ABSTRACT

Course Abbreviation and Number: MATH 125	**Course Title: Pre-calculus**
Number of Units:3	
College or Program: ☐CHABSS X CSM ☐CEHHS ☐COBA ☐Other_____	**Desired term of implementation:** X Fall ☐Spring ☐Summer Year2014	**Mode of Delivery:** X face to face ☐hybrid fully on-line
Course Proposer (please print):Marshall Whittlesey	**Email:mwhittle@csusm.edu**	**Submission Date:Feb. 2014**

1. Course Catalog Description: Designed for students preparing to take MATH 160. Equations and inequalities, functions, graphs, polynomial and rational functions, trigonometric functions, exponential and logarithmic functions, systems of linear equations, conics, sequences and series, and the binomial theorem.

2. GE Syllabus Checklist: The syllabi for all courses certified for GE credit must contain the following:

☑	Course description, course title and course number
☑	Student learning outcomes for General Education Area and student learning objectives specific to your course, linked to how students will meet these objectives through course activities/experiences
☑	Topics or subjects covered in the course
☑	Registration conditions
☑	Specifics relating to how assignments meet the writing requirement
☑	Tentative course schedule including readings
☑	Grading components including relative weight of assignments

SIGNATURES

Course Proposer _____ 2/25/14   Department Chair _____ 2/25/14   Kvalgen

Please note that the department will be required to report assessment data to the GEC annually.   DC Initial

Library Faculty _____ Date 2/27/14   Support ☒ Do not support* ☐

Impacted Discipline Chair _____ Date 2/25/14   Support ☒ Do not support* ☐   Price Physics

Impacted Discipline Chair _____ Date   Support ☒ Do not Support* ☐

GEC Chair _____ Date   Approve ☐ Do not Approve ☐

cs

***** If the proposal is not supported, a memo describing the nature of the objection must be provided.**

Course Coordinator: Varies each year. Contact the Dept. Chair for a name.   Phone   Email:

CHEM _____ support 2/26/14 ☒

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California State University, San Marcos General Education Program
GENERAL EDUCATION NEW COURSE CERTIFICATION REQUEST
• AREA B4: Mathematics and Quantitative Reasoning
See GE Handbook for information on each section of this form

Part A: B4 Quantitative Reasoning General Education Learning Outcomes (GELOs) related to course content.
[Please type responses into the tables.]

Math/Quant Reasoning GELOs this course will address:	Course content that addresses each GELO.	How will these GELOs be assessed?
B4.1: Explain and apply a variety of fundamental mathematical concepts, symbols, computations and principles.	Concepts: 1-variable equation; function;graph;sequences and series. Symbols: x,y,f(x);e,log,binary operation symbols,sigma and factorial symbols. Computations: all those involving polynomials, roots, rational, exponential, logarithmic, trigonometric and factorial functions. Principles: the same operation applied to two sides of an equation results in another equation; the product of factors which equal zero means that one of the factors must be zero; division by zero is not allowed; multiplication of both sides of an inequality by a positive (negative) makes the inequality stay the same (change);finding all solutions of an equation involves involves finding necessary and sufficient conditions for being a solution.	Students will be given a problem involving one or more of the concepts learned and be expected to solve it using the relevant symbols and computations and principles. Students will be expected to state their solution in a logical manner.
B4.2: Determine which quantitative or symbolic reasoning methods are appropriate for solving a given problem and correctly implement those methods.	Solution methods for various kinds of 1-variable equations: linear, quadratic, square root, polynomial, rational, trigonometric, exponential and logarithmic.	The student will be given a 1-variable equation and be expected to determine what method of solution is appropriate, and implement it properly.

Part B: General Education Learning Outcomes required of all GE courses related to course content:

GE Outcomes required of all Courses	Course content that addresses each GE outcome?	How will these GELOs be assessed?
Students will communicate effectively in writing to various audiences. (writing)	Homework and exam problems will require students to explain their thinking.	Students will be expected to write out solutions to problems, explaining their thinking.
Students will think critically and analytically about an issue, idea or problem. (critical thinking)	Problems given will require students to determine what is being asked of them, think about what method/procedure of solution is appropriate, and properly implement that method/procedure.	Students will be expected to solve problems by using accepted principles of mathematical thinking in a logical way.

Part C: GE Programmatic Goals: The GE program aligns with CSUSM specific and LEAP Goals. All B4 courses must meet at least one of the LEAP Goals.

GE Programmatic Goals	Course addresses this LEAP Goal:
LEAP 1: Knowledge of Human Cultures and the Physical and Natural World.	☐ No X Yes
LEAP 2: Intellectual and Practical Skills	☐ No X Yes
LEAP 3: Personal and Social Responsibility	☐ No ☐ Yes
LEAP 4: Integrative Learning	☐ No ☐ Yes
CSUSM Specific Programmatic Goals	**Course content that addresses the following CSUSM goals. Please explain, *if applicable.***
CSUSM 1: Exposure to and critical thinking about issues of diversity.	X ☐ No ☐ Yes *(please describe):*

CSUSM 2: Exposure to and critical thinking about the interrelatedness of peoples in local, national, and global contexts.	X☐ *No* ☐ *Yes (please describe):*

Part D: Course requirements to be met by the instructor.

Course Requirements:	How will this requirement be met by the instructor?
Course meets the All-University Writing requirement: A minimum of 2500 words of writing shall be required for 3+ unit courses.	Students will be expected to write out solutions to problems, explaining their thinking.
All courses offered in area B4 must have a prerequisite of at least intermediate algebra and must use a level of mathematics beyond that of intermediate algebra. No remedial algebra courses (e.g., Math 10, 20, and 30) can be used to satisfy this requirement. Even if a course has intermediate algebra as a prerequisite, it will not satisfy the Quantitative Reasoning Requirement unless it also meets each of the following three conditions:	Math 125 (pre-calculus) has an explicit prerequisite of ELM (intermediate algebra). Pre-calculus is considered to be a level of algebra above the level of intermediate algebra, as it involves extensions of the methods of symbolic and equation techniques done in intermediate algebra.
• It must focus on the use of mathematical language and formal reasoning in a variety of diverse disciplines, using a broad range of examples.	The mathematical language used includes: notions of variable, equation, solution, function, graph, sequence, series. Students study these things and focus on solving problems concerning them. Formal reasoning includes using the ideas that: the same operation applied to two sides of an equation results in another equation; the product of factors which equal zero means that one of the factors must be zero; division by zero is not allowed; multiplication of both sides of an inequality by a positive (negative) makes the inequality stay the same (change); finding all solutions of an equation involves finding necessary and sufficient conditions for being a solution. These ideas are used as justifications for each step in a problem as a student proceeds to a solution. The language and reasoning are applied to a variety of disciplines in several ways. In word problems students learn that abstract ideas such as a variable, graph, sequence or series could represent something concrete in many areas: finance, chemistry, biology, physics, construction, taxation, agriculture, economics, medicine, psychology, sociology, etc. These examples are intended to help the student understand the broad application of the subject.
• It must provide some historical perspective on the role which this approach has played in the development of human knowledge and of our understanding of the world.	Students are introduced to some of the most well-known people in the development of algebra in the last 2,000 years, as well as the rough times that important discoveries occurred, and how these people and discoveries relate to material studied in the course. Here are some examples. They learn that the word algebra has Arabic roots, and how the word itself relates to techniques of problem solving. They learn that Diophantus of Alexandria coined the idea of the abbreviated word form (i.e., letters stand for unknowns) and its use in solving problems in class. They learn that the Cartesian coordinate system and logarithm were invented much later (1600s) in response to the development of more complex problems. While solving polynomial equations, they learn that Gauss proved the

	fundamental theorem of algebra concerning when and how they are solvable. They learn that usage of trigonometric functions began slowly about 1500 years ago with the measurement of chords in circles, which led directly to the sine function. Other trigonometric functions came later.
• It must demonstrate a variety of methods, such as the use of abstract symbols, of numeric techniques, of logical reasoning, of geometry, etc.	Methods demonstrated include: usage of variables to represent quantities; usage of solution technique to solve equations; usage of graphs to understand patterns and trends easily via picture; usage of a set of principles which are used to justify moving from one assertion to the next; usage of functions to show relationships between variables.
A **statistics component** may be included which must:	
• Develop the students' ability to comprehend the power and broad utility of the fundamental mathematical models presented, rather than merely teaching rote statistical skills; and	N/A to Math 125
• Must indicate applications to several areas.	N/A to Math 125
A **computer science component** may be included which must:	
• Teach a computer language that is suitable for use in diverse areas;	N/A to Math 125
• Teach this language in such a way that the student is led to a fundamental understanding of the nature of problem solving by combining data structures with algorithms; and	N/A to Math 125
• Provide fundamental skills in the use of computers for the application of university level quantitative methods to the solution of problems in many diverse areas.	N/A to Math 125

Marshall Whittlesey

From: Jocelyn Ahlers
Sent: Tuesday, February 04, 2014 3:43 PM
To: Marshall Whittlesey
Subject: Re: signatures

Hi, Marshall -
Those people and their recertifications... :)

I'm happy to sign off on all of these. Does this email constitute a signature, or do you need me to print, sign, and send them?
Thanks,
Jocelyn

Marshall Whittlesey

From: Marshall Whittlesey
Sent: Monday, February 03, 2014 4:53 PM
To: Jocelyn Ahlers
Subject: signatures
Attachments: math160B42014.docx; math160sylgeneric.doc; math125B42014.docx; math125sylgeneric.doc

Jocelyn,

I'm going to need your signatures on whichever of these B4 forms you think 'impacts' Liberal Studies due to the depth of study requirement.

No changes in delivery of the courses is intended. It's just the routine recertification that somebody is making us do - I forget who. ☺

Let me know if you have any concerns.

Thanks.

Marshall

Marshall Whittlesey

From:	Jeff Nessler
Sent:	Monday, February 03, 2014 8:49 AM
To:	Marshall Whittlesey
Subject:	Re: GE forms

Marshall,

These look fine to me.

Jeff

From: Marshall Whittlesey <mwhittle@csusm.edu>
Date: Friday, January 31, 2014 5:57 PM
To: Tracey Brown <traceyb@csusm.edu>, Jose Mendoza <jmendoza@csusm.edu>, Edward Price <eprice@csusm.edu>, Ricardo Fierro <fierro@csusm.edu>, Andre Kundgen <akundgen@csusm.edu>, Jeff Nessler <jnessler@csusm.edu>
Subject: GE forms

Dear Department chairs,

As you know, GEC is doing a comprehensive review of lower division GE this year, and we're filling out the GE forms. I am filling out these forms for the mathematics department. I believe you chair departments which are 'affected disciplines' for Math 125 and/or 160, so your signature on these forms would be in order.

Please take a look at the files and let me know if you are prepared to sign the B4 form under 'impacted discipline', or if you have questions. No changes in the delivery of these courses is planned or anticipated.

Thx.

Marshall

California State University, San Marcos General Education Program
GENERAL EDUCATION NEW COURSE CERTIFICATION REQUEST
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SIGNATURES

_____   _____
Course Proposer   Date   Department Chair   date

Please note that the department will be required to report assessment data to the GEC annually. _____
                                                                                DC Initial

	Support	Do not support*		Support	Do not support*
	☐	☐	*[signature]* ²/28/14 ☑	☐

_____
Library Faculty   Date   Impacted   Date
                                   Discipline Chair   BioLoGy

	Support	Do not Support*		Approve	Do not Approve
	☐	☐		☐	☐

_____   _____
Impacted Discipline   Date   GEC Chair   Date
Chair

* If the proposal is not supported, a memo describing the nature of the objection must be provided.

Course Coordinator: Varies each year. Contact the Dept. Chair for a name.   Phone   Email:

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Math 125: Pre-calculus(Fall 2014)Course Information (Mr. Whittlesey)

Catalogue course description: Designed for students preparing to take MATH 160. Equations and inequalities, functions, graphs, polynomial and rational functions, trigonometric functions, exponential and logarithmic functions, systems of linear equations, conics, sequences and series, and the binomial theorem.

Meeting times: TR 1-2:15 in MARK 208, CRN 45265. You must attend every day in the first two weeks of class in order to avoid being dropped from the class. (See "administrative withdrawal" in the CSUSM General Catalog.) If I am late to class, you are responsible for staying until I arrive or official word arrives that class is cancelled. **There is no rule stating that you may leave after a few minutes if the instructor doesn't show up.**

Prerequisites: *Completion of the Entry-Level Mathematics (ELM) requirement. May not be taken for credit by students who have received credit for Math 115.* I reserve the right to 'administratively drop' students who have not satisfied the prerequisites.

Texts: *Precalculus - Mathematics for Calculus*, 5th edition, by Stewart, Redlin and Watson.

Tentative coverage: Sections 2.1-2.4, 2.6-2.8,3.1-3.6,4.1-4.5,5.1-5.4,6.1-6.5,7.1-7.5,8.1,8.3-8.5, 11.1-11.3.

Homework: There will be many homework problems. These will be the basis of your exams.

Exams: We'll have two in-class exams about 1/3 and 2/3 of the way through the semester (tentative schedule: Ex. 1: Sept. 26; Ex. 2: Oct. 29 and a third in the final examination slot on Tues, Dec. 10 from 11:30-1:30 pm. Makeup exams will only be given for legitimate reasons; you should make every effort to take exams on time. If an event arises whereby you are unable to make it, you should contact me as soon as possible. (e.g., if you are sick, please have somebody you live with leave a message with me.) I reserve the right to resolve a missed exam by other means. **You must have an ID card (e.g., CSUSM ID, driver's license, or military ID) to take this class; I will check them during exams. I do not generally allow use of calculators on exams.**

Contact Info: Office hours are in my office W 2-4:30; or **by appointment**. If you have a quick question, feel free to drop by outside my office hours to ask it. My office is Sci2 343, and the phone number is 750-8002. Email: mwhittle@csusm.edu. If you send me email, please keep it as short and to the point as possible. Do not send attachments - write in text only. **You should read your csusm.edu email regularly; I may send emails to the class via those addresses.** If you don't read your campus email often, you should have it forwarded to the account you do read. See http://www.csusm.edu/iits/support/email/gettinganaccount.html to arrange this. I will also be posting information such as the syllabus, quiz and exam solutions, etc, at cc.csusm.edu.

Grading: Final Grade will be calculated from Exams 1-3 (about 100 points each), and homework (50 points). The total number of points is 350 and your final grade will be determined by the following table.

Grade	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	F
Cutoff	333	315	298	280	263	245	228	210	193	175	158	0

At my discretion, I may give extra credit for doing problems on the board during class. **If you miss class any exam day, this grading scheme is voided.** Knowing basic definitions and ability to do basic calculations with them are essential to pass this course. Ability to do solve standard kinds of equations is essential for a grade of B. Expect to be able to do word problems for a grade of A. **IMPORTANT: In order to receive GE credit for this class, you only need a D-minus. You need a C if you wish to take Math 160 (C-minus is not enough) or if your major requires it (see your advisor for further information.)**

Extra help: Come to my office hours, or visit the **Math Lab in Kellogg 1109** which offers free help on a walk-in basis during business hours.

Deadlines: Last day to drop with no record: end of 2nd week of classes. The rules for dropping classes are complicated; see the CSUSM General Catalog 2012-14, p. 81-83, for more details concerning dropping courses.

Cheating: If you are caught cheating during the course I reserve the right to give you a zero on the relevant assignment or give you an F for the course. **During exams, you must cover your work so that other students cannot see it. If another student sees your work and succeeds in copying it, both you and that student are guilty of cheating.**

Free Speech and Behavior Restrictions: It is your responsibility to arrive on time and stay until the end of class. You should plan ahead to avoid trips to the lavatory during class. If you arrive at class late, shut the door quietly behind you, tiptoe in, quietly be seated as close to the door as possible, and otherwise minimize the disturbance. Avoid bringing food and drink to class, especially if it has an aroma. Please don't ever give me a gift; if you like what I do, please just say thank you.

General Education Program Student Learning Outcomes:

Students will communicate effectively in writing to various audiences. (writing)

Students will think critically and analytically about an issue, idea or problem. (critical thinking)

General Education Student Learning Outcomes for General Education Area B4:

B4.1: Explain and apply a variety of fundamental mathematical concepts, symbols, computations and principles.

B4.2: Determine which quantitative or symbolic reasoning methods are appropriate for solving a given problem and correctly implement those methods.

Course Student Learning Outcomes: The student will be familiar with the concept of function and how it is applied in the sciences. The student will become familiar with properties of polynomials, exponential, logarithmic, trigonometric and inverse trigonometric functions and how they are used in the sciences. Students will be able to solve equations involving these sorts of functions. Students will be able to determine asymptotes, zeros, x- y-intercepts, and other properties of a given function. Students should be able to derive formulas from given identities and be able to apply trigonometric identities. Lastly, the student will be able to use the tools of Pre-Calculus to solve word problems.

Writing Requirement: This course has a writing requirement of 2,500 words. This will be fulfilled by completing the exams, quizzes and homework. Work that is graded will be evaluated partly on the quality of the writing.