oversight of student preparation for international travel. Additionally, two out of six programs were selected to determine whether travel documentation was prepared and processed in compliance with University student travel policies. The following was noted:

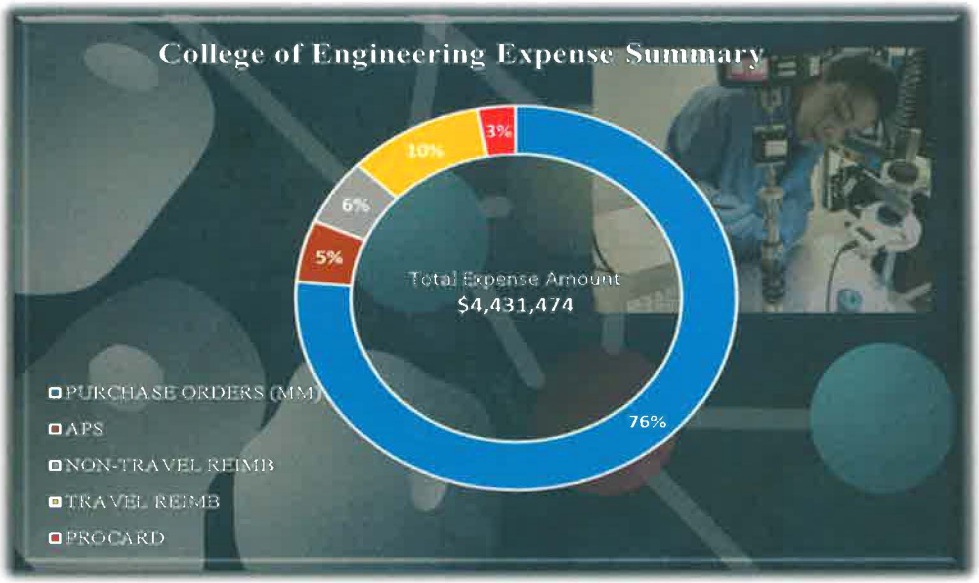
The CoEng has a well-prepared Global Program Manager in place to oversee and prepare students for international travel. Documentation was readily available, complete, and in compliance with University guidelines.

No Exceptions Noted

D. M&O Expenditures

M&O expenditures were reviewed to provide the college's administration with information to help determine if its financial objectives are being met. Additionally, International (foreign) travel expense reimbursements and APS expenditures were tested for compliance to University policies and procedures, and state and federal polices, when applicable.

The following is a summary of the expenses reviewed:



International Travel

The UTEP Handbook of Operational Procedures (HOP) Travel Policy 6.3.5 General Rules for Travel to Foreign Countries requires *"all international travel must be arranged by a UT System contracted travel agency. This includes airfare, hotel, and car rentals"* and *"it is mandatory for all travelers to register with International SOS."* Internet travel websites are not allowed for booking, and first class or business class airfare require prior approval and supporting documentation if limited exceptions are met. Additionally, HOP 6.2. requires travel authorizations be completed prior to travel.

Seven hundred twenty-four travel expense reports were processed for CoEng, totaling $442,650.34. Four out of 24 (17%) CoEng employees who traveled internationally during FY18 were selected for testing, resulting in eight processed expense reimbursements, totaling $13,690.76. The following was determined:

D.1. Travelers Not in Compliance with University Foreign Travel Policies and Procedures

- **Untimely Travel Authorizations**
  One out of eight (13%) travel authorizations was not requested in a timely manner. One trip occurred prior to authorization, which was granted three days after travel completion.

- **Unauthorized Travel Agency**
  One out of eight (13%) travel arrangements was not made through the UT System contracted travel agency, Anthony Travel, or the Concur Online Tool. Travel was arranged through a third party website, Orbitz.com.

- **SOS Enrollment**
  Two out of eight (25%) international trips could not be confirmed as enrolled in the SOS emergency program due to travel not processed through an authorized travel agency. Conference host provided travel arrangements (air/hotel).

- **Unauthorized First Class Travel**
  One of eight (13%) travel reimbursements included first class airfare for the flight to an international location.

Travelers did not comply with University foreign travel policies and procedures. Lack of adherence to travel policies may lead to financial and safety risks to both the traveler and University.

Recommendation:

Adherence to travel policies and procedures will allow departments to process travel reimbursements in a timely manner with the appropriate authorities and keep within the appropriated travel budget. Enrollment in the International SOS program allows for 24-hour medical, security, and travel assistance and tracking in cases of emergency while traveling outside the U.S. When an authorized agent is not used, it is up to the traveler to self-enroll in the SOS program. There is currently no system to review previous enrollments when travelers self-enroll; therefore, enrollment through an authorized travel agency is strongly recommended.

Level: This finding is considered **MEDIUM** due to the potential risk from lack of compliance with University policies and procedures.

Management Response:

The Engineering Business Center (EBC) already has training sessions in place for our new faculty and staff every semester where international travel and other policies and best practices are covered. We will extend these sessions to our current administrative staff as refresher trainings. The Engineering Business Center will include in their checklist for international travel authorization requests to request proof of enrollment in the International SOS program. In addition, the EBC has developed a monthly newsletter and the first release was on June 1, 2019. The objective is to have another channel of communication with our faculty and staff to inform them of significant updates and deadlines, reminders of current policies and procedures, and more importantly to continue to build trust with our faculty and staff to reinforce our business support.

Responsible Party:

Marina I. Rivera, College Administrative Officer

Implementation Date:

September 1, 2019

CONCLUSION

Based on the results of audit procedures performed, we conclude that the College of Engineering has been proactive in areas such as Global Programs and the upcoming ABET review. However, we identified opportunities to enhance and enforce existing policies, specifically:

- Facilities access control, and
- Foreign travel.

We wish to thank the management and staff of the College of Engineering for their assistance and cooperation provided throughout the audit.

APPENDIX A: ABET CRITERIA FOR ACCREDITING ENGINEERING PROGRAMS*

Effective for Reviews during the 2019-2020 Accreditation Cycle

CRITERION 5: CURRICULUM

The general curriculum requirements specify subject areas appropriate to engineering but do not prescribe specific courses. The program curriculum must provide adequate content for each area, consistent with the student outcomes and program educational objectives, to ensure that students are prepared to enter the practice of engineering. The curriculum must include:

(a) a minimum of 30 semester credit hours (or equivalent) of a combination of college-level mathematics and basic sciences with experimental experience appropriate to the program.

(b) a minimum of 45 semester credit hours (or equivalent) of engineering topics appropriate to the program, consisting of engineering and computer sciences and engineering design, and utilizing modern engineering tools.

(c) a broad education component that complements the technical content of the curriculum and is consistent with the program educational objectives.

(d) a culminating major engineering design experience that 1) incorporates appropriate engineering standards and multiple constraints, and 2) is based on the knowledge and skills acquired in earlier course work.

PROGRAM SPECIFIC CURRICULUM CRITERIA

Civil Engineering:

The curriculum must prepare graduates to:

- apply knowledge of mathematics through differential equations, calculus-based physics, chemistry, and at least one additional area of basic science;
- apply probability and statistics to address uncertainty;
- analyze and solve problems in at least four technical areas appropriate to civil engineering; conduct experiments in at least two technical areas of civil engineering and analyze and interpret the resulting data;
- design a system, component, or process in at least two civil engineering contexts;
- include principles of sustainability in design;
- explain basic concepts in project management, business, public policy, and leadership;
- analyze issues in professional ethics; and explain the importance of professional licensure.

Industrial Engineering:

The curriculum must:

- Prepare graduates to design, develop, implement, and improve integrated systems that include people, materials, information, equipment and energy.
- Include in-depth instruction to accomplish the integration of systems using appropriate analytical, computational, and experimental practices.

Metallurgical and Materials Engineering:
The curriculum must prepare graduates to apply:

- advanced science (such as chemistry, biology and physics),
- computational techniques and engineering principles to materials systems implied by the program modifier,
    - e.g., ceramics, metals, polymers, biomaterials, composite materials;
- to integrate the understanding of the scientific and engineering principles underlying the four major elements of the field: structure, properties, processing, and performance related to material systems appropriate to the field;
- to apply and integrate knowledge from each of the above four elements of the field using experimental, computational and statistical methods to solve materials problems including selection and design consistent with the program educational objectives.

Mechanical Engineering:
The curriculum must require students to apply:

- principles of engineering, basic science, and mathematics (including multivariate calculus and differential equations);
- to model, analyze, design, and realize physical systems, components or processes;
- and prepare students to work professionally in either thermal or mechanical systems while requiring topics in each area.

Electrical Engineering:
The structure of the curriculum must provide both breadth and depth across the range of engineering topics implied by the title of the program. The curriculum must include:

- probability and statistics, including applications appropriate to the program name;
- mathematics through differential and integral calculus;
- sciences (defined as biological, chemical, or physical science);
- and engineering topics (including computing science) necessary to analyze and design complex electrical and electronic devices, software, and systems containing hardware and software components.

The curriculum for programs containing the modifier "electrical," "electronic(s)," "communication(s)," or "telecommunication(s)" in the title must include:

- advanced mathematics, such as differential equations,
- linear algebra,
- complex variables, and
- discrete mathematics.

Computer Science:
The curriculum for programs containing the modifier "computer" in the title must include:

- discrete mathematics.

Criterion 6: Faculty

In general, the program must demonstrate that the faculty members are of sufficient number and have the competencies to cover all the curricular areas of the program. The program faculty must have appropriate qualifications and must have and demonstrate sufficient authority to ensure the proper guidance of the program and to develop and implement processes for the evaluation, assessment, and continuing improvement of the program. The overall competence of the faculty may be judged by such factors as education, diversity of backgrounds, engineering experience, teaching effectiveness and experience, ability to communicate, enthusiasm for developing more effective programs, level of scholarship, participation in professional societies, and licensure as Professional Engineers.

Program Specific Faculty Criteria

Civil Engineering:

The program must demonstrate that faculty teaching courses that are primarily design in content are qualified to teach the subject matter by:

- virtue of professional licensure,
- or by education and design experience.
- The program must demonstrate that it is not critically dependent on one individual.

Industrial Engineering:

Evidence must be provided that the program faculty understand professional practice and maintain currency in their respective professional areas. Program faculty must have responsibility and sufficient authority to define, revise, implement, and achieve program objectives.

Metallurgical and Materials Engineering:

The faculty expertise for the professional area must encompass the four major elements of the field.

Mechanical Engineering: The program must demonstrate that faculty members responsible for the upper-level professional program are maintaining currency in their specialty.

Electrical Engineering: No program specific faculty criteria.

Computer Science: No program specific faculty criteria.

*Resource: www.abet.org