

## Associate in Arts & Sciences – Direct Transfer (DTA) Associate of Science

### GENERAL INFORMATION

Everett Community College offers a transferable program of study designed for students who wish to fulfill their lower division requirements at EvCC. Students whose eventual goal is research in physics or astronomy, or to work in high-tech industry should work towards a baccalaureate degree in physics. The first two years of courses (or more if pre-college level courses are required) can be taken at the community college, and the junior and senior year completed at a 4-year college or university.

EvCC offers two degrees that are part of a statewide agreement that smooths the transfer process for students. Both degrees offer qualified students priority for admission with junior status at most 4-year institutions in Washington. Students interested in colleges and universities outside of Washington may also find the requirements of these degrees to be appropriate.

► The **Associate of Arts and Sciences - DTA** degree enables the student to complete basic distribution requirements in Math, English, Humanities, Social Sciences and Natural Sciences, and to begin the major course of study. However, the student will have to take additional freshman and sophomore level science courses at the university before being eligible for junior level courses in a science major.

► The **Associate of Science** degree requires that the student complete all freshman and sophomore math and science courses and a limited number of courses in English, Humanities and Social Science. Upon transfer, the student should be eligible for junior level science courses, but will need to complete the remaining distribution requirements before graduation with a baccalaureate degree. It is likely that the student will also have to complete additional pre-major courses in physics to qualify for some junior level courses at the transfer institution.

**Degree checklists are on pages 3 and 4 of this guide.**

### SUGGESTED PREPARATION

To begin college study in physics, students should have solid writing and communication skills, a strong algebra and calculus background, and high school courses in biology, chemistry and physics. Students who do not have that background may gain it at the community college before starting the courses that will count toward their degree.

During the first two years of college study, students should develop a strong background in English (2 quarters), Math (calculus) and Chemistry, as well as two years of physics (see recommended courses on the next page). Most transfer institutions will also require two to three quarters of college level foreign language or two to three years of high school foreign language. For specific requirements in your area of interest or for the school to which you wish to transfer, it is strongly recommended that you contact an EvCC physics advisor (below) and contact the transfer institution.

### PROGRAM ADVISOR

- Jed Seriven, Whitehorse Hall 312, (425) 388-9452  
jserven@everettcc.edu
- Andie Vanture, Whitehorse Hall 224, (425) 388-9556  
avanture@everettcc.edu
- Kristine Washburn, Whitehorse Hall 216, (425) 388-9431  
kwashburn@everettcc.edu

### WEBSITES

Websites of physics/astronomy departments at common transfer institutions:

[June 2018]

Central Washington University	<a href="http://www.cwu.edu/physics/">www.cwu.edu/physics/</a>
Eastern Washington University	<a href="http://www.ewu.edu/cstem/departments/physics">www.ewu.edu/cstem/departments/physics</a>
The Evergreen State College	<a href="http://www.evergreen.edu/">www.evergreen.edu/</a>
University of Washington	<a href="http://www.phys.washington.edu">www.phys.washington.edu</a> <a href="http://www.astro.washington.edu">www.astro.washington.edu</a>
Washington State University	<a href="http://www.physics.wsu.edu">www.physics.wsu.edu</a>
Western Washington University	<a href="https://cse.wvu.edu/physics">https://cse.wvu.edu/physics</a>
Pacific Lutheran University	<a href="http://www.plu.edu/physics">www.plu.edu/physics</a>
University of Puget Sound	<a href="http://www.pugetsound.edu">www.pugetsound.edu</a>
Seattle Pacific University	<a href="http://spu.edu/academics/college-of-arts-sciences/physics">http://spu.edu/academics/college-of-arts-sciences/physics</a>
Seattle University	<a href="http://www.seattleu.edu/scieng/physics">www.seattleu.edu/scieng/physics</a>

### GETTING STARTED AT EVCC

Our Enrollment Services Office provides information about application, advising, orientation and registration for new and continuing students. New students must complete entry advising through the Advising Center prior to registering for first quarter classes.  
Contact:

Enrollment Services, Parks 201, 425-388-9219, [admissions@everettcc.edu](mailto:admissions@everettcc.edu)

Advising Center, Rainier Hall 108, 425-388-9339, [www.everettcc.edu/advising](http://www.everettcc.edu/advising)

## CAREER OPTIONS

*“Physics majors who seek employment at the Bachelor’s Degree level may find that the job market for them is more promising than for graduates in many fields... . Employers value physics graduates for several reasons. Two are the breadth and adaptability physics training usually identifies. Another is the analytical ability traditionally associated with physics graduates. Still another is the experimental attitude and knowledge which come from thorough laboratory training.”*

Undergraduate Handbook for Physics at the University of Washington, Seattle

Adapted from The Occupational Outlook Handbook, (2008), provides the following information at this website: <http://stats.bls.gov/oco/ocos052.htm>

Physicists explore and identify basic principles and laws governing motion and gravitation, the macroscopic and microscopic behavior of gasses, and the structure and behavior of matter, the generation and transfer of energy, and the interaction of matter and energy. Some physicists use these principles in theoretical areas, such as the nature of time and the origin of the universe; others apply their physics knowledge to practical areas, such as the development of advanced materials, electronic and optical devices, and medical equipment.

Physicists design and perform experiments with lasers, particle accelerators, telescopes, mass spectrometers, and other equipment. On the basis of their observations and analysis, they attempt to discover and explain laws describing the forces of nature, such as gravity, electromagnetism, and nuclear interactions. Physicists also find ways to apply physical laws and theories to problems in nuclear energy, electronics, optics, materials, communications, aerospace technology, navigation equipment, and medical instrumentation.

Astronomy is sometimes considered a subfield of physics. Astronomers use the principles of physics and mathematics to learn about the fundamental nature of the universe, including the sun, moon, planets, stars, and galaxies. They also apply their knowledge to solve problems in navigation, space flight, and satellite communications and to develop the instrumentation and techniques used to observe and collect astronomical data.

Most physicists work in research and development. Some do basic research to increase scientific knowledge. Physicists who conduct applied research build upon the discoveries made through basic research and work to develop new devices, products, and processes. For example, basic research in solid-state physics led to the development of transistors and, then, integrated circuits used in computers.

Physicists also design research equipment. This equipment often has additional unanticipated uses. For example, lasers are used in surgery; microwave devices are used in ovens; and measuring instruments can analyze blood or the chemical content of foods. A small number of physicists work in inspection, testing, quality control, and other production-related jobs in industry.

Much physics research is done in small or medium-size laboratories. However, experiments in plasma, nuclear, and high-energy physics, as well as in some other areas of physics, require extremely large, expensive equipment, such as particle accelerators. Physicists in these subfields often work in large teams. Although physics research may require extensive experimentation in laboratories, research physicists still spend time in offices planning, recording, analyzing, and reporting on research.

Almost all astronomers do research. Some are theoreticians, working on the laws governing the structure and evolution of astronomical objects. Others analyze large quantities of data gathered by observatories and satellites and write scientific papers or reports on their findings. Some astronomers actually operate large space- or ground-based telescopes, usually as part of a team. However, astronomers may spend only a few weeks each year making observations with optical telescopes, radio telescopes, and other instruments. For many years, satellites and other space-based instruments, such as the Hubble space telescope, have provided prodigious amounts of astronomical data. New technology resulting in improvements in analytical techniques and instruments, such as computers and optical telescopes and mounts, is leading to a resurgence in ground-based research. A small number of astronomers work in museums housing planetariums. These astronomers develop and revise programs presented to the public and may direct planetarium operations.

Physicists generally specialize in one of many subfields: elementary particle physics, nuclear physics, atomic and molecular physics, physics of condensed matter (solid-state physics), optics, acoustics, space physics, plasma physics, or the physics of fluids. Some specialize in a subdivision of one of these subfields. For example, within condensed matter physics, specialties include superconductivity, crystallography, and semiconductors. However, all physics involves the same fundamental principles, so specialties may overlap, and physicists may switch from one subfield to another. Also, growing numbers of physicists work in interdisciplinary fields, such as biophysics, chemical physics, and geophysics.

A doctoral degree is the usual educational requirement because most jobs are in basic research and development; a bachelor’s or master’s degree is sufficient for some jobs in applied research and development.

For Physics careers, see: <http://www.aps.org/careers/>  
For Astronomy careers, see <http://aas.org/learn/careers-astronomy>

(February 2013)

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## NOTES FOR THE ASSOCIATE DEGREES

### Associate in Arts and Sciences – DTA and Associate of Science

These checklists are designed for transfer students with an interest in **Physics or Astronomy**. Students should meet with an advisor and maintain this checklist while at Everett Community College.

The quarter before expected completion, this checklist should be submitted with a diploma application to the Enrollment Services Office. This checklist refers to requirements listed in the curriculum guide titled “Associate in Arts and Sciences – DTA”, which lists all the courses which are approved for the various categories of requirements.

Though courses in a foreign language are not required in the Associate degrees, some universities may require two or three quarters of foreign language for admission or for graduation.

**Note 1:** Courses must be from three different disciplines. No more than 10 credits in any one discipline may be used in Humanities, Social Science and Science.

**Note 2:** Prerequisites: This program of study assumes the student has college level English and math skills. All new students are required to take EvCC placement tests. All science courses require completion of ENGL 098 or placement into ENGL& 101. Chemistry courses require completion of MATH 096 or equivalent placement, as well as completion of CHEM& 140 or a high school chemistry course.

**Note 3:** Completion of listed and recommended courses may result in more than 90 credits being earned for the degree. The advantage is that the completion of these courses will enable you to progress more efficiently in your major at a university. Alternatively, some of the more advanced courses may be done at the university instead. Please consult with an advisor to decide the best option for you.

**Note 4:** PHYS& 114 is essential as a pre-requisite for Engineering PHYS& 241. If rigorous physics has been taken in high school, this requirement may be waived by passing a placement test. PHYS& 115 and 116 are suggested but not required.

**Note 5:** Any lab science course may be used here.

# Associate of Science – Physics & Astronomy

Please review the notes on page two.

Courses listed with an ampersand in the course number (e.g. ENGL&101) reflect the Common Course Numbering System. For more information, go to [www.everettcc.edu/ccn](http://www.everettcc.edu/ccn)

Student Name: \_\_\_\_\_ Advisor Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Note: Prior to starting some or all of the following courses, students should:

Complete PHYS 130

Where completed/Course Title \_\_\_\_\_ Year Completed \_\_\_\_\_ Grade \_\_\_\_\_

COMPLETION of Diversity Course

Where completed/Course Title \_\_\_\_\_ Year Completed \_\_\_\_\_ Grade \_\_\_\_\_

Course Number	Course Title	Credits	Quarter Completed	Grade
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## COMMUNICATIONS SKILLS (5 credits)

*ENGL& 101 or 101D	English Composition I	5	_____	_____
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## MATHEMATICS (29 credits)

*MATH& 151	Calculus I	5	_____	_____
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*MATH& 152	Calculus II	5	_____	_____
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*MATH& 163	Calculus 3	5	_____	_____
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*MATH& 264	Calculus 4	4	_____	_____
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*MATH 260	Linear Algebra	5	_____	_____
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*MATH 261	Differential Equations	5	_____	_____
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\*HUMANITIES AND SOCIAL SCIENCE (15 credits, in three different disciplines, selected from both the Humanities and Social Science course list for the Associate of Science – see separate guide.)

_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

## SCIENCE (27 credits)

*PHYS& 241/231	Engineering Physics I with Lab	5.5	_____	_____
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*PHYS& 242/232	Engineering Physics II with Lab	5.5	_____	_____
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*PHYS& 243/233	Engineering Physics II with Lab	5.5	_____	_____
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*CS& 131 or 141	Computer Science/Programming	5	_____	_____
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*CHEM& 161 (See Note 5)	General Chemistry with Lab I	5.5	_____	_____
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## SUGGESTED ELECTIVES (Select a minimum of 14 credits.)

CHEM& 162	General Chemistry with Lab II	5.5	_____	_____
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CHEM& 163	General Chemistry with Lab III	5.5	_____	_____
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PHYS& 114 (See Note 4)	General Physics I	5	_____	_____
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PHYS& 115 (See Note 4)	General Physics II	5	_____	_____
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PHYS& 116 (See Note 4)	General Physics III	5	_____	_____
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CS 132 or 143	Computer Science/Programming II	5	_____	_____
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ENGR& 204	Electrical Circuits	5	_____	_____
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ENGR& 224	Thermodynamics	4	_____	_____
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**Total: minimum 90 credits required, minimum 2.0 GPA. See Note 2.**

\* Courses with an asterisk (\*) constitute the minimum requirements for the AS degree. Other courses are taken in consultation with advisor.

Everett Community College does not discriminate based on, but not limited to, race, color, national origin, citizenship, ethnicity, language, culture, age, sex, gender identity or expression, sexual orientation, pregnancy or parental status, marital status, actual or perceived disability, use of service animal, economic status, military or veteran status, spirituality or religion, or genetic information in its programs, activities, or employment. The Title IX Coordinator has been designated to handle inquiries regarding nondiscrimination policies and can be reached at 2000 Tower Street, Everett, WA 98201, TitleIXCoordinator@everettcc.edu, or 425-388-9271. This publication is effective **JANUARY 2017**. The College reserves the right to change courses, programs, degrees and requirements. It is the student's responsibility to be aware of correct information by routinely checking with Enrollment Services and/or the advisors listed in this publication. Requirements applicable to all certificates and degrees are published in the College Catalog. Nothing contained herein shall be construed to create any offer to contract or any contractual rights.

For more information, call 425-388-9219, Everett Community College, 2000 Tower Street, Everett, WA 98201, [www.everettcc.edu](http://www.everettcc.edu)

# Associate in Arts and Sciences – DTA

Please review the notes on page two. This checklist is targeted at transfer students with an interest in pursuing a **PHYSICS OR ASTRONOMY** degree at a four-year institution. Students should meet with an advisor and maintain this checklist while at Everett Community College. The quarter before expected completion, this checklist should be submitted with a diploma application to the Enrollment Services Office. This checklist refers to requirements listed in the curriculum guide titled “Associate in Arts and Sciences – DTA”, which lists all the courses which are approved for the various categories of requirements. Note: Though courses in a foreign language are not required in the DTA degree, some universities may require two or three quarters of foreign language for admission or for graduation. Courses listed with an ampersand in the course number (e.g. ENGL&101) reflect the Common Course Numbering System. For more information, go to [www.everettcc.edu/ccn](http://www.everettcc.edu/ccn)

Student Name: \_\_\_\_\_ Advisor Signature: \_\_\_\_\_ Date: \_\_\_\_\_

COMPLETION of [College Success Course](#) \_\_\_\_\_  
 \_\_\_\_\_ Where completed/Course Title \_\_\_\_\_ Year Completed \_\_\_\_\_ Grade \_\_\_\_\_

COMPLETION of Diversity Course \_\_\_\_\_  
 \_\_\_\_\_ Where completed/Course Title \_\_\_\_\_ Year Completed \_\_\_\_\_ Grade \_\_\_\_\_

Note: Prior to starting some or all of the following courses, students should:

COMPLETE PHYS 130 \_\_\_\_\_  
 \_\_\_\_\_ Where completed/Course Title \_\_\_\_\_ Year Completed \_\_\_\_\_ Grade \_\_\_\_\_

Course Number	Course Title	Credits	Quarter Completed	Grade
<b>BASIC COMMUNICATIONS SKILLS</b> (Minimum of 10 credits from approved list, including at least 5 credits in composition.)				
*ENGL& 101 or 101D	English Composition I	5	_____	_____
ENGL& 102 or ENGL 103	_____	5	_____	_____
ENGL& 230	Technical Writing	3	_____	_____
<b>BASIC QUANTITATIVE SKILLS</b> (5 credits)				
MATH & 141	Precalculus I: College Algebra	5	_____	_____
<b>*HUMANITIES</b> (15 credits from the <a href="#">DTA approved Humanities List</a> . See Note 1.)				
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
<b>*SOCIAL SCIENCE</b> (15 credits from the <a href="#">DTA approved Social Science List</a> . See Note 1.)				
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
<b>SCIENCE AND MATH</b> (Minimum 15 credits following the <a href="#">Natural Sciences requirements of the DTA degree</a> . See Notes 1 and 2.)				
*MATH& 151	Calculus I	5	_____	_____
*MATH& 152	Calculus II	5	_____	_____
*MATH& 163	Calculus 3	5	_____	_____
*MATH& 264	Calculus 4	4	_____	_____
*MATH 260	Linear Algebra	5	_____	_____
*MATH 261	Differential Equations	5	_____	_____
*PHYS& 241/231	Engineering Physics I with Lab	5.5	_____	_____
*PHYS& 242/232	Engineering Physics II with Lab	5.5	_____	_____
*PHYS& 243/233	Engineering Physics III with Lab	5.5	_____	_____
*CS& 131 or CS& 141	Computer Science/Programming	5	_____	_____
*CHEM& 161 (See Note 5)	General Chemistry with Lab I	5.5	_____	_____
<b>SUGGESTED ELECTIVES</b>				
CHEM& 162	General Chemistry with Lab II	5.5	_____	_____
CHEM& 163	General Chemistry with Lab III	5.5	_____	_____
PHYS& 114 (See Note 4)	General Physics I	5	_____	_____
PHYS& 115 (See Note 4)	General Physics II	5	_____	_____
PHYS& 116 (See Note 4)	General Physics III	5	_____	_____
CS 132 or 143	Computer Science/Programming II	5	_____	_____
ENGR& 204	Electrical Circuits	5	_____	_____
ENGR& 224	Thermodynamics	4	_____	_____

**Minimum 90 credits required, with minimum 2.0 GPA. See Note 3.**

\* Courses with asterisk (\*) constitute the minimum requirements for AAS DTA degree with a physics major.