

# 2016-17 Program Assessment Report

# **Biology-Health Sciences B.S.**

## **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

N/A

#### **Program Mission**

The Bachelor of Science program in Biological - Health Sciences prepares undergraduate students for professional and graduate schools in the medical sciences (medicine, dentistry, pharmacy, veterinary sciences, physical therapy, physician assistant, etc.).

#### **Program Educational Objectives**

- Provide an integrated foundation of knowledge in biological disciplines that includes morphological, cellular, molecular, physiological, developmental, and evolutionary principles.
- Train students to utilize the scientific method and develop skills in analysis, evaluation, and critical thinking. (as well as communication, team-building, and professionalism may be added following more discussion).
- Prepare students for entrance into graduate schools and professional health schools, including
  preparation for national admissions examinations such as the Graduate Record Examination
  (GRE), Medical College Admission Test (MCAT), Dental School Admissions Test (DAT), and similar
  examinations, or qualify them for entry level positions in biology and health-related
  occupations.

#### **Program Faculty Review**

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

Showcase Learning Opportunities

N/A

## **Program History & Vision**

#### **Program History**

The Biology - Health Sciences program offered on the Klamath Falls campus serves all OIT students wishing to major in a course of study that prepares for entry into professional programs in medicine, dentistry, pharmacy, veterinary medicine, physical therapy, physician assistant, optometry, and related health fields.

Biology - Health Sciences was originally called Health Sciences but renamed in 2012-2013. The Health Sciences program was implemented in 1996. It is a popular program with an enrollment of approximately 150 students. The number of students graduating from the Biology - Health Sciences was 15 in 2012-2013, 17 in 2013-2014, 27 in 2014-2015, and 20 in 2015-2016.

The number of students graduating in past years when the program was called Health Sciences was 8 (1999-2000), 2 (2000-2001), 9 (2001-2002), 10 (2002-2003), 10 (2003-2004), 11 (2004-2005), 7 (2005-2006), 1 (2006-2007), 3 (2007-2008), 2 (2008-2009), 2 (2009-2010), 1 (2010-2011), 6 (2011-2012), 1 (2012-2013), and 0 (2013-2014).

The Biology program was implemented in 2006-2007 and removed from the catalog in 2012-2013. The number of students graduating in past years were 10 (2006-2007), 8 (2007-2008), 18 (2008-2009), 14 (2009-2010), 12 (2010-2011), 13 (2011-2012), 2 (2012-2013), 5 (2013-2014), 2 (2014-2015), and 1 (2015-2016).

We have limited information regarding employment rates and salaries, as most students go on to graduate school and are not employed for two to four years while working on their graduate degrees. Many take a year off while applying to graduate schools, making follow up more difficult, and generally only a low percentage of students complete the exiting senior surveys.

#### **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**

Practically speaking, program enrollment has remained essentially steady in recent years (~150 students in 3 of the past 4 years)

Attachment 1\_Enrollment\_5\_Year\_History\_by\_Major

#### **Program Graduates**

Despite enrollment remaining steady, we have seen an increase in graduation rates in recent years (~20 in the past two years, up from ~10 four years ago, the first year of this program in its current)

Attachment 2\_Graduates\_10\_Year\_History\_by\_Major

#### **Employment Rates and Salaries**

It is difficult to draw firm conclusions regarding employment rates and salaries, as most students go on to graduate school and are not employed for two to four years while working on their graduate degrees. Many take a year off while applying to graduate schools, making follow up more difficult.

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

## **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 Biology-Health Sciences B.S.	2016-17	2017-18	2018-19
OIT-BBHS 2016-17.1 Students will demonstrate scientific knowledge and understanding.	BIO 211		
OIT-BBHS 2016-17.2 Students will be proficient in scientific reasoning and critical thinking.			
OIT-BBHS 2016-17.3 Students will be able to effectively find and use resources from the literature.			
OIT-BBHS 2016-17.4 Students will demonstrate effective	BIO 209		
oral, written and visual communication.	BIO 409		
OIT-BBHS 2016-17.5 Students will demonstrate mathematical knowledge and skills in the biological sciences.			

## 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-BBHS 2016-17.1 Stu	idents will demonstrate scientific knowledge and understanding
Course/Event	BIO 211
Legend	F – Foundation
Assessment Measure	Direct – Exam Questions (multiple choice type)
Criterion	For the 6 multiple choice questions ("Demonstrate foundational knowledge in the natural sciences"): exemplary: 6/6 correct proficient: 4-5/6 correct partially proficient: 2-3/6 correct Does not meet expectations: 0-1/6 correct
Assessment Measure	Direct – Exam Questions (essay or problem)
Criterion	For the short answer question (question #28, diatomaceous earth) ("Apply scientific principles to biological and/or medical examples or contexts") exemplary - 9-10/10 pts proficient 7-8/10 pts partially proficient 4-6/10 pts Does not meet expectations: less than 4/10 pts
Course/Event	Student Exit Survey
Legend	C – Capstone

Assessment Measure	Indirect – Student Exit Survey
Criterion	None

OIT-BBHS 2016-17.4 Stu	idents will demonstrate effective oral, written and visual communication.
Course/Event	BIO 209
Legend	F – Foundation
<b>Assessment Measure</b>	Direct – Oral Presentation
Criterion	See 2016-17 ESLO Communication Rubric
<b>Assessment Measure</b>	Direct – Term Paper
Criterion	See 2016-17 ESLO Communication Rubric
Course/Event	BIO 409
Legend	P – Practice
<b>Assessment Measure</b>	Direct – Oral Presentation
Criterion	See 2016-17 ESLO Communication Rubric
Assessment Measure	Direct – Term Paper
Criterion	See 2016-17 ESLO Communication Rubric
Course/Event	Student Exit Survey
Legend	C – Capstone
<b>Assessment Measure</b>	Indirect – Student Exit Survey
Criterion	None

## **Analysis of Results**

OIT-BBHS 2016-17.1 Students will demonstrate scientific knowledge and understanding.								
Criterion	Criterion Met							
Summary	N/A							
Improvement Narrative	N/A							

OIT-BBHS 2016-17.4 Students will demonstrate effective oral, written and visual communication.							
Criterion	Met						
Summary	N/A						
Improvement Narrative	N/A						

## References

Program Assessment Coordinator: Travis Lund, Assistant Professor, Natural Sciences

Office of Academic Excellence

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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.

5 Year	5 Year % Change					
Difference	% Change					
0	-					
3	-					
-10	-90.9%					
17	-					
-8	-19.5%					
-36	-24.7%					
1	-					
-15	-100.0%					
15 -9	11.0% -7.1%					
-9	-100.0%					
-60	-100.0%					
-15	-27.3%					
-19	-23.2%					
-24	-10.6%					
26	30.2%					
1	100.0%					
7	5.8%					
121	159.2%					
-35	-52.2%					
33	137.5%					
34	- 2 404					
-1 -7	-3.4% -14.3%					
-7 919	-14.3% 185.7%					
-1	-100.0%					
-6	-46.2%					
-19	-38.8%					
18	-					
25	-					
12	-					
38	-					
1	100.0%					
114	-					
-7	-87.5%					
-71 -30	-78.0% -51.7%					
-30	-68.5%					
-57	-08.5%					
-28	-21.7%					
10	-					
146	70.2%					
-41	-28.3%					
17	-					
86	-					
-1	-100.0%					
-13	-40.6%					
3 -21	8.8% -38.9%					
-21	-38.9%					
2	4.3%					
19	38.0%					
9	14.8%					
3	-					
3	-					
-14	-73.7%					
31	-					
2	-					
-14	-22.6% -17.2%					
-47 27	-17.2%					
27 22	- 39.3%					
0	37.5%					
-111	-100.0%					
-2	-18.2%					
-12	-7.3%					
56	50.9%					
32	37.6%					
	-					
17	9.6%					
25						
25 2	-					
25 2 2	-					
25 2 2 1	-					
25 2 2 1 0	-					
25 2 2 1 0 0	- - - - - - - - - -					
25 2 2 1 0 0 30	- - - - 187.5% 11.4%					
25 2 2 1 0 0	- - - - 187.5% 11.4% <b>29.5%</b>					

61					
Nursing	50	49	52	61	69
Operations Management	61	66	65	69	70
Optical Engineering	0	0	3	3	3
Picture Archive/Comm Sys Spec	0	0	1	2	3
Polysomnographic Technology	19	13	6	12	5
Population Health Management	0	0	3	24	31
Pre-Clinical Lab Science	0	8	1	20	2
Pre-Dental Hygiene	62	65	35	37	48
Pre-Medical Imaging Tech	273	287	253	237	226
Pre-Medical Lab Science	0	0	0	0	27
Pre-Nursing	56	60	53	69	78
Pre-Paramedic Education	0	3	3	7	0
Pre-Renewable Energy Eng	111	0	0	0	0
Pre-Respiratory Care	11	12	8	11	9
Radiologic Science	164	163	154	160	152
Renewable Energy Engineering	110	206	203	180	166
Respiratory Care	85	84	88	103	117
Sleep Health-Polysom Tech Opt	0	0	4	6	17
Software Engineering Tech	260	268	289	309	285
Spec in Entrepreneur/Small Bus	0	0	0	1	2
Specialization in Accounting	0	0	0	2	2
Specialization in Marketing	0	0	1	1	1
Specialization Travel/Tourism	0	1	0	0	0
System Engr & Technical Mgmt	0	0	2	3	0
Technology and Management	16	30	43	46	46
Vascular Technology	88	95	80	93	98
Total (Duplicated)	4,146	4,539	4,407	4,923	5,371
Total (Unduplicated)	4,001	4,414	4,273	4,786	5,232

# 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		534		612		599	

#### 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

#### Attachment 3\_Grad\_Data\_First\_Destination\_3\_Year\_History\_by\_Major

Oregon Tech Graduate Outcome Data												
a=2013/2014/2015 combined	% Em	ployed	% Conti	nuing Ed	% Looking	g for Work	% Not	Looking	Succe	ss Rate	Mediar	Salary
b=2014/2015/2016 combined	а	b	а	b	а	b	а	b	а	b	а	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/Entrepreneurs	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

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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