

New Fairfield Public Schools
New Course or New Instructional Program Proposal

Directions:

Before completing this form, please discuss this proposal with the appropriate administrator(s) in your school. Complete this proposal form thoroughly, and attach any supporting documentation that would help the District Curriculum and Program Council understand this proposal better. Be sure that you adhere to all deadlines*, and be certain to acquire all required signatures. The deadline* for any course or program proposal that has budgetary implications and/or needs to be published in the NFHS *Program of Studies* is October 31, so please plan accordingly to make certain that all approvals of this application can be completed by October 31. All other proposals can be forwarded at any time of the year.

- 1. Please list the names and identify the school/department of those individuals who are making this proposal? If those making the proposal are not teachers, please explain thoroughly:**

Mr. Michael Clarke, Interim Principal
Mr. Keegan Finlayson, Director of STEM and Intervention
Mrs. Catherine Hall, Math Department Chairperson

- 2. Give the title of new course or instructional program. Indicate the department in which this course/program will reside:**

The instructional program being proposed is **College Math Topics**. This course will reside in the Mathematics Department.

- 3. Please indicate if the new course or instructional program is a semester or year long, and indicate the applicable grade levels. Please indicate the course level if applicable:**

The program would be open to students entering the twelfth grade in September 2019. This is a full year course. The prerequisite for the course is completion of Algebra 2 with a passing grade. The course would be a college preparatory course and as such would hold a weight 3 in GPA calculation.

- 4. Please give the rationale for this proposal, and include its relationship to the past, current and future development of curricular offerings in New Fairfield:**

Currently at NFHS a junior who completes Algebra 2 has the option of taking either Pre-Calculus or Introduction to Statistics. Some students that have received credit for Algebra 2 have future plans or interests that do not require a Pre-Calculus or Statistics course. This course would provide students an alternative that would allow them to continue working with the

mathematical concepts that they would need for an introductory college math course or to place into a credit-bearing math course after taking a college entrance placement test such as the ACCUPLACER or the ASVAB (military entrance exam).

Many other area schools offer courses with similar rationale and content. A few examples are:

Wilton Public Schools - Math Modeling

Newtown Public Schools - College Math Topics

Brookfield Public Schools - Math Modeling/Discrete Mathematics

Bethel Public Schools - Math IV

Ridgefield Public Schools - College Algebra and Trig

5. Please indicate the target population for this proposal:

This course is intended for a student in his or her senior year who has completed Algebra 2 and who would like an alternative class to Pre-Calculus or Statistics.

6. Please explain if this course or instructional program is an addition or a replacement for an existing course or program.

This instructional program is an addition to current options offered by the Math Department.

7. List any prerequisite for this course or instructional program:

Students must be seniors who have received credit for Algebra 2.

8. Please write a short description of the new course or instructional program that would be suitable for the high school *Program of Studies* or for a curriculum document:

This integrated mathematics course includes topics in algebra, probability and statistics and financial literacy. Students will solve first, second and higher degree equations as well as equations in two variables. Students will investigate topics that will provide them the opportunity to use and interpret statistics. Study skills and applications will be stressed throughout the course. This course is designed to give students a fourth year of preparatory math and will review and develop skills needed for the SAT/ACT, the Accuplacer Exam, the A.S.V.A.B. or for a first-year basic mathematics course at the college level. A graphing calculator is required for this course.

9. Please list (or attach a list) of the long-term course or program goals that define the broad outcomes that this course or program seeks to help students achieve:

The goal is to meet the needs of students who have met the course requirements for Algebra 2 and have interests that lie outside of Pre-Calculus or Statistics by preparing them to take a college-level credit-bearing mathematics course. A focus on real-life application of the mathematics will be emphasized whenever applicable.

10. Please indicate what topics, units, or material will be used to meet the long-term goals listed above. How will technology be utilized to enhance the course or program goals? What assessment strategies will be used in this course or program? What are the unique components of this course or program content that makes it a worthwhile addition for our students?

To meet the needs of the target population, instruction will occur in such topics as:

College-Level Math - These topics are from the ACCUPLACER placement test and are included in many 100-level credit bearing college math courses.

These are the main components of college-level math that will be included in the course:

- **Operations with algebraic expressions (Reinforcement):** topics include the evaluation of simple formulas and expressions, adding and subtracting monomials and polynomials, multiplying and dividing monomials and polynomials, the evaluation of positive rational roots and exponents, simplifying algebraic fractions, and factoring.
- **Solution of equations, inequalities, and word problems (Reinforcement):** topics include solving linear equations and inequalities; solving quadratic equations by factoring; and solving verbal problems presented in an algebraic context, including geometric reasoning and graphing, and the translation of written phrases into algebraic expressions.
- **Algebraic operations:** topics include simplifying rational algebraic expressions, factoring, expanding polynomials, and manipulating roots and exponents.
- **Solutions of equations and inequalities:** topics include the solution of linear and quadratic equations and inequalities, equation systems, and other algebraic equations.
- **Coordinate geometry:** topics include plane geometry, the coordinate plane, straight lines, conics, sets of points in the plane, and graphs of algebraic functions.
- **Applications and other algebra topics:** topics include complex numbers, series and sequences, determinants, permutations and combinations, fractions, and word problems.
- **Functions and trigonometry:** topics include polynomials, algebraic, exponential, and logarithmic and trigonometric functions.

Additional Topics

Additional topics and concepts will be included based on student need for future mathematics classes. Such topics will include:

- Standardized Assessment Preparation
- Financial Literacy
- Probability and Statistics

Course Outline

Unit	Topics	Resource(s)	Pacing	Standards/Assessments
Review of Basic Algebra	<ul style="list-style-type: none"> ● Integer Exponents and Scientific Notation ● Addition, Subtraction, Multiplication and Division of Polynomials ● Factoring Polynomials ● Simplifying and operations with Rational Expressions 	Big Ideas Algebra 2, Larson PreCalculus textbook	2-3 weeks	Formative and Summative Assessments
Equations and Inequalities	<ul style="list-style-type: none"> ● Solving and application of quadratic equations and inequalities ● Solving polynomial and Rational Equations including real life applications ● Complex numbers ● Absolute value equations and inequalities 	Big Ideas Algebra 2, Larson PreCalculus textbook	4 weeks	Formative and Summative Assessments
Functions and their Graphs	<ul style="list-style-type: none"> ● Functions and Function Notation ● Linear functions ● Proportion and variation with a focus on real-life application ● Transformations of functions ● Piecewise functions ● Function Operations 	Big Ideas Algebra 2, Larson PreCalculus textbook	3 weeks	Formative and Summative Assessments
Exponential and	<ul style="list-style-type: none"> ● Graphs and applications of exponential functions 	Big Ideas Algebra 2,	3 weeks	Formative and Summative

Logarithmic Functions	<ul style="list-style-type: none"> • Graphs and applications of Logarithmic functions • Properties of logarithmic functions • Solving exponential and logarithmic functions 	Larson PreCalculus textbook		Assessments Possible project based assessment on application of exponential models in real life
Systems	<ul style="list-style-type: none"> • Solving systems of equations including using matrices • Matrix operations and algebra • Linear programming - with a focus on application problems • Solving nonlinear systems of equations 	Big Ideas Algebra 2, Larson PreCalculus textbook	2-3 weeks	Formative and Summative Assessments including applications of matrices and systems.
Conic Sections	Exploration of the equations, properties and graphs of Circles, Parabolas, Ellipses and Hyperbolas	Larson PreCalculus Textbook	2 weeks	Formative and Summative Assessments, assessments (may be construction based)
Standardized Test Preparation	Content will be determined based on prior year's SAT data. Focus will be on topics from the Heart of Algebra and Data Analysis on the SAT and strands from the Accuplacer. Many seniors take the SAT again in the early fall/late winter, so this preparation would be beneficial for them.	Released assessment materials and prep books, Khan Academy	Flexible time frame based on student need	Formative and summative assessments based on released items from standardized assessments.
Financial Literacy	Topics may vary based on student interest/needs and may include but are not limited to: Auto loans and expenses including applications of simple and compounded interest, credit cards and personal loans, stocks, bonds and mutual funds and home ownership including budgeting.	Data found online through research	2-3 weeks	Project-Based Assessment
Probability and Statistics	Topics may vary based on student	Current	4 weeks	Project- Based

	interest/needs and may include but are not limited to: Permutations, Combinations and The Multiplication Counting Principle, Probability and Odds, Measure of Central Tendency, Normal Distribution, Regression, Data Analysis and display	Introduction to Statistics textbook		Assessment based on student collected data to be analyzed, displayed and presented
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10. Resources

Students will use technology such as a graphing calculator and online programs such as Desmos, Geogebra and Khan Academy which are all free to students. Many assessment strategies will be used throughout the course including formative and summative assessments as well as some project-based and collaborative assessments. This course has some flexibility in the curriculum to accommodate students of varying abilities and interests.

11. Please indicate any special location needs, such as the computer lab:

There will be no special location needs for this course.

12. Please enumerate the resources – both human and financial – that you anticipate will be needed to develop this course or program correctly. Please indicate any special training that will be necessary to implement this course or program, and give the cost of this training:

The only human resources required will be a .2 FTE which would be a shift of resources, with no additional FTE. No other costs or training are associated with the new course.

13. Please give the title and cost of the proposed text and attach it, if possible. Indicate any special equipment needs for this course and the anticipated cost of this equipment:

Materials for the course would consist of materials already owned by the NFPS, mainly the Big Ideas Algebra 2 resources, the Larson Precalculus textbook and the Introduction to Statistics textbook. Open source released material found in other texts on the internet may also be used.

14. Please address the questions below separately, and then attach your responses to this form:

a) What impact will this course/program proposal have upon other courses/programs currently being offered in the district?

This course is only offered for seniors and does not replace content from any other course and therefore would only impact student enrollment in Introduction to Statistics and Precalculus.

b) What impact would this proposal have on scheduling, staffing, and resources?

None

c) Do you anticipate that this course/program will have an impact on feeder programs and follow-up courses/programs currently being offered in the district?

No

d) What do you anticipate will be the impact – in terms of new print and non-print materials on the library/media center?

None

e) Would adoption of this course/program proposal require specific staff adjustments, such as hiring new staff or retaining veteran staff?

The courses will be taught by current staff with no need to hire additional staff.

Signatures of those making this proposal: (The signatures indicate that all parts of this proposal have been thoroughly completed.)

_____ **Date:** _____

_____ **Date:** _____

Signature of Department Chair indicating approval (if applicable):

_____ **Date:** _____

Signature of Principal indicating approval: (Please note that this proposal must bear the principal's signature before it can be sent to District Curriculum and Program Council.)

_____ **Date:** _____

Signature of Assistant Superintendent indicating approval:

_____ **Date:** _____