

Fall 2005
Statewide Engineering AS-T Track 2 Major Related Program (MRP) Agreement

These pathways are applicable to students planning to prepare for various engineering majors at universities in Washington.

This document represents agreement regarding expanded detail for the existing Associate in Science- Transfer, Track 2 between the baccalaureate institutions offering engineering bachelor's degrees and the community and technical colleges system. Baccalaureate institutions party to this agreement are: UW Seattle, WSU, EWU, Gonzaga, Henry Cogswell, Saint Martin's U, Seattle Pacific U, Seattle U, Walla Walla College.

Community colleges agree:

- When community colleges list the AS-T, track 2 in their publications, they will provide the expanded detail shown below regarding the three major pathways in the field of engineering while retaining the current AS-T, track 2 description for purposes of students majoring in computer science, physics and atmospheric sciences.
- When community colleges award the AS-T degree for engineering students following these expanded details, rather than using AS-T #2 on the transcript, colleges will designate completion as follows for clarity on the transcript and use by SBCTC for tracking reporting purposes:
 - AS-T Bio/Chem E/MRP. Exit Code of O and CIP of 14.0701 (or leave CIP blank)
 - AS-T Comp E EE/MRP Exit Code of P and CIP of 14.1001 (or leave CIP blank)
 - AS-T Other Engineer/MRP Exit Code Q and CIP of 14.1901(or leave CIP blank)
- If community colleges find that changes to the MRP are needed, they will notify the Instruction Commission, which will, in turn, notify the Joint Access Oversight Group (JAOG). JAOG will review the changes, as detailed in the section below (review process posted on the JAOG web site <http://www.sbctc.ctc.edu/transfer/jaog.asp>).
- Where the pathway lists student choice in engineering classes, the published associate degree listing will include advice to students about contacting potential transfer institutions regarding their choices.

The participating baccalaureate institutions agree:

- Students completing the AS-T, track 2 degrees, including those who follow these expanded details will, if admitted to the university, be admitted as juniors with the all or most prerequisites for the specific engineering major completed (depending on choices made among engineering electives) and with lower division general education courses partially completed in a manner similar to the partial completion by freshmen-entry engineering students.
- The same 2.0 GPA requirement that applies to AST in general applies to these expanded details pathways. Engineering programs are competitive and may require a higher GPA overall or a higher GPA in specific courses.

- Baccalaureate institutions will apply up to 110 credits quarter credits required under this agreement to the credits required in the bachelor's degree, subject to institutional policy on the transfer of lower division credits.
- Baccalaureate institutions will each build an **alert mechanism** into their curriculum review process for changes related to the prerequisites for the engineering degree.
 - The alert will go to the institution's or sector's JAOG member.
 - If the proposed change will affect lower division course taking, the JAOG member will bring the issue to JAOG attention for action to review or update this Major Related Program Agreement.
- Prior to making changes in the admission requirements, institutions agree to participate in the JAOG-designed **review process** and to abide by the related implementation timelines (review process posted on the JAOG web site <http://www.sbctc.ctc.edu/transfer/jaog.asp>).
- This statewide process applies only to changes¹ in the requirements for admission to the major. References to changes do not include changes in graduation requirements that are completed at the upper division or the GPA an institution may establish for admission to a program.

The Joint Access Oversight Group (JAOG) will:

- When undertaking a review of possible changes in the pathway, JAOG will notify the HECB of the review and of subsequent changes made to the agreement.

Associate in Science –Transfer, Track 2 Expanded Detail for Engineering MRPs

| Engineering is a broad discipline and one pathway will not fit the requirements for all of the sub-disciplines contained within engineering. Therefore, these pathways within the Associate of Science – Transfer, Track2 Degree are designed for the following major areas: | | | |
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| Associate of Science – Transfer, Track 2 Degree Requirements | Bioengineering and Chemical pre-Engineering (BIO and CHEM E) Pathway | Computer and Electrical pre-Engineering (Comp E and EE) Pathway | Mechanical/Civil/Aeronautical/ Industrial/ Materials Science/ pre-Engineering (Other Engineering) Pathway |
| Communication Skills (Min. 5 quarter credits) College level composition course. | Communication Skills College Writing - 5 credits | Communication Skills College Writing - 5 credits | Communication Skills College Writing - 5 credits |
| Mathematics (10 quarter credits) Two courses at or above introductory calculus level. Third | Mathematics Calculus 1,2,3 - 15 credits Differential Equations - 3 - 5 credits | Mathematics Calculus 1,2,3 - 15 credits Differential Equations - 3 - 5 credits | Mathematics Calculus 1,2,3 - 15 credits Differential Equations - 3 - 5 credits |

¹ As judged by impact on students. This statewide process is called into play when potential majors need to complete specific courses not previously identified or present test results or information not included in the agreement.

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| quarter calculus or approved statistics course: 5 quarter credits chosen with the help of an advisor based on the requirements of the specific discipline at the baccalaureate institution the student plans to attend. | | Linear Algebra - 5 credits | Linear Algebra - 5 credits |
| Computer programming (4 quarter credits) course chosen with the help of an advisor based on the requirements of the specific discipline at the baccalaureate institution the student plans to attend. | Computer Programming Computer Programming for Engineers - 4 - 5 credits | Computer Programming Computer Programming for Engineers - 4 - 5 credits (language required by different institutions may vary) | Computer Programming Computer Programming for Engineers - 4 - 5 credits |
| Physics (15 quarter credits) Calculus-based or non-calculus based sequence including laboratory. Students should be advised that some baccalaureate programs require physics with calculus. | Science Engineering Physics 1,2,3 + labs - 15 - 18 credits General Chemistry 1,2,3 + labs - 15 - 18 credits | Science Engineering Physics 1,2,3 + labs - 15 - 18 credits General Chemistry 1 + lab - 5 - 6 credits | Science Engineering Physics 1,2,3 + labs - 15 - 18 credits General Chemistry 1,2 + labs - 10 - 12 credits |
| Chemistry with laboratory (5 quarter credits) required for Engineering majors. Others should select 5 credits of science based on advising. | Organic Chemistry 1 + lab - 4 - 6 credits Organic Chemistry 2 or Biology for Science Majors + labs - 4 - 6 credits | | |
| Other Pre-major Prerequisites & Electives The remaining 31 quarter credits should be planned with the help of an advisor based on the requirements of the specific discipline at the baccalaureate institution the student selects to | Engineering (select 2)* - 10 credits <u>Select 2 Electives as appropriate for intended major and intended bachelor's institution:</u> Linear Algebra Calculus 4 (Advanced or Multi-variable Calculus) Technical Writing | Engineering Required (8-10 cr) • Electrical Circuits - 4 - 5 credits • A second course in Computer Programming- object oriented - 4-5 credits Math, Science & Engr. Electives (select 4)² - 20 credits *Select 4 | Engineering Required (15 cr) • Statics - 5 credits • Mechanics of Materials - 5 credits • Dynamics - 5 credits • Math/Engr Electives (Select 3)* - 15 credits Select 3 Electives(15 credits) as |

² The October 23, 2005 version of this agreement included the course "Computer Programming II" in the list below. Computer Programming II - that is the second course in object oriented programming - is a requirement for the Comp E and EE track, not an elective. The Washington Council for Engineering and Related Technical Education (WCERTE) voted unanimously to adopt this editorial change to the degree agreement at our meeting on April 28th, 2006 at Eastern Washington University.

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| attend. For Engineering disciplines, these credits should include a design component consistent with ABET accreditation standards. | Electrical Circuits Thermodynamics Chemical Process, Principles and Calculations Biology for Science Majors I + labs Biology for Science Majors II + labs Organic Chemistry 2 + labs | <i>Electives as appropriate for intended major and intended bachelor's institution:</i> Innovation in Design Calculus 4 (Advanced or Multi-variable Calculus) Technical Writing Statics Thermodynamics Digital Logic Biology for Science Majors I + labs | <i>appropriate for intended major and intended bachelor's institution:</i> Innovation in Design Calculus 4 (Advanced or Multi-variable Calculus) 3-D Visualization and CAD (Engineering Graphics) Technical Writing Thermodynamics Electrical Circuits Materials Science |
| <u>Humanities / Fine Arts / English and Social Science (15 credits)</u> Minimum 15 quarter credits: Minimum 5 credits in Humanities, minimum 5 credits in Social Science, plus an additional 5 credits in either Humanities or Social Science for a total of 15 credits. Courses taken must come from the current ICRC distribution list in order to count as General Education or General University Requirements (GER's/GUR's) at the receiving institution. Additional general educational requirements, cultural diversity requirements, and foreign language requirements, as required by the receiving institution, must be met prior to the completion of a baccalaureate degree. | Arts, Humanities and Social Sciences Three Electives (min. 5 credit from among each English, Fine Arts, Humanities, Social Science) - 15 credits A course in Economics is recommended. Humanities and social sciences courses taken at the CC to meet these requirements will be accepted toward the humanities and social science requirements at the receiving institution | Arts, Humanities and Social Sciences Three Electives (min. 5 credit from among each English, Fine Arts, Humanities, Social Science) - 15 credits A course in Economics is recommended. Humanities and social sciences courses taken at the CC to meet these requirements will be accepted toward the humanities and social science requirements at the receiving institution | Arts, Humanities and Social Sciences Three Electives (min. 5 credit from among each English, Fine Arts, Humanities, Social Science) - 15 credits A course in Economics is recommended. Humanities and social sciences courses taken at the CC to meet these requirements will be accepted toward the humanities and social science requirements at the receiving institution |
| Total Maximum Credits 90 - 103 | Total Maximum Credits 95 - 104 | Total Maximum Credits 102 - 110 | |

No community college currently offers the Chemical Process, Principles and Calculations listed as an engineering elective in the Bio and Chem E pathway and only a few colleges offer the Digital Logic in the Comp E and EE or the Electrical Circuits in the Other Engineering pathway. WCERTE is considering regionally coordinated offering of these and other infrequently available engineering course. A subgroup of the workgroup looking at the feasibility of online and/or mixed mode development and offering of these courses.

APPENDIX A

Statewide Major Ready Pathway (MRP) -Participants to the Agreement

The Joint Access Oversight Group (JAOG) reviewed this agreement on October 5, 2005 and forwarded it for approval by the chief academic officers and engineering deans of the public and private baccalaureate institutions offering the engineering program and the Instruction Commission representing the chief academic officers of the public community and technical colleges.

Approved by the Instruction Commission, on behalf of the Washington State Community and Technical Colleges on _____ Date

Approved by the Baccalaureate Institutions:

Washington State University

Carole A. Clark 11/4/05
Dean, College of Engineering and Architecture Date

RC Boster 11/4/05
Provost/Chief Academic Officer Date

Eastern Washington University

Raymond G. Luther 11/14/05
Dean, Date

Ron Della 11-16-05
Provost/Chief Academic Officer v. Date

University of Washington

Evelyn Kuhn 12-14-05
Dean, College of Engineering Date

Angela M. ... 12/23/05
Provost/Chief Academic Officer University of Washington Date

APPENDIX B

Engineering AS-T/MRP Workgroup Participants

Co-Chairs: Robert (Bob) Olsen and Jeff McCauley

Community and Technical Colleges:

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Jim Hamm
Chris Byrne
Muhammad Mir
Jill Davishahl
Eric Davishahl

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Keith Clay
Bob Maplestone
Dennis Schaffer
Patricia Cheadle
Larry Smith

Kenneth Schroeder
Nancy Verheyden
Art West
Jim Bellotty
Kelly Casey
Jane Twaddle

Baccalaureate Institutions:

Anthony de Sam Lazaro
Bill Bender
George Simmons
Brian Miller
Mara Rempa
Carolyn Denney

Chen-Ching Liu
Frank Ashby
Robert (Bob) Olsen
David McLean
Donald Richter
Steve Dillman

Carlos Oncina,
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Dennis Horn
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Joan Sarles

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Washington
Cynthia Morana, Council of Presidents

Joint Access Oversight Group Members

Mary Chikwinya, Pierce College Puyallup, co-
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Jane Sherman, Washington State University,
co-chair
Bill Eaton, Peninsula College
Ivan Gorne, Highline Community College,
Ron Leatherbarrow, Bellevue Community
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Susan Tinker, Skagit Valley Community
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Patricia Onion, Whatcom Community College,

Pam Praeger, Spokane Falls Community
College
Linda Beath, Central Washington University
Kris Bulcroft, Western Washington University
Deborah Wiegand, University of Washington
Larry Briggs, Eastern Washington University
Steve Hunter, The Evergreen State College
Brad Tomhave, University Puget Sound
Violet Boyer, Independent Colleges of
Washington
Jan Yoshiwara and Loretta Seppanen, SBCTC

Cynthia Morana, Council of Presidents
Andi Smith, HECB – Ex officio