



**48-175**

# **Descriptive Geometry**

Spring Semester • 9 units • UT 1.30-2.50



Carnegie Mellon University - Qatar Campus



- **email**

[ramesh@cmu.edu](mailto:ramesh@cmu.edu)

- **blackboard**

access via ...

- **website**

[www.andrew.cmu.edu/~ramesh/teaching/course/48-175/](http://www.andrew.cmu.edu/~ramesh/teaching/course/48-175/)

- **Descriptive Geometry** ←

- Topics
- Text and materials
- Duration
- Grading
- Recitation
- Office hours
- Special needs
- Attendance
- FAQ

**Gaspard Monge** - remembered as the

man who both invented – at the very tender age of 18 – a technique –

Descriptive Geometry on which all modern graphical communication is based and initiated a fundamental change in the teaching of constructive geometry.

Two other noteworthy achievements:

- Founded the École Polytechnique
- Went on the expedition to Egypt that found the Rosetta Stone

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- Practical methods in 2-D geometry
- Basics of 3-D descriptive geometry
- Lines in descriptive geometry
- Planes in descriptive geometry
- Spatial relations on lines
- Intersections (of lines and planes)
- Rotations in 3-dimensional space
- Location of points and tangent planes on solids and surfaces
- Intersection of geometric solids and surfaces
- Shades and shadows
- Axonometric and perspective projections
- Development of surfaces

- Descriptive Geometry
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I have written a **course text**

You will need a **compass, triangles, ruler, protractor, pencils, erasers** to do the assignments and exams.

A **portable drawing board** is handy for those who are not architecture majors. All are reasonably priced and easily available.

I expect you to follow my drawings in class.

Drawings on letter sized or A4 paper for most assignments.

I may require you to deal with A3 paper for the exams.

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### **Classes Sundays & Tuesdays**

- Approx. 14 weeks or 25 lectures

**2-hour Final exam in April**

**2-hour Mid-term during exam  
week of February/March**

**Assignments every two weeks** –  
handed out on a lecture day and  
due 14 days later on the same  
lecture day in class

Date	Class	Assignment	Text
Week 1	About the course		
Week 2	Geometric Constructions	<u>A1 due wk 4</u>	<u>Chapter 1</u>
Week 3	Basics of Descriptive Geometry		<u>Chapter 2</u>
Week 4	Lines in Descriptive Geometry	<u>A2 due wk 6</u>	<u>Chapter 3</u>
Week 5	Planes in Descriptive Geometry		<u>Chapter 4</u>
Week 6	Spatial Relations on Lines	<u>A3 due wk 8</u>	<u>Chapter 5</u>
Week 7	Plane Intersections and Piercing Points		<u>Chapter 6</u>
Week 8	<b>SPRING BREAK - NO CLASS</b>		

Date	Class	Assignment	Text
Week 9	Mid-term exam review	<u>A4 due wk 11</u>	
Week 10	Method of Revolution		Chapter 7
Week 11	Solids and Surfaces	<u>A5 due wk 13</u>	Chapter 8
Week 12	Shades and Shadows		Chapter 9
Week 13	Axonometric Projection	<u>A6 due wk 15</u>	Chapter 10
Week 14	Central Projections		Chapter 11
Week 15	Open topic		
Week 16	<b>EXAM WEEK - NO CLASS</b>		



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Posted **after Tuesday lectures** on  
Blackboard

### **Due Tuesday fortnight later**

Assignments will be accepted late up to  
48 hours after the deadline.

There is a penalty of 1 point per  
problem per 12 hours.

In addition to the physical copy, late  
assignments should be scanned and  
submitted via blackboard for timestamp  
purposes

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I DISLIKE grades !!!

Poor grades say one of two things to a  
any student on this campus

– *you're bright and no mistake !*

(prerequisite to get into CMU)

Either

You have no aptitude for the subject  
(that's forgivable)

Or

You don't try (that's not forgivable)

– so TRY

Sadly, grades are a NECESSARY evil !!!

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**A**  
90-100  
Excellent

**B**  
80-90  
Good

**C**  
70-80  
Fair

**D**  
60-70  
Pass

**R**  
<60  
Sorry, but if you are in Architecture,  
you'll have to retake the course

**Assignments 60%**  
**Final 24%**  
**Mid-term 12%**  
**Recitation 4%**

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In class participation make up 4% of your grade.

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I am available **on my teaching days**

**Sundays + Tuesdays**

My office is .....

I always respond to email

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As long your needs fulfills any legitimate reason accepted by this university.

I'll do my best if it is within my power to help.

If not, you must contact your primary academic advisor in your home department

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I don't take attendance ..

open laptop, tablets, email, social networking are **banned** during lectures

However ... I follow the 'Buckley Amendment' now known as the **'FERPA'** rules

I return your assignments to **you and only you** ... in class (or in my office afterwards)

I discuss your grades, assignments, exams with **you and only you** ... after class or in my office

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*Is this course even necessary in this day and age of design computing?*

In one sense, not really

In another, absolutely

*Then why?*

It depends on you.

Every good designer understands geometry and understands it well and constructively.

Conversely, any designer who does not understand geometry is unlikely to be good.



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*Is THIS in the exam?*

**Yes and then some**

*What's NOT in the exam?*

**Everything else**

*It's CLOSED BOOK?!*

**Yes**

*You DON'T grade on a curve!*

**No ... I don't grade on a curve**

*You DON'T!!*

**No ... I don't**

*You cannot be SERIOUS!*

***I usually am and I am now***

▶ about the course (this is a joke)

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- **Clearance waiver** ←

Because Descriptive Geometry was once classified as ***a military secret.***

It has not been declassified as such you will need to sign a waiver.

Actually it is proforma.

All you need to do see Erica Harp at the main office and give her your name and say you agree to whatever is required for this course.

She will understand – just make sure she has taken down your name.

FIGURE 31

*“to study architectural shadows carefully and with his [sic!] artistic faculties fully awake to their essential value, that he may express them quickly, readily and truly on all his studies in design...”*



*“shadows should have influenced, most intimately and constantly, however gradually and unconsciously, the development of styles in different latitudes.* It is hard to imagine that the *broad and simple designs of the Greek* could have been evolved in a northern climate where the low-lying sun would have never modeled them as does the *brilliant southern sunlight for which they were intended...*”

