

**Oregon Institute of Technology
Medical Imaging Technology Department
Vascular Technology Degree Completion Program Assessment
2007-08**

I. Introduction

The Vascular Technology Degree Completion program was implemented in Fall 1994 as an online program. Students who are accepted into the Vascular Technology Degree Completion program are already registered Vascular Technologists working in the field who have passed their national registry exam in Vascular Technology. The vascular program on-campus was the first in the nation. The program was originally developed at the request of the students. The distance delivery version began in 1994 and has slowly grown over time. The program averages 40 students active every quarter, with a total of 80 students enrolled in the program.

II. Program Purpose, Objectives and Student Learning Outcomes

The Vascular Technology Degree Completion faculty met with the Department Chair and Assessment Coordinator multiple times during the fall 2007 and agreed to adopt the student learning outcomes as suggested by the programmatic accrediting body known as the, "Joint Review Committee of Diagnostic Medical Sonography." The final version is listed below.

Vascular Technology Program Purpose

The OIT vascular technology degree completion program enables registered professionals in vascular technology to further their knowledge and skills necessary for career advancement, to become effective communicators, problem solvers, critical thinkers, responsible managers and leaders, and to value life long learning.

Program Educational Objectives

The program prepares students to:

1. Utilize diagnostic techniques, sound judgment and good decision making to provide patient services.
2. Be leaders in the field of vascular technology who contribute to the field on a local, regional or national level.
3. Think critically, communicate effectively and exemplify professional ethics.
4. Become life-long learners and responsible citizens.

Student Learning Outcomes

1. The student will demonstrate the ability to communicate effectively in oral, written and visual forms.
2. The student will demonstrate the ability to work effectively in teams.
3. The student will demonstrate an ability to provide basic patient care and comfort.
4. The student will employ professional judgment and discretion.
5. The student will demonstrate knowledge and understanding of human gross anatomy, sectional anatomy, and normal and abnormal vascular anatomy.
6. The student will demonstrate knowledge and understanding of vascular physiology, pathology, and pathophysiology.
7. The student will demonstrate knowledge and understanding of vascular physical principles and instrumentation.
8. The student will demonstrate knowledge and understanding of clinical vascular diagnostic procedures and testing.
9. The student will demonstrate an understanding of diverse cultural and humanistic traditions in the global society.
10. The student will be able to perform scholarly research and to contribute that knowledge to the field of vascular technology.

III. Three-Year Cycle for Assessment of Student Learning Outcomes

The following are the ten main outcomes which will be assessed at a rate of three each per year on a three-year cycle, as listed in Table 1 below.

Vascular Technology Degree Completion Student Learning Outcomes Assessment Schedule	2007 - 2008	2008 - 2009	2009- 2010
The student will demonstrate the ability to communicate effectively in oral, written and visual forms.		x	
The student will demonstrate the ability to work effectively in teams.		x	
The student will demonstrate an ability to provide basic patient care and comfort.			x
The student will employ professional judgment and discretion.	x		
The student will demonstrate knowledge and understanding of human gross anatomy sectional anatomy and normal and abnormal vascular anatomy.	x		
The student will demonstrate knowledge and understanding of vascular physiology, pathology, and pathophysiology.			x
The student will demonstrate knowledge and understanding of vascular physical principles and instrumentation.		x	
The student will demonstrate knowledge and understanding of clinical vascular diagnostic procedures and testing	x		
The student will demonstrate an understanding of diverse cultural and humanistic traditions in the global society.			x
The student will be able to perform scholarly research and to contribute to the field of vascular technology.			

Table 1. Vascular Technology Degree Completion Education Cycle

IV. Summary of 2007-08 Assessment Activities

The Vascular Technology Degree Completion Program faculty conducted formal assessment of three student learning outcomes during fall term 2007, winter 2008 and spring 2008. In addition, one assessment was done to assess critical thinking in winter 2008 and a graduate survey was sent out to assess programmatic learning outcomes.

Student Learning Outcome#4: The student will employ professional judgment and discretion.

The Vascular Technology faculty conducted an analysis of where this outcome is reflected in the curriculum. The mapping of this outcome in the Vascular Technology courses can be found in Appendix A1.

Assessment Fall 2007

SLO #4 outcome that was assessed Fall term 2007 and Spring term 2008 was to ensure that students in the Vascular Degree Completion Program are using professional judgment and discretion. Each student was asked to complete a project.

A grading rubric was used to assess the students' work. The following six areas were measured in the grading rubric. 1) the ability to perform the tasks and roles required (competency), 2)integrating all data, 3)attention to detail- attending to fine detail (which included writing skills) 4)seeing the whole- getting the bigger picture, 5) developing expertise, 6) problem solving using logic and reasoning. A summary of the results is shown in table 2 below.

Summary Outcome
SLO #4, Assessing Professional Judgment and Discretion in VAS 366
(Fall term 2007 and Spring 2008)

Performance Criteria	Assessment Methods	Measurement Scale	Minimum Acceptable Performance	Results
1) the ability to perform the tasks and roles	Rubric	1 - 4, 80% at 3 or 4	Baseline data	Fall 82% Spring 87%
2) integrating all data	Rubric	1 - 4, 80% at 3 or 4	Baseline data	Fall %82 Spring 87%
3) attending to fine detail (includes writing skills)	Rubric	1 - 4, 80% at 3 or 4	Baseline data	Fall 75% Spring 87%
4) getting the bigger picture	Rubric	1 - 4, 80% at 3 or 4	Baseline data	Fall 88% Spring 87%
5) developing expertise	Rubric	1 - 4, 80% at 3 or 4	Baseline data	Fall 88% Spring 87%
6)problem solving using logic and reasoning,	Rubric	1 - 4, 80% at 3 or 4	Baseline data	Fall 75% Spring 87%

Table 2: Outcome Summary Fall and Spring Quarter Grading Summary on Professional Judgment and Discretion

The assessment took place in VAS 366 using a grading rubric. However, due to the small class size this was re-tested again in the spring. There were 8 students in the spring in VAS 366. All 11 students met or exceeded the grading criteria in terms of professional judgment and discretion.

The observed strengths on the project were that students were able to perform the tasks and roles required within the scope of practice in the field of vascular technology. The students were also able to integrate the data and to see the whole picture. Although the results were good, it was felt that minor weaknesses were identified in areas of logic/reasoning and with incorporating scholarly writing skills.

Action Taken:

1. Add a student example to the course shell for students to see and use as a template.
2. Add a discussion to help students with their reasoning in regards to the module.
3. Educate the students though discussion or email early on to what is expected in terms of scholarly writing and the use of citations.

Spring Re-Assessment

These actions were completed in winter quarter 2008. There were 8 students in the spring VAS 366 special circulatory course and the students improved scores in using logic/reasoning and scholarly writing skills. There were 9 discussion posts made by students in talking out the module and a student example was given. The students were given instructions to help with the scholarly writing. The results revealed that all students scored above the 80% benchmark and improved scores in scholarly writing and using logic/reasoning to justify their viewpoints.

Detailed records of this assessment can be found in the department assessment coordinator’s notebook.

Student Learning Outcome #5: The student will demonstrate knowledge and understanding of human gross anatomy, sectional anatomy, and normal and abnormal vascular anatomy.

The Vascular Technology faculty conducted an analysis of where this outcome is reflected in the curriculum. The mapping of this outcome in the Vascular Technology courses can be found in Appendix A2.

Assessment Fall Term 2007

SLO#5 was directly assessed in the Fall term 2007 and indirectly assessed in the spring of 2008. The indirect assessment was completed by sending out a student survey in VAS 366 spring term to measure student self confidence in the identification of vascular anatomy.

Summary Outcome
SLO #5, understanding of human gross anatomy, sectional anatomy, and normal and abnormal cardiovascular anatomy
Survey

Performance Criteria	Assessment Methods	Measurement Scale	Minimum Acceptable Performance	Results
Cardiovascular Normal & Cross Sectional Anatomy	Rubric	1 - 4, 80% at 3 or 4	Baseline data	100%
Valvular Anatomy Normal and Cross Sectional Anatomy	Rubric	1 - 4, 80% at 3 or 4	Baseline data	100%
Ventricular Anatomy Normal and Cross Sectional Anatomy	Rubric	1 - 4, 80% at 3 or 4	Baseline data	100%
Cardiovascular Tomographic Orientation	Rubric	1 - 4, 80% at 3 or 4	Baseline data	100%

Table 3: Outcome Summary, Spring Anatomy Survey in VAS 366

All 8 students in the spring VAS 366 class reported 100% confidence in the ability to identify cardiovascular anatomy.

Action Taken:

1. Continue sending out surveys in the VAS 366 to ensure that student confidence remains high.

The direct fall assessment was completed in VAS 365, fall term 2007 by assessing the final scanning project for the course with 6 students. This direct measurement was reassessed in the spring of 2008 in the same course with 4 students. A grading rubric was used to evaluate each students' ability to identify the anatomy in each view that they scanned. There were a total of 14 essential views that were required as a part of this project assessment. Their ability to successfully scan the view was ranked and recorded.

Summary Outcome
SLO #5, understanding of human gross anatomy, sectional anatomy, and normal and abnormal cardiovascular anatomy
Final Project Assessment

Performance Criteria	Assessment Methods	Measurement Scale	Minimum Acceptable Performance	Results
Essential View 1-Aorta	Rubric	1 - 4, 80% at 3 or 4	Baseline data	Fall 100% Spring 100%
Essential View 2-Iliacs	Rubric	1 - 4, 80% at 3 or 4	Baseline data	Fall 100% Spring 100%
Essential View 3-Celiac	Rubric	1 - 4, 80% at 3 or 4	Baseline data	Fall 83% Spring 100%
Essential View 4- SMA	Rubric	1 - 4, 80% at 3 or 4	Baseline data	Fall 83% Spring 100%
Essential View 5- IMA	Rubric	1 - 4, 80% at 3 or 4	Baseline data	Fall 100% Spring 100%
Essential View 6- Renal Arteries Midline	Rubric	1 - 4, 80% at 3 or 4	Baseline data	Fall 100% Spring 100%
Essential View 7- Kidneys	Rubric	1 - 4, 80% at 3 or 4	Baseline data	Fall 100% Spring 100%

Essential View 8- Renal Arteries Flank	Rubric	1 - 4, 80% at 3 or 4	Baseline data	Fall 100% Spring 100%
Essential View 9- Renal Arteries Prone	Rubric	1 - 4, 80% at 3 or 4	Baseline data	Fall 100% Spring 100%
Essential View 10- Kidneys	Rubric	1 - 4, 80% at 3 or 4	Baseline data	Fall 83% Spring 100%
Essential View 11- Liver	Rubric	1 - 4, 80% at 3 or 4	Baseline data	Fall 100% Spring 100%
Essential View 12- Spleen	Rubric	1 - 4, 80% at 3 or 4	Baseline data	Fall 100% Spring 100%
Essential View 13- Hepatic Artery	Rubric	1 - 4, 80% at 3 or 4	Baseline data	Fall 100% Spring 100%
Essential View 14- Portal Vein	Rubric	1 - 4, 80% at 3 or 4	Baseline data	Fall 100% Spring 100%

Table 4: Outcome Summary Fall and Spring Assessment of Anatomy

All the students met the benchmark in the scanning final project. However, there were minor weaknesses noted. These minor weaknesses included the anatomical identification of the superior mesenteric artery and in the identification of the horizontal kidney views.

Actions Taken

1. The students were given additional instructions on how to scan the kidney and the superior mesenteric artery.
2. This was done through emails and the discussion boards with the course shell.

Re-assessed Spring 2008

This SLO was evaluated again in spring term to increase the number of student responses to get additional data. Actions were taken in the spring course to address these minor weaknesses. The students were given additional instructions on how to scan the SMA, and the horizontal kidney. This was done through emails and the discussion boards with the course shell. There were 22 discussion posts that were related to the identification of these minor weaknesses. All four students in the Spring of 2008 met the benchmark of >80% on their scanning finals. All the students improved in the anatomy identification of the SMA and the horizontal kidney.

Detailed records of this assessment can be found in the department assessment coordinator's notebook.

Student Learning Outcome #8: The student will demonstrate knowledge and understanding of clinical vascular diagnostic procedures and testing.

The Vascular Technology faculty conducted an analysis of where this outcome is reflected in the curriculum. The mapping of this outcome in the Vascular Technology courses can be found in Appendix A3.

The Student Learning Outcome #8 was assessed Fall term 2007 and was to ensure that students understood their clinical vascular technology diagnostic procedures and testing. This was done in VAS 420A by using a grading rubric to evaluate students' case studies. This is a good way to identify whether the students understand diagnostic procedures and testing, because case studies are performed by the students and the instructor can directly see what methods are being used. The goal of each student's case study is to strive for publication in a scientific medical journal. That assessment looked at the following 6 items. 1) vascular scanning protocols-demonstrates an understanding of cardiac testing protocols, 2)vascular interpretation-demonstrates an understanding of how to interpret the results, 3)competency-understanding the historical background and relevancy of the case, 4) communication-an ability to discuss the case in depth, 5) scholarly research-understanding of current and relevant medical literature and can cite it properly 6) scientific writing- demonstrates the ability to write in a scientific and scholarly method in order to convey the results accurately. A summary of the results are shown in table 5 below.

Summary Outcome
SLO #8, The student will demonstrate knowledge and understanding of clinical vascular technology diagnostic procedures and testing
Case Studies

Performance Criteria	Assessment Methods	Measurement Scale	Minimum Acceptable Performance	Results
Demonstrates understanding of vascular scanning protocols	Rubric	1 - 4, 80% at 3 or 4	Baseline data	Fall 100% Spring 100%
Demonstrates understanding of vascular interpretation	Rubric	1 - 4, 80% at 3 or 4	Baseline data	Fall 100% Spring 100%
Demonstrates understanding of historical background and relevancy of the case.	Rubric	1 - 4, 80% at 3 or 4	Baseline data	Fall 100% Spring 100%
Demonstrates an ability to discuss the case and all its aspects.	Rubric	1 - 4, 80% at 3 or 4	Baseline data	Fall 100% Spring 100%
Including research from the databases and citing this research in the case studies (understanding scholarly research)	Rubric	1 - 4, 80% at 3 or 4	Baseline data	Fall 50% Spring 100%
Written component contains all parts of scientific writing:	Rubric	1 - 4, 80% at 3 or 4	Baseline data	Fall 50% Spring 100%

Table 5: Outcome Summary Fall Quarter Assessment of Diagnostic and Clinical Procedures (Case Presentations)

The areas of observed strengths included an ability to demonstrate good cardiac scanning protocols, cardiac interpretation, the importance or relevancy of the case, the ability to write good introductions, discussions and references. There were minor weaknesses noted in three areas of the written case study: 1) abstract, 2) methods and procedures, and 3) conclusions and with providing scholarly research.

Action Taken:

The instructor will give more student examples and discuss earlier in the term how to effectively write each area of the case study to include necessary components. Students need an introductory exercise to force them to use the library databases. These actions will help the students be more successful at getting their case studies published.

Re-assessed Spring Term 2008

Actions were completed spring term to address these minor issues. Actions were taken spring term with 2 students in the VAS 420A course. During spring term the students were introduced to the medical databases and shown how to use them. In addition, students were given student examples of how to write in the required scientific format. Both the students met the benchmark of >80% in spring term.

Detailed records of this assessment can be found in the department assessment coordinator's notebook.

Critical Thinking Assessment

During winter term, 10 students were assessed using a campus wide critical thinking rubric (see Appendix). This assessment was done in VAS 385, where students had to apply new learning to real life case scenarios. The performance criteria for the critical thinking assessment were the following. 1)Identifies and explains problem/question issue-, 2) recognizes stakeholders and contexts, 3)frames personal responses and/or acknowledges other's perspectives, 4) evaluates assumptions, 5)evaluates evidence, 6) evaluates implications, conclusions and consequences.

Performance Criteria	Assessment Methods	Measurement Scale	Minimum Acceptable Performance	Results
1. Identifies and explains problem/question/issue	Rubric	1 - 4, 80% at 3 or 4	Baseline data	100%
2. Recognizes stakeholders and contexts	Rubric	1 - 4, 80% at 3 or 4	Baseline data	85%
3. Frames personal responses and/or acknowledges other perspectives	Rubric	1 - 4, 80% at 3 or 4	Baseline data	85%
4. Evaluates assumptions	Rubric	1 - 4, 80% at 3 or 4	Baseline data	85%
5. Evaluates evidence	Rubric	1 - 4, 80% at 3 or 4	Baseline data	100%
6. Evaluates implications, conclusions, and consequences	Rubric	1 - 4, 80% at 3 or 4	Baseline data	100%

Table 6: Outcome Data Summary-Critical Thinking Fall Quarter 2007

All students met the benchmark of >80% in critical thinking skills and were felt to be proficient in implementing critical thinking skills on two case scenarios.

Graduate Survey Assessment

A survey on the Vascular Degree Completion learning outcomes was sent out spring of 2008 to the graduates in the degree completion program.

Performance Criteria	Assessment Methods	Measurement Scale	Minimum Acceptable Performance	Results
The student will demonstrate the ability to communicate effectively in oral, written and visual forms	Rubric	1 - 4, 80% at 3 or 4	Baseline data	100%
The student will demonstrate the ability to work effectively in teams.	Rubric	1 - 4, 80% at 3 or 4	Baseline data	66%
The student will demonstrate an ability to provide basic patient care and comfort.	Rubric	1 - 4, 80% at 3 or 4	Baseline data	66%
The student will employ professional judgment and discretion.	Rubric	1 - 4, 80% at 3 or 4	Baseline data	100%
The student will demonstrate knowledge and understanding of human gross anatomy, sectional anatomy and normal/abnormal anatomy.	Rubric	1 - 4, 80% at 3 or 4	Baseline data	100%
The student will demonstrate knowledge and understanding of cardiovascular physiology, pathology, and pathophysiology.	Rubric	1 - 4, 80% at 3 or 4	Baseline data	100%
The student will demonstrate knowledge and understanding of cardiovascular physical principles and instrumentation.	Rubric	1 - 4, 80% at 3 or 4	Baseline data	100%
The student will demonstrate knowledge and understanding of clinical cardiovascular diagnostic procedures and testing.	Rubric	1 - 4, 80% at 3 or 4	Baseline data	100%
The student will demonstrate an understanding of diverse cultural and humanistic traditions in the global society.	Rubric	1 - 4, 80% at 3 or 4	Baseline data	100%

Table 7: Outcome Data Summary-Graduate Student Survey

Six surveys were returned and four students felt that there the degree completion program did not teach them how to work effectively as a team. In addition those same four students did not teach them how to provide basic patient care and comfort. It was felt that the degree completion program does not teach basic patient care and comfort because the students are already working in the field prior to coming to program. This is a skill that is assumed the

students have before they enter the program. Working effectively as a team is an SLO that will be coming up assessment in the future. This is an area that will require further investigation.

Action Taken:

1. To change the graduate survey to question whether students feel they have basic patient care skills prior to entering the program and if they feel they need additional skills in this area.
2. To assess working effectively as a team in the degree completion program in 2008-2009 round of assessments with the hopes of gaining more information.
3. To survey additional graduates to get a better sampling.

V. Evidence of Student Learning

During the 2007-08 academic year, the Vascular Technology Degree Completion faculty formally assessed the student learning outcomes summarized below.

A department meeting was held on 5/6/2008 where strengths and weaknesses were identified in the following ways. An advisory council was formed this year and is made up of 5 graduate students who have completed either the echo or vascular degree completion program.

Student Learning Outcome #4: The student will employ professional judgment and discretion.

Strengths: The observed strengths on both the project was that students were able to perform the tasks and roles required within the scope of practice in the field of echocardiography. The students were also able to integrate the data and see the whole picture. All students met the benchmark.

Areas needing improvement: None at this time.

Student Learning Outcome #5: The student will demonstrate knowledge and understanding of human gross anatomy, sectional anatomy, and normal and abnormal vascular anatomy.

Strengths: All the students surveyed reported that they knew their anatomy. The students who performed scanning final exams demonstrated that they met their benchmark in the identification of the anatomy. Some minor weaknesses were noted in identification of the superior mesenteric artery and the flank. After taking some simple actions even these minor weaknesses disappeared upon reassessment.

Areas needing improvement: None at this time

Student Learning Outcome #8: The student will demonstrate knowledge and understanding of clinical vascular diagnostic procedures and testing.

Strengths: The areas of observed strengths included an ability to demonstrate good vascular scanning protocols, vascular interpretation, the importance or relevancy of the case, the ability to write good introductions, discussions and references. There were minor weaknesses noted in three areas of the written case study: 1) abstract, 2) methods and procedures, and 3) conclusions and with providing scholarly research. All students met the benchmark of 80%. Actions were taken to improve the minor weaknesses and reassessment was done to confirm that improvements were made.

Areas needing improvement: None at this time.

Additional Assessment on Critical Thinking

Strengths: Students demonstrated proficiency on all performance criteria, including identifying the problem/question issue; recognizing stakeholders and contexts; framing personal responses and/or acknowledging other's perspectives; evaluating assumptions; evaluating evidence; and evaluating implications, conclusions and consequences.

Areas needing improvement: None at this time.

VI. Changes Resulting from Assessment.

Student Learning Outcome #5: The student will demonstrate knowledge and understanding of human gross anatomy, sectional anatomy, and normal and abnormal vascular anatomy.

Although students met the benchmark for all performance criteria, there were minor weaknesses noted in identification of the superior mesenteric artery and the flank kidney views. Students were given additional instructions on how to scan the kidney and the superior mesenteric artery. Upon re-assessment, students demonstrated proficiency in this area.

Student Learning Outcome #8: The student will demonstrate knowledge and understanding of clinical vascular diagnostic procedures and testing.

Although students met benchmarks for all performance criteria, there were minor weaknesses identified in the written case studies. The instructor provided more student examples and discussed earlier in the term how to effectively write each area of the case study to include necessary components. Students were given an introductory exercise to require them to use the library databases. Upon re-assessment students demonstrated proficiency on the written portion of the case study.

Appendix A1

Curriculum Map for Vascular Degree Completion Program

SLO: Professional Judgment and Discretion

BIO	220*	Cardiovascular Physiology	4
BUS	316	Total Quality in Health Care	3
BUS	317	Health Care Management	3
CHE	210*	Clinical Pharmacology	3
SPE	321*	Small Group & Team Comm	3
VAS	335*	Radiographic Vascular Anatomy	3
VAS	337*	Survey of Echocardiography**	3
VAS	365*	Abdominal Vascular Disease	4
VAS	365*	Abdominal Vascular Disease	4
VAS	366*	Special Circulatory Problems	4
VAS	375*	Survey of Abdominal Sonography**	3
VAS	385*	Vascular Laboratory Management	3
VAS	420 A*	Special Vascular Technology Externship	8
VAS	420 B*	Special Vascular Technology Externship	7
	*	Communication elective (from Gen Ed list)***	3

Appendix A2

Curriculum Map for Vascular Degree Completion Program

SLO: The student will demonstrate knowledge and understanding of human gross anatomy and normal/abnormal cardiovascular anatomy.

BIO	220*	Cardiovascular Physiology	4
BUS	316	Total Quality in Health Care	3
BUS	317	Health Care Management	3
CHE	210*	Clinical Pharmacology	3
SPE	321*	Small Group & Team Comm	3
VAS	335*	Radiographic Vascular Anatomy	3
VAS	337*	Survey of Echocardiography**	3
VAS	365*	Abdominal Vascular Disease	4
VAS	365*	Abdominal Vascular Disease	4
VAS	366*	Special Circulatory Problems	4
VAS	375*	Survey of Abdominal Sonography**	3
VAS	385*	Vascular Laboratory Management	3
VAS	420 A*	Special Vascular Technology Externship	8
VAS	420 B*	Special Vascular Technology Externship	7
	*	Communication elective (from Gen Ed list)***	3

Appendix A3

Curriculum Map for Vascular Degree Completion Program

SLO: The student will demonstrate knowledge and understanding of clinical vascular technology diagnostic procedures and testing.

BIO	220*	Cardiovascular Physiology	4
BUS	316	Total Quality in Health Care	3
BUS	317	Health Care Management	3
CHE	210*	Clinical Pharmacology	3
SPE	321*	Small Group & Team Comm	3
VAS	335*	Radiographic Vascular Anatomy	3
VAS	337*	Survey of Echocardiography**	3
VAS	365*	Abdominal Vascular Disease	4
VAS	365*	Abdominal Vascular Disease	4
VAS	366*	Special Circulatory Problems	4
VAS	375*	Survey of Abdominal Sonography**	3
VAS	385*	Vascular Laboratory Management	3
VAS	420 A*	Special Vascular Technology Externship	8
VAS	420 B*	Special Vascular Technology Externship	7
	*	Communication elective (from Gen Ed list)***	3