COMPUTER AIDED DESIGN AND DRAFTING (CADD)

Southeast Campus
Student Commons (SCOM), Room 214
971-722-6031
pcc.edu/programs/drafting-design/

COURSE OF STUDY

The coursework listed below is required. The following is an example of a term-by-term breakdown.

<table>
<thead>
<tr>
<th>Term</th>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>First Term</td>
<td>CADD 100</td>
<td>CADD Orientation</td>
<td>3</td>
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<td></td>
<td>CADD 115</td>
<td>Practical Mathematics for CAD Designers</td>
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<td></td>
<td>CADD 160</td>
<td>Drafting Fundamentals</td>
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<td>CADD 175</td>
<td>SolidWorks Fundamentals</td>
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<td>Second Term</td>
<td>CADD 105</td>
<td>Digital Design Fabrication Fundamentals</td>
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<td>CADD 126</td>
<td>Introduction to AutoCAD</td>
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<td>CADD 185</td>
<td>Inventor Fundamentals</td>
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<td>CADD 195</td>
<td>Statics and Mechanics for Mechanical Designers</td>
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<td>CADD 235</td>
<td>Materials and Design for Manufacturing Processes</td>
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<td>Third Term</td>
<td>CADD 245</td>
<td>Product Design and Development Fundamentals</td>
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<td>CADD 255</td>
<td>Kinematics Drafting</td>
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<td>CADD 265</td>
<td>Mechanical Design Drafting</td>
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<td>CADD 285</td>
<td>Advanced Inventor</td>
<td>3</td>
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<td></td>
<td>or CADD 275</td>
<td>SolidWorks Advanced</td>
<td>3</td>
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<td></td>
<td>Computer Aided Design and Drafting Electives</td>
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<td>Total Credits</td>
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COMPUTER AIDED DESIGN AND DRAFTING ELECTIVES

- ARCH 110 Introduction to Architectural Drawing 2
- CADD 275 SolidWorks Advanced 3
- CADD 285 Advanced Inventor 3
- CMET 111 Portland Design: Brews, Bridges and Bikes 3
- ENGR 101 Engineering Fundamentals 4
- MCH102 Introduction to Manufacturing 3
- MCH 115 Geometric Dimensioning and Tolerancing 3.5
- WLD 101 Welding Processes & Applications 4

CADD 100. CADD Orientation. 3 Credits.
Introduces product lines and manufacturing operations through visual media or facility tours. Covers fundamentals of technical report writing, memos, and resume development with instruction relating to sentence structure, paragraph and essay development, and written expression. Includes internet research of technical products related to drafting and design, and American National Standards Institute drafting practices and terminology. Introduces file systems and learning management systems using Windows and PCC specific protocols. Prerequisites: (WR 90 and RD 90) or IRW 90 or equivalent placement or instructor approval. Audit available.

CADD 105. Digital Design and Fabrication Fundamentals. 3 Credits.
Introduces skills needed to set-up, operate, and maintain a Fused Deposition Modeling (FDM), 3D printer machine. Introduces set-up and operation of a CNC router to manufacture a simple project. Introduces computer aided manufacturing (CAM) for creating 2D and 2.5D tool paths. Prerequisites: (WR 115 and RD 115) or IRW 115 and MTH 20 or equivalent placement. Audit available.

CADD 115. Practical Mathematics for CAD Designers and Drafters. 4 Credits.
Introduces computational topics relevant to the computer aided design and drafting occupation. Includes the use of mathematics to solve computer aided design problems, drafting measurement systems and conversions, mechanical tolerance and estimation analysis, GD&T, applied trigonometry, geometry and descriptive geometry topics and computer aided design related technical formulas. Prerequisites: (MTH 58, MTH 60, or MTH 62) and (RD 90 or IRW 90 or ESOL 260). Audit available.
CADD 126. Introduction to AutoCAD. 3 Credits.
Introduces AutoCAD software as a design tool. Includes instruction in the operation of both CPU hard drive and USB drive data storage, and plotting. Covers creation, retrieval and modification of drawings that meet industry standards using basic AutoCAD commands. Audit available.

CADD 136. Intermediate AutoCAD. 3 Credits.
Continues the study of AutoCAD software as a design tool. Covers slide files, block attributes, user coordinate systems, v-points, 3-D entity creation, external references, and paper/model space drawing manipulation. Prerequisite: CADD 126. Audit available.

CADD 160. Drafting Fundamentals. 4 Credits.
Introduces skills needed to produce 2-D mechanical drawings using hand sketching techniques on grid paper. Includes orthographic projection, lettering, auxiliary views, sections and pictorial drawings. Covers dimensioning basics. Audit available.

CADD 165. Intermediate Drafting. 4 Credits.
Continues material presented in CADD 160. Introduces geometric construction, fasteners, keys, keys/keys and keyways, surface finish, and tolerances. Prerequisite: CADD 160. Audit available.

CADD 175. SolidWorks Fundamentals. 3 Credits.
Introduces SolidWorks software as a 3-D design tool. Covers creation, retrieval and modification of 3-D and layout drawings using basic SolidWorks commands. Includes skills needed to create parametric models of parts and assemblies; generate dimensioned layouts; and Bill of Materials of those parts and assemblies. Audit Available.

CADD 185. Inventor Fundamentals. 3 Credits.
Introduces Inventor as a feature-rich, parametric 3D design tool for assembly-centric modeling and collaborative engineering. Includes part and assembly modeling, using adaptive features and parents, utilizing work groups, surfacing basics, managing data, and the Engineer’s Notebook. Audit available.

CADD 195. Statics and Mechanics for Mechanical Designers. 4 Credits.
Introduces the technical designer to engineering statics, strength of materials and applications to computer aided mechanical design and analysis. Emphasizes good design practices for robust and optimized mechanical designs. Requirement: A scientific calculator. Prerequisites: CADD 115, (CADD 175 or CADD 185), (MTH 60 or MTH 62) and (RD 90 or IRW 90 or ESOL 250). Audit available.

CADD 235. Materials and Design for Manufacturing Processes. 3 Credits.
Covers practical application of industry standard product development process(es) and associated tools. Prerequisites: CADD 195, CADD 235 and (CADD 175 or CADD 185) or instructor approval.

CADD 245. AutoCAD 3-D and Solid Modeling. 3 Credits.
Introduces 3-Dimensional drafting and design procedures. Examines concepts including 2D and 3D primitives, User Coordinate Systems, 3D v-points, complex extrusions, regions, shading and rendering, 3D solid models, and supporting AutoCAD 3D databases. Prerequisite: CADD 275 or CADD 285. Audit available.

CADD 255. Kinematics Drafting. 3 Credits.
Introduces mechanisms that translate motion and force, including cams, gears, belts/pulleys and chains/sprockets. Introduces components such as pawls, ratchets, linkages and levers. Includes drawings of stock (shell) items and custom designs. Prerequisite: CADD 165, Audit available.

CADD 285. Advanced Inventor. 3 Credits.
Covers advanced techniques used in creating and modifying parametric, assembly-centric 3D models with Inventor. Develops extensive knowledge in the areas of part and assembly modeling, adaptive features, utilizing work groups, surfacing, managing data and the Engineers Notebook. Prerequisite CADD 165, or department permission. Audit available.