

# The University of Southern Mississippi

## Detailed Assessment Report 2019-2020 Architectural Engineering Technology BS

### Mission / Purpose

The University of Southern Mississippi's Architectural Engineering Technology (ACT) program provides students with a broad-based education with an emphasis on critical thinking, technical problem-solving ability, and computer applications in addition to a background in architectural design. The ACT program is committed to producing graduates who possess the necessary skills, critical thinking, discipline and work ethics to enter the A/E/C industry fully capable of performing entry-level tasks at the office and in the field. The University of Southern Mississippi is a community of engaged citizens, operating as a public, student-centered, doctoral-granting research university serving Mississippi, the nation, and the world. The University is dedicated to scholarship and learning, integrating students at all levels in the creation and application of knowledge through excellence in teaching, research, creative activities, outreach, and service. The University nurtures student success by providing distinctive and competitive educational programs embedded in a welcoming environment, preparing a diverse student population to embark on meaningful life endeavors. The mission of the ACT program directly relates to the mission of the University. The ACT program aims to provide well-rounded professionals of the built environment, engaging and empowering graduates to transform lives and communities. The ACT program provides technology and management education to students who desire career pathways in architecture, engineering, or construction firms. To achieve its mission, the ACT program creates a nurturing learning environment that fosters the development of critical thinking skills, develops knowledge and technology expertise, and supports innovation.

### Student Learning Outcomes/Objectives, with Any Associations and Related Measures, Targets, Findings, and Action Plans

#### **SLO 1: Written and Oral Communication**

Apply written and oral communication in both technical and non-technical environments (ETAC-ABET Baccalaureate degree programs: Student Learning Outcome 3)

#### Related Measures:

##### **M 1: Written Report and Oral Presentations**

M1 (direct): The ACT 401 Architectural Studio IV (Capstone) course requires students to create, utilize, and present design, construction and operations documents. Students submitted several written reports that included pre-design research with a written description of Sustainability and Resiliency in construction, Building codes and zoning, Mechanical system calculations, FEMA Tornado and Hurricane Safe room design, and a USM Gulf Park Campus Master plan study. The oral component was assessed four times during the semester during the programming, conceptual design, design development, and final oral presentation phase. All presentations were made to a panel of jury members.

Source of Evidence: Capstone course assignment Project, individual.

#### **Target:**

Target: 80% of students will achieve an overall score of 70 or greater.

#### **Findings (2019-2020) - Target: Met**

Spring 2020: Hattiesburg on-campus AET students: 88.9% (N=9). 8 out of 9 on campus AET students received a 70% or better in this project.

##### **M 2: Student Intern Feedback from Supervisor**

M2 (indirect): The AEC 496 Internship course will gather data from supervisor evaluations of student intern's performance. Question #1 of the Student Intern Evaluation addresses the intern's ability to apply

written and oral communication in both technical and non-technical environments.

Source of Evidence: Employer survey, incl. perceptions of the program

**Target:**

Target: Employers are "satisfied" or "very satisfied" with 80% of student interns' performance.

**Findings (2019-2020) - Target: Met**

Fall 2019: Hattiesburg on campus AET students: 100% (N=2). 2 out 2 on campus AET students received a 70% or better in this project.

Spring 2020: Hattiesburg on campus AET students: 100% (N=2). 2 out 2 on campus AET students received a 70% or better in this project.

Summer 2020: Hattiesburg on campus AET students: 100% (N=4). 4 out 4 on campus AET students received a 70% or better in this project.

**SLO 2: Economic Analysis and Cost Estimates**

Perform economic analyses and cost estimates related to design, construction, and maintenance of building systems (ETAC-ABET Program Criteria for AET: Student Learning Outcome 1)

**Related Measures:**

**M 3: Create an Estimate**

M1 (direct): The Estimating II (AEC 365) course is the second of two estimating courses required for the Architectural Engineering Technology degree. Students create several estimates in this course with each one increasing in scope and complexity. Assignment three requires students to assemble a cost estimate and report.

Source of Evidence: Project, either individual or group

**Target:**

Target: 80% of students will achieve an overall score of 70 or greater.

**Findings (2019-2020) - Target: Met**

Fall 2019: Hattiesburg on campus AET students: 40% (N=10) 4/10 on campus AET students received a 70% or better in this project.

**Related Action Plans (by Established cycle, then alpha):**

For full information, see the *Details of Action Plans* section of this report.

**Address Estimating Findings**

*Established in Cycle: 2016-2017*

The Estimating II class remains a challenge for AET students, as reported in the 2018-19 findings. This semester, a School of ...

**M 4: Student Intern Feedback from Supervisor - Estimating Understanding**

M2 (indirect): The AEC 496 Internship course will gather data from supervisor evaluations of student intern's performance. Question #2 of the Student Intern Evaluation addresses the intern's ability to perform cost estimates related to design, construction, and or maintenance of building systems.

Source of Evidence: Employer survey, incl. perceptions of the program

**Target:**

Target: Employers are "satisfied" or "very satisfied" with 80% of student interns' performance.

**Findings (2019-2020) - Target: Met**

Fall 2019: Hattiesburg on campus AET students: 100% (N=2). 2 out 2 on campus AET students received a 70% or better in this project.

Spring 2020: Hattiesburg on campus AET students: 100% (N=2). 2 out 2 on campus AET students received a 70% or better in this project.

Summer 2020: Hattiesburg on campus AET students: 100% (N=4). 4 out 4 on campus AET students received a 70% or better in this project.

**SLO 3: Software Utilization for A/E Design**

Demonstrate the ability to utilize software that is appropriate to produce A/E design and construction documents (ETAC-ABET Program Criteria for AET: Student Learning Outcome 3)

**Related Measures:**

**M 5: Construction Document Development**

M1 (direct): The ACT 336 (Construction Documents) course entails the creation of a minimum set of digital documents for the Built Environment.

Source of Evidence: Project, either individual or group

**Target:**

Target: 80% of students will achieve an overall score of 70 or greater.

**Findings (2019-2020) - Target: Met**

Spring 2020: Hattiesburg on campus AET students: 100% (N=17). 17 out 17 on campus AET students received a 70% or better in this project.

**M 6: Student Intern Feedback from Supervisor - Technology Skills**

M2 (indirect): The AEC 496 Internship course will gather data from supervisor evaluations of student intern's performance. Question #3 of the Student Intern Evaluation addresses the intern's ability to utilize software/technology that is appropriate to produce or utilize A/E design and construction documents.

Source of Evidence: Employer survey, incl. perceptions of the program

**Target:**

Target: Employers are "satisfied" or "very satisfied" with 80% of student interns' performance.

**Findings (2019-2020) - Target: Met**

Fall 2019: Hattiesburg on campus AET students: 100% (N=2). 2 out 2 on campus AET students received a 70% or better in this project

Summer 2020: Hattiesburg on campus AET students: 100% (N=4). 4 out 4 on campus AET students received a 70% or better in this project.

**SLO 4: Employ Architectural Design Concepts**

Employ concepts of architectural design in a studio environment (ETAC-ABET Program Criteria for AET: Student Learning Outcome 2)

**Related Measures:**

**M 7: Create and Present Design Solution**

M1 (direct): The ACT 400 Architectural Studio III course requires students to create, utilize, and present design and construction documents at the district, site, and structure scales. The final project entails the design and documentation of a building situated in downtown Hattiesburg, MS.

Source of Evidence: Project, either individual or group

**Target:**

Target: 80% of students will achieve an overall score of 70 or greater.

**Findings (2019-2020) - Target: Met**

Spring 2020: Hattiesburg on-campus AET students: 100% (N=9). 9 out 9 on campus AET students received a 70% or better in this project.

**M 8: Student Intern Feedback from Supervisor - Design Knowledge**

M2 (indirect): The AEC 496 Internship course will gather data from supervisor evaluations of student intern's performance. Question #6 of the Student Intern Evaluation addresses the intern's ability to employ concepts of architectural design in a studio environment.

Source of Evidence: Employer survey, incl. perceptions of the program

**Target:**

Target: Employers are "satisfied" or "very satisfied" with 80% of student interns' performance.

**Findings (2019-2020) - Target: Met**

Fall 2019: Hattiesburg on campus AET students: 100% (N=2). 2 out 2 on campus AET students received a 70% or better in this project.

Spring 2020: Hattiesburg on campus AET students: 100% (N=2). 2 out 2 on campus AET students received a 70% or better in this project.

Summer 2020: Hattiesburg on campus AET students: 100% (N=4). 4 out 4 on campus AET students received a 70% or better in this project.

**Other Outcomes/Objectives, with Any Associations and Related Measures, Targets, Findings, and Action Plans**

**O/O 5: PO 1: Increase Enrollment**

PO 1: Increase on-campus enrollment for the ACT program.

**Related Measures:**

**M 9: Institutional Research Data**

M1 (direct): Fall 2016 through fall 2020 enrollment data was collected from the USM Office of Institutional Research. The aim of this program objective is to increase enrollment from fall to fall semesters.

Source of Evidence: External report from Institutional Research at USM

**Target:**

Target: The target of this program objective is to increase enrollment from fall to fall semesters in the ACT program.

**Findings (2019-2020) - Target: Met**

Fall 2016: 61 AET students

Fall 2017: 66 AET students

Fall 2018: 81 AET students

Fall 2019: 81 AET students

Fall 2020: 98 AET students

**O/O 6: PO 2: Employer Satisfaction with Intern**

PO 1: Employers are "satisfied" or "very satisfied" with student intern's overall performance.

**Related Measures:**

**M 10: Overall Student Intern's Performance**

M1 (indirect): The AEC 496 Internship course will gather data from supervisor evaluations of student intern's performance. Question #7 of the Student Intern Evaluation addresses the overall performance of the student during the time of his or her internship.

Source of Evidence: Employer survey, incl. perceptions of the program

**Target:**

Target: Employers are "satisfied" or "very satisfied" with 80% of student interns' performance.

**Findings (2019-2020) - Target: Met**

Fall 2019: Hattiesburg on campus AET students: 100% (N=2). 2 out 2 on campus AET students received a 70% or better in this project.

Spring 2020: Hattiesburg on campus AET students: 100% (N=2). 2 out 2 on campus AET students received a 70% or better in this project.

Summer 2020: Hattiesburg on campus AET students: 100% (N=4). 4 out 4 on campus AET students received a 70% or better in this project.

## Details of Action Plans for This Cycle (by Established cycle, then alpha)

### **Address Estimating Findings**

The Estimating II class remains a challenge for AET students, as reported in the 2019-20 findings. It was even lower than the previous cycle. Last cycle, a School of Construction + Design Tutoring Center was implemented to assist with Estimating II assignments. We have created a tutoring center where AET students can get help with this class.

In addition, we have a new faculty member for the pre-requisite course, Estimating 1, and the faculty for Estimating 2 works with the professor for Estimating 1 course to better prepare the AET students for Estimating 2.

The process of closing the loop for the ACT program has been established by the Director, Dr. Erich Connell, and the program Coordinator, Leffi Cewe-Malloy. Dr. Connell has been the Director of the School of Construction for 5 years, and Ms. Cewe-Malloy began her role as Coordinator during the fall 2019 semester. It is important that all courses are assessed using the Course Evaluation process outlined below; however, special attention will be dedicated to the Estimating I and Estimating II courses. A plan for remediation is part of the Course Evaluation process identified below; the remediation process for this course will be identified at the end of the fall 2020 semester because this course is currently being offered.

The Course Evaluation process is identified below for the ACT program. In this Course Evaluation process, courses are evaluated at the end of each fall and spring semester. The steps in the process of course evaluation and closing the loop are identified below: Courses are taught according to a cohort model; courses are only delivered during the fall OR spring. At the end of the fall or spring semester, a Course Assessment form is completed by the instructor of record for each course delivered. The Course Assessment form contains the following information: course name and identifiers, ABET criterion, assessment methodology, acceptable target and findings, recommendations / reflections, action plan, status of previous action plan. A faculty meeting is held at the end of each semester to review the results for each course. The measurements are reviewed at this meeting to determine if course changes or actions for remediation are needed. This meeting also serves the purpose of ensuring that previous action plans have been implemented and achieved based on the "status of previous action plan" from the previous year's Course Assessment form. The Director and Program Coordinator will hold a special meeting if proper adjustments have not been made to a course or assessment tool based on the instructor's self-assessment. Adjustments are made before the course is delivered again. To preemptively address this issue before the next WEAVE cycle, all courses related to Economic Analysis and Cost Estimates have been re-evaluated during a series of dedicated faculty meetings. The findings for the past three years indicated a need to reassess the course objectives, textbook, software, and instructional methods used for Estimating II. And the Estimating II course has been revised accordingly.

**Established in Cycle:** 2016-2017

**Implementation Status:** In-Progress

**Priority:** High

**Relationships (Measure | Outcome/Objective):**

**Measure:** Create an Estimate | **Outcome/Objective:** Economic Analysis and Cost Estimates

**Implementation Description:** This semester, a School of Construction + Design Tutoring Center has been implemented to assist with Estimating II assignments. In addition, we have a new faculty member for the pre-requisite course, Estimating 1, and the faculty for Estimating 2 works with the professor for Estimating 1 course to better prepare the AET students for Estimating 2.

**Projected Completion Date:** 12/2020

**Responsible Person/Group:** John Hannon (Course Instructor); Leffi Cewe-Malloy (Coordinator); Erich Connell (Director)

**Additional Resources Requested:** No needed resources are known at this time to remedy this issue; remediation is in effect this semester, fall 2020.

## Analysis Questions and Analysis Answers

### **What specifically did your assessments show regarding proven strengths or progress you made on outcomes/objectives?**

One of the AET Program's main strengths that has enabled us to better track outcomes is the faculty commitment to submitting the end-of-the-semester course assessment data. Those data enable assessment of all course outcomes and allows the Program Coordinator and Faculty to meet to discuss possible actions we may take collectively to improve. This has been the most critical component for improving our outcomes to meet accreditation and program objectives.

Recent efforts to improve the AET findings from previous cycles indicate positive momentum in the courses required for AET students (ACT 336, ACT363, ACT 364, ACT 400, ACT 401).

All students achieved a 70 or better in the capstone course, so the findings related to written communication and oral presentation skills are also encouraging. Enhancing written and oral communications skills is a priority of the University and the School of Construction and Design, and the AET students meet or exceed the School's standards. Another positive, notable finding is related to an increased design awareness in the architectural studios.

The AET program employs an educational model where knowledge is created by the transforming of experience, or experiential learning. This learning style is ideal for the studio environment because it nurtures exploration and critical thinking; inquiry and investigation are viewed as activities central to students' understanding.

The findings also indicate that employer satisfaction is high, which means our reputation is consistent and supported by upperclassmen AET students.

We have hired instructors that are architects, and that has improved the curriculum, and led to better prepared students after graduation.

### **What specifically did your assessments show regarding any outcomes/objectives that will require continued attention?**

Two-thirds of the courses required for Architectural Engineering Technology and Construction Engineering Technology programs are shared. This is an apt use of limited resources and further solidifies the ACT program's viability within the School.

Findings indicate that AET students do not perform as well in the shared courses (with the AEC prefix). A quantifiable reasoning for this issue is unknown at this time, but a contributing factor could be an increased class size for shared classes. To remedy this issue, all courses are being evaluated in both the ACT and BCT programs by the respective faculty. Further, the Estimating II courses, which tend to be the most problematic for AET students, has been evaluated by the faculty and revised by the course instructor.

## Annual Report Section Responses

### **Program Summary. Summarize highlights of the past year for this particular academic program. Provide context to an outside reviewer.**

The Architectural Engineering Technology program at Southern Miss is a four-year pre-professional program grounded in the study of architecture and design. The mission of ARCH@USM is to prepare students for successful



careers in the design and construction industry and to prepare students for advanced study in professional Master of Architecture programs. It is a face-to-face program as most Architecture programs are.

Our program provides graduates with an excellent platform for future graduate studies or a career in architecture and related fields. Alumni of our program typically track one of two paths upon graduation, directly to graduate school or employment in architecture or related industries.

The program continues to grow year by year, and this spring we had to teach 2 studios, as we have more students than can fit into one studio class.

Our Architecture program is unique as the students get a broader education compare to traditional programs eg. Sixty-six percent of the coursework is shared among the AET and CM programs with each requiring students to achieve 120 credit hours to graduate. The strategy for this arrangement of shared coursework is for the two disciplines (Architects and CMs) to work together in academics as they will during their work careers. The Department has a niche in this regard which aligns well with the modern concept of Integrated Design which is used extensively in the Design-Build project delivery method.

The AET had an accreditation visit by ABET in the October 2019, and we were accredited to September of 2022.

We have hired instructors that are architects, and that has improved the curriculum, and led to better prepared students after graduation. Our findings also indicate that employer satisfaction is high, which means our reputation is consistent and supported by upperclassmen AET students.

The Architectural (Engineering Technology) program is now a member of the Association of Collegiate Schools of Architecture - ACSA. And that continuous to show the growth and development our program.

**Continuous Improvement Initiatives. Any department-level or program-level action plans for improvement that are not necessarily tied to a specific student learning outcome or program objective should be described in this field.**

As part of our recruitment for new students, In the summer of 2020 we created a professional promotional video outlining the strengths of the AET program. The video included positive commentary from our on-campus students, online students, former students, IAC members, and our faculty and staff. We will continue to seek opportunities to leverage that good work and further promote the AET program, Department, School, and University.

Kimber Atwell the academic advisor has achieved continued success as Student Advancement Administrator and has attended multiple high school / community college recruiting events, including Pathways 2 Possibilities and Pathways 2 Construction, before the COVID pandemic. These events provided a variety of career pathway options for students to gain hands on experience in various vocational areas, such as, Architecture and Construction.

Craft of Construction and Design Day: Each year The School of Construction + Design host prospective high school and community college students on campus, but because the COVID pandemic we had to cancel the event.

Southern Miss Student Constructors Organization (SMSCO) Meetings - SMSCO is the most active organization in the School of Construction for both architectural and construction students. An average of 30 students attended the 7 meetings throughout the fall, and the beginning of the spring before the COVID pandemic. SMSCO Golf Tournament - SMSCO had to cancel the 24th Annual Golf Tournament.

Many of our other events such as student competition, field trips for the design studios that had been planned for the spring, also had to be cancelled.

**Closing the Loop. Summarize the results of previous action plan implementation. Provide evidence of improvement based on analysis of the results.**

The process of closing the loop for the ACT program was established by the Director, Dr. Erich Connell, and the former program Coordinator, Jessica Lee. Dr. Connell has been the Director of the School of Construction for 5 years, and Leffi Cewe-Malloy started as the architecture Program Coordinator beginning in fall 2019.

The Course Evaluation process requires courses to be evaluated at the end of each semester. The steps in the process of course evaluation and closing the loop are identified below: Courses are taught according to a cohort model; courses are only delivered during the fall or spring.

Evaluation of the ACT program occurs at the Industry Advisory Council meetings during the fall and spring semesters. All courses within ACT program will be reviewed on a three-year cycle, with no less than 4-courses reviewed at the end of each semester for quality improvement and assessment.

Estimating II; The Estimating II class remains a challenge for AET students, as reported in the previous findings. It was even lower than the previous cycle. Last cycle, a School of Construction + Design Tutoring Center was implemented to assist with Estimating II assignments. We have created a tutoring center where AET students can get help with this class.

In addition, we have a new faculty member for the pre-requisite course, Estimating 1, and the faculty for Estimating 2 works with the professor for Estimating 1 course to better prepare the AET students for Estimating 2.