How This Course Works.

• We have a Web Page: http://faculty.tcc.fl.edu/scma/jonesd

• We have email: jonesd@tcc.fl.edu
  (You need to check your “mymail.tcc.fl.edu” account at least twice a day, morning & evening.)

• We have BlackBoard: http://blackboard.tcc.fl.edu
  where you will find your grades. You can also get to the ODE Web Page through BlackBoard.
• We have **CourseCompass / MyMathLab (MML)**. It is found at [http://portal.coursecompass.com/](http://portal.coursecompass.com/). There you will find Quizzes and **some** homework.

• We have **class** – in more ways than one!
  – Class = Maturity, style, and character.
  – Class Periods. You need to attend!

• We must have **commitment!** – I’ll talk about this all semester!
Let’s Do Some Calc03!

PRELIMINARY

• Look at the *Differentiation Rules* on the inside front cover-page of your textbook. Do you know all these rules? You should! (It would really be great if you knew how to derive them, but I guess that’s too much to expect!)
Let’s Do Some Calc03!

PRELIMINARY // Cont.

• Look at the *Trigonometry Formulas*, which are right after the Index and right before the “Brief Table of Integrals” in the back of your textbook. Do you know all these formulas? You should! (It would really be great if you knew how to derive at least *some* of them!)
Let’s Do Some Calc03!

PRELIMINARY // Cont.

• In the “Table of Integrals” at the back of your textbook, you should know the following integral formulas: #1 – 4, 6, 16, 28, 56, 57, 82, 88, 90, 102, 109, 113, 114, 123, and 124.

• You should be fairly familiar with the first five Taylor Series listed on the “Series” page (right after the Table of Integrals).
Let’s Do Some Calc03!

PRELIMINARY // Cont.

• You should at least be familiar with the Binomial Series, which is also listed on the “Series” page.

• You should know all the limit formulas on the “Limit” page, which comes next.

• And then on the last page of the book, you should know all the “Integration Rules.”
Now We Can Get Into Sect. 12.1
Sect. 12.1 – Three-Dimensional Coordinate Systems
(p. 832)

• There are four (4) topics to be learned in this section:
  • The “Right-Hand Rule.”
  • Equations of “basic” objects in 3-Space.
  • The Distance Formula.
  • The Equation of a Sphere.
• The “Right Hand Rule.”

Pretend for just a moment that you are a little kid, and stick out your right hand as if it were a gun. (index finger – the barrel and thumb – the hammer). Now extend your middle finger so that it is perpendicular to both your index finger and your thumb. – – – You are now looking at the “Right Hand Rule:” Your **index finger** is the **positive x-axis**; your **middle finger** is the **positive y-axis**; and your **thumb** is the **positive z-axis**.
Sect. 12.1
Discussion

• Equations of basic objects in 3-Space.

Example.

In 2-Space, \( x + y = 1 \) is an equation for a (straight) line. But if we are now considering this equation in 3-Space, we must take z into account. But z is not mentioned in this equation. Now you must understand that equations place restrictions and/or conditions on the coordinate variables. This equation places no restrictions on the z-coordinate. Therefore, as long as the x plus the y equals 1, z can be anything at all. Thus the equation represents a plane in 3-Space.
Sect. 12.1

Discussion

• The Distance Formula (comes from Pythagoras)
• In 2-Space it looks like this

If \( P_1(x_1,y_1) \) and \( P_2(x_2,y_2) \), then
\[
d(P_1, P_2) = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}
\]

• In 3-Space it looks like this

If \( P_1(x_1,y_1,z_1) \) and \( P_2(x_2,y_2,z_2) \), then
\[
d(P_1, P_2) = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2 + (z_2 - z_1)^2}
\]
Sect. 12.1
Discussion

• The **Sphere**

• The Circle in 2-Space – (Center-Radius Form)
  Example: \((x-7)^2 + (y+3)^2 = 4\)
  What is the radius? What are the coordinates of the center?

• The Sphere in 3-Space – (Center-Radius Form)
  Example: \((x-7)^2 + (y+3)^2 + (z+5)^2 = 4\)
  What is the radius? What are the coordinates of the center?
Sect. 12.1
Discussion

• Sphere in STANDARD FORM:

\[ Ax^2 + By^2 + Cz^2 + Dx + Ey + Fz + G = 0 \]

• How do you get from Standard Form to Center-Radius Form and vice-versa?

• Hint: Completing the Square!