# Vicksburg Community Schools Proposal Form with Guidance

**Please review _VCS General Guidelines for Program Review and Proposal Development_ prior to completion of this form. Send completed _Proposal Form_ and supporting documents to the Curriculum office by March 1st.**

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Title of Proposal: <u>AP Pre Calculus</u>          Proposal Author(s): <u>Angie Walton</u>

Department and Curriculum Area: <u>VHS Mathematics</u>          Building: <u>VHS</u>

Committee Members: <u>Adam Brush, Mandy Keiser, Angela Walton</u>

❖ <u>This proposal is for:</u> *(put an X next to all that apply)*
- ☐ Textbook and other teaching resources *(requires planned pilot process as part of the proposal request)*
- X New courses or course revisions
- ☐ Full program or curriculum area reviews
- ☐ Program or curriculum area modifications
- ☐ Supplemental Instructional/Intervention Resource

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Dates of Anticipated Review and Action:     DCILT: <u>2/22/24</u>     BOE: <u>3/11/24</u>

Principal's Signature(s): *Adam Brush*

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*(To be completed by Director of Curriculum and Instruction upon receipt of proposal.)*
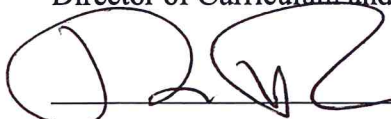
Date Received: 2/12/24

Comments on proposal:

_____

_____

_____

RESPONSE:

☐ Need more information: _____

☒ Proceed as outlined in the proposal

*Neil Van Naff*                         2/22/24
_____          _____
Director of Curriculum and Instruction          Date

                                          2/23/24
_____          _____
Director of Technology          Date

1

I. **Proposal Background & Overview** – Write a narrative that includes *all* of the following:
- ☐ Relevant background/history.
- ☐ Problem or other basis for the proposal (i.e. student needs, etc.).
- ☐ Reasons for making the change.
- ☐ Targeted Continuous Improvement Goals

*Vicksburg High School has offered a Trigonometry and Pre-Calculus course for many, many years. The intent of this course is to prepare students for Calculus (in their senior year of high school, AP Calculus, or at college). This proposed course would serve the same purpose with some added benefit.*

*Recently, the College Board has introduced a new course (AP Pre-Calculus); this course's content is similar to our Trig and Pre-Calc. This proposed new course gives students a third opportunity to earn an AP credit in a math class, which translates to College Algebra credit in college (if students pass the exam).*

*Additionally, this course update will enhance the alignment of the AP Pre-Calculus course with the AP Calculus course. In fact, the rationale that the College Board gives for the reason behind offering this new AP class is to enhance student's readiness for AP Calculus or collegiate Calculus.*

**Continuous Improvement Goal**
*Strategy 2.3: Building and district teams will ensure implementation of instructional practices, interventions and supports that are organized along a continuum to meet the academic needs of each and every learner and are aligned to the district curriculum. [MTSS Academic]*

II. **Complete Description of Proposed Change(s)** – Write a narrative that includes *all* of the following:
- ☐ List all major changes, components and/or strategies of the proposal.
- ☐ Give rationale for each change (base the rationale on research or best practice information).
- ☐ Include new course/textbook title, course/textbook replaced, credit, and prerequisite(s).
- ☐ Attach the current standards, course outline, and/or general syllabus.

*This course update will result in an adjustment to the course syllabus - this is to better serve the needs of future Calculus students. This syllabus reflects the detailed design that has been published by the College Board.*

*This change will also result in the adoption of a new primary resource, a textbook. This will replace the self-created materials that have been utilized for a number of years.*

*Larson, Ron, and Paul Battaglia. Precalculus with Limits. Cengage Learning, 2018.*

*Credit: Precalculus*

*Prerequisite: Algebra 2 or Advanced Algebra 2*

**Proposed Topics/Syllabus**

| Unit | Unit Title | Topics |
|------|-----------|--------|
| *1* | *Polynomial and Rational Functions* | • *Change in Tandem* <br> • *Rates of Change* <br> • *Rates of Change in Linear and Quadratic Functions* <br> • *Polynomial Functions and Rates of Change* <br> • *Polynomial Functions and Complex Zeros* <br> • *Polynomial Functions and End Behavior* <br> • *Rational Functions and Zeros* <br> • *Rational Functions and Vertical Asymptotes* |

| | | |
|---|---|---|
| | | • *Rational Functions and Holes*<br>• *Equivalent Representations of Polynomial and Rational Expressions*<br>• *Transformations of Functions*<br>• *Function Model Selection and Assumption Articulation*<br>• *Function Model Construction and Application* |
| 2 | *Exponential and Logarithmic Functions* | • *Change in Arithmetic and Geometric Sequences*<br>• *Change in Linear and Exponential Functions*<br>• *Exponential Functions*<br>• *Exponential Function Manipulation*<br>• *Exponential Function Context and Data Modeling*<br>• *Competing Function Model Validation*<br>• *Composition of Functions*<br>• *Inverse Functions*<br>• *Logarithmic Expressions*<br>• *Inverses of Exponential Functions*<br>• *Logarithmic Functions*<br>• *Logarithmic Function Manipulation*<br>• *Exponential and Logarithmic Equations and Inequalities*<br>• *Logarithmic Function Context and Data Modeling*<br>• *Semi-log Plots* |
| 3 | *Trigonometric and Polar Functions* | • *Periodic Phenomena*<br>• *Sine, Cosine and Tangent*<br>• *Sine and Cosine Function Values*<br>• *Sine and Cosine Function Graphs*<br>• *Sinusoidal Functions*<br>• *Sinusoidal Function Transformations*<br>• *Sinusoidal Functions Context and Data Modeling*<br>• *The Tangent Function*<br>• *Inverse Trigonometric Functions*<br>• *Trigonometric Equations and Inequalities*<br>• *The Secant, Cosecant and Cotangent functions*<br>• *Equivalent Representations of Trigonometric Functions*<br>• *Trigonometry and Polar Coordinates*<br>• *Polar Function Graphs*<br>• *Rates of Change in Polar Functions* |
| 4 | *Functions Involving Parameters, Vectors, and Matrices* | • *Parametric Functions*<br>• *Parametric Functions Modeling Planar Motion*<br>• *Parametric Functions and Rates of Change*<br>• *Parametrically Defined Circles and Lines*<br>• *Implicitly Defined Functions*<br>• *Conic Sections*<br>• *Parametrization of Implicitly Defined Functions*<br>• *Vectors*<br>• *Vector-Valued Functions*<br>• *Matrices*<br>• *The inverse and Determinant of a Matrix*<br>• *Linear Transformations and Matrices*<br>• *Matrices as Functions*<br>• *Matrices Modeling Contexts* |

| Grade | New Textbook Title/Instructional Resource | Previous Textbook/Instructional Resource To Be Replaced |
|---|---|---|
| *11-12* | *PreCalculus with Limits 4th Edition Ron Larson / Paul Battaglia*<br>*recommended on College Board Site:*<br>*https://apcentral.collegeboard.org/courses/ap-precalculus/course-audit  Under textbook listing* | *New (no textbook used in current course)* |

*Please see the document linked below for the AP PreCalculus Course and Exam Description*

- *https://apcentral.collegeboard.org/media/pdf/ap-precalculus-course-and-exam-description.pdf*

III. **Implementation Plan** – include *all* of the following:
   ☐ Give a full explanation of the implementation timeline, action items, and responsibilities for implementing.
   ☐ Itemize, in detail, all proposal costs. Include 1st year costs and a budget to maintain the proposal after implementation. Include resources needed to support change. (texts, soft/hardware, web-based license, consumables, training, substitute cost for training, equipment, personnel). *Include attachment if needed.*

a. Implementation strategies

| Timeline | Action | Person(s) Responsible |
|---|---|---|
| Oct 2023 | Write Curriculum Proposal | Angela Walton |
| Oct 2023 | Submit course description in Red Book (for scheduling). | Angela Walton |
| Jan 2024 | Submit Curriculum Proposal and Materials Request for new course | Angela Walton |
| February 22, 2024 | Proposal to DCILT | Angie Walton/Adam Brush |
| March 2024 | Proposal to Board of Education | Angie Walton |
| March 2024 | Vertical Alignment PD Session | Angela Walton |
| Summer 2024 | APSI- AP Summer Institute Training | Angela Walton |
| July-August 2024 | Course Development | Rachel King |
| Fall 2024 | Full year course begins/Start utilizing new text and resources | Rachel King |

b. Proposal Costs

| Description | Number Needed/ Cost per Unit | Total Cost | Funding Source |
|---|---|---|---|
| Materials *(add rows if needed)* | | | |
| Books | 35 student books x $146.85 | $5139.75 + $ 325.24 shipping | District General Fund |
| Cengage Learning Testing by Cognero | 80 digital licenses x $39.00 (6 years) | $3120.00 | District General Fund |
| Annotated Instructor's Edition and Working Teacher Edition Instructor Companion Site and Test Bank | 2 Teachers Editions (Free) | $0 | NA |

| | | | |
|---|---|---|---|
| Enhanced WebAssign | | | |
| Professional Learning/Summer Curriculum Work | | | |
| Professional Learning APSI in Kentucky | Registration - $700 Lodging - $600 Stipend 4 days for 1 person - $612 | $1912 | Title IIA |
| | Mileage | $468 | Building Budget |
| Summer Curriculum Work - Course development/Unit planning after APSI | Stipend 1 person for 2 days $100+$53 | $306 | District General Fund |
| **Total Costs** | **$ 11271** - Materials: $8585; PL & SCW: $2686 | | |

IV. **Anticipated/Expected Impact** – include *all* of the following:
   - ☐ List the anticipated proposal outcomes. Describe how the proposal will impact students, staff, and the instructional program. Include expected gains in student success. Include how this proposal articulates with other courses/levels in this subject area & across the curriculum.

> - Improved grades in AP Calculus
> - Improved pass-rate for the AP Calculus Exam
> - Success in a collegiate College Algebra course
> - Additional opportunities for AP Capstone students to earn credit toward their diploma

V. **Proposal Evaluation Plan and Student Achievement** – include *all* of the following:
   - ☐ Explain how this proposal will be evaluated, the timeline used, what data is to be collected (survey results, national, state, district, or classroom assessments), and how the evaluation will be reported.

| How Proposal Will Be Evaluated (who, process) | Timeline | Data to Be Collected | How Evaluation Will Be Shared/Reported |
|---|---|---|---|
| Analysis of Summative Assessments (classroom) - Angie Walton, Rachel King | After each unit/semester | Unit Tests/Midterm and Final Exam, AP Exam data | Shared with Math Team and admin |
| Analysis of Summative Assessments (College Board) - Angie Walton | Released in July after national exam | AP Exam | Shared with Math Team and admin |
| Collect and discuss classroom assessments - Angie Walton, Rachel King | After each unit | Informal student self assessments | Shared with Math Team and admin |

VI. **PLC Foundation** – Write a narrative that includes responses to *all* of the following questions:
   - ☐ Is the implementation of this plan consistent with our purpose as a district?
   - ☐ Will implementing this proposed plan help us become the school/district we envision?
   - ☐ Are the people responsible for implementing this plan prepared to commit to doing it fully and well?

☐ Will implementing this plan enable us to achieve our goals as a school district?

*The implementation of AP Pre Calculus is fully consistent with our district's purpose and educational vision. By embracing this proposed plan, we are taking a significant step towards becoming the school/district we envision. The emphasis on increased rigor, improved student understanding, heightened engagement, and enhanced critical thinking aligns perfectly with our goal of providing a rigorous and comprehensive education for our students. Students taking AP Pre-Calculus will also be better prepared for AP Calculus.*

*The individuals responsible for implementing this plan are not only prepared but also committed to doing it fully and well. The proposal includes professional development opportunities for staff, ensuring that they are equipped to effectively implement the curriculum and utilize innovative teaching methods. This commitment to preparation and support is crucial for the successful implementation of the plan and demonstrates our dedication to providing the best possible education for our students.*

*Implementing this plan will enable us to achieve our goals as a school district by fostering a deeper understanding of mathematical concepts, leading to improved academic performance, heightened confidence, and better retention of knowledge among our students. Additionally, the integration of real-world applications within the curriculum promotes interdisciplinary connections across the curriculum, aligning with our goal of providing a well-rounded education that prepares students for success in various fields. This holistic approach to education supports our district's mission of preparing students to be college and career-ready by providing them with the skills and knowledge they need to succeed.*

**Prior to submitting this form, review your proposal using the checklist outlined under each section to ensure required information has been provided. Incomplete proposals will be returned.**