



COURSE OUTLINE: MATH 220S
C Credit – Not Degree Applicable
COURSE ID 010331
MARCH 2018

COURSE DISCIPLINE : MATH
COURSE NUMBER : 220S
COURSE TITLE (FULL) : Intermediate Algebra Bridge
COURSE TITLE (SHORT) : Intermediate Algebra Bridge

CATALOG DESCRIPTION

MATH 220S is a course designed to serve as a self-paced multimedia bridge course. Students who have completed MATH 130 or MATH 131 and would like to switch to a STEM major may take this course to return to a STEM path. Topics include fundamental laws, curve plotting, linear equations, quadratics equations, fractional exponents, radical and rational expressions and equations, factoring, functions, Cramer's rule, algebra of functions, graphs of functions, arithmetic and geometric sequences and series, the binomial theorem, conic sections, and systems of linear equations and inequalities,. MATH 130 or MATH 131 AND MATH 220S collectively is equivalent to MATH 101.

CATALOG NOTES

Note: This course is designed for students who have taken MATH 130 or MATH 131 and have decided are now majoring in science, technology, engineering, mathematics, or business. This course may not be taken for credit by students who have completed MATH 120, MATH 220B, or MATH 101. A maximum of 7 units will be granted for MATH 220S and MATH 131 OR a maximum of 8 units will be granted for MATH 220S and MATH 130.

Total Lecture Units:0.00

Total Laboratory Units: 2.00

Total Course Units: 2.00

Total Lecture Hours:0.00

Total Laboratory Hours: 108.00

Total Laboratory Hours To Be Arranged: 0.00

Total Contact Hours: 108.00

Total Out-of-Class Hours: 0.00

Prerequisite: MATH 130 or 131.



ENTRY STANDARDS

| | Subject | Number | Title | Description | Include |
|---|---------|--------|--|---|---------|
| 1 | MATH | 130 | * Elementary & Intermediate Algebra for Statistics | factor polynomials; | Yes |
| 2 | MATH | 130 | * Elementary & Intermediate Algebra for Statistics | solve rational equations; | Yes |
| 3 | MATH | 130 | * Elementary & Intermediate Algebra for Statistics | graph quadratic functions; | Yes |
| 4 | MATH | 130 | * Elementary & Intermediate Algebra for Statistics | solve equations with radicals; | Yes |
| 5 | MATH | 130 | * Elementary & Intermediate Algebra for Statistics | solve absolute value equations and inequalities; | Yes |
| 6 | MATH | 130 | * Elementary & Intermediate Algebra for Statistics | solve linear equations and inequalities; | Yes |
| 7 | MATH | 130 | * Elementary & Intermediate Algebra for Statistics | find the equation of a line and interpret the slope and intercept; | Yes |
| 8 | MATH | 130 | * Elementary & Intermediate Algebra for Statistics | solve a system of linear equations using elimination, and graphing; | Yes |



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|----|------|-----|--|--|-----|
| 9 | MATH | 130 | * Elementary & Intermediate Algebra for Statistics | solve applied problems; | Yes |
| 10 | MATH | 130 | * Elementary & Intermediate Algebra for Statistics | find the inverse of a function; | Yes |
| 11 | MATH | 130 | * Elementary & Intermediate Algebra for Statistics | solve logarithmic and exponential equations; | No |
| 12 | MATH | 130 | * Elementary & Intermediate Algebra for Statistics | find the nth term of arithmetic and geometric sequences; | No |
| 13 | MATH | 130 | * Elementary & Intermediate Algebra for Statistics | graph functions (linear, exponential, logarithmic); | Yes |
| 14 | MATH | 130 | * Elementary & Intermediate Algebra for Statistics | apply the Binomial Theorem; | No |
| 15 | MATH | 130 | * Elementary & Intermediate Algebra for Statistics | compute basic statistics for a variable, including mean, median, mode, quartiles , range, variance and standard deviation; | No |
| 16 | MATH | 130 | * Elementary & Intermediate Algebra for Statistics | describe the distribution of a quantitative variable in terms of its shape, center and spread, using graphical techniques; | No |
| 17 | MATH | 130 | * Elementary & Intermediate Algebra for Statistics | apply addition and multiplication rules of probability in problem solving including computing expected value; | No |
| 18 | MATH | 130 | * Elementary & Intermediate Algebra for Statistics | identify probability models and compute their areas . | No |
| 19 | MATH | 131 | Intermediate Algebra for Statistics | solve absolute value equations and inequalities; | Yes |
| 20 | MATH | 131 | Intermediate Algebra for Statistics | solve linear equations and inequalities; | Yes |



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|----|------|-----|-------------------------------------|--|-----|
| 21 | MATH | 131 | Intermediate Algebra for Statistics | solve equations with radicals; | Yes |
| 22 | MATH | 131 | Intermediate Algebra for Statistics | find the equation of a line and interpret the slope and intercept; | Yes |
| 23 | MATH | 131 | Intermediate Algebra for Statistics | solve a system of linear equations using elimination, graphing, and matrices; | Yes |
| 24 | MATH | 131 | Intermediate Algebra for Statistics | solve applied problems; | Yes |
| 25 | MATH | 131 | Intermediate Algebra for Statistics | find the inverse of a function; | Yes |
| 26 | MATH | 131 | Intermediate Algebra for Statistics | solve logarithmic and exponential equations; | No |
| 27 | MATH | 131 | Intermediate Algebra for Statistics | find the nth term of arithmetic and geometric sequences; | No |
| 28 | MATH | 131 | Intermediate Algebra for Statistics | graph functions (linear, exponential, logarithmic); | Yes |
| 29 | MATH | 131 | Intermediate Algebra for Statistics | apply the Binomial Theorem; | No |
| 30 | MATH | 131 | Intermediate Algebra for Statistics | compute basic statistics for a variable, including mean, median, mode, quartiles, range, variance and standard deviation; | No |
| 31 | MATH | 131 | Intermediate Algebra for Statistics | describe the distribution of a quantitative variable in terms of its shape, center and spread, using graphical techniques; | No |
| 32 | MATH | 131 | Intermediate Algebra for Statistics | apply addition and multiplication rules of probability in problem solving including computing expected value; | No |
| 33 | MATH | 131 | Intermediate Algebra for Statistics | identify probability models and compute their areas. | No |



EXIT STANDARDS

- 1 solve absolute value equations and inequalities.
- 2 solve linear equations and compound inequalities.
- 3 perform operations with polynomials.
- 4 simplify complex fractions.
- 5 perform operations with radical expressions.
- 6 simplify expressions with rational exponents.
- 7 divide polynomials synthetically.
- 8 solve rational equations.
- 9 solve radical equations.
- 10 find the equation of a line.
- 11 solve a system of linear equations.
- 12 solve systems of linear inequalities.
- 13 find the composition of two functions.
- 14 solve application problems.
- 15 solve quadratic equations with real and complex solutions.
- 16 find the inverse of a function.
- 17 use the properties of logarithms to simplify and expand expressions.
- 18 solve logarithmic and exponential equations.
- 19 find the n th term of arithmetic and geometric sequences.
- 20 find the sum of a finite series and an infinite geometric series.
- 21 graph functions (linear, quadratic, exponential, logarithmic).
- 22 graph conic sections centered at any point.
- 23 solve a non-linear system.
- 24 expand the power of a binomial.

STUDENT LEARNING OUTCOMES

- 1 solve equations and inequalities (linear, absolute value, rational, radical, quadratic, exponential, logarithmic, systems);
- 2 simplify algebraic expressions (polynomial/quadratic, rational, radical);
- 3 graph various functions and relations (linear, quadratic, exponential, logarithmic, conic sections);
- 4 use mathematical models to solve application problems (linear, rational, systems, quadratic, exponential, logarithmic, sequences, series);
- 5 apply the formulas of sequences and series (arithmetic, geometric, binomial).



COURSE CONTENT WITH INSTRUCTIONAL HOURS

| | Description | Lecture | Lab | Total Hours |
|---|---|---------|-----|-------------|
| 1 | Systems of Equations and Inequalities <ul style="list-style-type: none"> • Solution of three equations in three variables • Determinants • Cramer's Rule • Systems of linear inequalities | 0 | 12 | 12 |
| 2 | Exponents, Polynomials, and Factoring <ul style="list-style-type: none"> • Multiplying polynomials and dividing polynomials • Synthetic division • The difference of two squares; the sum and difference of two cubes • Solving equations by factoring | 0 | 12 | 12 |
| 3 | Rational Expressions <ul style="list-style-type: none"> • Simplifying rational expressions • Multiplying and dividing rational expressions • Adding and subtracting rational expressions • Complex fractions • Equations containing rational expressions • Applications • Difference quotients | 0 | 15 | 15 |
| 4 | Rational Exponents and Radicals <ul style="list-style-type: none"> • Rational exponents • Radical expressions • Adding and subtracting radical expressions • Multiplying and dividing radical expressions • Solving equations with radicals • Applications of radicals Complex numbers | 0 | 15 | 15 |
| 5 | Quadratic Equations <ul style="list-style-type: none"> • Completing the square • Quadratic formula • The discriminant and its applications • Equations quadratic in form • Non-linear inequalities of one variable • Parabolas | 0 | 15 | 15 |



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|---|---|---|----|------------|
| 6 | The Conic Sections <ul style="list-style-type: none"> • Circles Ellipses and hyperbolas • Second-degree inequalities • Nonlinear systems of equations and inequalities | 0 | 12 | 12 |
| 7 | Sequences and Series <ul style="list-style-type: none"> • Sequences • Series and summation notation • Arithmetic progressions • Geometric progressions • The binomial expansion | 0 | 15 | 15 |
| 8 | Review of Exponential and Logarithmic Functions <ul style="list-style-type: none"> • Exponential and Logarithmic functions • Properties of logarithms • Solving exponential and logarithmic equations | 0 | 12 | 12 |
| | | | | 108 |

OUT OF CLASS ASSIGNMENTS

- 1 homework (e.g. problems sets related to course content);
- 2 online assignments (e.g. problems sets embedded within the approved learning management system).

METHODS OF EVALUATION

- 1 short mastery quizzes may be given online;
- 2 two to three chapter tests will be given per unit;
- 3 a cumulative final exam at the end of each unit.

METHODS OF INSTRUCTION

- Lecture
- Laboratory
- Studio
- Discussion
- Multimedia
- Tutorial
- Independent Study
- Collaboratory Learning



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- Demonstration
- Field Activities (Trips)
- Guest Speakers
- Presentations

TEXTBOOKS

| Title | Type | Publisher | Edition | Medium | Author | ISBN | Date |
|----------------------|-------------|------------------|----------------|---------------|---------------------|-------------------|-------------|
| Intermediate Algebra | Required | Cengage | 5 | Print | Gustafson, David | 1-111- 56767-0 | 2013 |