Unit 6: Applications of the Definite Integral in Geometry, Science, and Engineering

16 Lessons (2.5 weeks)

C#4

Objectives	Methods	Resources	Assessment
The students will 1. use the definite integral to find the area between two curves. 2. find volumes of three-dimensional solids by slices, disks and washers methods. 3. find volumes of three-dimensional solids by cylindrical shells methods. 4. use definite integrals to find "work" as defined in physics and engineering.	• teacher lecture • teacher working examples on the board • student guided practice of problems in book • cooperative learning groups • individual assistance • partner work • homework	• Calculus, 6th Ed., James Stewart; Thomson Brooks/Cole, 2008	• check homework • Quizzes • Tests • Oral response • Board work

Unit 7: Inverse Functions: Exponential, Logarithmic, and Inverse Trigonometric functions

22 Lessons (3 weeks)

C#6, C#7, C#10

Objectives	Methods	Resources	Assessment
The students will 5. find and graph inverse functions. 6. discover and use the relationship between the derivative of a function and the derivative of its inverse. 7. review properties and uses of exponential and logarithmic functions. 8. memorize and use the derivative formulas for exponential and logarithmic functions. 9. develop, memorize and use the derivative formulas for inverse trigonometric functions. 10. use L'Hospital's Rule to find limits of indeterminate forms.	• teacher lecture • teacher working examples on the board • student guided practice of problems in book • cooperative learning groups • individual assistance • partner work • homework	• Calculus, 6th Ed., James Stewart; Thomson Brooks/Cole, 2008	• check homework • Quizzes • Tests • Oral response • Board work

Unit 8: Techniques of Integration

26 Lessons (4 weeks)

C#9

Objectives	Methods	Resources	Assessment
The students will 11. overview methods for evaluating integrals. 12. evaluate integrals using integration by parts 13. use trigonometric identities to integrate certain combinations of trigonometric functions 14. evaluate integrals using trigonometric substitution 15. integrate rational functions using partial fractions 16. develop a strategy to evaluate integrals using the techniques learned in this unit. 17. perform numerical integration approximation using the Midpoint Rule, Trapezoidal Rule and Simpson's Rule. 18. evaluate improper integrals of Type 1 and Type 2	• teacher lecture • teacher working examples on the board • student guided practice of problems in book • cooperative learning groups • individual assistance • partner work • homework	• Calculus, 6th Ed., James Stewart; Thomson Brooks/Cole, 2008	• check homework • Quizzes • Tests • Oral response • Board work

Unit 9: Applications of INtegration

4 Lessons (1 week)

C#8

Objectives	Methods	Resources	Assessment
The students will 19. find the length of a plane curve. 20. find the area of a surface of revolution.	• teacher lecture • teacher working examples on the board • student guided practice of problems in book • cooperative learning groups • individual assistance • partner work • homework	• Calculus, 6th Ed., James Stewart; Thomson Brooks/Cole, 2008	• check homework • Quizzes • Tests • Oral response • Board work

Unit 10: Differential Equations

13 Lessons (2 weeks)

C#12

Objectives	Methods	Resources	Assessment
The students will 21. model population growth using differential equations 22. express differential equations using direction fields. 23. use Euler's method as a numerical approximation to the specific solution of a differential equation. 24. solve separable differential equations. 25. solve exponential growth and decay problems. 26. use Newton's Law of Cooling 27. understand and use the logistic differential equation.	• teacher lecture • teacher working examples on the board • student guided practice of problems in book • cooperative learning groups • individual assistance • partner work • homework	• Calculus, 6th Ed., James Stewart; Thomson Brooks/Cole, 2008	• check homework • Quizzes • Tests • Oral response • Board work

Unit 11: Infinite Sequences and Series

30 Lessons (4.5 weeks)

C#11, C#13, C#14, C#15

Objectives	Methods	Resources	Assessment
The students will 1. review basic ideas concerning sequences and series. 2. determine whether a sequence converges or diverges. 3. determine whether a series converges or diverges using: - integral test - p-series comparison - geometric series with $\|r\|<1$ - comparison test - test for divergence - alternating series test - ratio or root test 4. find the radius of convergence and the interval of convergence for a power series 5. represent functions as power series 6. represent functions as Maclaurin and Taylor series 7. evaluate integrals as infinite series	• teacher lecture • teacher working examples on the board • student guided practice of problems in book • cooperative learning groups • individual assistance • partner work • homework	• Calculus, 6th Ed., James Stewart; Thomson Brooks/Cole, 2008	• check homework • Quizzes • Tests • Oral response • Board work