Geneseo Community Unit School District No. 228

209 SOUTH COLLEGE AVENUE • GENESEO, ILLINOIS 61254 • (309) 945-0450 • FAX: (309) 945-0445

Scott D. Kuffel
Superintendent

November 11, 2010

Following is the timeline for the High School Course Planning Guide 2011-2012:

November 11, 2010 - Information and document to Board of Education

December 9, 2010 - Approval by Board

January 31 through February 11, 2011 - Registration begins at High School

March 3—First draft of Master Schedule

April 7—Final Draft of Master Schedule

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Mr. Scott D. Kuffel
Superintendent

REVIEW OF PROPOSED HIGH SCHOOL COURSE OFFERINGS

November 11, 2010

To: Board of Education
Fr: Scott D. Kuffel
Cc: Michael Haugse, HS Principal

I have reviewed the courses listed below and recommend that the Board of Education accept and approve these courses as eligible to be placed within the HS Course Planning Guide for 2011-12. Understand that there may be a recommendation to either remove specific courses from the Course Planning Guide, and/or to keep certain classes within the Guide but not allow students to register for them for 2011-12.

These courses would not be officially approved until the December 2010 Meeting, and to allow you an opportunity to have specific questions answered, ***Mr. Haugse will be available at his office in Geneseo High School on Monday, November 8th at 7:00 p.m.*** during Parent/Teacher Conferences. There may also be teachers available during that time if you have questions or comments.

The courses for review and approval are as follows:

Digital Fabrication (a course using the new CNC Machine in the Industrial Tech Dept)
Statistics (a Yearlong course)
AP Advanced Calculus BC (we currently offer only AB)
AP Microeconomics (1 Semester)
AP Macroeconomics (1 Semester)

I was particularly impressed with these faculty proposals in the way that they referenced our District's vision and our Academic Targets policy. Faculty who are fairly new to the High School, which also inspires and validates our notion that innovation can sometimes come from outside our normal four walls, proposed most of these courses. You will also notice a balance between Advanced Placement courses and Business/Vocational offerings.

I hope you carefully review these proposals and offer your feedback to either myself or Mr. Haugse.

Geneseo Community Unit School District 228

2011-12

High School Proposed Courses

TO: High School Leadership Team

FROM: Greg Smith

RE: **DIGITAL FABRICATION - CNC COURSE PROPOSAL**

DATE: Oct 21, 2010 Max 17 / Min 12
enrollment =
Digital Fabrication -CNC (One Semester)

Rationale:

The purpose for this course proposal is to increase opportunities and skills for students wanting to pursue careers in advanced manufacturing. Geneseo High School is preparing students to live and work in a world that is increasingly dependant upon technology. Through cross-curricular activities with the Technology Education Department, students can be exposed to CNC (Computer Numerical Control) High Frequency Spindle (Router) to learn about manufacturing. Students will have the competitive edge they need to secure a "high skill, high wage" job in today's tough economy. Students will be able to make useful projects with the CNC. This course proposal for Digital Fabrication – CNC aligns with the "list of 21st Century skills" such as problem solving, synthesizing across content areas, dealing with information overload, basic debugging, basic understanding of usability concepts, and reflection.

Costs:

Student Costs: Any personal project beyond class projects.

District Additional Costs: Possible Textbook. Waiting for a review copy. None. Instructor supplemental resources for *CNC Machining, First Edition,* by Richard A. Gizelback, 2009, 978-1-59070-790-6. Costs - $56.25 Textbook and $60.00 Instructor's CD.

Other Considerations:

Prerequisites: Grades 10-12 and Introduction to Woods – Manufacturing or Introduction to Metals - Manufacturing

Course Description:

Digital Fabrication – CNC is designed to provide a more in-depth understanding of how manufacturing works. Machining will take place on the ShopBot – CNC machine. Students will learn the software associated with the design and operation of the CNC machine, Aspire, ShopBot Control Software, and Pro/E (Pro-Engineering – CAD). Students will design and produce a product.

Below is the course syllabus for Digital Fabrication - CNC

DIGITAL FABRICATION – CNC COURSE SYLLABUS

Instructional Materials
Textbook: *CNC Machining, First Edition,* by Richard A. Gizelbach, 2009, Tinley Park, IL: Goodheart-Wilcox, 978-1-59070-790-6

Instructor's Guide: *CNC Machining, First Edition,* by Richard A. Gizelbach, 2009, Tinley Park, IL: Goodheart-Wilcox, 978-1-59070-792-0

Evaluation:

Test / Quizzes	40%
Lab Projects	40%
Homework	15%
Professionalism (Participation)	5%

Tentative Course Schedule:

UNIT 1: ASPIRE
Design Software
Tutorials
Examination I

UNIT 2: NUMERICAL CONTROL AND CNC
What is Numerical Control and CNC?
Ch. 1
Examination II

UNIT 3: AXIS AND COORDINATE SYSTEM
Axis and Coordinate System
Ch. 2
Examination III

UNIT 4: TOOLPATHING
How Tool Paths Work
Tutorials
Examination IV

UNIT 5: SHOPBOT CONTROL SOFTWARE
How ShopBot CNC works
Tutorials
Examination V

UNIT 6: MATERIALS
What materials can be machined with the CNC machine?
Examination VI

Statistics 1 year course rational.

- We would like to replace the semester of Trigonometry with a yearlong Statistics course.
- Reasons of dropping Trigonometry:
    - Low numbers
    - Many students took Pre-Calculus so it is no longer an introductory course, but remedial. It wasn't designed for that.
- The semester course of statistics was an introductory study of statistics and probability. A year long course would allow for us to cover more depth of statistics that is covered at the college level courses.
- The course can be applied to areas of sociology, business, economics, education, medicine, and mathematics.
- As a department, we feel more students will be able to take the year long course because of less conflict with scheduling a semester class.

Course: Statistics

Instructor: Mrs. Schnowske

School year: 2011-2012

Class Textbook: Elementary Statistics, Addison Wesley Longman, Inc., 2001, ISBN: 0-201-61477-4

Description of the course: This is a two-semester course designed to provide an introductory study of statistics and probability to areas of applied sociology, business, economics, education, medicine, and mathematics. Students will learn the language of statistics and apply statistical techniques to practical applications.

Course content and objectives:

- Introduction to statistics- will learn how to conduct a survey and how to design an experiment.
- Describing, exploring, and comparing – will perform statistical analysis on sets of numerical data, compare the results and draw conclusions.
- Probability – will learn how to find probably for numerous events.
- Probability distributions- perform statistical analysis on probability distribution tables.
- Normal distributions – determine the type of distribution the data set represents and perform statistical analysis on the tables.
- Determine probabilities for binomial probability distributions along with performing statistical analysis to the distributions.
- Apply the Central Limit Theorem to practical applications.
- Estimate population means and variances of large and small samples.
- Hypothesis testing on the mean, standard deviation, and variance of large and small samples.
- Make inferences about two means and the variations in the two samples.
- Find correlations and regression in data sets

Grading Procedures:
Your grade will be based upon two areas: Homework- 25% and 75% Quizzes and Tests. All homework assignments are 10 points, quizzes are 100 points and tests are100 points.

Homework: Homework is collected on a daily basis. Students will receive completion points for their homework, however, **the assignment must always show work and corrections must be made on the problems missed.** Late work will not be accepted.

Absences: If you are absent, it is **YOUR** responsibility to get the missing assignments when you return or go to **http://www.gcsdblogs.org/schnowske//** If the absence was excused, you have two days to complete the assignment. If the absence was unexcused, you only have one day to complete the assignment. If you will absent because of a

school function or doctor's appointment, you are required to get the assignment before you leave school.

Supplies:

1. Textbook
2. ***3-Ring Binder**
3. Loose-leaf paper
4. Dividers: Bell work, notes, quizzes, and journal entries
5. A pencil and a pen
6. Calculator TI-34II or TI-83 or 84 models
7. Graphing paper

***Students are to save all homework in order, handouts, notes, bell work, journal entries and quizzes in their binder for a test grade each quarter.**

Classroom Rules:

1. *Come prepared to class.
2. Be in your seat by the time the bell rings or you will be issued a tardy.
3. Raise your hand to participate and only talk when given permission.
4. Be respectful and act appropriate towards the teacher and students.

***A tardy will be issued if you have to go back to your locker.**

If you do not follow the rules, I will issue a verbal warning. If the behavior continues, you will be asked to stay after class a minute. If the behavior still continues, I will send you to the office.

Conference hours: Before school: 7:30 A.M. – 8 :00 A.M.
2nd hour: 8:58 A.M. – 9:47 A.M.
After school: 3:00 P.M. – 3:30 P.M.

During this time, I am happy to conference with parents and help students with any questions or concerns. If you stop by during my conference hour, please make arrangements ahead of time. I also can be contacted at sschnowske@dist228.org.

Advanced Placement Calculus BC Proposal

The mathematics department has noticed over the years of offering AP Calculus AB, that there are traditionally 25 to 40 % of the students who would easily succeed at AP Calculus BC. We feel we are not doing them a service by not providing this course. Along with these students, there would be additional students who would take the course with a lot of hard work ahead of them. The addition of Quality Core Pre-Calculus to our curriculum has enabled us to take this next step. We would still offer AP Calculus AB as an alternative, along with the new course.

Almost all Calculus textbooks are set up to teach both of the classes from the one book, this is the case for ours. We would not need to find another textbook; the one we use currently is fine. What we would need to do, is cover more chapters in the textbook.

> Larson, Ron, Robert P. Hostetler, and Bruce H. Edwards. *Calculus*. 7th ed. Boston: Houghton Mifflin, 2002.

We see this as strengthening the mathematics offerings and differentiating the district from other districts in the area. We also feel that as a "test offering" that the students almost have a no fail option as they will still receive an AB sub – score. This is outlined below and on the back of this page.

The College Board's Recommendation.

> A Calculus AB subscore is reported based on performance on the portion of the exam devoted to Calculus AB topics (approximately 60 percent of the exam). The Calculus AB subscore is designed to give colleges and universities more information about the student. Although each college and university sets its own policy for awarding credit and/or placement for AP Exam scores, it is recommended that institutions apply the same policy to the Calculus AB subscore that they apply to the Calculus AB score. Use of the subscore in this manner is consistent with the philosophy of the courses, since common topics are tested at the same conceptual level in both Calculus AB and Calculus BC.

The difference between Calculus AB and Calculus BC is that AB is illustrated below, with the scores and credits given by a few of the Illinois Universities.

AP Calculus AB : Typically counts as Calculus I in most colleges and universities

AP Calculus BC : Typically counts as Calculus I and Calculus II in most colleges and universities

Illinois State University	3, 4, 5	AB	MATH 145	4 hours
	3, 4, 5	BC	MATH 145 & 146	8 hours
Northern Illinois University	3, 4, 5	AB	MATH 229	4 hours
	4, 5	BC	MATH 229 & 230	8 hours
	2, 3	BC	MATH 229	4 hours
Western Illinois University	3, 4, 5	AB	MATH 133	4 hours
	4, 5	BC	MATH 133 & 134	8 hours
	2, 3	BC	MATH 133	4 hours

Topic Outline for Calculus BC

The topic outline for Calculus BC includes all Calculus AB topics. Additional topics are found in paragraphs that are marked with a plus sign (+) or an asterisk (*). The additional topics can be taught anywhere in the course that the instructor wishes. Some topics will naturally fit immediately after their Calculus AB counterparts. Other topics may fit best after the completion of the Calculus AB topic outline. (See AP Central for sample syllabi.) Although the exam is based on the topics listed here, teachers may wish to enrich their courses with additional topics.

I. Functions, Graphs and Limits

Analysis of graphs. With the aid of technology, graphs of functions are often easy to produce. The emphasis is on the interplay between the geometric and analytic information and on the use of calculus both to predict and to explain the observed local and global behavior of a function.

Limits of functions (including one-sided limits)

- An intuitive understanding of the limiting process.
- Calculating limits using algebra.
- Estimating limits from graphs or tables of data.

Asymptotic and unbounded behavior

- Understanding asymptotes in terms of graphical behavior.
- Describing asymptotic behavior in terms of limits involving infinity.
- Comparing relative magnitudes of functions and their rates of change (for example, contrasting exponential growth, polynomial growth and logarithmic growth).

Continuity as a property of functions

- An intuitive understanding of continuity. (The function values can be made as close as desired by taking sufficiently close values of the domain.)
- Understanding continuity in terms of limits.
- Geometric understanding of graphs of continuous functions (Intermediate Value Theorem and Extreme Value Theorem).

* **Parametric, polar and vector functions.** The analysis of planar curves includes those given in parametric form, polar form and vector form.

II. Derivatives

Concept of the derivative

- Derivative presented graphically, numerically and analytically.
- Derivative interpreted as an instantaneous rate of change.
- Derivative defined as the limit of the difference quotient.
- Relationship between differentiability and continuity.

Derivative at a point

- Slope of a curve at a point. Examples are emphasized, including points at which there are vertical tangents and points at which there are no tangents.
- Tangent line to a curve at a point and local linear approximation.
- Instantaneous rate of change as the limit of average rate of change.
- Approximate rate of change from graphs and tables of values.

Derivative as a function

- Corresponding characteristics of graphs of f and f'.
- Relationship between the increasing and decreasing behavior of f and the sign of f'.
- The Mean Value Theorem and its geometric interpretation.
- Equations involving derivatives. Verbal descriptions are translated into equations involving derivatives and vice versa.

Second derivatives

- Corresponding characteristics of the graphs of f, f' and f''.
- Relationship between the concavity of f and the sign of f''.
- Points of inflection as places where concavity changes.

Applications of derivatives

- Analysis of curves, including the notions of monotonicity and concavity.
+ Analysis of planar curves given in parametric form, polar form and vector form, including velocity and acceleration.
- Optimization, both absolute (global) and relative (local) extrema.
- Modeling rates of change, including related rates problems.
- Use of implicit differentiation to find the derivative of an inverse function.
- Interpretation of the derivative as a rate of change in varied applied contexts, including velocity, speed and acceleration.
- Geometric interpretation of differential equations via slope fields and the relationship between slope fields and solution curves for differential equations.
+ Numerical solution of differential equations using Euler's method.
+ L'Hospital's Rule, including its use in determining limits and convergence of improper integrals and series.

Computation of derivatives

- Knowledge of derivatives of basic functions, including power, exponential, logarithmic, trigonometric and inverse trigonometric functions.
- Derivative rules for sums, products and quotients of functions.
- Chain rule and implicit differentiation.
+ Derivatives of parametric, polar and vector functions.

III. Integrals

Interpretations and properties of definite integrals

- Definite integral as a limit of Riemann sums.
- Definite integral of the rate of change of a quantity over an interval interpreted as the change of the quantity over the interval:

$$\int_a^b f'(x)\,dx = f(b) - f(a)$$

- Basic properties of definite integrals (examples include additivity and linearity).

*Applications of integrals. Appropriate integrals are used in a variety of applications to model physical, biological or economic situations. Although only a sampling of applications can be included in any specific course, students should be able to adapt their knowledge and techniques to solve other similar application problems. Whatever applications are chosen, the emphasis is on using the method of setting up an approximating Riemann sum and representing its limit as a definite integral. To provide a common foundation, specific applications should include finding the area of a region (including a region bounded by polar curves), the volume of a solid with known cross sections, the average value of a function, the distance traveled by a particle along a line, the length of a curve (including a curve given in parametric form), and accumulated change from a rate of change.

Fundamental Theorem of Calculus

- Use of the Fundamental Theorem to evaluate definite integrals.
- Use of the Fundamental Theorem to represent a particular antiderivative, and the analytical and graphical analysis of functions so defined.

Techniques of antidifferentiation

- Antiderivatives following directly from derivatives of basic functions.
+ Antiderivatives by substitution of variables (including change of limits for definite integrals), parts, and simple partial fractions (nonrepeating linear factors only).
+ Improper integrals (as limits of definite integrals).

Applications of antidifferentiation

- Finding specific antiderivatives using initial conditions, including applications to motion along a line.
- Solving separable differential equations and using them in modeling (including the study of the equation $y' = ky$ and exponential growth).
+ Solving logistic differential equations and using them in modeling.

Numerical approximations to definite integrals. Use of Riemann sums (using left, right and midpoint evaluation points) and trapezoidal sums to approximate definite integrals of functions represented algebraically, graphically and by tables of values.

*IV. Polynomial Approximations and Series

* **Concept of series.** A series is defined as a sequence of partial sums, and convergence is defined in terms of the limit of the sequence of partial sums. Technology can be used to explore convergence and divergence.

* **Series of constants**
  + Motivating examples, including decimal expansion.
  + Geometric series with applications.
  + The harmonic series.
  + Alternating series with error bound.
  + Terms of series as areas of rectangles and their relationship to improper integrals, including the integral test and its use in testing the convergence of p-series.
  + The ratio test for convergence and divergence.
  + Comparing series to test for convergence or divergence.

* **Taylor series**
  + Taylor polynomial approximation with graphical demonstration of convergence (for example, viewing graphs of various Taylor polynomials of the sine function approximating the sine curve).
  + Maclaurin series and the general Taylor series centered at $x = a$.
  + Maclaurin series for the functions e^x, $\sin x$, $\cos x$ and $\frac{1}{1-x}$.
  + Formal manipulation of Taylor series and shortcuts to computing Taylor series, including substitution, differentiation, antidifferentiation and the formation of new series from known series.
  + Functions defined by power series.
  + Radius and interval of convergence of power series.
  + Lagrange error bound for Taylor polynomials.

TO: High School Leadership Team

FROM: Tim Gronski

RE: **AP MICROECONOMICS, AP MACROECONOMICS COURSE PROPOSAL**

DATE: Oct 21, 2010

AP Microeconomics (fall semester)
AP Macroeconomics (spring semester)

Rationale:

The purpose for this course proposal is to increase opportunities for college bound students to demonstrate academic excellence and to expand the level of academic rigor at Geneseo High School. There are currently 11 AP courses available for students within the current high school curriculum; this proposal will increase the availability for AP coursework to 13 putting GHS at the forefront for AP course offerings in the region. This course proposal for AP Economics aligns with the District 228 philosophy and initiative of *"improving student achievement in regards to readiness for post-secondary learning."*

Costs:

Student Costs: Students will purchase the course textbook, *Principles of Economics, Fourth Edition,* by N.G. Mankiw, 2007, New York, N.Y.: Worth Publisher. This text will be used in both Micro and Macro. Currently, new copies are $111 and used copies available at www.amazon.com are selling for under $30. Students will also be required to purchase the textbook study guide, which is a paperback text available for $15 new from www.amazon.com. AP Exam fee $87 per course.

District Additional Costs: None. Instructor supplemental resources for *Principles of Economics, Fourth Edition,* by N.G. Mankiw, 2007 including test bank $150 (estimate), which will be purchased with *Vocational grant funds.*

Other Considerations:

AP *Micro*economics will be taught one section in the fall and AP *Macro*economics will be taught one section in the spring as part of the Business Department course offerings. These two courses can be offered without adding additional school resources or personnel. I propose that either Micro or Macro fulfill the Illinois Consumer Education graduation requirement. Illinois high schools that offer AP Economics generally follow this practice of allowing successful completion of a course in AP Economics to **satisfy the state Consumer Education graduation requirement.**

Prerequisites: The *College Board* recommendation of requiring **successful completion of Algebra 1** prior to taking AP Economics.

All students will be required to take the AP exam in May per school AP course policy.

Course Description:

AP Microeconomics: The purpose of an AP course in Microeconomics is to provide a thorough understanding of the principles of economics that apply to the functions of individual decision makers, both consumers and producers, within the larger economic system. It places primary emphasis on the nature and functions of product markets, and includes the study of factor markets and of the role of government in promoting greater efficiency and equity in the economy.

AP Macroeconomics: An AP course in Macroeconomics is designed to give students a thorough understanding of the principles of economics that apply to an economic system as a whole. Macroeconomics places particular emphasis on the study of national income and price determination, and also develops student familiarity with economic performance measures, economic growth, and international economics.

Below are the course syllabi for both Micro and Macroeconomics.

Both courses are designed to prepare students for success on the AP exam in May.

AP MICROECONOMICS COURSE SYLLABUS

Instructional Materials

Textbook: *Principles of Economics, Fourth Edition,* by N.G. Mankiw, 2007, New York, N.Y.: Worth Publishers.

Study Guide: *Principles of Economics Student Study Guide, Fourth Edition,* by N.G. Mankiw, 2007, New York, N.Y.: Worth Publishers.

The Wall Street Journal

Additional text-related materials are available at:

http://www.worthpublishers.com/mankiw

Evaluation:

Exams	40%
*Quizzes	20%
Assigned textbook problems	20%
Final Exam	20%.

*Quizzes will follow the completion of each chapter. Students will be allowed to drop their lowest quiz grade at semester's end.

Tentative Course Schedule:

UNIT 1: BASIC ECONOMIC CONCEPTS
Introduction, Thinking like an Economist, Interdependence and the Gains from Trade
Ch. 1-3
Examination I

UNIT 2: THE NATURE AND FUNCTIONS OF PRODUCT MARKETS
How Markets Work
Ch. 4-6
Examination II

UNIT 3: FACTOR MARKETS
Markets and Welfare
Ch. 7-9
Examination III

UNIT 4: MARKET FAILURE AND THE ROLE OF GOVERNMENT
The Economics of the Public Sector
Ch. 10-12
Examination IV

UNIT 5: STRUCTURES AND ORGANIZATION OF MARKETS
Firm Behavior and the Organization of Industry
Ch. 13-17
Examination V

The Economics of Labor Markets
Ch. 18-20
Examination VI

UNIT 6: FUTURE STUDIES IN MICROECONOMICS
Consumer Choice and the Frontier of Microeconomics
Ch. 21-22

Final Exam

AP MACROECONOMICS COURSE SYLLABUS

Textbook: *Principles of Economics, Fourth Edition,* by N.G. Mankiw, 2007, New York, N.Y.: Worth Publishers.

Study Guide: *Principles of Economics Student Study Guide, Fourth Edition,* by N.G. Mankiw, 2007, New York, N.Y.: Worth Publishers.

The Wall Street Journal

Additional text-related materials are available at:

http://www.worthpublishers.com/mankiw

Evaluation:

Unit Exams	30%
Chapter Quizzes	30% (lowest quiz score dropped at semester's end)
Research Project	10%
Assigned Chapter Problems	10%
Final Exam	20%

Research Project: This project calls for the preparation of a report on macroeconomic trends in the U.S. economy. Students will be asked to track and graph key macroeconomic indicators--GDP, inflation, unemployment, interest rates, money supply, exchange rates, government spending and taxation, the current account, and other measures of economic conditions. Students will also include a "special focus" section in their project; the topic will be related to Macroeconomics and will be pre-approved by the instructor.

The final report will summarize statistical data, analyze macroeconomic trends and discuss policy responses. Attention will be given to conditions in the global economy and its impact on the U.S. Students will be asked to evaluate and analyze macroeconomic trends using graphs, charts and data. The report is expected to be 10 pages in length minimum including graphs. More details will be given in class regarding the research project.

Tentative Course Schedule:

Introduction to Basic Economic Concepts Review (chapter 1-3)

UNIT 1: THE DATA OF MACROECONOMICS

Ch. 23 Measuring a Nation's Income
Ch. 24 Measuring the Cost of Living
Examination I

UNIT 2: THE REAL ECONOMY IN THE LONG RUN

Ch. 25 Production and Growth
Ch. 26 Saving, Investment, and the Financial System
Ch. 27 The Basic Tools of Finance
Ch. 28 Unemployment
Examination II

UNIT 3: MONEY AND PRICES IN THE LONG RUN

Ch. 29 The Monetary System
Ch. 30 Money, Growth, and Inflation
Examination III

UNIT 4: THE MACROECONOMICS OF OPEN ECONOMIES

Ch. 31 Open-Economy Macroeconomics
Ch. 32 A Macroeconomic Theory of the Open Economy, International Trade & Finance
Examination IV

UNIT 5: SHORT-RUN ECONOMIC FLUCTUATIONS

Ch. 33 Aggregate Demand and Aggregate Supply
Ch. 34 The Influence of Monetary and Fiscal Policy on Aggregate Demand
Ch. 35 The Short-Run Trade-off between Inflation and Unemployment
Examination V

Final Exam

Research Project Due one week prior to the close of school.