*Katherine A. Czeranko*

***katherine.czeranko@asu.edu***

# SUMMARY: University, community college, and secondary education teaching experience with a secondary education mathematics teaching certificate. Experienced RF Design and Analysis Systems Engineer. Held a TS/SCI. Experienced in MATLAB with Signal Processing Toolbox. MS and BS in

**Electrical Engineering from George Mason University. Completed Research in Undergraduate Mathematics Education I (RUME I) course with a successful completion of the qualifying exam in anticipation of entrance into the Mathematics Education Ph.D. program at Arizona State University.**

**EDUCATION:** **George Mason University Fairfax, Virginia Master of Science in Electrical Engineering**

05/94

# George Mason University Fairfax, Virginia Bachelor of Science in Electrical Engineering

05/92

**CERTIFICATION:**

# State of Arizona Teaching Certification for Secondary Education in Mathematics

08/09

**EXPERIENCE:**

**08/13 – present: *Instructor – College of Integrative Sciences and Arts***

# Arizona State University Mesa, Arizona

* Attend workshops involving and implement inquiry oriented teaching materials to facilitate student ownership of content in linear algebra and differential equations
* Strong interpersonal, written, verbal, and time management skills • Ability to work with diverse populations and the ability to communicate
* Possess excellent problem-solving skills and critical analyses abilities.
* Conduct Calculus I for Engineers classes
* Teach students about the exponential, logarithmic, and trigonometric functions.
* Ensure students understand the concept of derivative: rate of change of a function, slope of the tangent line at a point on a function
* Conduct Applied Linear Algebra classes
* Techniques included modeling data with matrices
* Theoretical techniques and definitions such as one-to-one, onto, eigenvectors, and eigenvalues
* Student-centered learning including small-group interaction
* Conduct Calculus II for Engineers classes
* Enable students to understand integration as a method to measure areas under curves, distance traveled
* Show students many methods of integration, including integration by substitution, integration by parts, integration by trigonometric substitution, integration by long division, integration by partial fraction expansion
* Discuss Convergence and Divergence of Series
* Conduct Calculus III for Engineers classes
* Enable students to understand parametric equations, vectors and planes, surface derivatives, surface integration
* Student-centered learning including small-group interaction
* Conduct Modern Differential Equations classes
* Enable students to solve for functions described by a differential equation based on various techniques• Student-centered learning including small-group interaction
* Conduct Brief Calculus classes
* Demonstrate usage of the derivative and the integral in applications to the life sciences and business
* Conduct Precalculus classes
* Material includes function definition, linear functions, exponential and logarithmic functions, quadratic functions, and trigonometric functions

**08/15 – present**: **Undergraduate Honors Contract Mentor College of Integrative Sciences and Arts, Arizona State University Mesa, Arizona**

* Monitor research and development of ideas for students in honors contracts

**06/20 – present**: **Capstone Supervisor College of Integrative Sciences and Arts, Arizona State University Mesa, Arizona**

* Monitor, suggest, and develop ideas to Capstone project members majoring in computer science

**06/20 – 08/20**: **Research Aide – Sciences and Mathematics College of Integrative Sciences and Arts, Arizona State University Mesa, Arizona**

* Develop online assessments, including quiz bank questions, within Canvas for Applied Linear Algebra

**05/19 – 06/19: Hiring Committee Participant – College of Integrated Sciences and Arts 05/18 – 06/18 Sciences and Mathematics Arizona State University Mesa, Arizona**

* Guided instructional assistants in developing content for review sessions

# 08/17-05/19 Supervisor to Supplemental Instructors for Modern Differential Equations College of Integrated Sciences and Arts, Sciences and Mathematics Arizona State University Mesa, Arizona

* Reviewed applications for a mathematics instructor position within the college
* Participated in discussions with other committee members reviewing qualifications

# 06/17: TIMES Fellow – Workshop Participant Fairfax High School Fairfax, Virginia

* Worked through differential equations material with other instructors using activities designed for interaction within student groups
* Currently use activities to progress through teaching units in differential equations

# 07/14: Workshop Participant – City University of New York BMCC New York, New York

* Facilitated teacher and student learning in multi-variable calculus using three-dimensional manipulatives with other workshop participants.
* Currently use manipulatives in my teaching of Calculus III for Engineers

**07/13 – 07/17**: ***Research Aide – School of Letters and Sciences***

# Arizona State University Mesa, Arizona

Working on grant *"Collaborative Research: Developing Inquiry Oriented Instructional Materials for Linear Algebra"*

Responsibilities included data collection, data analysis, writing research reports, and disseminating results under the supervision of the PI. Data collection included handwritten or online surveys, as well as in person interviews and data from classroom settings. Transcription was performed. Research reports were written for peer reviewed journals, conference proceedings, or book chapters. Presentations were prepared for conferences. A proposed student assessment instrument was developed using a multiple-choice part and an explanation part. This assessment was modeled after the Colorado Upper-division Electrostatics (CUE) diagnostic (Wilcox & Pollock, 2013).

|  |  |
| --- | --- |
| **01/13 – 05/13**: | ***Faculty Associate – School of Letters and Sciences*** |
|  | **Arizona State University Mesa, Arizona** |
| **08/10 – 12/12**: | ***Faculty Associate – Department of Applied Sciences and Mathematics*** |

# Arizona State University Mesa, Arizona

Responsibilities include developing lesson plans, homework, quizzes, and tests; and grading all homework, quizzes, and tests.

# 01/13 – 05/13

* Conduct two Modern Differential Equations classes
* Demonstrate the application of differential equations to real-world problems using MATLAB
* Conduct a Calculus II for Engineers class

# 08/12 – 12/12

* Conduct a Calculus I for Engineers class
* Conduct a Calculus III for Engineers class
* Conduct a Modern Differential Equations class

# 08/12

* Conduct a two-week intensive Online Hybrid Enhanced Freshman Mathematics class intended for increasing mathematics placement scores
* Course is completely online, allowing for self-paced learning of math topics starting from real numbers, fractions, and elementary algebraic concepts

# 01/12 – 05/12

* Conduct an Online Hybrid Enhanced Freshman Mathematics class
* Conduct a Calculus II for Engineers class
* Conduct a Precalculus class

# 08/11 – 12/11

* Conduct a Calculus I for Engineers class
* Conduct two Online Hybrid Enhanced Freshman Mathematics classes

**01/11 – 05/11**

* Conduct a Precalculus class
* Conduct a Brief Calculus class
* Conduct a Calculus II for Engineers class

# 08/10 – 12/10

• Conduct a Brief Calculus class

**08/03 – 07/13**: ***Adjunct Professor - Mathematics Division***

# Chandler-Gilbert Community College Chandler, Arizona

Responsibilities include developing lesson plans, homework, quizzes, and tests; and grading all homework, quizzes, and tests.

# 07/13

* Conduct a College Algebra class
* Material includes function definition, linear functions, exponential and logarithmic functions, and quadratic functions

# 05/13 – 07/13

* Conduct a Calculus and Analytic Geometry II class
* Enable students to understand integration as a method to measure areas under curves, distance traveled
* Show students many methods of integration, including integration by substitution, integration by parts, integration by trigonometric substitution, integration by long division, integration by partial fraction expansion
* Discuss Convergence and Divergence of Series

**01/13 – 05/13**

* Conduct a College Algebra class

# 08/12 – 12/12

* Conduct a Calculus and Analytic Geometry I class
* Teach students about the exponential, logarithmic, and trigonometric functions.
* Ensure students understand the concept of derivative: rate of change of a function, slope of the tangent line at a point on a function

**07/12**

* Conduct a College Algebra class

# 05/12 – 07/12

* Conduct a Calculus and Analytic Geometry II class **01/12 – 05/12**
* Conduct a Calculus and Analytic Geometry I class

# 08/11 – 12/11

* Conduct a Calculus and Analytic Geometry I class
* Conduct a Calculus and Analytic Geometry III class
* Enable students to understand vectors and planes, surface derivatives, surface integration
* Conduct a College Algebra class

# 06/11 – 07/11

* Conduct a Calculus and Analytic Geometry II class
* Conduct a Calculus and Analytic Geometry III class

**01/11 – 05/11**

* Conduct 2 sections of a Calculus and Analytic Geometry III class

# 08/10 – 12/10

* Conduct a Calculus and Analytic Geometry I class
* Conduct a Calculus and Analytic Geometry III class
* Conduct a College Algebra class

# 06/10 – 07/10

* Conduct a Calculus and Analytic Geometry II class
* Conduct a Calculus and Analytic Geometry III class

**01/10 – 05/10**

* Conduct 2 Calculus and Analytic Geometry III classes

# 08/09 – 12/09

* Conduct a Calculus and Analytic Geometry III class
* Conduct a Calculus and Analytic Geometry I class

# 05/09 – 08/09

* Conduct a Calculus and Analytic Geometry II class
* Conduct a Trigonometry Class
* Teach students the concept of the unit circle, the radian measure, and introduce trigonometric functions.

**01/09 – 05/09**

* Conduct a Calculus and Analytic Geometry III class

# 08/08 – 12/08

* Conduct a Calculus and Analytic Geometry III class
* Conduct a Calculus and Analytic Geometry I class

# 05/08 – 08/08

* Conduct a Calculus and Analytic Geometry III class
* Conduct a Trigonometry Class

# 01/08 – 05/08

* Conduct a Calculus and Analytic Geometry III class
* Conduct a Calculus and Analytic Geometry I class

# 08/07 – 12/07

* Conduct a Calculus and Analytic Geometry III class
* Conduct a Calculus and Analytic Geometry I class

# 05/07 – 07/07

* Conduct a Calculus and Analytic Geometry III class
* Conduct a Trigonometry Class

**01/07 – 05/07**

* Conduct a Calculus and Analytic Geometry II class

**08/06 – 12/06**

* Conduct a Calculus and Analytic Geometry III class

# 05/06 – 07/06

* Conduct a Calculus and Analytic Geometry III class
* Conduct a Trigonometry Class

# 01/06 – 05/06

* Conduct a Differential Equations class
* Enable students to solve for functions described by a differential equation based on various techniques
* Show students how to set up real-life problems in a differential equation format
* Conduct a Calculus and Analytic Geometry II class **08/05 – 12/05**
* Conduct a Calculus and Analytic Geometry III class
* Conduct a Calculus and Analytic Geometry I class

**06/05 – 07/05**

* Conduct a Trigonometry Class

# 01/05 – 05/05

* Conduct a Calculus and Analytic Geometry II class
* Conduct a Calculus and Analytic Geometry I class

# 08/04 – 12/04

* Conduct a Calculus and Analytic Geometry I class  **08/03 – 05/04**
* Conduct a Calculus and Analytic Geometry III class

**06/06 – 06/09: Mathematics Teacher- Mathematics Department**

# Hamilton High School Chandler, Arizona

Responsibilities include classroom management, developing lesson plans, homework, quizzes, and tests; and grading all homework, quizzes, and tests.

* Conduct three Mathematics Year 3 sections
* Material includes function definition, exponential and logarithmic functions, quadratic functions, linear functions, understanding of the conics.
* Conduct a Mathematics Year 4 section
* Material includes Precalculus material, including rational functions, logarithmic and exponential functions
* Conduct an Honors Mathematics Year 2 section
* Material includes all Geometry concepts including definitions and applications of various geometrical figures.
* Completed the Mathematics Year 2 curriculum in 3 quarters of instruction.
* Began Mathematics Year 3 material during the 4th quarter of instruction.

## 10/03 – Present: Mathematics and Science Tutor

Assist high school and college students with concepts in algebra, algebra 2/trigonometry, geometry, and physics.

|  |  |
| --- | --- |
| **12/97 – 04/02:** | ***Senior Engineer I - RF Design and Analysis*** |
|  | **Raytheon Missile Systems Company Tucson, Arizona** |
| **01/97 – 12/97:** | ***Senior Engineer I - RF Design and Analysis*** |
|  | **Hughes Missile Systems Company Tucson, Arizona** |

* Performed analysis to support guidance section concept design trades.
* Designed, coded, and implemented new logic in MATLAB as model demonstration for new code development.
* Added detection and angle estimation algorithms to an existing 6-DOF simulation. Receiving training on a data collection tool.

**02/94 – 01/97: *Electrical Engineer - Air Defense Technology Division***

# Science Applications International Corporation (SAIC) Arlington, Virginia

* Developed and documented code for a Quadratic Distance Classifier Algorithm that assigns radar signatures to one of multiple test targets.
* Developed and documented code for a Piecewise Level Fusion Algorithm for radar and FLIR sensors.
* Developed an Intranet Web Page for the division.
* Designed and implemented an optimum linear filter and a pulse compression algorithm in MATLAB that was used to process and analyze surveillance radar data.
* Improved a phase gradient auto focusing routine for Synthetic Aperture Radar (SAR) ALMAZ imagery.

**06/93 – 12/93: *Graduate Research Assistant***

# Center for Command, Control, Communications, and Intelligence George Mason University Fairfax, Virginia

Disseminated information (via e-mail and fliers) regarding weekly Sensor Interpretation Group (SIG) workshops which brought "State of the Art" developments in government and industry to the University.

* Created C and MATLAB code for Quadratic Distance Classifiers (QDCs), which recognize stationary targets in SAR.
* Researched papers that provided comparisons of new classifier methods to the traditional techniques.

**08/92 – 05/93:** ***Graduate Teaching Assistant***

# Department of Electrical and Computer Engineering George Mason University Fairfax, Virginia

* Instructed an undergraduate Digital Logic Design class
* Assisted students with conceptual and homework-related problems
* Held regular office hours
* Prepared special help sessions with the supervising professor's guidance

**TECHNICAL SKILLS:**

**02/04 *Learning Invention Laboratory* Tempe, Arizona**

# MATEC

Participated in a teleconference exchanging teaching ideas and tools for the technology classroom. Exchanged learning inventions via teleconferencing.

**AWARDS:**

**04/04, 04/05, 04/06, 04/10** Recognized as an “Outstanding Adjunct Faculty” in the Department of

Mathematics at Chandler-Gilbert Community College through the Mathematics Adjunct Professional Development Awards Program