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SEO SCHOLARS

POSITION DESCRIPTION & APPLICATION TASK
Curriculum Writer, Part-Time – New York City
Fall Semester 2017 (Start Date: ASAP)

SEO SCHOLARS is a free eight-year academic program that provides motivated, low-income public high school students with an out-of-school supplemental academic curriculum, college guidance and the leadership development necessary to gain admission to, and succeed at, competitive colleges and universities.

Project: College Calculus Course Development

Description of Work:

The Part-Time Curriculum Writers are responsible for compiling, editing, and writing curriculum under the direction of the Assistant Director of Math Curriculum. You will be in charge of developing curricular materials (Lesson Plans, Problem Sets, Quizzes, Exam, and Instructor Answer Keys) for a new course, College Calculus, to run for 130 12th grade students starting January 2018.

This course is meant to be a brief survey course to introduce students to a few big ideas that students will see when they enter their first college course to better prepare students as they to transition to their first real college calculus course.

You will adapt pre-existing external curriculum materials subject to the Creative Commons License (for example, MIT Open Courseware Single Variable Calculus) to fit into the parameters of a 16-hour "College Calculus" course. You may also adapt your own material if you have taught an undergraduate Calculus I course before.

Course Logistics: This course is comprised of 8 lessons. Each lesson is comprised of 2 one-hour long classes, so 16 hours total for the entire course. Class size is 20 – 24 students, and approximately 20% of students have seen some calculus before in their schools.

In a typical lesson, the first hour of class is comprised of a short quiz and the mini-lesson/lecture, and the second hour is set aside for small group student work. All students have chromebooks and wi-fi access, and instructors will have access to projectors, so lessons can incorporate apps that provides immediate classroom feedback (i.e. Socrative) or short videos. Additionally, students will take one exam at the beginning and end of the course.

Course Content: This course covers the following content:

- Lesson #1: Exam and review of functions (polynomial, rational, exponential, trigonometric)
- Lesson #2: Composition of functions (including inverses)
- Lesson #3: Limits
- Lesson #4: The derivative (definition and 1st and 2nd derivative tests)
- Lesson #5: Calculating the derivative (chain rule, product/quotient rule)
- Lesson #6: The antiderivative (geometric interpretation and Riemann sums)
- Lesson #7: Calculating the antiderivative (i.e. through u-substitution)
- Lesson #8: Fundamental Theorem of Calculus and Exam

Position Details:

Candidate Requirements:

- Holds a Bachelor's Degree in Mathematics, Math Education, or some related field
- Has taught Precalculus or Calculus in high school or college settings.
- Lives in NYC or the surrounding area (must be able to meet with managers at SEO's office on an as-needed basis)
- The work will require coming into the SEO main office in New York City (55 Exchange Place) for orientation, however after that one time this project can be done remotely. You will have occasional meetings over the phone with the Assistant Director of Math Curriculum.

Compensation: You will be compensated at $30/hour. Anticipated time spent on each lesson is 10 hours, so $300 per lesson ($2400 for this entire project).

Anticipated Completion Date: January 8th, 2018.

Application Instructions:

Please e-mail a resume and completed application task (either Option #1 or Option #2 as described on page 3) to mthoms@seo-usa.org. In the body of the e-mail, indicated whether you have taught a pre-calculus or calculus course before (either high school or college), past experiences writing math curriculum, and familiarity with computer programs/software relevant to this project.

Application Task:

Do not spend more than 1 hour on this task. Complete one of the options below.

OPTION #1: Teaching the Limit

A key fundamental understanding in calculus is the concept of a limit.

a) How would you introduce this concept to students who have never been exposed to it before?

b) Create a task sequence that would help students develop an understanding of this concept. (Note: it is fine to use/modify an existing curricular resource, just make sure to cite and explain your choice)

The purpose of this task is to provide a sketch of what a lesson on the limit would look like. Here are some guidelines:

- Do not spend a lot of time on formatting, however use Equation Editor where applicable.
- Feel free to use "screen capture"
- If time is an issue, feel free to provide a narrative of what the task sequence would look like.

OPTION #2: Reflection on Curricular Material

NOTE: You may choose Option #2 only if you have taught or developed curriculum for a Precalculus or Calculus course in high school or undergraduate settings.

a) Send in a copy of some piece of curriculum that you have written or used in your precalculus or calculus class. For example, this could be a lesson plan, classwork sheet, activity, or homework assignment. If it is something that you did not write, makes sure to cite where it came from.

b) Provide a short, written reflection on how this piece of curriculum curricular document is designed to help a student develop a mathematical understanding. You may also include what you would change to make this piece of curriculum more effective.