AUGUST 31, 2022

Submitted in Support of: Auburn University System Engineering Technology (SET) Program Development and Application (CS-20-1601)

REPORT ON COHORT 1 AND COHORT 2 REGISTRATION
SYSTEMS ENGINEERING TECHNOLOGY PROGRAM

AUBURN UNIVERSITY
INSTITUTE FOR DIGITAL ENTERPRISE ADVANCEMENT (IDEA)
VICTORY SOLUTIONS
CALHOUN COMMUNITY COLLEGE

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1   SET Objective

The overall objective of this effort is to advance training in digital engineering and manufacturing methods and processes through the creation of a 2-year degree in Systems Engineering Technology (SET). SET is a curriculum specifically created for the community college student. We have chosen to develop SET as a concentration in the existing Computer Information Systems (CIS) degree program. The ideal SET student has computer skills, an interest in how things work, and a desire to pursue a career in an engineering field.

SET will enable and accelerate the incorporation of Digital Engineering and Manufacturing into the workplace through education and partnership. It is our vision to provide a National collaborative center for identifying, sharing, and recommending best practices and solutions in Digital Engineering and Manufacturing. We initially implement SET through a community college or 2-year curriculum vehicle which should appeal to incoming freshmen and career transitioning professionals including returning veterans.

The SET program has been structured as a concentration under the umbrella of the existing CIS Associate in Applied Science (AAS) degree program. This strategy provided a time and cost advantage over creating an entirely new AAS degree and minimizes procedural risks. The program will require 64 semester credit hours to complete and can be completed by a full-time student in two years. Currently, many CIS majors attend part-time, with the median time to completion for recent graduates being three years. We anticipate SET students will behave similarly.

2   Phase 2, Program Year 2 Metrics for Success

Metrics for successful prototype completion were specified in the Cornerstone OTA agreement and shown below in Figure 1. As discussed in the SET Program Year 2 Annual Report, the metric for 2.1 was met. As for metric 2.2, the cohort 2 enrollment is presently 23 students. The total SET enrollment and Cohort 2 enrollment will be discussed further in sections 4 and 5 of this report. Metric 2.7 is intended to be a two-year goal of 20 intern students. The first summer intern session saw 8 students employed with at least 3 continuing as part-time interns beyond the summer session.

SOW Element	Goal	Notes	Results
2.1 1st Cohort Class	10	Seeking at least 10 students for SYS 101	August 21 class had 35 registrants with 20+ completing SYS101
2.2 2nd Cohort Class	25	Seeking at least 25 students for SYS 101, 2nd Cohort. May introduce 1 additional school	2nd Cohort planned for Aug 22, but SYS 101 attracted 8 additional students in Spring and Summer 22 courses. Wallace State has delayed SET start until Fall 2023.
2.7 Internships	20	Seek to place at least 20 students	8 interns placed Summer 2022. This 2-year metric is on pace.

Figure 1. Program Year 2 Metrics

3   SET Cohort 1 Summary

The first cohort for the SET program has exceeded all expectations of our team. The initial enrollment was 35 students. Attrition during drop/add reduced the class size to 30, including 7 high school students in dual enrollment. With the interest in SET, Calhoun decided to offer the entry level course, SYS 101, in both the spring 2022 and summer 2022 semesters. 13 new students were added. However, this out-of-sequence start has required extra instructors to ensure proper matriculation of the newer students.

23 students from Fall 2021 were eligible (enrolled at Calhoun) to continue in the SET curriculum. 19 continued in SYS 231, the first MBSE modeling class with 14 enrolled in Fall 2022. Figure 2 below shows the continued enrollment numbers for the first cohort.
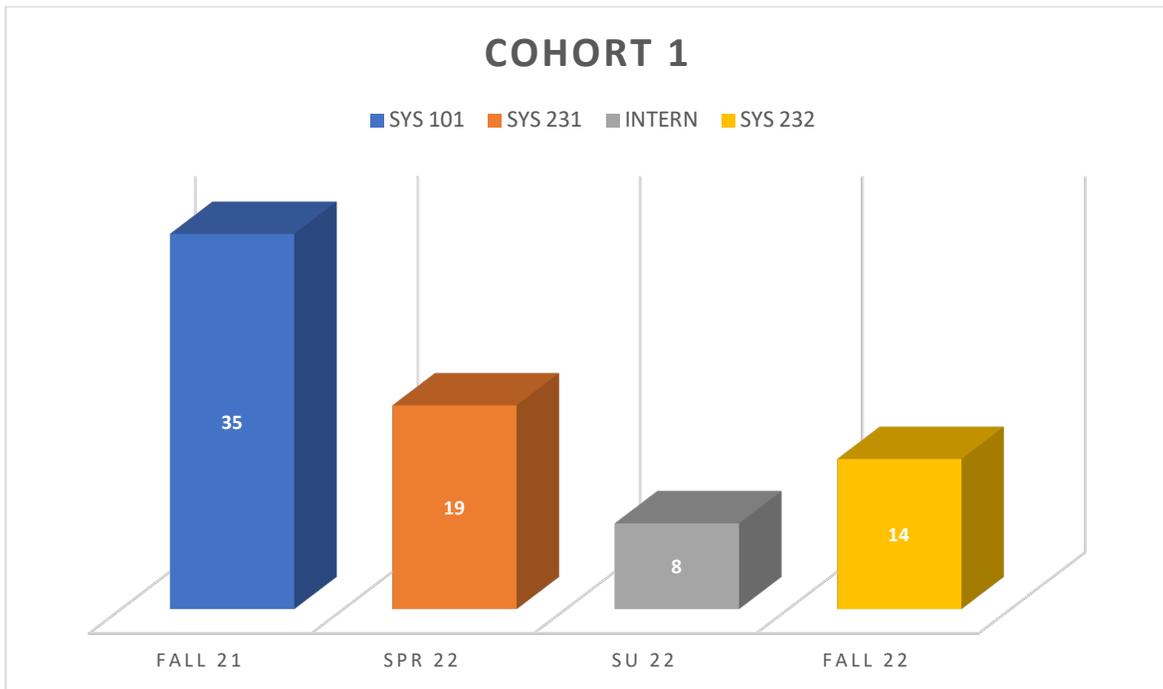

Figure 2. Cohort 1 Matriculation Numbers

4   Overall SET Enrollment

The enrollment numbers for SET enrollment have remained high considering the impact of the pandemic. The interest in SET is best gauged by the number of students enrolled in SYS 101. Since its inception only 12 short months ago, Calhoun has enrolled 71 students in SYS 101! Our entire team is confident that we have created a course of study that resonates with students seeking a STEM career. It is our fervent hope that employers agree. Industry interest in our interns and subsequent feedback indicates that they do agree. Figure 3 below shows total enrollment in all courses.
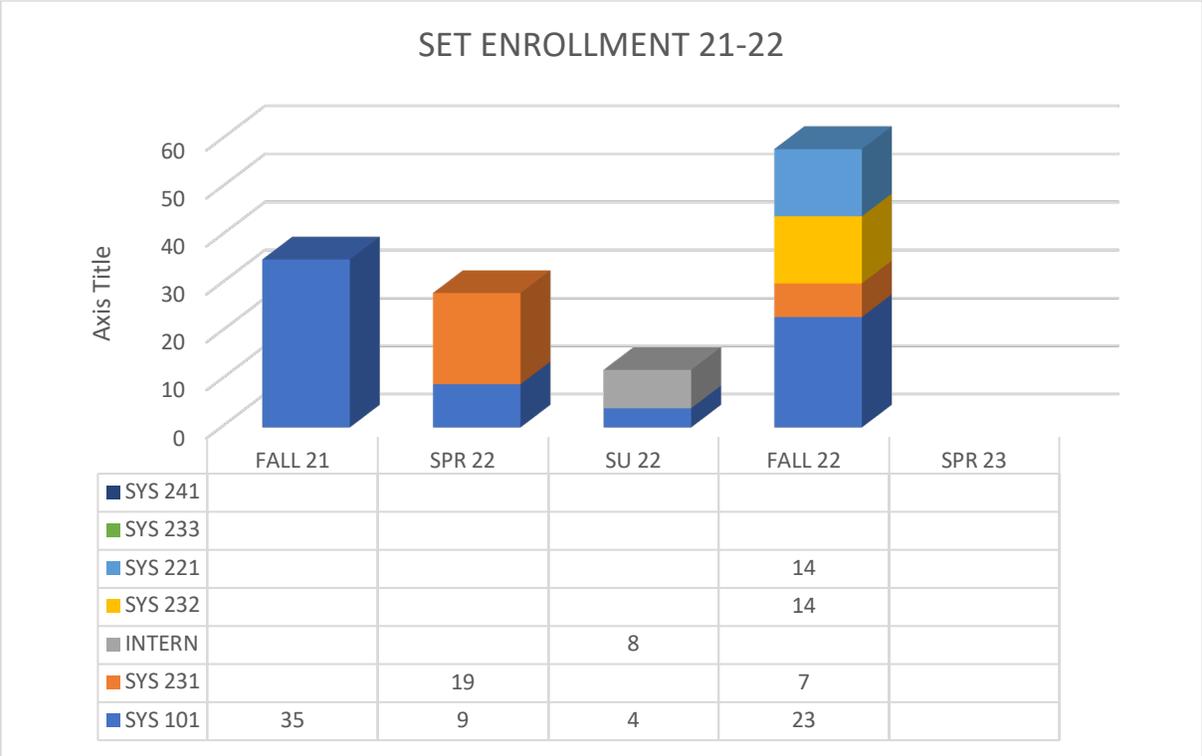
SET ENROLLMENT 21-22

	FALL 21	SPR 22	SU 22	FALL 22	SPR 23
■ SYS 241					
■ SYS 233					
■ SYS 221				14	
■ SYS 232				14	
▨ INTERN			8		
■ SYS 231		19		7	
■ SYS 101	35	9	4	23	

Figure 3. Overall SET Enrollment

This chart illustrates the continued interest in the SET course of study. However, reviewing the data behind the chart tells an even more compelling story. Figure 4 shows 58 students enrolled in SET courses for Fall 2022! Some of these may have been in other courses of study at Calhoun but almost 60 students are now headed to careers in digital engineering because of this program. Again, reviewing the data from

Figure 4 below, the reader can see that 71 students have entered the SET program over the 4 semesters that SYS 101 has been offered. The interest is apparent.

	SYS 101	SYS 231	INTERN	SYS 232	SYS 221	SYS 233	SYS 241	
FALL 21	35							35
SPR 22	9	19						28
SU 22	4		8					12
FALL 22	23	7		14	14			58
SPR 23								0
	71	26	8	14	14	0	0	

Figure 4. Total SET Enrollment since Fall 2021

5   SET Cohort 2 Enrollment

The enrollment numbers for Cohort 2, not including the "out-of-sequence" students is 23 students. We discovered a communication gap from those of us administering the program to the recruitment and advisor teams at Calhoun. The early enrollment numbers were lagging our expectations. The Calhoun President, Dr. Jimmy Hodges, hosted a meeting with key executives across the campus and invited IDEA to present the SET concept and courses of study. Each department applied extra focus to understanding and marketing SET. Social media marketing proved to be a key component of outreach to this new cohort and yielded 23 students.

If the students from Spring and Summer 2022 are considered part of Cohort 2 then metric 2.2 has been exceeded without adding another school. These 36 students comprise the second wave of students training in digital engineering techniques. Calhoun has realized the strain that out of sequence starts places on instructors to ensure proper matriculation and have chosen to offer SYS 101 in the Fall semester only. We think that is a wise move and will help foster the launch of SET+, our apprenticeship program that will enforce a cohesive cohort of students to work and learn together as full-time employees of local companies. This program is in development and is targeted for a Fall 2023 launch at Calhoun.

6   SET Internships

Initial SET intern program is a success!

Key to Phase 2 SET goals is creation of apprenticeship and internship opportunities for SET students. Through existing work experience and ongoing discussions with potential employers like US Army CCDC, NASA and Boeing, we believe there is a significant demand for both this early support/familiarization as well as enhanced preparation for further employment post-graduation. Figure 5 shows the companies and number of interns employed this summer. Average salary was $21 per hour.

Victory Solutions (Boeing Subcontract)	3 Interns
Strata-G Solutions	2 Interns
Trideum	1 Intern
Intrepid	2 Interns

Figure 5. SET Intern Positions

7   Summary

Initial SET program is a success! (so far)

With 71 students enrolled over the past 12 months in our introductory systems engineering course, SYS 101, we are exceeding our expectations. While student enrollment is an excellent indicator of success the proof of industry need will be graduate employment. SET will need to transition from an education "push" to an industry "pull" to be successful. Those of us who conceived the SET concept came from industry and government and have a reasonable sense of the need. June 2023 will be the true bellwether as we see if our first graduates are hired and embraced as part of the systems engineering ecosystem. Our mission is to accelerate the adoption of digital engineering and digital manufacturing in the workplace and develop the workforce to do so. SET is only part of that mission, but a crucial part. Onward we go in support of the National Imperative for Industrial Skills.