APTECH 90B Course Outline as of Fall 2015

CATALOG INFORMATION

Dept and Nbr: APTECH 90B   Title: QUANT REASON/APTECH
Full Title: Quantitative Reasoning in Applied Technology
Last Reviewed: 10/17/2011

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total		
Maximum	4.00	Lecture Scheduled	4.00	17.5	Lecture Scheduled	70.00
Minimum	4.00	Lab Scheduled	0	6	Lab Scheduled	0
		Contact DHR	0		Contact DHR	0
		Contact Total	4.00		Contact Total	70.00
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 140.00   Total Student Learning Hours: 210.00

Title 5 Category: AA Degree Applicable
Grading: Grade Only
Repeatability: 00 - Two Repeats if Grade was D, F, NC, or NP
Also Listed As:
Formerly: CET 90B

Catalog Description:
A course in quantitative reasoning which applies trigonometry principles to problems encountered in surveying, civil engineering, construction, electronics and related engineering technologies.

Prerequisites/Corequisites:
Course Completion of APTECH 90A (or CET 90A)

Recommended Preparation:

Limits on Enrollment:

Schedule of Classes Information:
Description: A course in quantitative reasoning which applies trigonometry principles encountered in surveying, civil engineering, construction, electronics and related engineering technologies. (Grade Only)
Prerequisites/Corequisites: Course Completion of APTECH 90A (or CET 90A)
Recommended:
Limits on Enrollment:

Transfer Credit: CSU;
Repeatability: Two Repeats if Grade was D, F, NC, or NP

ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:

AS Degree:	Area		Effective:	Inactive:
	B	Communication and Analytical Thinking	Fall 2009	Spring 2016
	B	Communication and Analytical Thinking	Fall 1981	Fall 2009
	MC	Math Competency		
CSU GE:	Transfer Area		Effective:	Inactive:
	B4	Math/Quantitative Reasoning	Fall 1991	Fall 1997
IGETC:	Transfer Area		Effective:	Inactive:
CSU Transfer:		Effective:	Inactive:	
UC Transfer:		Effective:	Inactive:	

CID:

Certificate/Major Applicable:
Both Certificate and Major Applicable

COURSE CONTENT

Outcomes and Objectives:
The student will be able to:
1. State the purpose, function and application of trigonometry, including definitions, characteristics of functions, radian and degree measurements, and inverse functions.
2. Use the Pythagorean theorem to lay out a right triangle with a tape measure.
3. Use trigonometry to solve right and oblique triangles as used in construction trades.
4. Apply vectors to analysis of horizontal and vertical components of forces.
5. Calculate lengths of arcs and areas of sectors found in the construction trades.
6. Graph and analyze trigonometric functions with respect to amplitude, periodicity and resonance.

Topics and Scope:

1. Application of Trigonometric Functions
    a. definitions for surveying
    b. characteristics of functions used
    c. radian and degree measurements to triangular lots
    d. right triangles as found in construction applications
    e. length and areas of sectors (i.e. streets and highway curves)
2. Application involving Oblique Triangles

a. applying trigonometric functions to similar triangles
   b. oblique triangles
   c. area of triangles
   d. Law of Sines
   e. Law of Cosines
   f. ambiguous triangles and associated errors in judgment
3. Components of Vectors and Vector Addition
   a. definition of vectors
   b. addition and subtraction of vectors
   c. complex numbers
   d. polar coordinates
4. Applications of Arc Lengths and Areas
   a. length and areas of sectors (i.e. streets and highway curves)
   b. analytic geometry
   c. irregularly shaped lots
5. Application of Sine and Cosine Graphs
   a. general graphing of functions and graphing by the addition of coordinates
   b. analysis of amplitude, periodic function and resonance

Assignment:

1. Daily reading outside of class (20-40 pages per week)
2. Problem set assignments (1-6 per week)
3. Quizzes (1-4 per semester)
4. Exams (1-8 per semester); Final
5. Projects (Calculator explorations and application activities) (2-8 per semester)

Methods of Evaluation/Basis of Grade:

Writing: Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

None, This is a degree applicable course but assessment tools based on writing are not included because problem solving assessments are more appropriate for this course.	Writing 0 - 0%

Problem Solving: Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Problem set assignments	Problem solving 5 - 20%

Skill Demonstrations: All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

Projects	Skill Demonstrations 5 - 10%

Exams: All forms of formal testing, other than skill performance exams.

Objective examinations (multiple choice, true false, matching, completion, etc.), quizzes and final.	Exams 70 - 85%

Other: Includes any assessment tools that do not logically fit into the above categories.

None	Other Category 0 - 0%

Representative Textbooks and Materials:
Technical Mathematics, Paul A. Carter: Wiley, 2011
Technical Mathematics, Dale Ewen: Prentice Hall, 2004.