

Kolbe Academy Home School

GRADE EIGHT OR NINE ALGEBRA I (K) *Foerster Algebra 1*

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COURSE TITLE: Algebra I

COURSE TEXTS:

- ❖ *Algebra I Expressions, Equations, and Applications*, Paul A. Foerster, © 2006

COURSE DESCRIPTION:

This course plan includes a one year course in Algebra I (K). Parents should preview the course plans to gain a better understanding of what each course entails.

The beginning Algebra I (K) course moves at a very quick pace as much of the material in the first 2 chapters is review of Pre-Algebra. A review of decimals, fractions, and percentages is not included so parents should be sure the student is comfortable with those topics before beginning the course. Students who do well in the Algebra I (K) course will find themselves ready for the study of Algebra II (K) or Algebra II/Trig (H) during the following year.

SCOPE AND SEQUENCE:

Algebra I

1. Expressions and Equations
2. Operations with Negative Numbers
3. Distributing, Axioms, and Other Properties
4. Harder Equations
5. Some Operations with Polynomials and Radicals
6. Quadratic Equations
7. Expressions and Equations Containing Two Variables
8. Linear Functions, Scattered Data, and Probability
9. Properties of Exponents
10. More Operations with Polynomials
11. Rational Algebraic Expressions
12. Radical Algebraic Expressions
13. Inequalities
14. Functions and Advanced Topics

DIPLOMA REQUIREMENTS:

Summa Cum Laude diploma candidates are required to follow either the Kolbe Core course (K) or Kolbe Honors course (H) track outlined in this course plan. **Magna Cum Laude** and **Standard** diploma candidates may choose to pursue the (H) or (K) designation, but are not required to do so, and instead have the option of altering the course plan as they choose. **Summa** students must complete 4 years of mathematics during their high school course of study including Algebra I, Geometry, Algebra II, and Pre-Calculus (or higher). **Magna** students must complete 3 years of mathematics during their high school course of study including Algebra I, Geometry, and Algebra II (or higher). **Standard** diploma students must complete 2 years of mathematics including Algebra I. Please see below for specific course titles, semester reporting requirements and transcript designations for Algebra II (K) and Algebra II/Trigonometry (H).

SEMESTER REPORTING REQUIREMENTS:

Designation*		K
Course Title	Algebra I	Algebra I
Semester 1	Any TWO samples of written and graded work from Semester 1.	1) Completed Midterm 1 Core Exam 2) Completed Semester 1 Core Exam
Semester 2	Any TWO samples of written and graded work from Semester 2.	1) Completed Midterm 2 Core Exam 2) Completed Semester 2 Core Exam

*Designation refers to designation type on transcript. K designates a Kolbe Academy Core course. H designates a Kolbe Academy Honors course.

If the student wishes to have the course distinguished on the transcript with a (K) as a Kolbe Academy Core course please be sure to send the correct exams and components each semester for verification as specified above. **If no designation on the transcript is desired, parents may alter the lesson plan and any written sample work is acceptable to receive credit for the course each semester.** If you have any questions regarding what is required for the (K) designation or diploma type status, please contact the academic advisory department at 707-255-6499 ext. 5 or by email at advisors@kolbe.org.

COURSE PLAN "AT A GLANCE" OUTLINE:**Core Algebra I (K)****Semester 1**

Weeks 1-8: Chapters 1-5 section 3
 Week 9: Midterm 1 Exam
 Weeks 10-17: Chapters 5 section 3 to 8 to
 Chapter 7 section 7
 Week 18: Semester 1 Exam

Semester 2

Weeks 1-8: Chapter 7 section 8 to Chapter 11
 section 7
 Week 9: Midterm 2 Exam
 Weeks 10-17: Chapters 11-13, select topics in
 Chapter 14
 Week 18: Semester 2 Exam

Please note that some chapters are not covered in their entirety. Be sure to refer to the course plan that follows for specific guidance.

COURSE PLAN METHODOLOGY:

Mastery in mathematics is achieved through constant practice, so these course plans are written such that math is visited everyday (5 days/week). Each section, when assigned, is usually meant to be done in 1 day. In some instances, however, section assignments are longer, in which case there may be 3 or 4 days of assignments in a week. During these weeks, longer assignments may be broken up into two days. It is recommended that students keep to a 5 day/week schedule with mathematics despite the scheduling of their other courses.

The **Oral Practice** problems that appear at the beginning of the exercises with each lesson are assigned in this course plan only occasionally. In the sections in which they are not assigned, parents may still desire to use these to check for understanding during a lesson or may want to use them as short quiz grades or participation grades, if desired.

The **Exercise Assignments** for each section generally include most or all odd numbered problems. Most odd numbered problems are answered in the back of the student text to aid students in understanding whether they have understood the methodology of the problem. If additional work is needed, students may want to pick more of the odd or a few of the even numbered problems for further practice.

At the end of every chapter, a **Chapter Review** is assigned. The Chapter Review could be used as a test for the student. The Chapter Review questions, if used as a test, should be completed in less than one hour. One set of comprehensive **Exams** for Kolbe Core (K) students is included at the end of the course plan to be taken quarterly. A full two hours should be allotted for the student to complete Kolbe Academy's Mid Semester and Semester Exams. All questions are taken from the Test bank provided by the author.

Kolbe Academy Home School

ALGEBRA 1 Honors (H) *Foerster Algebra 1*

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COURSE TITLE: Algebra 1 Honors

COURSE TEXTS AND RESOURCES:

- ❖ *Algebra 1 Expressions, Equations, and Applications, 3rd Edition*, Paul A. Foerster, © 2006
- ❖ *Algebra 1 Expressions, Equations, and Applications Solutions Manual*, Paul A. Foerster
- ❖ *Foerster's Algebra 1 Home Study Companion Flash Drive*, David Chandler (optional)

COURSE DESCRIPTION:

This course plan includes a one-year course in Algebra 1 Honors (H). Parents should preview the course plans to gain a better understanding of what it entails.

The beginning of the Algebra 1 (H) course moves at a very quick pace as much of the material in the first 2 chapters is review of Pre-Algebra. A review of decimals, fractions, and percentages is not included, so parents should be sure the student is comfortable with those topics before beginning the course.

SCOPE AND SEQUENCE:

Algebra 1

- | | |
|------------|--|
| Chapter 1 | Expressions and Equations |
| Chapter 2 | Operations with Negative Numbers |
| Chapter 3 | Distributing: Axioms and Other Properties |
| Chapter 4 | Harder Equations |
| Chapter 7 | Expressions and Equations Containing Two Variables |
| Chapter 8 | Linear Functions, Scattered Data, and Probability |
| Chapter 13 | Inequalities |
| Chapter 5 | Some Operations with Polynomials and Radicals |
| Chapter 6 | Quadratic Equations |
| Chapter 9 | Properties of Exponents |
| Chapter 10 | More Operations with Polynomials |
| Chapter 11 | Rational Algebraic Expressions |
| Chapter 12 | Radical Algebraic Expressions |
| Chapter 14 | Functions and Advanced Topics |

DIPLOMA REQUIREMENTS:

Summa Cum Laude diploma candidates are required to follow either the Kolbe Core Algebra (K) course (K) or Kolbe Honors course (H) track outlined in this course plan. **Magna Cum Laude** and **Standard** diploma candidates may choose to pursue the (H) or (K) designation, but are not required to do so, and instead have the option of altering the course plan as they choose. **Summa** students must complete 4 years of mathematics during their high school course of study including Algebra 1, Geometry, Algebra 2, and Pre-Calculus (or higher). **Magna** students must complete 3 years of mathematics during their high school course of study including Algebra 1, Geometry, and Algebra 2 (or higher). **Standard** diploma students must complete 2 years of mathematics including Algebra 1. Please see below for specific semester reporting requirements and transcript designations for Algebra 1 (K) and Algebra 1 (H).

SEMESTER REPORTING REQUIREMENTS:

Designation*	H
Course Title	Algebra 1
Semester 1	Completed Chapter 7 Test (Parts 1 and 2) Completed Algebra 1 Honors Semester 1 Exam
Semester 2	Completed Chapter 10 Test Completed Algebra 1 Honors Semester 2 Exam

*Designation refers to designation type on transcript. H designates a Kolbe Academy Honors course.

If the student wishes to have the course distinguished on the transcript with an (H) as a Kolbe Academy Honors course, please be sure to send the correct exams and components each semester for verification as specified above. **If no designation on the transcript is desired, parents may alter the lesson plan and any written sample work is acceptable to receive credit for the course each semester.** If you have any questions regarding what is required for the (H) designation or diploma type status, please contact the academic advisory department at 707-255-6499 ext. 5 or by email at advisors@kolbe.org.

COURSE PLAN "AT A GLANCE" OUTLINE:**Semester 1 Material Covered:**

Week 1	Chapter 1: 1-1 through 1-10
Week 2	Chapter 2: 2-1 through 2-9
Week 3	Chapter 3: 3-1 through 3-6
Week 4	Chapter 4: 4-1 through 4-5
Week 5	Chapter 4: 4-6 through 4-7
Week 6	Chapter 7: 7-1 through 7-4
Week 7	Chapter 7: 7-5 through 7-6
Week 8	Chapter 7: 7-7 through 7-9
Week 9	Chapter 7: 7-10
Week 10	Chapter 8: 8-1 through 8-4
Week 11	Chapter 13/Chapter 6: 13-1 through 13-3, 6-3
Week 12	Chapter 13: 13-4 through 13-5
Week 13	Chapter 13: 13-6 through 13-7
Week 14	Chapter 5: 5-1 through 5-4
Week 15	Chapter 5: 5-5 through 5-7
Week 16	Chapter 5: 5-8 through 5-10
Week 17	Semester 1 Review
Week 18	Semester 1 Review

Exam Schedule:

Chapter 1 Test
Chapter 2 Test
Chapter 3 Test
Chapter 4 Test
Chapter 7-1 through 7-6 Test
Chapter 7-7 through 7-10 Test
Chapter 8 Test
Chapter 13 Test
Chapter 5 Test
Algebra 1 Honors Semester 1 Exam

Semester 2 Material Covered:

Week 1	Chapter 6: 6-1 through 6-4
Week 2	Chapter 6: 6-5 through 6-8
Week 3	Chapter 6: 6-9 through 6-11
Week 4	Chapter 9: 9-1 through 9-4
Week 5	Chapter 9: 9-5 through 9-8
Week 6	Chapter 10: 10-1 through 10-4
Week 7	Chapter 10: 10-5 through 10-9
Week 8	Chapter 11: 11-1 through 11-3
Week 9	Chapter 11: 11-4 through 11-6
Week 10	Chapter 11: 11-7 through 11-8
Week 11	Chapter 11/Chapter 12: 11-9 through 11-11, 12-1
Week 12	Chapter 12: 12-2 through 12-4
Week 13	Chapter 12: 12-5 through 12-7
Week 14	Chapter 12: 12-8 through 12-10
Week 15	Chapter 14: 14-1 through 14-3
Week 16	Chapter 14: 14-4 through 14-5
Week 17	Chapter 14: 14-6 through 14-7
Week 18	Semester 2 Review

Exam Schedule:

Chapter 6 Test
Chapter 9 Test
Chapter 10 Test
Chapter 11-1 through 11-8 Test
Chapter 11-9 through 11-10 Test
Chapter 12 Test
Chapter 14 Test
Algebra 1 Honors Semester 2 Exam

COURSE PLAN METHODOLOGY:

Mastery in mathematics is achieved through constant practice. It is recommended that students keep to a 5 day/week schedule with mathematics despite the scheduling of their other courses.

The **Oral Practice** problems that appear at the beginning of the exercises with each lesson are assigned in this course plan only occasionally. In the sections in which they are not assigned, parents may still desire to use these to check for understanding during a lesson or may want to use them as short quiz grades or participation grades, if desired.

The **Exercise Assignments** for each section generally include most or all odd numbered problems. Most odd numbered problems are answered in the back of the student text to aid students in determining whether they have understood the methodology of the problem. If additional work is needed, students may want to pick more of the odd or a few of the even numbered problems for further practice.

Each chapter includes a **Chapter Review**. They can be used to prepare for Chapter Tests. One set of comprehensive **Exams** for Kolbe Core (H) students is included at the end of the course plan to be taken at the end of each semester. A full two hours should be allotted for the student to complete Kolbe Academy's Semester Exams. All questions are taken from the test bank provided by the author.

Kolbe Academy Home School

ALGEBRA 2 HIGH SCHOOL MATH Kolbe Core Level *Foerster Algebra 2*

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COURSE TITLE: Algebra 2

COURSE TEXTS AND RESOURCES:

- ❖ *Algebra and Trigonometry: Functions and Applications*, Paul A. Foerster, © 2006
- ❖ *Algebra and Trigonometry Solutions Manual*, Paul A. Foerster, Second Edition
- ❖ *Kolbe Academy Graphing Calculator Lab Manual*, © 2009
- ❖ *Kolbe Academy Graphing Calculator Lab Manual Teacher's Guide*
- ❖ *Math without Borders* Foerster Flash Drive Lecture Set [optional]

COURSE DESCRIPTION:

This course plan includes a one-year course in Algebra 2. Parents should preview the course plans to gain a better understanding of what this course entails.

The Algebra 2 course moves at a very reasonable pace for most high school students. It is meant to be a college preparatory course in nature, taking the student through a great number of Algebra 2 concepts, but also spending a little more time on reviewing Algebra 1 than the honors version of the course. This course of study can be completed by most average students. Upon completion of Algebra 2, students will be ready to tackle any Precalculus course the following year. If a student is struggling with this course, parents may want to call and speak with an advisor, but the following modifications could be made – omitting Chapters 9 & 10.

SCOPE AND SEQUENCE:

Algebra 2

- Chapter 1 Preliminary Information
- Chapter 2 Functions and Relations
- Chapter 3 Linear Functions
- Chapter 4 Systems of Linear Equations and Inequalities
- Chapter 5 Quadratic Functions and Complex Numbers
- Chapter 6 Exponential and Logarithmic Functions
- Chapter 7 Rational Algebraic Functions
- Chapter 10 Higher-Degree Functions and Complex Numbers
- Chapter 9 Quadratic Relations and Systems
- Chapter 8 Irrational Algebraic Functions

COURSE PLAN "AT A GLANCE" OUTLINE:**Semester 1 Material Covered:**

Week 1	Chapter 1: 1-1 through 1-4
Week 2	Chapter 1: 1-5 through 1-7
Week 3	Chapter 1/2: 1-8 through 2-2
Week 4	Chapter 2: 2-3 through 2-4
Week 5	Chapter 2/3: 2-5 through 3-2
Week 6	Chapter 3: 3-3 through 3-5
Week 7	Chapter 3/4: 3-5 through 4-1
Week 8	Chapter 4: 4-2 through 4-4
Week 9	Chapter 4: 4-4 through 4-7
Week 10	Chapter 4: 4-8 through 4-11
Week 11	Chapter 4/5: 4-12 through 5-2
Week 12	Chapter 5: 5-3
Week 13	Chapter 5: 5-4 through 5-6
Week 14	Chapter 5: 5-7 through 5-8
Week 15	Chapter 6: 6-1 through 6-3
Week 16	Chapter 6: 6-4 through 6-5
Week 17	Chapter 6: 6-6; begin Semester 1 Review
Week 18	Semester 1 Review

Exam Schedule:

Chapter 1 Test
Chapter 2 Test
Chapter 3 Test
Chapter 4 Test
Chapter 5 Test
Algebra 2 Semester 1 Exam

Semester 2 Material Covered:

Week 1	Chapter 6: 6-7 through 6-9
Week 2	Chapter 6: 6-10 through 6-13
Week 3	Chapter 6: 6-14 through 7-1
Week 4	Chapter 7: 7-2 through 7-4
Week 5	Chapter 7: 7-4 through 7-6
Week 6	Chapter 10: 10-2 through 10-4
Week 7	Chapter 7: 7-6 through 7-12
Week 8	Chapter 9: 9-1 through 9-4, 9-6
Week 9	Chapter 9: 9-4 through 9-6
Week 10	Chapter 7: 7-7 through 7-8
Week 11	Chapter 7: 7-9
Week 12	Chapter 7: 7-10 through 7-11
Week 13	Chapter 7/8: 7-12 through 8-2
Week 14	Chapter 8: 8-3 through 8-4
Week 15	Chapter 8: 8-5 through 8-6
Week 16	Chapter 8: 8-7 through 8-8
Week 17	Semester 2 Review
Week 18	No New Material

Exam Schedule:

Chapter 6 Test
Chapter 7/10 Test
Chapter 9 Test
Chapter 7 (later sections) Test
Chapter 8 Test
Algebra 2 Semester 2 Exam

Please note – Chapters 7 and 10 are combined. Parts of chapter 7 are postponed until after Chapter 9.

COURSE PLAN METHODOLOGY:

Mastery in mathematics is achieved through constant practice, so these course plans are written such that math is visited everyday (5 days/week). Each section, when assigned, is meant to be done in 1 day unless otherwise specified in the course plan. It is recommended that students keep to a 5 day/week schedule with mathematics despite the scheduling of their other courses.

The ***Do These Quickly*** problems (i.e. Q1-Q10) that appear at the beginning of the exercises with each lesson are meant to be completed in 5 minutes or less. Students should **not** write out all the steps neatly for these problems, but instead try to quickly write down the answer and move on. These problems are meant to recall concepts learned in previous courses (Geometry, Algebra I, and even basic mathematics) and in later chapters to review concepts learned in earlier portions of the book. Overall, these problems will help a student to think quickly, a skill that is useful in taking standardized tests, and will assist the student in remembering useful mathematical tools learned in the past. **These problems can be used as quiz grades, if desired.**

The ***Exercise Assignments*** for each section generally include odd numbered problems. Most odd numbered problems are answered in the back of the student text to aid students in understanding whether they have understood the methodology of the problem.

The ***Chapter Tests*** may be found in this course plan. Comprehensive ***Semester Exams*** may be found after the Chapter Tests and are to be taken at the end of each semester. Answer keys for both may be found after the tests and exams. A full two hours should be allotted for the student to complete the Semester Exams. Unless otherwise specified, tests and exams are intended to be taken closed book. If the student is not seeking the Kolbe Core (K) designation, then the parent or instructor may provide alternate instructions for the tests and make adjustments to the questions on the tests.

The ***Kolbe Academy Graphing Calculator Lab Manual (CALC)*** is written into the course plan as appropriate. Solutions to the graphing calculator problems are provided in the Kolbe Academy Solution Manual to the Graphing Calculator Lab Manual. While it isn't absolutely essential for students to learn how to use a graphing calculator, it is preferable, especially in courses of Algebra 2 and beyond. Students need to know how to graph things on paper, but it is very useful to use a graphing calculator for the more complex problems where graphing (or other calculations) would bog the student down with unnecessary busy work. Furthermore, the ACT and SAT both allow the use of a graphing calculator, so it can greatly benefit students to know some short cuts to aid them on the math portions of these exams.

The ***Kolbe Academy Graphing Calculator Lab Manual Teacher's Guide*** includes an overview of the functions of the TI-84. Kolbe has also provided the same overview in the Appendix of this course plan. The Texas Instruments (TI) graphing calculators are the most widely used by high school and college students and is the recommended calculator for this course. Note that the TI-83+ or TI-84 is highly recommended as it has far more capabilities than the earlier versions of the graphing calculator. Any special program or function will be outlined in the Texas Instruments Guidebook that comes with your calculator. Note that the TI-85 and TI-86 are set up quite differently from the TI-83, and 84. However, with a little independent study, these versions can also be used easily with the Graphing Calculator Lab Manual.

DIPLOMA REQUIREMENTS:

Summa Cum Laude diploma candidates are required to follow the Kolbe Core course (K) track outlined in this course plan. **Magna Cum Laude** and **Standard** diploma candidates may choose to pursue the (K) designation, but are not required to do so, and instead have the option of altering the course plan as they choose. **Summa** students must complete 4 years of mathematics during their high school course of study including Algebra 1, Geometry, Algebra 2, and Pre-Calculus (or higher). **Magna** students must complete 3 years of mathematics during their high school course of study including Algebra 1, Geometry, and Algebra 2 (or higher). **Standard** diploma students must complete 2 years of mathematics including Algebra 1. Please see below for specific course titles, semester reporting requirements for Algebra 2 and Algebra 2 (K).

SEMESTER REPORTING REQUIREMENTS:

Designation*	No Designation	K	H
Course Title	Algebra 2	Algebra 2	Algebra 2 w/Trig
Semester 1	Any TWO samples of written and graded work from Semester 1.	1. Completed Chapter 3 Test 2. Completed Semester 1 Exam	Please use the Honor's level Foerster's Algebra 2 w/Trigonometry course plan to receive the H designation
Semester 2	Any TWO samples of written and graded work from Semester 2.	1. Completed Chapter 9 Test 2. Completed Semester 2 Exam	

*Designation refers to designation type on transcript. K designates a Kolbe Academy Core course.

If the student wishes to have the course distinguished on the transcript with a (K) as a Kolbe Academy Core course, please be sure to send the correct exams and components each semester for verification as specified above. **If no designation on the transcript is desired, parents may alter the lesson plan and any written sample work is acceptable to receive credit for the course each semester.** If you have any questions regarding what is required for the (K) designation or diploma type status, please contact the academic advisory department at 707-255-6499 ext. 5 or by email at advisors@kolbe.org.

Kolbe Academy Home School

HONORS ALGEBRA 2 & TRIGONOMETRY HIGH SCHOOL MATH

Foerster Algebra and Trigonometry

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COURSE TITLE: Honors Algebra 2 & Trigonometry

COURSE TEXTS:

- ❖ *Algebra and Trigonometry: Functions and Applications*, Paul A. Foerster, © 2006
- ❖ *Algebra and Trigonometry: Functions and Applications Solutions Manual*, Second Edition
- ❖ Kolbe Academy Graphing Calculator Lab Manual, © 2009
- ❖ Kolbe Academy Solution Manual to the Graphing Calculator Lab Manual
- ❖ *Math without Borders* Foerster DVD Lecture Set [optional]

COURSE DESCRIPTION:

This course plan includes a one-year course in Honors Algebra 2 & Trigonometry.

The Honors Algebra 2/Trigonometry course moves at a very quick pace and emphasizes the more difficult concepts and mathematical applications in the text. This course of study, although up to the parent's discretion, is recommended for students who received an A in either Algebra 1 or Geometry and received at least a B+ in both Algebra 1 and Geometry. Students who do well in the Honors Algebra 2/Trigonometry course will find themselves ready for the study of Calculus during the following year. All students pursuing Honors should expect to find the content and pace of the coursework challenging and should be sure to allot extra time for their studies. Those wishing to pursue the Honors designation in this course will have a heavier emphasis on the mathematical applications of concepts learned in the course.

SCOPE AND SEQUENCE:

Honors Algebra 2/Trigonometry

- Chapter 1 Preliminary Information
- Chapter 2 Functions and Relations
- Chapter 3 Linear Functions
- Chapter 4 Systems of Linear Equations and Inequalities
- Chapter 5 Quadratic Functions and Complex Numbers
- Chapter 6 Exponential and Logarithmic Functions
- Chapter 7 Rational Algebraic Functions
- Chapter 10 Higher-Degree Functions and Complex Numbers
- Chapter 9 Quadratic Relations and Systems
- Chapter 8 Irrational Algebraic Functions
- Chapter 13 Trigonometric and Circular Functions
- Chapter 14 Properties of Trigonometric and Circular Functions
- Chapter 15 Triangle Problems

COURSE PLAN “AT A GLANCE” OUTLINE:

Semester 1 Material Covered:

Week 1	Chapter 1: 1-1 through 1-5
Week 2	Chapter 1: 1-6 through Chapter 2: 2-3
Week 3	Chapter 2: 2-3 through Chapter 3: 3-2
Week 4	Chapter 3: 3-3 through 3-6
Week 5	Chapter 4: 4-1 through 4-6
Week 6	Chapter 4: 4-7 through 4-11
Week 7	Chapter 4: 4-12 through Chapter 5: 5-2
Week 8	Chapter 5: 5-3 through 5-6
Week 9	Chapter 5: 5-7 through Chapter 6: 6-1
Week 10	Chapter 6: 6-2 through 6-4
Week 11	Chapter 6: 6-5 through 6-8
Week 12	Chapter 6: 6-9 through 6-11
Week 13	Chapter 6: 6-12 through 6-15
Week 14	Chapter 7: 7-1 through 7-4
Week 15	Chapter 7: 7-4 through Chapter 10: 10-2
Week 16	Chapter 10: 10-3 through Chapter 7: 7-6
Week 17	Chapter 9: 9-1 through 9-6
Week 18	Semester 1 Review

Exam Schedule:

Chapter 1 Test
Chapter 2 Test
Chapter 3 Test
Chapter 4 Test
Chapter 5 Test
Chapter 6 Test
Chapter 7/10 Test
Chapter 9 Test
Algebra 2 Honors Semester 1 Exam

Semester 2 Material Covered:

Week 1	Chapter 7: 7-7 through 7-9
Week 2	Chapter 7: 7-9 through 7-11
Week 3	Chapter 7: 7-11 through Chapter 8: 8-2
Week 4	Chapter 8: 8-3 through 8-5
Week 5	Chapter 8: 8-6 through Chapter 13: 13-1
Week 6	Chapter 13: 13-2 through 13-5
Week 7	Chapter 13: 13-6 through 13-9
Week 8	Chapter 13: 13-9 through 13-11
Week 9	Chapter 13: 13-12 through Chapter 14: 14-2
Week 10	Chapter 14: 14-2 through 14-3
Week 11	Chapter 14: 14-3 through 14-5
Week 12	Chapter 14: 14-8 through 14-8
Week 13	Chapter 14: 14-9
Week 14	Chapter 14: 14-10 through Chapter 15: 15-3
Week 15	Chapter 15: 15-4 through 15-6
Week 16	Chapter 15: 15-7 through 15-9
Week 17	Chapter 15: 15-9 through 15-10
Week 18	Semester 2 Review

Exam Schedule:

Chapter 7(2 nd half) Test
Chapter 8 Test
Chapter 13 Test
Chapter 14 Test
Chapter 15 Test
Algebra 2 Honors Semester 2 Exam

COURSE PLAN METHODOLOGY:

Mastery in mathematics is achieved through constant practice, so these course plans are written such that math is visited everyday (5 days/week). Each section, when assigned, is meant to be done in 1 day unless otherwise specified in the course plan. It is recommended that students keep to a 5 day/week schedule with mathematics despite the scheduling of their other courses.

The ***Do These Quickly*** problems (i.e. Q1-Q10) that appear at the beginning of the exercises with each lesson are meant to be completed in 5 minutes or less. Students should **not** write out all the steps neatly for these problems, but instead try to quickly write down the answer and move on. These problems are meant to recall concepts learned in previous courses (Geometry, Algebra 1, and even basic mathematics) and in later chapters to review concepts learned in earlier portions of the book. Overall, these problems will help a student to think quickly, a skill that is useful in taking standardized tests, and will assist the student in remembering useful mathematical tools learned in the past. **These problems can be used as quiz grades, if desired.**

The ***Exercise Assignments*** for each section generally include odd numbered problems. Most odd numbered problems are answered in the back of the student text to aid students in understanding whether they have understood the methodology of the problem. If additional work is needed, students may want to pick a few of the even numbered problems for further practice.

The ***Chapter Tests*** may be found in this course plan. Comprehensive ***Semester Exams*** may be found after the Chapter Tests and are to be taken at the end of each semester. Answer keys for both may be found after the tests and exams. A full two hours should be allotted for the student to complete the Semester Exams. Unless otherwise specified, tests and exams are intended to be taken closed book. If the student is not seeking the Kolbe Honors (H) designation, then the parent or instructor may provide alternate instructions for the tests and make adjustments to the questions on the tests.

The ***Kolbe Academy Graphing Calculator Supplement (CALC)*** is written into the course plan as they correspond with the appropriate sections. Solutions to the graphing calculator problems are provided in the Kolbe Academy Graphing Calculator Lab Manual Teacher's Guide. While it isn't absolutely essential for students to learn how to use a graphing calculator, it is preferable, especially in courses of Algebra 2 and beyond. Students need to know how to graph things on paper, but it is very useful to know how to appropriately use a graphing calculator for the more complex problems where graphing (or other calculations) would bog the student down with unnecessary busy work. Furthermore, the ACT and SAT both allow the use of a graphing calculator, so it can greatly benefit students to know some short cuts to aid them on the math portions of these exams.

The ***Kolbe Academy Graphing Calculator Lab Manual Teacher's Guide*** includes an overview of the functions of the TI-84. Kolbe has also provided the same overview in the Appendix of this course plan. The Texas Instruments (TI) graphing calculators are the most widely used by high school and college students and is the recommended calculator for this course. Note that the TI-83+ or TI-84 is highly recommended as it has far more capabilities than the earlier versions of the graphing calculator. Any special program or function will be outlined in the Texas Instruments Guidebook that comes with your calculator. Note that the TI-85 and TI-86 are set up quite differently from the TI-83, and 84. However, with a little independent study, these versions can also be used easily with the Graphing Calculator Lab Manual.

DIPLOMA REQUIREMENTS:

Summa Cum Laude diploma candidates are required to follow either the Kolbe Core (K) or Kolbe Honors (H) tracks for math courses. **Magna Cum Laude** and **Standard** diploma candidates may choose to pursue the (H) or (K) designation, but are not required to do so, and instead have the option of altering the course plan as they choose. **Summa** students must complete 4 years of mathematics during their high school course of study including Algebra 1, Geometry, Algebra 2, and Pre-Calculus (or higher). **Magna** students must complete 3 years of mathematics during their high school course of study including Algebra 1, Geometry, and Algebra 2 (or higher). **Standard** diploma students must complete 2 years of mathematics including Algebra 1. Please see below for specific course titles, semester reporting requirements and transcript designations for Algebra II and Algebra II/Trigonometry (H).

SEMESTER REPORTING REQUIREMENTS:

Designation*	No Designation	K	H
Course Title	Algebra 2 w/Trig	Algebra 2	Algebra 2 w/ Trig
Semester 1	Any TWO samples of written and graded work from Semester 1.	Please use the Core level Foerster's Algebra 2 course plan to receive the K designation.	1. Completed Chapter 5 Test 2. Completed Semester 1 Exam
Semester 2	Any TWO samples of written and graded work from Semester 2.		1. Completed Chapter 13 Test 2. Completed Semester 2 Exam

*Designation refers to designation type on transcript. (K) designates a Kolbe Academy Core course. (H) designates a Kolbe Academy Honors course.

If the student wishes to have the course distinguished on the transcript with an (H) as a Kolbe Academy Honors course, please be sure to send the correct exams and components each semester for verification as specified above. **If no designation on the transcript is desired, parents may alter the lesson plan and any written sample work is acceptable to receive credit for the course each semester.** If you have any questions regarding what is required for the (K) or (H) designations or diploma type status, please contact the academic advisory department at 707-255-6499 ext. 5 or by email at advisors@kolbe.org

Kolbe Academy Home School

PRECALCULUS HIGH SCHOOL MATH Kolbe Core Level

Foerster Precalculus: Concepts and Applications, 3rd Edition

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COURSE TITLE: Precalculus

COURSE DESCRIPTION:

This course is a one-year course (10 credits) in high school Precalculus. Parents should preview the course plans to gain a better understanding of what this course entails.

The Kolbe Core (K) track, although left up to the parent's discretion, is recommended for any student who has successfully completed Algebra II (K) or Algebra II/Trig (H). If a student finds the work load unbearable, please contact the advisor department so that suggestions can be made for the student to succeed in this course.

COURSE TEXTS, RESOURCES, & MATERIALS:

- ❖ *Precalculus: Concepts and Applications*, Paul A. Foerster, © 2012, 3rd edition
- ❖ *Precalculus Parent/Instructor Material* -: registration instructions sent by e-mail upon purchase of textbook
 - Provides access to:
 - PDF copy of textbook Solutions Manual
 - Graphing Calculator Programs
- ❖ *Math Without Borders* Foerster's Precalculus Home Study Companion w/Solutions Flash Drive, [optional]
- ❖ Programmable Graphing Calculator, preferably TI-83 or TI-84 model

SCOPE AND SEQUENCE:

Unit 1: Algebraic, Exponential, and Logarithmic Functions

1. Chapter 1- Functions and Mathematical Models
2. Chapter 2 - Properties of Elementary Functions
3. Chapter 4- Polynomial and Rational Functions

Unit 2: Trigonometric and Periodic Functions

1. Chapter 5 - Periodic Functions and Right Triangle Problems
2. Chapter 6 - Applications of Trigonometric and Circular Functions
3. Chapter 7- Trigonometric Function Properties, Identities, and Parametric Functions
4. Chapter 8- Properties of Combined Sinusoids
5. Chapter 9- Triangle Trigonometry

Unit 2: Analytic Geometry

1. Chapter 10 - Conic Sections and Quadratic Surfaces
2. Chapter 11- Polar Coordinates, Complex Numbers, and Moving Objects

Unit 4: Introduction to Discrete and Continuous Mathematics

1. Chapter 14 - Probability, and Functions of a Random Variable
2. Chapter 15 - Sequences and Series

COURSE PLAN "AT A GLANCE" OUTLINE:**Semester 1 Material Covered:**

Week 1	Chapter 1: 1-1 through 1-3
Week 2	Chapter 1: 1-4 through 1-8
Week 3	Chapter 2: 2-1 through 2-3
Week 4	Chapter 2: 2-3 through 2-6
Week 5	Chapter 2: 2-8 through Chapter 4: 4-2
Week 6	Chapter 4: 4-2 through 4-4
Week 7	Chapter 4: 4-5 through 4-7
Week 8	Chapter 4: 4-9 through Chapter 5: 5-2
Week 9	Chapter 5: 5-3 through 5-5
Week 10	Chapter 5: 5-6 through Chapter 6: 6-2
Week 11	Chapter 6: 6-2 through 6-5
Week 12	Chapter 6: 6-6 through 6-8
Week 13	Chapter 6: 6-9 through Chapter 7: 7-2
Week 14	Chapter 7: 7-2 through 7-4
Week 15	Chapter 7: 7-4 through 7-6
Week 16	Chapter 7: 7-6 through 7-7
Week 17	Semester 1 Review
Week 18	Semester 1 Review

Exam Schedule:

Chapter 1 Test
Chapter 2 Test
Chapter 4 Test
Chapter 5 Test
Chapter 6 Test
Chapter 7 Test
Precalculus Semester 1 Exam

Semester 2 Material Covered:

Week 1	Chapter 8: 8-1 through 8-3
Week 2	Chapter 8: 8-3 through 8-6
Week 3	Chapter 8: 8-7 through Chapter 9: 9-2
Week 4	Chapter 9: 9-3 through 9-6
Week 5	Chapter 9: 6-7 through 9-7
Week 6	Chapter 9:9-8 through Chapter 10: 10-2
Week 7	Chapter 10: 10-2 through 10-4
Week 8	Chapter 10: 10-5 through 10-8
Week 9	Chapter 11: 11-1 through 11-4
Week 10	Chapter 11: 11-4 through 11-6
Week 11	Chapter 14: 14-1 through 14-4
Week 12	Chapter 14: 14-4 through 14-6
Week 13	Chapter 14: 14-6 through 14-8
Week 14	Chapter 14: 14:8 through 14-9
Week 15	Chapter 15: 15-1 through 15:3
Week 16	Chapter 15: 15-3 through 15-4
Week 17	Semester 2 Review
Week 18	Semester 2 Review

Exam Schedule:

Chapter 8 Test
Chapter 9 Test
Chapter 10 Test
Chapter 11 Test
Chapter 14 Test
Chapter 15 Test
Precalculus Semester 2 Exam

COURSE PLAN METHODOLOGY:

The **Quick Review** problems that appear at the beginning of the exercises with each lesson are meant to be completed in 5 minutes or less. Students should **not** write out all the steps neatly for these problems, but instead try to quickly write down the answer and move on. These problems are meant to recall concepts learned in previous sections, chapters or math courses. Overall, these problems will help a student to think quickly – a skill that is useful in taking standardized tests- and will assist the student in remembering useful mathematical tools learned in the past. These problems can be used as short, timed quizzes if desired.

A selection of exercises from the **Problem Sets** will be assigned with each section for the student to complete. A sufficient number of problems have been carefully chosen to help the student become proficient in a topic and prepare them for the Kolbe semester exams. The author's intent was not to have students complete all of the problems in the book, but to have a diverse number of problems available to the teacher. Most odd numbered problems are answered in the back of the student text. It is advisable for students to check their work as they go along in an assignment to be sure that they have understood the methodology of the section. The solution manual may be used by the student to check any even numbered problems. If additional work is needed, students may want to pick a few of the even numbered problems for further practice.

The **Chapter Tests and Comprehensive Semester Exams** may be found after the weekly lessons in this course plan. **Answer Keys** may be found after the Chapter Tests and answer keys and are to be taken at the end of each semester. A full two hours should be allotted for the student to complete Kolbe Academy's Semester Exams.

Students are expected to be utilizing a programmable **Graphing Calculator**. This skill is especially important now that the use of a graphing calculator is permissible on the math portion of the standardized tests including the SAT, ACT, and PSAT. The Kolbe Academy exams are set up specifically to hone testing skills with and without the use of the graphing calculator. Kolbe Academy has traditionally suggested the use of the TI-83 or TI-84 graphing calculator models. Graphing calculator programs required to complete problems are available for free to students and are accessed through the *Precalculus Parent/Instructor Materials*. If you did not receive an e-mail with a link to request this access please contact Kolbe Academy at homeinfo@kolbe.org, or at 707-255-6499 Ext. 5.

DIPLOMA REQUIREMENTS:

Summa Cum Laude diploma candidates are required to follow either the Kolbe Core course (K) course track outlined in this Calculus course plan. **Magna Cum Laude** and **Standard** diploma candidates may choose to pursue the (K) designation, but are not required to do so, and instead have the option of altering the course plan as they choose. **Summa** students must complete 4 years of mathematics during their high school course of study including Algebra I, Geometry, Algebra II, and Pre-Calculus (or higher). **Magna** students must complete 3 years of mathematics during their high school course of study including Algebra I, Geometry, and Algebra II (or higher). **Standard** diploma students must complete 2 years of mathematics including Algebra I. Please see below for specific course titles, semester reporting requirements and transcript designations for Precalculus and Precalculus (K).

REQUIRED SAMPLE WORK:

Designation*		K	H
Course Title	Precalculus	Precalculus	Precalculus
Semester 1	1. Any two written and graded samples of work	1. Completed Chapter 4 Test 2. Completed Semester 1 Exam	Please use the Honors level Precalculus course plan to receive the H designation.
Semester 2	1. Any two written and graded samples of work	1. Completed Chapter 10 Test 2. Completed Semester 2 Exam	

*Designation refers to designation type on transcript. K designates a Kolbe Academy Core course.

If the student wishes to have the course distinguished on the transcript with a (K) as a Kolbe Academy Core course, please be sure to send the correct exams and components each semester for verification as specified above. **If no designation on the transcript is desired, parents may alter the lesson plan and any written sample work is acceptable to receive credit for the course each semester.** If you have any questions regarding what is required for the (K) designation or diploma type status, please contact the academic advisory department at 707-255-6499 ext. 5 or by email at advisors@kolbe.org.

Kolbe Academy Home School

PRECALCULUS HIGH SCHOOL MATH Kolbe Honors Level

Foerster Precalculus: Concepts and Applications, 3rd Edition

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COURSE TITLE: Precalculus

COURSE DESCRIPTION:

This course is a one-year course (10 credits) in high school Precalculus. The honors track, although up to the parent's discretion, is aimed for students who have shown aptitude toward mathematics in their Geometry and Algebra II courses, or who have successfully completed the honors Algebra II/Trig course. All students pursuing honors should expect to find the content and pace of the coursework challenging and should be sure to allot extra time for their studies.

The Kolbe Honors (H) track, although up to the parent's discretion, is recommended for students who have achieved one of the following: a "B" or better in Algebra II/Trig (H) or an "A" in Algebra II (K). All students pursuing honors should expect to find the content and pace of the coursework challenging and should be sure to allot extra time for their studies

COURSE TEXTS AND MATERIALS:

- ❖ *Precalculus: Concepts and Applications*, Paul A. Foerster, © 2012, 3rd edition
- ❖ *Precalculus Parent/Instructor Material* –: available in Parent Portal
 - Provides access to:
 - PDF copy of textbook Solutions Manual
 - Graphing Calculator Programs
- ❖ *Math Without Borders* Foerster's Precalculus Home Study Companion w/Solutions Flash Drive, Optional
- ❖ Programmable Graphing Calculator, preferably TI-83 or TI-84 model

SCOPE AND SEQUENCE:

Unit 1: Algebraic, Exponential, and Logarithmic Functions

1. Chapter 1- Functions and Mathematical Models
2. Chapter 2 - Properties of Elementary Functions
3. Chapter 3 - Fitting Functions to Data (Honors Only)
4. Chapter 4- Polynomial and Rational Functions

Unit 2: Trigonometric and Periodic Functions

1. Chapter 5 - Periodic Functions and Right Triangle Problems
2. Chapter 6 - Applications of Trigonometric and Circular Functions
3. Chapter 7- Trigonometric Function Properties, Identities, and Parametric Functions
4. Chapter 8- Properties of Combined Sinusoids
5. Chapter 9- Triangle Trigonometry

Unit 2: Analytic Geometry

1. Chapter 10 - Conic Sections and Quadratic Surfaces
2. Chapter 11- Polar Coordinates, Complex Numbers, and Moving Objects
3. Chapter 12 – Three Dimensional Vectors (Honors Only)

Unit 4: Introduction to Discrete and Continuous Mathematics

1. Chapter 14 - Probability, and Functions of a Random Variable
2. Chapter 15 - Sequences and Series
3. Chapter 16 – Introduction to Limits, Derivatives, and Integrals (Honors Only)

COURSE PLAN “AT A GLANCE” OUTLINE:**Semester 1 Material Covered:**

Week 1	Chapter 1: 1-1 through 1-4
Week 2	Chapter 1: 1-5 through Chapter 2: 2-1
Week 3	Chapter 2: 2-2 through 2-5
Week 4	Chapter 2: 2-6 through 3-1
Week 5	Chapter 3: 3-2 through 3-5
Week 6	Chapter 3: 3-5 through Chapter 4: 4-2
Week 7	Chapter 4: 4-3 through 4-5
Week 8	Chapter 4: 4-6 through 4-8
Week 9	Chapter 5: 5-1 through 5-4
Week 10	Chapter 5: 5-5 through Chapter 6: 6-2
Week 11	Chapter 6: 6-2 through 6-6
Week 12	Chapter 6: 6-7 through 6-9
Week 13	Chapter 7: 7-1 through 7-2
Week 14	Chapter 7: 7-3 through 7-4
Week 15	Chapter 7: 7-5 through 7-6
Week 16	Chapter 7:7. Begin Exam Review
Week 17	Semester 1 Review
Week 18	Exam Week

Exam Schedule:

Chapter 1 Test
Chapter 2 Test
Chapter 3 Test
Chapter 4 Test
Chapter 5 Test
Chapter 6 Test
Chapter 7 Test
Precalculus Honors Semester 1 Exam

Semester 2 Material Covered:

Week 1	Chapter 8: 8-1 through 8-3
Week 2	Chapter 8: 8-5 through 8-7
Week 3	Chapter 9: 9-1 through 9-5
Week 4	Chapter 9: 9-6 through 9-8
Week 5	Chapter 10:1 through 10:3
Week 6	Chapter 10: 10-4 through Chapter 11: 11-1
Week 7	Chapter 11: 11-2 through 11-5
Week 8	Chapter 11: 11-5 through Chapter 12: 12-1
Week 9	Chapter 12: 12-2 through 12-5
Week 10	Chapter 12: 12-6 through 12-9
Week 11	Chapter 14: 14-1 through 14-4
Week 12	Chapter 14: 14-5 through 14-7
Week 13	Chapter 14: 14-7 through Chapter 15: 15-1
Week 14	Chapter 15: 15-2 through 15-4
Week 15	Chapter 16: 16-1 through 16-3
Week 16	Chapter 16: 16-3 through 16-5; Begin Exam Review
Week 17	Semester 2 Review
Week 18	Exam Week

Exam Schedule:

Chapter 8 Test
Chapter 9 Test
Chapter 10 Test
Chapter 11 Test
Chapter 12 Test
Chapter 14 Test
Chapter 15 Test
Chapter 16 Test
Precalculus Honors Semester 2 Exam

COURSE PLAN METHODOLOGY:

The **Quick Review** problems that appear at the beginning of the exercises with each lesson are meant to be completed in 5 minutes or less. Students should **not** write out all the steps neatly for these problems, but instead try to quickly write down the answer and move on. These problems are meant to recall concepts learned in previous sections, chapters or math courses. Overall, these problems will help a student to think quickly, a skill that is useful in taking standardized tests, and will assist the student in remembering useful mathematical tools learned in the past. These problems can be used as short, timed quizzes if desired.

A selection of exercises from the **Problem Sets** will be assigned with each section for the student to complete. A sufficient number of problems have been carefully chosen to help the student become proficient in a topic and prepare them for the Kolbe semester exams. The author's intent was not to have students complete all of the problems in the book, but to have a diverse number of problems available to the teacher. Most odd numbered problems are answered in the back of the student text. It is advisable for students to check their work as they go along in an assignment to be sure that they have understood the methodology of the section. The solution manual may be used by the student to check any even numbered problems. If additional work is needed, students may want to pick a few of the even numbered problems for further practice.

The **Chapter Tests and Comprehensive Semester Exams** may be found after the weekly lessons in this course plan. **Answer Keys** may be found after the Chapter Tests and answer keys and are to be taken at the end of each semester. A full two hours should be allotted for the student to complete Kolbe Academy's Semester Exams

It follows then, that students are expected to be utilizing a programmable **Graphing Calculator**. This skill is especially important now that the use of a graphing calculator is permissible on the math portion of the standardized tests including the SAT, ACT, and PSAT. The Kolbe Academy exams are set up specifically to hone testing skills with and without the use of the graphing calculator. Kolbe Academy has traditionally suggested the use of the TI-83 or TI-84 graphing calculator models. Graphing calculator programs required to complete problems are available for free to students and are accessed through the *Precalculus Parent/Instructor Materials* available in the Parent Portal.

DIPLOMA REQUIREMENTS:

Summa Cum Laude diploma candidates are required to follow either the Kolbe Core course (K) or Kolbe Honors course (H) track for this Precalculus course. **Magna Cum Laude** and **Standard** diploma candidates may choose to pursue the (H) or (K) designation, but are not required to do so, and instead have the option of altering the Precalculus course plan as they choose. **Summa** students must complete 4 years of mathematics during their high school course of study including Algebra I, Geometry, Algebra II, and Pre-Calculus (or higher). **Magna** students must complete 3 years of mathematics during their high school course of study including Algebra I, Geometry, and Algebra II (or higher). **Standard** diploma students must complete 2 years of mathematics including Algebra I. Please see below for specific course titles, semester reporting requirements and transcript designations for Precalculus.

REQUIRED SAMPLE WORK:

Designation*	No Designation	K	H
Course Title	Precalculus	Precalculus	Precalculus
Semester 1	1. Any two written samples of work	Please use the Core level Foerster's Precalculus course plan to receive the K designation.	1. Completed Chapter 4 Test 2. Completed Semester 1 Exam
Semester 2	1. Any two written samples of work		1. Completed Chapter 11 Test 2. Completed Semester 2 Exam

*Designation refers to designation type on transcript. K designates a Kolbe Academy Core level course. H designates a Kolbe Academy Honors level course.

If the student wishes to have the course distinguished on the transcript with an (H) as a Kolbe Academy Honors course, please be sure to send the correct exams and components each semester for verification as specified above. **If no designation on the transcript is desired, parents may alter the lesson plan and any written sample work is acceptable to receive credit for the course each semester.** If you have any questions regarding what is required for the (K) or (H) designations or diploma type status, please contact the academic advisory department at 707-255-6499 ext. 5 or by email at advisors@kolbe.org.

Kolbe Academy Home School

HIGH SCHOOL Calculus *Foerster Calculus: Concepts and Applications*

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COURSE TITLE: Calculus

COURSE TEXTS:

- ❖ *Calculus: Concept and Applications*, Paul A. Foerster, © 2010 (T4094)
- ❖ Solutions Manual (T4094A), Optional

COURSE MATERIALS:

- ❖ Programmable Graphing Calculator, preferably TI-83 or TI-84 model (required)
- ❖ Calculator Programs – download at www.keymath.com, scroll down, and click on Calculus
- ❖ Not available from Kolbe- An AP Calculus prep book for students interested in taking either AP exam.

COURSE DESCRIPTION:

This course plan includes a one year course (10 credits) in high school Calculus. The Kolbe Honors Calculus I and II (H) course prepares the student for the AP Calculus BC exam, which typically gives Calculus I and II credit at many colleges and universities. The Kolbe Core Calculus (K) course prepares the student for the AP Calculus AB exam, which typically gives Calculus I credit at most colleges and universities. (see each university's AP policy for credits)

The Kolbe Honors (H) track, although up to the parent's discretion, is recommended for students who have achieved one of the following: a "A" or better in Algebra II/Trig (H), an A in PreCalculus (K), or a "B+" in PreCalculus (H). All students pursuing honors should expect to find the content and pace of the coursework challenging and should be sure to allot extra time for their studies.

The Kolbe Core (K) track is recommended for students who have achieved one of the following: a "B" or better in Algebra II/Trig (H), or successful completion of PreCalculus (K or H).

SCOPE AND SEQUENCE:

Kolbe Core Calculus (K)

1. Limits, Derivatives, and Integrals
2. Properties of Limits
3. Derivatives, Antiderivatives, and Indefinite Integrals
4. Products, Quotients, and Parametric Functions
5. Definite and Indefinite Integrals
6. The Calculus of Exponential and Logarithmic Functions
7. The Calculus of Growth and Decay
8. The Calculus of Plane and Solid Figures
9. Algebraic Calculus Techniques for Elementary Functions
10. The Calculus of Motion – Averages, Extremes and Vectors

Kolbe Honors Calculus I & II (H) – all above topics plus the following

11. The Calculus of Variable-Factor Products
12. The Calculus of Functions Defined by Power Series

DIPLOMA REQUIREMENTS:

Summa Cum Laude diploma candidates are required to follow either the Kolbe Core course (K) or Kolbe Honors course (H) track outlined in this Calculus course plan if 40 credits of math have not already been earned toward graduation. **Magna Cum Laude** and **Standard** diploma candidates may choose to pursue the (H) or (K) designation, but are not required to do so, and instead have the option of altering the course plan as they choose. **Summa** students must complete 4 years (40 credits) of mathematics during their high school course of study including Algebra I, Geometry, Algebra II, and Pre-Calculus (or higher). **Magna** students must complete 3 years of mathematics during their high school course of study including Algebra I, Geometry, and Algebra II (or higher). **Standard** diploma students must complete 2 years of mathematics including Algebra I. Please see below for specific course titles, quarterly reporting requirements and transcript designations for Calculus.

REQUIRED SAMPLE WORK:

Designation*		K	H
Course Title	Intro to Calculus	Calculus	Calculus I & II
Quarter 1	1. Any written sample of work	1. Completed Quarter 1 Kolbe Core Calculus Exam.	1. Completed Quarter 1 Kolbe Honors Calculus Exam.
Quarter 2	1. Any written sample of work	1. Completed Quarter 2 Kolbe Core Calculus Exam.	1. Completed Quarter 2 Kolbe Honors Calculus Exam.
Quarter 3	1. Any written sample of work	1. Completed Quarter 3 Kolbe Core Calculus Exam.	1. Completed Quarter 3 Kolbe Honors Calculus Exam.
Quarter 4	1. Any written sample of work	1. Completed Quarter 4 Kolbe Core Calculus Exam.	1. Completed Quarter 4 Kolbe Honors Calculus Exam.

*Designation refers to designation type on transcript. K designates a Kolbe Academy Core course. H designates a Kolbe Academy Honors course.

If the student wishes to have the course distinguished on the transcript with a (K) as a Kolbe Academy Core course or with an (H) as a Kolbe Academy Honors course, please be sure to send the correct exams and components each quarter for verification as specified above. **If no designation on the transcript is desired, parents may alter the lesson plan and any written sample work is acceptable to receive credit for the course each quarter.** If you have any questions regarding what is required for the (K) or (H) designations or diploma type status, please contact the academic advisory department at 707-255-6499 ext. 5 or by email at advisors@kolbe.org.

COURSE PLAN "AT A GLANCE" OUTLINE:**Core Calculus (K)****Quarter 1**

Weeks 1-8: Chapters 1, 2 & 3
Omit Section 1-5
Week 9: Quarter 1 Exam

Quarter 2

Weeks 1-8: Chapters 4 & 5
Omit Section 4-7
Week 9: Quarter 2 Exam

Quarter 3

Weeks 1-8: Chapters 6 & 7
Omit Section 7-5 & 7-6
Week 9: Quarter 3 Exam

Quarter 4

Weeks 1-8: Chapters 8, 9 & 10
Omit Sections 8-4 to 8-7, 9-4, 9-5, 9-7, 9-9,
9-10, & 10-6
Week 9: Quarter 4 Exam

Honors Calculus I & II (H)**Quarter 1**

Weeks 1-8: Chapters 1, 2, 3 & 4
Omit Section 1-5
Week 9: Quarter 1 Exam

Quarter 2

Weeks 1-8: Chapters 5, 6 & 7
Week 9: Quarter 2 Exam

Quarter 3

Weeks 1-8: Chapters 8 & 9
Omit Section 8-6
Week 9: Quarter 3 Exam

Quarter 4

Weeks 1-8: Chapters 10, 11 & 12
Omit Sections 11-3 to 11-6
Week 9: Quarter 4 Exam

Please note that many chapters are not covered in their entirety. Be sure to refer to the course plan that follows for specific guidance.

COURSE PLAN METHODOLOGY:

The **Quick Review** problems that appear at the beginning of the exercises with each lesson are meant to be completed in 5 minutes or less. Students should **not** write out all the steps neatly for these problems, but instead try to quickly write down the answer and move on. These problems are meant to recall concepts learned in previous sections, chapters or math courses. Overall, these problems will help a student to think quickly, a skill that is useful in taking standardized tests, and will assist the student in remembering useful mathematical tools learned in the past. These problems can be used as short, timed quizzes if desired.

A selection of exercises from the **Problem Sets** will be assigned with each section for the student to complete. A sufficient number of problems have been carefully chosen to help the student become proficient in a topic and prepare them for the Kolbe Quarterly exams and specific AP Calculus exam. The author's intent was not to have students complete all of the problems in the book, but to have a diverse number of problems available to the teacher. Most odd numbered problems are answered in the back of the student text. It is advisable for students to check their work as they go along in an assignment to be sure that they have understood the methodology of the section. The solution manual may be used by the student to check any even numbered problems. If additional work is needed, students may want to pick a few of the even numbered problems for further practice.

At the end of every chapter, a **Chapter Review** is assigned. The **Chapter Test** that appears at the end of each chapter is assigned during the review and/or test weeks to help prepare the student for the Kolbe Quarterly Exams. However, parents may opt to give these Chapter Tests immediately following the completion of a chapter if they would like to include more test grades in the student's overall grade. Be sure to review which questions are assigned from each test as not all Chapter Tests are always completed in their entirety. The Chapter Test questions, if used as a test, should be completed in less than one hour.

Four Quarterly Exams are included at the end of the course plan. Please be sure to utilize the correct exams for your student. There are two sets – a set for students seeking our Kolbe Core (K) designation and a set for those seeking our Honors (H) designation. Each exam has two "sittings", Part 1 which does not allow the use of the graphing calculator and Part 2 which does allow it. Students should turn in Part 1 before being given Part 2. One hour for each sitting, or two hours total, should be sufficient for completion of the exams. All questions are taken from the test bank provided by the author.

It follows then, that students are expected to be utilizing a programmable **Graphing Calculator**. The College Board allows graphing calculators on the AP Calculus exams (both AB & BC) saying, "The use of a graphing calculator is considered an integral part of the AP Calculus course, and is permissible on parts of the AP Calculus Exams. Students should use this technology on a regular basis so that they become adept at using their graphing calculators. Students should also have experience with the basic paper-and-pencil techniques of calculus and be able to apply them when technological tools are unavailable or inappropriate." The Kolbe Academy exams are set up specifically to hone testing skills in both the calculator and non-calculator portions of the AP exams. Kolbe Academy has traditionally suggested the use of the TI-83 or TI-84 graphing calculator models. If a program is needed for a calculator, students may download them by going to www.keymath.com, scrolling down, and clicking on Calculus. The programs are available for free to students.