Oregon TECH

2016-17 Program Assessment Report

Systems Engineering and Technical Management Dual Major

Mission, Objectives & Learning Outcomes

Oregon Tech Mission
Oregon Institute of Technology, an Oregon public university, offers innovative and rigorous applied degree programs in the areas of engineering, engineering technologies, health technologies, management, and the arts and sciences. To foster student and graduate success, the university provides an intimate, hands-on learning environment, focusing on application of theory to practice. Oregon Tech offers statewide educational opportunities for the emerging needs of Oregonians and provides information and technical expertise to state, national and international constituents.

Core Theme 1: Applied Degree Programs
Oregon Tech offers innovative and rigorous applied degree programs. The teaching and learning model at Oregon Tech prepares students to apply the knowledge gained in the classroom to the workplace.

Core Theme 2: Student and Graduate Success
Oregon Tech fosters student and graduate success by providing an intimate, hands-on learning environment, which focuses on application of theory to practice. The teaching and support services facilitate students' personal and academic development.

Core Theme 3: Statewide Educational Opportunities
Oregon Tech offers statewide educational opportunities for the emerging needs of Oregon's citizens. To accomplish this, Oregon Tech provides innovative and rigorous applied degree programs to students across the state of Oregon, including high-school programs, online degree programs, and partnership agreements with community colleges and universities.

Core Theme 4: Public Service
Oregon Tech will share information and technical expertise to state, national, and international constituents.

Program Alignment to Oregon Tech Mission and Core Themes
The Systems Engineering and Technical Management Dual Major program aligns with Oregon Tech's Mission and Core Themes in the following ways:

- Labs and Projects focus on application of tools and methods learned in the course. Capstone (final) projects require real-world application of course learning
- Student analyze well known and relevant industry problems
- Labs and Projects utilize state-of-the-art software used in industry

- Program is delivered via online format and available to students across the State of Oregon
- Student projects have helped local non-profits and federal agencies

Program Mission

The mission of the Dual Major in Systems Engineering and Technical Management is to equip graduates with the knowledge and skills to address complex multidisciplinary problems involving the design, modeling, analysis, and management of technological systems that employ a combination of devices, software, hardware, firmware, materials, and humans for such diverse purposes as communications, energy engineering, health care, transportation or manufacturing. The dual major curriculum provides engineering students with design viewpoints and methodologies that emphasize system integration, and with subject matter and tools for modeling and analysis especially appropriate for large complex systems including system theory, simulation, computational data analysis and statistics, and engineering management.

Program Educational Objectives

- PEO1: Graduates of the program will excel as professionals in the various fields of engineering.
- PEO2: Graduates of the program will demonstrate an ability to apply systems thinking and systems engineering methods to the solution of complex problems involving one or more engineering disciplines.
- PEO3: Graduates of the program will demonstrate an ability to manage technical projects in multidisciplinary teams, and will excel in problem solving, and elective communication.

Program Faculty Review

Program Student Learning Outcomes and Objectives were reviewed by program faculty during Fall Convocation Program Assessment Meeting.

Nothing to report.

Showcase Learning Opportunities

Students in the DMSEM program are encouraged to submit papers for publication and attend conferences. The SMSEM program also prepares students for INCOSE certification.

Program History & Vision

Program History

The DMSEM program began Fall 2014, with three (3) courses: SEM421, SEM422, and SEM425. These three (3) core courses are currently offered online using learning tools/methods.

Meeting with Advisory Board

Program faculty held a meeting with their Advisory Board during the academic year.

Advisory Board Review

The Advisory Board reviewed the Program Mission and Objectives during the academic year.

Program Enrollment

The Systems Engineering & Technical Management DM program is relatively new, starting in Fall 2014. A five-year trend is considered no applicable.

Attachment 1_Enrollment_5_Year_History_by_Major

Program Graduates

2015-2016 saw the first graduates from the DSEM program. Three (3) students graduated from the program. Since the program is relatively new, trends are difficult to comment on. Feedback from graduates has been positive. Professors have received direct feedback regarding the applicability of course learning to student's jobs.

Attachment 2_Graduates_10_Year_History_by_Major

Employment Rates and Salaries

Attached survey does not include graduates from the DMSEM program.

Attachment 3_Grad_Data_First_Destination_3_Year_History_by_Major

Pass Rates on Board and Licensure Exam

N/A

Results of Board or Licensure Exam

N/A

Other Program Assessment Data

N/A

Desired Data

N/A

Closing the Loop

Describe any actions taken and re-assessment done during this academic year in response to assessment findings from prior academic years.

N/A

Changes Implemented

N/A

Assessment Findings

N/A

Program Student Learning Outcomes Assessment Cycle

PROGRAM STUDENT LEARNING OUTCOMES 3-Year Cycle Vascular Technology B.S.	2016-17	2017-18	2018-19
OIT-DMSE 2016-17.a An ability to apply knowledge of mathematics, science, and engineering;			
OIT-DMSE 2016-17.b An ability to design and conduct experiments, as well as to analyze and interpret data;			
OIT-DMSE 2016-17.c An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability;			
OIT-DMSE 2016-17.d An ability to function on multi-disciplinary teams;			
OIT-DMSE 2016-17.e An ability to identify, formulate, and solve engineering problems;			
OIT-DMSE 2016-17.f An understanding of professional and ethical responsibility;			
OIT-DMSE 2016-17.g An ability to communicate effectively;			
OIT-DMSE 2016-17.h The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context;			
OIT-DMSE 2016-17.i An ability to engage in independent learning and recognize the need for continual professional development;			
OIT-DMSE 2016-17.j A knowledge of contemporary issues; and			
OIT-DMSE 2016-17.k An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.			
OIT-DMSE 2016-17.1 An ability to apply systems engineering methods to practical problems involving one or more engineering disciplines.	SEM 421 Student Exit Survey		
OIT-DMSE 2016-17.2 Knowledge and understanding of project management techniques and frameworks.	SEM 422 Student Exit Survey		

Assessment Map & Measure

F – Foundation – introduction of the learning outcome, typically at the lower-division level,
P – Practicing – reinforcement and elaboration of the learning outcome, or
C – Capstone – demonstration of the learning outcome at the target level for the degree

For each outcome, programs should identify at least 2 direct measures (student work that provides evidence of their knowledge and skills), and 1 indirect measure (student self-assessment of their knowledge and skills) for each outcome.

For every program, data from the Student Exit Survey will be an indirect measure at the capstone level.

OIT-DMSE 2016-17.1 An ability to apply systems engineering methods to practical problems involving one or more engineering disciplines.	
Course/Event	SEM 421
Legend	C – Capstone
Assessment Measure	Direct – Project (individual)
Criterion	90% of students can effectively apply Systems Engineering methods to practical problems (as assessed by course project)
Course/Event	Student Exit Survey
Legend	C – Capstone
Assessment Measure	Indirect – Student Exit Survey
Criterion	90% of students claim proficiency (3 or higher)

OIT-DMSE 2016-17.2 Knowledge and understanding of project management techniques and frameworks.	
Course/Event	SEM 422
Legend	C – Capstone
Assessment Measure	Direct – Assignment
Criterion	90% of students can effectively apply project management methods and tools (as assessed by course assignments)
Attachment 4_Homework_7_Project_Schedule__Economic_Decisions_PartA_B	
Course/Event	Student Exit Survey
Legend	C – Capstone
Assessment Measure	Indirect – Student Exit Survey
Criterion	90% of students claim proficiency (3 or higher)

Analysis of Results

OIT-DMSE 2016-17.1 An ability to apply systems engineering methods to practical problems involving one or more engineering disciplines.	
Criterion	Met
Summary	100% of students met the outcome. See attached.
Improvement Narrative	N?A
Attachment 5_2016_2017_DMSE__2	

OIT-DMSE 2016-17.2 Knowledge and understanding of project management techniques and frameworks.	
Criterion	Met
Summary	100%of students met the outcome. See attached.
Improvement Narrative	N/A
Attachment 6_2016_2017_DMSE__2.2	

References

Program Assessment Coordinator: James Eastham, Assistant Professor, Electrical Engineering and Renewable Energy

Office of Academic Excellence

Oregon TECH

Majors History, Fall 4th Week
November 30, 2016

The following data represents majors declared by student as of Fall 4th week. Students with multiple/dual majors have been reported
under each major in which they enrolled; therefore the student headcount will be duplicated. A small number of students that declared
a third major have now been included in this report. Data reported is combined for all levels and all locations.
Some programs may have had name changes such as CLS and have been reported as they were (historically).

Description	Fall 2012	Fall 2013	Fall 2014	Fall 2015	Fall 2016	5 Year Difference	5 Year % Change
ABA Course Series	0	0	3	0	0	0	-
Accounting Certificate	0	0	0	0	1	1	-
Allied Health	0	0	0	0	3	3	-
Allied Health Management	11	5	3	2	1	-10	-90.9%
Applied Behavior Analysis	0	0	0	10	17	17	-
Applied Mathematics	41	38	47	42	33	-8	-19.5%
Applied Psychology	146	149	122	96	110	-36	-24.7%
Automat, Robot, & Cntrl Engr	0	0	0	0	1	1	-
Biology	15	8	1	1	0	-15	-100.0%
Biology-Health Sciences	136	150	150	138	151	15	11.0%
Civil Engineering	127	121	110	120	118	-9	-7.1%
Clinical Lab Science-Earlyadm	6	10	35	22	0	-6	-100.0%
Clinical Laboratory Science	62	85	94	95	2	-60	-96.8%
Communication Studies	55	42	39	47	40	-15	-27.3%
Computer Engineering Tech	82	82	81	86	63	-19	-23.2%
Dental Hygiene	226	240	211	221	202	-24	-10.6%
Diagnostic Medical Sonography	86	104	95	102	112	26	30.2%
Dispute Resolution Certificate	1	1	2	4	2	1	100.0%
Echocardiography	121	119	123	122	128	7	5.8%
Electrical Engineering	76	120	146	164	197	121	159.2%
Electronics Engineering Tech	67	58	51	37	32	-35	-52.2%
Embedded Systems Eng Tech	24	25	32	35	57	33	137.5%
Emergency Medical Services Mgt	0	0	17	20	34	34	-
EMT - Paramedic	29	30	29	28	28	-1	-3.4%
Environmental Sciences	49	49	51	48	42	-7	-14.3%
General Studies	495	736	632	1,031	1,414	919	185.7%
Geomatics	1	0	0	0	0	-1	-100.0%
Geomatics-option in GIS	13	14	10	10	7	-6	-46.2%
Geomatics-option in Surveying	49	39	26	31	30	-19	-38.8%
Health Care Mgmt-Admin Mgmt	0	10	14	19	18	18	-
Health Care Mgmt-Clinical Mgmt	0	4	10	11	25	25	-
Health Care Mgmt-Rad Science	0	3	6	12	12	12	-
Health Informatics	0	0	0	20	38	38	-
Health Sciences	1	1	0	1	2	1	100.0%
Information Technology	0	0	0	56	114	114	-
IT Accounting Option	8	4	2	1	1	-7	-87.5%
IT Applications Dev Opt	91	75	71	48	20	-71	-78.0%
IT Bus/Systems Analysis Opt	58	59	69	51	28	-30	-51.7%
IT Health Informatics Opt	54	68	59	32	17	-37	-68.5%
Magnetic Resonance Imagng Spec	0	0	0	0	4	4	-
Manufacturing Engineering Tech	129	99	109	107	101	-28	-21.7%
Marriage and Family Therapy	0	0	0	0	10	10	-
Mechanical Engineering	208	303	331	323	354	146	70.2%
Mechanical Engineering Tech	145	112	121	121	104	-41	-28.3%
Medical Lab Science-Earlyadm	0	0	0	0	17	17	-
Medical Laboratory Science	0	0	0	0	86	86	-
Mgmt Info Sys/Mgmt Acc Option	1	0	0	0	0	-1	-100.0%
Mgmt/Accounting Option	32	38	35	32	19	-13	-40.6%
Mgmt/Marketing Option	34	34	36	34	37	3	8.8%
Mgmt/Small Bus Mgmt Option	54	43	38	37	33	-21	-38.9%
MIT Applicant	0	0	1	2	0	0	-
Nuclear Medicine Technology	47	51	48	48	49	2	4.3%
Nursing	50	49	52	61	69	19	38.0%
Operations Management	61	66	65	69	70	9	14.8%
Optical Engineering	0	0	3	3	3	3	-
Picture Archive/Comm Sys Spec	0	0	1	2	3	3	-
Polysomnographic Technology	19	13	6	12	5	-14	-73.7%
Population Health Management	0	0	3	24	31	31	-
Pre-Clinical Lab Science	0	8	1	20	2	2	-
Pre-Dental Hygiene	62	65	35	37	48	-14	-22.6%
Pre-Medical Imaging Tech	273	287	253	237	226	-47	-17.2%
Pre-Medical Lab Science	0	0	0	0	27	27	-
Pre-Nursing	56	60	53	69	78	22	39.3%
Pre-Paramedic Education	0	3	3	7	0	0	-
Pre-Renewable Energy Eng	111	0	0	0	0	-111	-100.0%
Pre-Respiratory Care	11	12	8	11	9	-2	-18.2%
Radiologic Science	164	163	154	160	152	-12	-7.3%
Renewable Energy Engineering	110	206	203	180	166	56	50.9%
Respiratory Care	85	84	88	103	117	32	37.6%
Sleep Health-Polysom Tech Opt	0	0	4	6	17	17	-
Software Engineering Tech	260	268	289	309	285	25	9.6%
Spec in Entrepreneur/Small Bus	0	0	0	1	2	2	-
Specialization in Accounting	0	0	0	2	2	2	-
Specialization in Marketing	0	0	1	1	1	1	-
Specialization Travel/Tourism	0	1	0	0	0	0	-
System Engr & Technical Mgmt	0	0	2	3	0	0	-
Technology and Management	16	30	43	46	46	30	187.5%
Vascular Technology	88	95	80	93	98	10	11.4%
Total (Duplicated)	**4,146**	**4,539**	**4,407**	**4,923**	**5,371**	**1,225**	**29.5%**
Total (Unduplicated)	**4,001**	**4,414**	**4,273**	**4,786**	**5,232**	**1,231**	**30.8%**

Attachment 2_Graduates_10_Year_History_by_Major

Oregon TECH

10 Year History By Major and Degree Type
As of September 5, 2016

Specializations

	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Picture Archive/Comm Sys Spec	-	-	-	-	-	-	4	4	3	-
Specialization in Accounting	-	-	-	-	-	-	-	1	-	-
Specialization in Marketing	-	-	-	-	-	-	-	2	-	-
Total	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**7**	**3**	**0**

Certificates

	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Accounting Certificate	-	-	-	-	-	-	-	-	-	-
Dispute Resolution Certificate	1	2	1	2	4	1	6	11	1	2
Marketing Certificate	-	-	-	-	-	-	-	-	-	-
Polysomnographic Technology	-	-	4	14	13	11	8	6	3	9
Total	**1**	**2**	**5**	**16**	**17**	**12**	**14**	**17**	**4**	**11**

Associates

	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Associate of Arts	13	8	2	5	-	1	-	-	1	1
Computer Engineering Tech	7	5	3	2	3	-	5	7	6	6
Dental Hygiene	25	26	22	25	18	27	18	23	21	9
Electronics Engineering Tech	3	1	2	1	-	-	-	-	-	-
EMT - Paramedic	19	21	22	25	27	17	28	26	26	29
Office Systems Technology	-	2	2	-	-	-	-	-	-	-
Polysomnographic Technology	-	-	1	2	3	5	6	2	4	-
Respiratory Care	23	16	15	17	-	-	-	-	-	-
Sleep Health-Polysom Tech Opt	-	-	-	-	-	-	-	-	-	3
Software Engineering Tech	7	2	3	2	2	-	-	2	9	2
Total	**97**	**81**	**72**	**79**	**53**	**50**	**57**	**60**	**67**	**50**

Bachelors

	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Allied Health Management	-	-	-	1	2	4	3	2	1	-
Applied Environmental Science	1	-	-	-	-	-	-	-	-	-
Applied Mathematics	-	-	7	1	5	4	7	4	4	5
Applied Psychology	46	42	37	30	36	38	30	40	37	31
Biology	10	6	16	14	11	11	3	4	1	2
Biology-Health Sciences	-	-	-	-	-	-	10	14	20	18
Civil Engineering	23	23	29	28	20	14	23	17	15	25
Clinical Laboratory Science	23	24	24	22	22	35	27	34	49	46
Communication Studies	13	13	9	10	13	8	19	13	4	8
Computer Engineering Tech	15	7	14	8	13	3	4	3	3	3
Dental Hygiene	35	38	45	55	49	54	51	76	62	65
Diagnostic Medical Sonography	21	24	21	27	29	24	19	31	25	24
Echocardiography	6	4	16	9	21	32	31	32	29	35
Electrical Engineering	-	-	-	6	11	9	11	17	17	26
Electronics Engineering Tech	18	17	13	10	18	16	11	10	10	13

Bachelors

	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Embedded Systems Eng Tech	-	-	-	1	2	2	4	1	5	3
Emergency Medical Services Mgt	-	-	-	-	-	-	-	-	-	1
Environmental Sciences	1	1	3	1	5	5	4	5	11	14
Geomatics	10	8	5	5	1	-	-	-	-	-
Geomatics-option in GIS	-	-	2	1	1	3	3	5	1	2
Geomatics-option in Surveying	-	-	1	11	13	14	10	13	1	12
Health Care Mgmt-Admin Mgmt	-	-	-	-	-	-	-	-	1	2
Health Care Mgmt-Clinical Mgmt	-	-	-	-	-	-	-	-	1	-
Health Sciences	1	3	2	2	2	6	1	1	-	-
Industrial Management	-	-	-	1	-	-	-	-	-	-
Information Technology	4	4	1	2	-	1	-	-	-	-
IT Accounting Option	-	1	2	1	1	2	1	2	-	-
IT Applications Dev Opt	8	5	13	5	6	8	21	12	8	11
IT Bus/Systems Analysis Opt	1	1	4	10	12	6	12	14	13	8
IT Health Informatics Opt	-	-	-	-	2	4	9	6	14	7
Management Information System	12	2	8	3	-	2	-	-	-	-
Manufacturing Engineering Tech	30	15	16	18	18	9	13	5	11	12
Mechanical Engineering	3	3	17	12	11	19	14	27	23	45
Mechanical Engineering Tech	31	19	31	23	24	19	24	18	17	21
Mgmt Info Sys/Mgmt Acc Option	-	3	-	-	-	-	-	-	-	-
Mgmt/Accounting Option	8	4	3	8	4	9	9	12	5	8
Mgmt/Marketing Option	9	7	5	5	7	8	7	4	7	7
Mgmt/Small Bus Mgmt Option	9	11	11	18	8	6	8	12	4	7
Nuclear Medicine Technology	18	18	16	15	16	16	15	14	14	15
Operations Management	8	6	3	15	7	14	16	13	19	18
Optical Engineering	-	-	-	-	-	-	-	-	1	1
Population Health Management	-	-	-	-	-	-	-	-	-	5
Radiologic Science	47	51	50	53	51	50	48	55	45	56
Renewable Energy Engineering	-	-	6	9	29	35	60	35	29	29
Renewable Energy Systems	-	-	1	-	-	-	-	-	-	-
Respiratory Care	5	8	6	7	10	21	21	21	27	22
Software Engineering Tech	44	36	27	27	31	29	41	31	35	47
System Engr & Technical Mgmt	-	-	-	-	-	-	-	-	-	3
Technology and Management	-	-	-	-	-	-	1	1	11	8
Ultrasound/Diag Med Sono Opt	1	-	-	-	-	-	-	-	-	-
Ultrasound/Vascular Option	1	-	-	-	-	-	-	-	-	-
Vascular Technology	30	30	26	23	23	25	21	28	19	24
Total	**492**	**434**	**490**	**497**	**534**	**565**	**612**	**632**	**599**	**689**

Masters

	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Civil Engineering	-	-	-	-	-	-	-	-	2	6
Manufacturing Engineering Tech	3	4	7	2	6	8	12	4	8	9
Renewable Energy Engineering	-	-	-	-	-	-	-	1	11	9
Total	**3**	**4**	**7**	**2**	**6**	**8**	**12**	**5**	**21**	**24**

Grand Total

	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Grand Total	**593**	**521**	**574**	**594**	**610**	**635**	**699**	**721**	**694**	**774**

Oregon Tech Graduate Outcome Data

a=2013/2014/2015 combined	% Employed		% Continuing Ed		% Looking for Work		% Not Looking		Success Rate		Median Salary	
b=2014/2015/2016 combined	a	b	a	b	a	b	a	b	a	b	a	b
% among those reporting outcomes	83.3	**87.6**	6.1	**6.7**	9.4	**4.9**	1.2	**0.8**	90.6	**95.1**	$ 54,000	**$ 56,000**
Biology-Health Sciences	36	38	60	62	4	0	0	0	96	100	$ 20,750	$ 33,000
Civil Engineering	83	92	11	8	6	0	0	0	94	100	$ 50,000	$ 51,540
Communication Studies	60	67	13	11	27	22	0	0	73	78	$ 27,000	$ 28,500
Computer Engineering Technology	89	93	0	0	0	0	11	7	100	100	$ 63,000	$ 64,000
Dental Hygiene	86	96	4	1	9	2	1	1	91	98	$ 53,000	$ 57,500
Diagnostic Medical Sonography	97	98	3	2	0	0	0	0	100	100	$ 60,000	$ 60,868
Echocardiography	95	93	0	3	5	3	0	0	95	97	$ 60,500	$ 64,000
Electrical Engineering	87	83	0	10	13	7	0	0	87	93	$ 60,000	$ 60,000
Electronics Engineering Technology	73	82	7	5	20	14	0	0	80	86	$ 54,250	$ 66,750
Embedded Systems Engineering Tech	80	83	0	17	20	0	0	0	80	100	$ 58,250	$ 60,000
EMT/Paramedic	100	100	0	0	0	0	0	0	100	100	$ 48,000	$ 52,000
Environmental Sciences	67	76	11	18	22	6	0	0	78	94	$ 39,800	$ 40,000
Geomatics: GIS	100	100	0	0	0	0	0	0	100	100	$ 42,000	$ 42,000
Geomatics: Surveying	69	64	0	9	31	27	0	0	69	77	$ 40,500	$ 43,000
Health Care Management	75	80	25	20	0	0	0	0	100	100	$ 52,000	na
Health Informatics	75	79	10	11	15	11	0	0	85	89	$ 53,000	$ 52,000
Information Technology	84	88	0	2	16	10	0	0	84	90	$ 55,000	$ 55,000
Management: Accounting	78	83	6	6	17	11	0	0	83	89	$ 32,000	$ 32,250
Management: SmBus/Entrepreneursh	77	87	15	13	8	0	0	0	92	100	$ 33,000	$ 40,900
Management: Marketing	82	93	0	0	18	7	0	0	82	93	$ 39,250	$ 48,500
Manufacturing Engineering Technolo	77	85	5	4	13	11	0	0	87	89	$ 62,500	$ 60,000
Mathematics, Applied	60	71	20	29	0	0	20	0	100	100	na	na
Mechanical Engineering	71	82	12	9	10	5	7	4	90	95	$ 60,000	$ 60,000
Mechanical Engineering Technology	86	100	7	0	7	0	0	0	93	100	$ 60,000	$ 62,500
Medical Laboratory Science	100	100	0	0	0	0	0	0	100	100	$ 53,750	$ 55,000
Nuclear Medicine Technology	87	86	0	3	13	11	0	0	87	89	$ 57,000	$ 57,846
Nursing												
Operations Management	83	83	11	14	6	3	0	0	94	97	$ 63,000	$ 63,000
Polysomnographic Technology	83	100	0	0	17	0	0	0	83	100	$ 50,000	$ 40,500
Population Health Management	na	75	na	25	na	0	na	0	na	100	na	$ 42,000
Psychology, Applied	54	66	24	26	15	5	6	3	85	95	$ 30,000	$ 30,000
Radiologic Science	92	97	1	0	6	3	1	1	94	97	$ 47,000	$ 50,000
Renewable Energy Engineering	76	83	6	8	18	9	0	0	82	91	$ 57,000	$ 56,500
Respiratory Care	97	98	0	0	3	2	0	0	97	98	$ 56,000	$ 56,000
Software Engineering Technology	93	91	0	0	3	7	3	3	97	93	$ 62,250	$ 66,750
Technology and Management	100	88	0	0	0	12	0	0	100	88	na	na
Vascular Technology	92	91	0	0	8	9	0	0	92	91	$ 64,602	$ 62,000

Additional Notes:

Numbers may not add to 100 due to rounding

na=not reported, or not available due to small sample size

METHODOLOGY

Sample Frame 2016: 781 degrees awarded per FAST

Survey Response Rate: 49% Total Knowledge Rate 2016: 75%

Sources: Data collected from a variety of sources. Below, for 2016, in chronological order:

    Grad Fair paper survey

    Faculty senior exit survey

    Career Services survey

    Career Services followup with non-respondents

    Faculty information from their contact with students

    LinkedIn Profiles

Salaries of $2,500 and below and $250,000 and above were deleted.

Students with dual majors are included under each major

Known Outcomes 2016: 587

Known Outcomes 2013/2014/2015 combined N=1008

Known Outcomes 2014/2015/2016 combined N=1244

Advanced Systems Engineering: Homework #7

1) Shed/Out-building Construction Project: Suppose you are constructing a small storage shed on your property. The activities are shown below with the estimated duration (in days).

Activity	Duration (in days)
A Foundation Preparation	7
B Door frame construction & positioning	2
C Install exterior drainage around site	15
D Install electric & service drop	8
E Erect walls	10
F Sheetrock ceiling	2
G Roofing	5
H Door installation	3
I Window installation	5
J Hang gutters and downspouts	2
K Run electrical lines inside walls	1
L Install electric outlets	1
M Install lighting	1
N Finish work (paint inside & out)	3
O Install sheeting for small storage attic	2

   a) *Which activities cannot be started until other activities have been completed (**precedence relations**)?*
   b) *Show the network diagram*
   c) *Show the critical path analysis (with completed network diagram)*

2) Using MS-Project create a project schedule for this project (gantt chart)
3) Using Visio create a work breakdown structure (WBS)
4) Assign resources to each task given the following input and create resource charts:
   a. Task A: J&J Concrete
   b. Tasks B, E, G: Nick Unger & Co.
   c. Tasks C: Johnson Drainage
   d. Tasks D, K, L, M: Bright Lighting, Inc.
   e. Tasks F, H, I, J: AAA General Construction
   f. Tasks N: You the student
   g. Tasks O: You the student
5) The estimated cost for this project is $3,745. Currently, you are storing your extra items in the Evergreen Storage facility. This storage unit costs $200/month, which includes electric. You estimate electric for this project to be $23/month. Additionally, Evergreen has notified you that monthly rent will increase by $100 after your current lease is expired in 5 months (means: starting month 6 rent will go up).
   a. What is the break-even month for this project?
   b. In month 6 what is the IRR of this project?
   c. In what month is the IRR > 1.10% (saving account interest)

d. Imagine you are planning on selling your home after 18 months and this project will not add any value to your home. Part d1) Do you undertake the project anyway and why? Part d2) Would it be better to invest the money in a 3 year CD at 1.30%?

6) The following table shows estimated **baseline** costs for the project. Update your project with these estimated costs.

	Baseline Costs
A Foundation Preparation	170
B Door frame construction & positioning	195
C Install exterior drainage around site	275
D Install electric & service drop	180
E Erect walls	640
F Sheetrock ceiling	580
G Roofing	250
H Door installation	125
I Window installation	160
J Hang gutters and downspouts	120
K Run electrical lines inside walls	70
L Install electric outlets	200
M Install lighting	140
N Finish work (paint inside & out)	540
O Install sheeting for small storage attic	100
	$ 3,745

7) The following table shows actual project costs. Update your project with these actual costs. Note: must disable auto calculations in project options.

	Baseline	Actual
A Foundation Preparation	170	190
B Door frame construction & positioning	195	230
C Install exterior drainage around site	275	270
D Install electric & service drop	180	190
E Erect walls	640	620
F Sheetrock ceiling	580	600
G Roofing	250	240
H Door installation	125	130
I Window installation	160	180
J Hang gutters and downspouts	120	230
K Run electrical lines inside walls	70	50
L Install electric outlets	200	135
M Install lighting	140	120
N Finish work (paint inside & out)	540	280
O Install sheeting for small storage attic	100	100

8) Create a **Cost Overview** Dashboard, include entire dashboard in your PDF submission

9) Consider the following snapshot in time. Update your project with the following % complete. Show the Gantt chart given these updates.

Task	% Complete
A Foundation Preparation	100%
B Door frame construction & positioning	100%
C Install exterior drainage around site	100%
D Install electric & service drop	100%
E Erect walls	100%
F Sheetrock ceiling	100%
G Roofing	100%
H Door installation	90%
I Window installation	90%
J Hang gutters and downspouts	15%
K Run electrical lines inside walls	85%
L Install electric outlets	50%
M Install lighting	20%
N Finish work (paint inside & out)	30%
O Install sheeting for small storage attic	0%

10) Create a milestone called "start moving out of mini-storage", which is dependent on the roof being complete.

11) Show the Tracking Gantt chart

12) Explore other reports in MS-Project, submit one additional report and discuss the usefulness/value of the report.

SEM421/521 Final project	%	Grade	OIT-DMSE Outcome	Comments
Student 1	93%	A	Met	Very good final project
Student 2	80%	B	Met	Final project lacked use of tools/data, good SE framework
Student 3	95%	A	Met	Very good final project

SEM421/521 Final project	%	Grade	OIT-DMSE Outcome	Comments
Student 1	93%	A	Met	Very good final project
Student 2	80%	B	Met	Final project lacked use of tools/data, good SE framework
Student 3	95%	A	Met	Very good final project

SEM421/521 Final project	%	Grade	OIT-DMSE Outcome	Comments
Student 1	95%	A	Met	Excellent use of HDM, models, and SE frameworks