

**Career-Technical Credit Transfer (CT)²
Engineering Technology Career-Technical Assurance Guide (CTAG)
August 16, 2019**

The following courses, indicated by a Career-Technical Articulation Number (CTAN), are eligible for transfer among (CT)² approved courses and state institutions of higher education. The SCTAI alignment document with ODE competencies and post-secondary learning outcomes is available on the ODHE website at <https://www.ohiohighered.org/transfer/ct2/ctags>.

CTEGT001 - Introduction to Engineering (TAG Course OES001)	Credits: 1 Semester Hour
<p>Advising Notes: In order to access postsecondary credit for this CTAN, the student must:</p> <ul style="list-style-type: none"> • Successfully complete <u>ODE secondary course Engineering Principles (175002)</u>. • Matriculate to an institution of higher education with an approved or comparable course no later than 3 years after completing the approved secondary program. • Earn a qualifying score on the end of course exam. The score will be determined at the conclusion of field-testing at the end of the 2019-2020 academic year. 	<p>Secondary institutions must have pathway approval from the Ohio Department of Education. Certificate of Affirmation assurances are now incorporated into the CTE-26 application process.</p>
CTEGT002 - Engineering Graphics	Credits: 3 Semester Hours
<p>Advising Notes: In order to access postsecondary credit for this CTAN, the student must:</p> <ul style="list-style-type: none"> • Successfully complete <u>ODE secondary course Engineering Design (175001)</u>. • Matriculate to an institution of higher education with an approved or comparable course no later than 3 years after completing the approved secondary program. • Earn a qualifying score on the end of course exam. The score will be determined at the conclusion of field-testing at the end of the 2019-2020 academic year. 	<p>Secondary institutions must have pathway approval from the Ohio Department of Education. Certificate of Affirmation assurances are now incorporated into the CTE-26 application process.</p>

The CTAN identifies learning outcomes that are equivalent or common in introductory technical courses. For students to receive credit under these agreements, the career-technical secondary programs and the post-secondary institutions must document that their course content matches the learning outcomes in the CTAN.

Requirements and Credit Conditions:

1. The receiving institution must have a comparable program, major, or courses that have been approved through submission to the Ohio Department of Higher Education (CT)² approval process for the CTANs listed in this document.
2. Credits apply to courses in the specified technical area at Ohio's public institutions of higher education, if the institution offers courses in the specific technical area. In the absence of an equivalent course, and when the institution offers the technical program, the receiving institution will guarantee to grant and apply an equivalent credit value of the Career-Technical Articulation Number (CTAN) toward the technical requirements of the specific degree/certificate program.
3. The applicant must provide proof to the receiving institution that they successfully completed a course that has been approved through the (CT)² approval process and has earned a qualifying score on the end of course examination.
4. A career-technical student seeking credit under the terms of this CTAG must apply and be accepted to the college within three years of completing a career-technical education program.
5. A career-technical student who meets all eligibility criteria will receive the credit hour value for the comparable courses as offered at the receiving state institution of higher education.
6. The admission requirements of individual institutions and/or programs are unaffected by the implementation of (CT)² outcomes.
7. The transfer of credit, through this CTAG, will not exempt a student from the residency requirements at the receiving institution.

Public secondary career-technical students must complete a CTAN in the Engineering and Science Technology and Manufacturing Technology pathway to be eligible for credit under this CTAG. This pathway is outlined in the Ohio Department of Education's *Engineering and Science Technology and Manufacturing Career Field Technical Content Standards*.

CTEGT001 - Introduction to Engineering (TAG Course OES001)

| Credits: 1 Semester Hour

General Course Description: This course introduces the fields of engineering and engineering technologies to the student who is interested in engineering. Students will explore multiple disciplines and careers available. Additionally, the student will solidify knowledge of basic mathematics, measurements systems, and computer skills necessary to succeed in an engineering environment. Critical thinking and the expansion of one's thought process will be a large focus.

Credits: 1 Semester Hour

Learning Outcomes:

Outcomes marked with an asterisk are essential and must be included in the course.

1. *Understand and solve open-ended problems related to Engineering.
2. *Develop hands-on skills related to applications of Engineering.
3. *Function on a team in an academic environment.
4. *Have knowledge of various disciplinary and career areas within Engineering.
(With a focus on engineering disciplines and use of engineering examples)
5. *Understand Ethics in Engineering practice.
(With the use of Engineering examples)
6. *Understand an Introduction to computer tools for Engineering analysis and design.

General Course Description: Emphasis on print reading including lines, abbreviations, terminology, view identification, dimensioning practices, dimensioning calculations, tolerance calculations, and Sketching including orthographic, isometric, section, and auxiliary views. The course objective is for students to gain a basic proficiency for understanding and manipulating technical drawings and associated conventions. The course material for Print Reading and Sketching includes the alphabet of lines, orthographic projection, ordinary views, section views, auxiliary views, pictorial sketching, dimensioning, tolerancing, screw threads and fasteners, mathematics for design, and an introduction to geometric dimensioning and tolerances.

Credits: 3 Semester Hours

Learning Outcomes:

Outcomes marked with an asterisk are essential and must be included in the course.

1. *Discuss and interoperate the various types of engineering drawings such as mechanical prints, working drawings, assembly drawings, and schematics.
2. *Identify and construct drawings using geometric construction, multi-view projection, isometric projection, auxiliary, and section views.
3. *Interoperate the various line types, abbreviations, and symbols used on engineering drawings.
4. *Interoperate and produce various schematic drawings such as hydraulic, pneumatic, and electrical.
5. *Understand an Introduction to Computer Aided Drafting.

Engineering Technology Faculty Participation

Dr. Dan Burklo	Northwest State Community College	Lead Expert
David Mohring Dan Wagner	Northwest State Community College North Central State College	Faculty Panel Faculty Panel
Shane Bendele Dan Byas Colin Doolittle Bradley Geer Mike Kwiatkowski Dovel Meyers Robert Speckert Ralph Whaley	Columbus State Community College Columbus State Community College Northwest State Community College Northwest State Community College Northwest State Community College Shawnee State University Miami University Cincinnati State Technical and Community College	Item Writer Item Writer Exam Validation Item Writer/Exam Validation Item Writer/Exam Validation Item Writer Exam Validator Item Writer/Exam Validation
Anne Skuce	Ohio Department of Higher Education	