

# DRAFTING – MECHANICAL DESIGN (Occupational Program)

Curriculum Guide for Academic Year 2019-2020

## Table of Contents

Associate in Science Degree, p. 1  
 Certificate of Achievement, p. 2  
 Suggested Sequence of Classes, p. 3  
 Certificates of Accomplishment, p. 4  
     AutoCAD I, Fundamentals (108 hours), p. 4  
     AutoCAD II, Advanced Concepts (108 hours), p. 4  
     AutoCAD III, Visualization, Rendering, Animation (108 hours), p. 4  
     CAD Professional (324 hours), p. 4  
 Career Opportunities, p. 4  
 Program Mission and Outcomes, p. 5  
 Legend, p. 5

Students planning to **transfer** to a four-year college or university should refer to the ASSIST web site at [www.assist.org](http://www.assist.org) and **consult a counselor** before beginning a program of study. Please call 562-938-4561 for the LAC, or (562) 938-3920 for PCC to schedule a meeting with a counselor. Students may also wish to visit the Transfer Center on either campus.

Program of study leading to: <b>Associate in Science (A.S.) Degree</b>					
<u>Required Courses:</u>		UNITS	In Progress      Completed Grade		
	CAD 50	Mechanical Drafting, Introduction	2	<input type="text"/>	<input type="text"/>
†	CAD 51	Mechanical Drafting, Intermediate	2	<input type="text"/>	<input type="text"/>
	TEC 211	Print Reading for Industry	3	<input type="text"/>	<input type="text"/>
†	CAD 60	Geometric Dimensioning and Design	2	<input type="text"/>	<input type="text"/>
	<b>TOTAL UNITS</b>		<b>9</b>	<input type="text"/>	<input type="text"/>
<u>In Addition, Complete one of the following application (software) options:</u>		UNITS	In Progress      Completed Grade		
<b>AutoCAD: Please choose TWO (2) course from the following:</b>					
	CAD 202	AutoCAD Fundamentals	2	<input type="text"/>	<input type="text"/>
	DRAFT 203	AutoCAD II, Advanced Concepts	4	<input type="text"/>	<input type="text"/>
	DRAFT 204	3D Visualization/Animation	4	<input type="text"/>	<input type="text"/>
	<b>AutoCAD SUBTOTAL UNITS</b>		<b>6-8</b>	<input type="text"/>	<input type="text"/>
<b>CATIA: Please choose TWO (2) courses from the following:</b>					
	CAD 220	Introduction to CATIA	2	<input type="text"/>	<input type="text"/>
	DRAFT 221	Intermediate CATIA	3	<input type="text"/>	<input type="text"/>
	DRAFT 222	Advanced CATIA	3	<input type="text"/>	<input type="text"/>
	<b>CATIA SUBTOTAL UNITS</b>		<b>5-6</b>	<input type="text"/>	<input type="text"/>
<b>SolidWorks: Please choose TWO (2) courses from the following:</b>					
	DRAFT 230	Introduction SolidWorks Level 1	3	<input type="text"/>	<input type="text"/>
	DRAFT 231	Intermediate SolidWorks Level 2	3	<input type="text"/>	<input type="text"/>
	DRAFT 232	Advanced SolidWorks Level 3	3	<input type="text"/>	<input type="text"/>
	<b>SolidWorks SUBTOTAL UNITS</b>		<b>6</b>	<input type="text"/>	<input type="text"/>
	<b>OPTION A TOTAL UNITS</b>		<b>6-8</b>	<input type="text"/>	<input type="text"/>

In Addition, complete ONE (1) course from the following:			UNITS	In Progress	Completed Grade
ELECT 230A	Robotics Technology-Design		2		
ADMT 50	Advanced Manufacturing, Introduction		2		
MTFAB 50	Introduction to Metalworking		4		
WELD 50	Introduction to Welding		4		
<b>Subtotal Units</b>			<b>2-4</b>		
<b>MAJOR TOTAL UNITS</b>			<b>16-21</b>		

For graduation with an **Associate in Science (A.S.) Degree with a major in Drafting: Mechanical Design:**

- Minimum Unit Requirements:** Any course that appears on a curriculum guide and the General Education Pattern (Plan A) may fulfill both major and general education requirements (Approved by College Curriculum Committee Spring 2012). For this degree, complete a minimum of 60 units in courses numbered 1-599. Please note that additional elective units may be required to meet this minimum based upon courses selected to fulfill General Education for the Associate Degree.

Drafting: Mechanical Design Major    16-21 Units  
 General Education/ A.S. §    19 Units

- Scholarship:** Maintain an **overall grade point average (GPA) of 2.0** ("C" average) based on all accredited college work applied to the degree, no matter where completed. For this **field of concentration, complete each course above with a grade of "C" or better**, or "P" if course is graded on a P/NP basis.
- Residence for the Degree:** Complete at least 12 semester units of the required 60 semester units in residence at Long Beach City College in order for the college to grant an Associate of Arts and/or an Associate of Science Degree.
- Residence for the Field of Concentration:** Complete fifty percent (50%) or more of the unit requirements for this field of concentration in residence; this means at **least 8-10.5 units** of the required 16-21 units must be **completed at Long Beach City College**. Credit earned by exam, where applicable, may be included.
- General Education and Proficiency Requirements:** Complete the required A.A./A.S. General Education and Proficiency requirements\*, otherwise known as "Plan A". For Plan A requirements, refer to the general catalog or view it online at <http://osca.lbcc.edu>.
- General Education and Proficiency Requirements:** Complete the required A.A./A.S. General Education and Proficiency requirements\*, otherwise known as "Plan A". For Plan A requirements, refer to the general catalog or view it online at <http://osca.lbcc.edu>.
- Complete and submit the degree application form to the Admissions and Records office during your final semester of course work. These forms are available in the Admissions and Records office, or online at <http://admissions.lbcc.edu/>. Refer to the Schedule of Classes (<http://schedule.lbcc.edu>) and click the "Important Dates" link to view the actual deadline for each semester.

\*The requirements for general education/proficiency and the field of concentration (major) need to be from the same catalog year. This catalog year may be any year between the year of initial enrollment to the present, provided continuous enrollment is maintained throughout. See the catalog for definition of "continuous enrollment".

### Program of study leading to: **Certificate of Achievement**

<b>Required Courses: Core Skills 3907</b>			UNITS	In Progress	Completed Grade
	CAD 50	Mechanical Drafting, Introduction	2		
†	CAD 51	Mechanical Drafting, Intermediate	2		
†	CAD 52	CAD/CAM	2		
	TEC 211	Print Reading for Industry	3		
	CAD 60	Geometric Dimensioning and Tolerancing	3		
<b>TOTAL UNITS</b>			<b>12</b>		

<b>In Addition, Complete one of the following application (software) options:</b>			UNITS	In Progress	Completed Grade
<b>AutoCAD: Please choose TWO (2) courses from the following:</b>					
	CAD 202	AutoCAD, Fundamentals	2		
	DRAFT 203	AutoCAD II, Advanced Concepts	4		
	DRAFT 204	3D Visualization/Animation	4		

		<b>AutoCAD SUBTOTAL UNITS</b>	<b>6-8</b>	<input type="text"/>	<input type="text"/>
<b>CATIA: Please choose ONE (1) course from the following:</b>					
CAD 220	Introduction to CATIA		2	<input type="text"/>	<input type="text"/>
DRAFT 221	Intermediate CATIA		3	<input type="text"/>	<input type="text"/>
DRAFT 222	Advanced CATIA		3	<input type="text"/>	<input type="text"/>
		<b>CATIA SUBTOTAL UNITS</b>	<b>6</b>	<input type="text"/>	<input type="text"/>
<b>SolidWorks: Please choose ONE (1) course from the following:</b>					
CAD 230	Introduction SolidWorks Level 1		3	<input type="text"/>	<input type="text"/>
DRAFT 231	Intermediate SolidWorks Level 2		3	<input type="text"/>	<input type="text"/>
DRAFT 232	Advanced SolidWorks Level 3		3	<input type="text"/>	<input type="text"/>
		<b>SolidWorks SUBTOTAL UNITS</b>	<b>6</b>	<input type="text"/>	<input type="text"/>
<b>In addition, complete ONE (1) course from the following::</b>					
			<b>UNITS</b>	<b>In Progress</b>	<b>Completed Grade</b>
ELECT 230A	Robotics Technology - Design		2	<input type="text"/>	<input type="text"/>
† ADMT 50	Advanced Manufacturing, Introduction		3	<input type="text"/>	<input type="text"/>
† MTFAB 50	Introduction to Metalworking		4	<input type="text"/>	<input type="text"/>
WELD 50	Introduction to Welding		4	<input type="text"/>	<input type="text"/>
		<b>SUBTOTAL UNITS</b>	<b>2-4</b>	<input type="text"/>	<input type="text"/>
		<b>TOTAL UNITS</b>	<b>19-24</b>	<input type="text"/>	<input type="text"/>

For graduation with a **Drafting – Mechanical Design Certificate of Achievement – Core Skills**):

1. Complete each of the **REQUIRED COURSES** listed above with a **minimum grade of "C"**.
2. Complete fifty percent (50%) or more of the unit requirements for this field of concentration in residence; this means at **least 9.5-12 units** of the required 19-24 must be **completed at Long Beach City College**. Credit earned by exam, where applicable, may be included.
3. Complete and submit the certificate application form to the Admissions and Records office during your final semester of course work. These forms are available in the Admissions and Records office, or online at <http://admissions.lbcc.edu> Refer to the Schedule of Classes (<http://schedule.lbcc.edu>) and click the "Important Dates" link to view the actual deadline for each semester.

### Suggested Sequence of Classes

This is not an educational plan, as course offerings, student schedules, and circumstances vary. Students must meet all the prerequisites in order to be eligible for the sequence of courses.

A suggested, full-time sample sequence of courses for the required **60** units to reach an Associate Degree includes:

<u>First Semester</u>	<u>Units</u>	<u>Second Semester</u>	<u>Units</u>
CAD 50	2	DRAFT 51	2
DRAFT 201	4	DRAFT 202	3
<b>Semester Total</b>	<b>6</b>	<b>Semester Total</b>	<b>5</b>
<u>Third Semester</u>	<u>Units</u>	<u>Fourth Semester</u>	<u>Units</u>
DRAFT 52	2	DRAFT 203	3
DRAFT 60	3	DRAFT 52	2
<b>Semester Total</b>	<b>5</b>	<b>Semester Total</b>	<b>9</b>

Program of study leading to:

## Certificates of Accomplishment

### **Certificate: AutoCAD I, Fundamentals (108 Hours) 4015**

<u>REQUIRED COURSES</u>		UNITS	In Progress	Completed Grade
CAD 202	AutoCAD Fundamentals	2		
<b>TOTAL UNITS</b>		<b>2</b>		

### **Certificate: AutoCAD II, Advanced Concepts (108 Hours) 4016**

<u>REQUIRED COURSES</u>		UNITS	In Progress	Completed Grade
DRAFT 203	AutoCAD II, Advanced Concepts	4		
<b>TOTAL UNITS</b>		<b>4</b>		

### **Certificate: AutoCAD III, Visualization, Rendering, Animation (108 Hours) 4017**

<u>REQUIRED COURSES</u>		UNITS	In Progress	Completed Grade
DRAFT 204	3D Visualization/Animation	4		
<b>TOTAL UNITS</b>		<b>4</b>		

### **Certificate: CAD Professional (324 Hours) 4018**

<u>REQUIRED COURSES</u>		UNITS	In Progress	Completed Grade
DRAFT 202	AutoCAD I, Fundamentals	2		
DRAFT 203	AutoCAD II, Advanced Concepts	4		
DRAFT 204	3D Visualization/Animation	4		
<b>TOTAL UNITS</b>		<b>10</b>		

For graduation with a **Certificate of Accomplishment**:

1. Complete the above required units with a minimum grade point average of 3.0 ("B" average).
2. Fifty percent (50%) or more of the required units must be completed in residence at LBCC.

Complete and submit the certificate application form to the Admissions and Records office during your final semester of course work. These forms are available in the Admissions and Records office, or online at <http://admissions.lbcc.edu/>

## Career Opportunities

Students learn entry-level job skills in mechanical drafting and design.

The Associate Degree will prepare students for a mechanical-design-related career, and appropriate course selection will facilitate transfer to a professional degree program.

The Core Skills Certificate of Achievement will prepare students for an entry-level position as a mechanical drafter trainee in a variety of design professional settings and will serve as a foundation for specialization.

The Advanced Skills Certificate of Achievement will prepare student for an advanced position as a mechanical drafter or intermediate level drafting position in a variety of design professional settings and will serve as a foundation for specialization.

## **Program Mission and Outcomes**

To create an educational environment where students can achieve their individual goals by providing the knowledge and skills to enter the design field of their choice by using the latest technologies and industry trends.

Outcomes:

- Establish mastery of basic knowledge and skills and apply advanced technologies relevant to entering the mechanical drafting and design field at an entry or advanced level.
- Develop career awareness, planning, employability skills, work habits, and foundation knowledge necessary for success in the workplace
- Possess the necessary technical knowledge and communication skills to identify, articulate and solve problems pertaining to the industrial manufacturing environment and perform tasks required within the mechanical design drafting professions.

## **Legend**

† This course has a prerequisite. Prerequisite courses must be complete with at least a “C” or “P” grade. Refer to the General Catalog (<http://www.lbcc.edu/cat/index.html>), the Schedule of Classes (<http://schedule.lbcc.edu/>), or the online Credit Course Outline (<http://wdb-asir.lbcc.edu/coursecurriculum/coursedetails/>) for specific prerequisite information.