

***Technical Drawing 107 Syllabus***

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**Course Description:**

The goal of technical drawing is to communicate technical ideas. Other forms of communication, the written word or the spoken sentence, are woefully inadequate for this task. To succeed in this class, you will develop the necessary skills to communicate graphically through basic sketching and mechanical drawing, employing traditional drawing tools such as pencils, straightedges, triangles and scales. You will demonstrate, using drawing exercises, a working understanding of lines, their types and meaning, the various types of views, standard dimensioning practices, while at the same time, develop spatial analysis and visualization skills of 3-dimensional objects described by 2-dimensional drawings.

In addition, you will practice some of the soft skills required for successful employment in today's manufacturing world: problem solving, critical thinking, attention to detail, following instructions, showing up for work, asking for clarification when you don't understand, etc.

**Course Outcomes:**

This course will encompass many of the fundamental principles of graphics as they are used in the technical design field.

- Proper use of tools to achieve accurate and precise results
- Line types and line weights and their meanings.
- Scaling ratios commonly used in industry
- Lettering techniques
- Geometric construction problem solving
- Freehand sketching
- Dimensioning conventions for drawings
- Single and multi view Orthographic projections - Visualizing three dimensional objects in two dimensional space.
- Sectional views
- Primary and secondary or auxiliary views

**Prerequisite:**

You will be drawing objects using a variety of measurement systems, including decimal, fraction, and metric systems. Therefore, basic math skills will be helpful, particularly an understanding of fractions and base 10 decimals, as well as angles.

### **Required Text and Materials:**

The text for this course is: **Fundamentals of Modern Drafting by Paul Ross Wallach**

The drawing instruments listed below are required, and are available as a complete kit from the book store.

#### *Drawing Instruments:*

- T Square 24" long (if you plan to continue onto Tech D-127, then a 36" T Square is recommended)
- Architectural Scale
- Engineering Scale
- Metric Scale
- Triangles (avoid inking triangles that have tapered edges, you want square edges)
  - 30-60-90 Triangle 10" to 12" on longest edge
  - 45-45-90 Triangle 10" to 12" on longest edge
- Bow Compass capable of drawing a 5 ½" radius
- Dividers with 5 to 6 inch legs (optional, useful for navigation)
- Protractor (optional, triangles are more accurate)
- French Curve (optional, this is more of an artist tool)
- Drafting tape (not masking tape) or Tape Dots – one box
- Pencils:
  - *Here you have a choice*
  - **Wood Pencils** Hard (6H-8H), Medium (H-2H), Soft (HB or B) – **Mechanical Pencils** 0.3mm & 0.7mm *or* 0.5 & 0.9mm – buy pencil leads in the medium and soft range plus a hard wood pencil
  - **Clutch Pencils** – buy an assortment of 2mm leads covering the hardnesses listed above and a lead pointer.
- Eraser – Pink Pearl
- Erasing Shield
- Dusting Brush
- Small sandpaper pad for sharpening compass leads
- Circle template – 1" and smaller
- Isometric circle template
- Ames Lettering Guide
- small pad of graph paper. (5 squares per inch grid) for hand sketching, both rectangular and isometric grids.

This can also be printed from

<http://www.printfreegraphpaper.com/> as you need it. You will need about 10 to 20 sheets of each.



- Optional Drawing board – approximately 36” x 24” (for use outside of class, and you can use it in class too if you want).
- Portfolio case (instructor will discuss in class, no need to buy right away), but you might want to start watching the second hand stores for a good used inexpensive one. Refer at my Professor Online page where I talk about Portfolios.

### **Course Requirements:**

#### *Assignments*

The first portion of every class is dedicated to demonstrations, lectures, or activities designed to convey knowledge and understanding of the subject. After class demonstrations, an assignment will be given which will test your abilities to apply the information from the demonstration and from the book readings. Unless noted otherwise, drawing assignments are due by the end of the following class.

#### Drawing Assignment Grading Criteria:

Your work will be assessed and graded employing the following criteria. Not all criteria will apply to every assignment. Assignments must be judged to be at least 50% complete before they will be graded.

- Assignment accuracy and completeness – does your drawing convey the proper information clearly. Is the object being represented correct and complete, and dimensionally accurate? Did you follow the instructions, both written and verbal?
- Technical Accuracy – does your drawing follow the proper graphic standards: line weights and types, dimensions, labels, and technically correct?
- Line Quality – Are your lines of consistent weights, with clean ends and transitions? Do they copy clearly?
- Lettering Quality and Drawing Layout – Is your lettering consistent, neat and legible. Are light construction lines visible, and is the drawing composed properly and neatly on the sheet? Every line and note in a drawing has meaning, there are no meaningless lines. Does every line convey meaning or instructions?
- Critical Review – Take a close look at your final drawing before submitting it. If you see things that could be done better, but you don't have time or inclination to fix them, at least make a note on the back of the drawing. Seeing a problem is half of fixing it. You will get a better grade if you point out your drawing deficiencies.
- Timeliness – Is it turned in by the due date? You will have plenty of time to complete assignments, I would rather they be complete rather than on time. I don't normally mark off for being late, but I do expect the quality to be better as the quarter progresses. Also, note: the due dates displayed in Canvas are actually the assignment dates. Assignments are due when you get them done. If a zero appears in canvas for an assignment you have yet to turn in, don't panic, it is merely a place holder until you finish it.

- Does it have your name? Assignments without a complete name will not receive credit, and might not be returned, for obvious reasons (I don't know who to give it to). If you have turned in an assignment and after a week haven't received credit for it, check the inbox. It might be at the bottom and is missing your name.

In many ways, technical drawing is as much an art as a studied skill. It is not unusual to see hand drawn technical drawings framed and hanging on the wall. As in any art, Technical Drawing is learned through practice, and is not all memorized facts or theory. It is expected improvement will be shown over the course of the quarter. Therefore, assignments near the end of the quarter will be graded with a higher standard than those at the beginning of the quarter when the student is just starting out.

#### Revising or correcting drawings:

Drafting assignments may be revised or corrected per the instructor comments for an improved grade (up to 90%). It is acceptable to modify the original drawing to correct deficiencies as long as the final drawing remains fairly clean and neat. Otherwise, the drawing must be re-drawn. You only get one chance to revise a drawing, so be sure to make all the corrections the first time.

#### What is Cheating and what is allowed

All assignments are to be the original work performed by the student. Students may collaborate for ideas, concepts, and support, but each shall create and produce their own drawings. Tracing the work of others is absolutely unacceptable (you may trace your own work, however). Putting your name on someone else's drawing is also absolutely unacceptable.

#### Grade disputes

Students should store their drawings flat in their portfolio or a large envelope, and should retain all assignments until the course has been completed and graded. Keep all material returned for grade verification in case of a grade dispute. Sometimes, grades are not recorded correctly; it is the students responsibility to monitor their assignment grades on Canvas and notify the instructor of any discrepancies in a timely manner (do not wait until a disappointing grade is recorded at the end of the class before you decide to go point hunting).

#### *Portfolio*

A portfolio is required for this class. The portfolio is NOT a history of this class. It is a tool designed to showcase your talents so you can get a job. I require a portfolio in this class to get you started thinking about this, and I review the portfolio, not as an instructor, but as if I were a potential employer. Proper preparation of a portfolio allows students to showcase their work as well as hinting about their personality and professionalism. This is an important part of job interviews, and the student will be well served by beginning their portfolio now. The portfolio doesn't have to be expensive, but it should be professional looking and demonstrate your pride of the

contents. For additional information for portfolio requirements, refer to my Professor Online web page.

### *Quiz*

An on-line quiz will be periodically given on the subjects covered in each chapter in the book. Questions are based on the book, lecture, and independent research. If you don't know an answer, and you can't find it in the book, and I never talked about it, you may have to look it up on your own. We can, if you ask, review the quizzes in class, so if you are absolutely unsure and can't find a satisfactory answer, ask. Also keep in mind, some of the questions are designed to be controversial to generate discussion.

### *Exams*

A Final exam will also be given at the end of the quarter covering material from the entire quarter. It will include a combination of multiple choice questions, fill in the blank, and sketching exercises. It tends to focus on area where students typically have difficulties during the quarter, so you will want to study those subjects you don't fully understand.

### *Attendance and Participation*

Because of the extensive amount of information required to complete the drawing assignments, some of which is not in the book, attendance in all classes is encouraged. This class uses an active learning process where you learn by doing, so most of your time in class will be spent practicing your skills. Help from your instructor is instrumental in mastering the art of technical drafting. Drawings started in class have the advantage of instructor input and guidance. This approach, in most cases, will avoid unnecessary hours spent correcting and re-working drawing errors made during unsupervised drawing sessions.

Your attendance will be noted on a class by class basis and this record counts for a portion of your final grade. *Students arriving after attendance has been taken may not get credit for attendance.* As in most offices, you are allowed sick days. You can miss a class without it impacting your grade.

### **Final Grade**

Your final course grade will be based on a percentage system:

Drawing assignments	50%
Attendance	10%
Portfolio	10%
Quizzes	15%
Final	<u>15%</u>
Total	100%

The final grade recorded with the registrar is based on the percentage of available points you manage to earn during the course compared to the total possible. The total possible may vary depending on the progress of the quarter, but it is always 100%.

90%	4.0
80%	3.0+
70%	2.0+
60%	1.0+
57%	0.7+

Any percentage less than 57% is inadequate to receive class credit, and a grade of 0.0 will be recorded.

### **Withdrawal:**

If you decide that you must withdraw from this class, you must do so in conformance with Olympic College policy. A discontinuance of attendance without an Official Withdrawal Form or prior arrangement with the Instructor is an automatic 0.0 (F) for the class. This is school policy and governs all classes conducted at Olympic College.

### **About the Instructor and this class**

Ron Raty is a licensed architect with over 25 years of experience in architectural design and project management. He does not think of himself as a professional teacher. Therefore, his classes are managed in a manner similar to a design studio in a company, students should think of themselves as employees. They should arrive at work on time, they should complete their work in a timely manner, they should dress appropriately and act professionally and use appropriate language, they should show respect for their fellow employees and their employer. As in the work place, failure to do these things can have consequences.

### **American Disabilities Act Statement**

Any student who feels he/she may need an accommodation based on the impact of a disability should contact the office of Access Services. Access Services will inform the instructor of any special accommodations required.

Humanities and Student Services Building, Room 204  
Phone: 360-475-7540 or 1-800-259-6718 ext. 7540  
Fax: 360-475-7436  
E-mail: [AccessServices@olympic.edu](mailto:AccessServices@olympic.edu)

**A drafting station at home:**

Because the process of producing good mechanical drawings takes time and concentration, it is a good idea to set up a drawing station at home. It also allows you the freedom of working at home instead of on campus to finish an assignment. Choose a location that is comfortable, quiet and well lit. A portable drawing board is available at the book store for this purpose. Some of them even have parallel rules attached, which avoids having to deal with the T-square.

**A word about equipment:**

Look for good quality, smooth operating tools. The bookstore offers a drafting kit that contains all the equipment you need for the class. The tools available in the drafting kit are adequate, but because of economics, they are not of the highest quality. Quiet often, used older tools that can be found at a fraction of the cost of new, and they are very often made of high quality brass or bronze, much superior to the tools in the kit. A little time spent shopping the second hand stores or enquiring of retired friends and relatives can often pay big dividends in quality equipment.

**Cell Phones:**

Cell phone use during lectures and presentations is prohibited in the classroom. Please set your phone to vibrate or turn it off. If you have to take or make a call during class, please step out of the classroom as a courtesy to others.

**Food and Drink:**

In accordance with school policy, food and drinks are not allowed in the drafting room. During lab time, students may come and go as necessary to refresh themselves. Restrooms are down the hall towards the Welding lab.

**Sleeping in Class:**

If you feel the need to sleep, please go home or to the Library or someplace more appropriate. If you are sleeping in class, you won't get anything done, you will not benefit from the sleep, and the instructor will have to keep waking you up to make sure you're not dead. If you are going to sleep in class, you might as well go home.

**The 10 most common reasons for losing points.**

1. Poor drawing layout. Plan ahead with your drawing layout. The drawing should look visually centered on the paper, not crowded off to one edge.
2. No layout lines. Don't erase your light layout lines. They give excellent information to the instructor about how you developed your drawing, plus they give the drawing a certain artistic look. Layout lines should be light enough that they won't or barely copy, and won't visually interfere or confuse the rest of the drawing.
3. Drawing too light. Drawing lines should be as black as ink, so they copy without fading. Don't be afraid to go over lines multiple times if necessary to get it black. Use a softer pencil if necessary.
4. Poor lettering practices. Use guidelines to control the top/bottom of your lettering and keep it straight and consistent in height. When lettering, use a straight edge for vertical strokes to maintain consistency. Horizontal strokes can be free hand.
5. Circles too light or sketchy. When using a compass to draw circles, use a soft lead (HB) to get black lines. Don't free hand the circles to darken them. I would rather see light lines than free hand lines. The compass comes with a harder 2H lead, you should swap it out for a softer lead.
6. Circle lines too skinny. For thicker circle lines, dull the chisel point of your compass with the sand paper. You may have to go around the circle several times to get it thick and dark. Each time you go around, the chisel point wears down a little, and the line gets a little thicker.
7. Incomplete title blocks. Fill your title blocks with quality block lettering, using guidelines, just like everywhere else on your drawing. Fill in all the spaces, including a complete name. It is acceptable to create your own personalized title block, as long as all the information is included.
8. Line weight contrast. Maintain good obvious contrast between the thick and thin lines on your drawings. The thick object lines should jump out of the page and be obvious. The thinner lines, which show additional or clarifying information, should fall to the background. As a guideline, a 2 to 1 ratio works well.
9. Non-tangent arcs or circles. Tangent lines and arcs should have nice smooth transitions, no sharp corners. If there is a sharp corner, then they aren't tangent.
10. Read ALL the instructions, and follow them. This includes book instructions, instructions on Canvas, and instructor instruction given verbally.