

# GRANT SHIRLEY

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## EDUCATION

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### East Tennessee State University

*Expected May 2025*

B.S. in Mathematics

Minor in Physics

Society of Physics Students Vice President

Swashbucklers Tenor-Bass A Cappella President

Sigma Pi Sigma Physics and Astronomy Honors Society President

Overall GPA: 3.293

## EXPERIENCE

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### Combinatorics and Coding Theory in the Tropics

June - August 2024

*Peer Mentor*

*Ponce, PR*

- Gave lectures on topics such as mathematical reasoning, linear algebra, abstract algebra, and combinatorics.
- Assisted fellow REU students with mathematical study and research in several projects, while also participating in research.
- Served as a liaison between fellow REU participants and professors by making weekly schedules and coordinating meetings.
- Provided guidance and mentorship to younger mathematics and computer science students.
- Improved team dynamics and created a positive living environment by resolving conflicts and establishing a shared code of conduct.

### Combinatorics and Coding Theory in the Tropics

June - August 2023

*REU Participant*

*Ponce, PR*

- Studied under experienced mathematicians in various topics such as Abstract Algebra, Coding Theory and Number Theory.
- Engaged in guided and self-directed mathematics research in Combinatorics, Graph Theory and Matrix Theory.
- Collaborated with other undergraduate mathematics students on projects spanning various discrete math topics.
- Presented original research to REU colleagues, as well as in two talks at Joint Mathematics Meetings 2024, and in a talk at MAA's 2024 Southeast Section Meeting.
- Currently working with fellow REU students and affiliated professors to prepare research for publication.

### ETSU Renaissance Camps

June - August 2022

*Noyce Summer Internship*

*Johnson City, TN*

- Used lesson plans from experienced educators to teach STEM concepts to children between the ages of 6 and 13.
- Applied knowledge gained over this time period to develop original lessons and activities to teach math, physics, chemistry and biology concepts in an engaging way to a wide range of age groups.
- Utilized classroom management techniques to connect with students of varying ages and backgrounds.
- Assisted in the logistical and safety aspects of running a science-themed summer camp that went on frequent field trips, both in and out of state.

### University Career Services

August 2021 - May 2022

*Career Ambassador*

*Johnson City, TN*

- Assisted students and alumni with a high level of customer service.

- Exhibited leadership in overseeing special projects.
- Efficiently directed calls to appropriate stakeholders.

## RELEVANT COURSEWORK AND EXTRACURRICULARS

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### **Internship Experience for Mathematics and Statistics**

Spring 2025 (Planned)

*East Tennessee State University*

- Instructor: Michelle Joyner

### **Graph Theory I**

Fall 2024

*East Tennessee State University*

- Instructor: Robert Gardner
- Textbook: *Graph Theory* - J.A. Bondy, U.S.R. Murty, *Algebraic Graph Theory* - Chris Godsil, Gordon Royle

### **Analytics and Predictive Modeling**

Fall 2024

*East Tennessee State University*

- Instructor: Jeff R. Knisley

### **Numerical Analysis**

Fall 2024

*East Tennessee State University*

- Instructor: Michelle Joyner

### **Condensed Matter Physics**

Spring 2024

*East Tennessee State University*

- Instructor: Frank Hagelberg
- Textbook: *Introduction to Solid State Physics, Eighth Edition* - Charles Kittel, *Solid State Physics, First Edition* - Neil W. Ashcroft, N. David Mermin

*B*

### **Complex Variables**

Spring 2024

*East Tennessee State University*

- Instructor: Robert Gardner
- Textbook: *Complex Variables and Applications, Eighth Edition* - James Ward Brown, Ruel V. Churchill

*B-*

### **Intro to Modern Algebra I, II**

Fall 2023, Spring 2024

*East Tennessee State University*

- Instructor: Rodney Keaton
- Textbook: *Abstract Algebra, Third Edition* - David S. Dummitt, Richard M. Foote

*B-, B*

### **Analysis I, II**

Fall 2023, Spring 2024

*East Tennessee State University*

- Instructor: Anant Godbole
- Textbook: *Principles of Mathematical Analysis, Third Edition* - Walter Rudin, *Real Analysis, Fourth Edition* - H. L. Royden, P. M. Fitzpatrick

*A-, A-*

### **Applied Combinatorics and Problem Solving**

Fall 2023

*East Tennessee State University*

- Instructor: Robert Beeler
- Textbook: *How to Count: An Introduction to Combinatorics and Its Applications* - Robert Beeler

*A*

## Intro to Graph Theory

East Tennessee State University

Spring 2023

A-

- Instructor: Anant Godbole
- Textbook: *Pearls in Graph Theory: A Comprehensive Introduction* - Gerhard Ringel, Nora Hartsfield

## Relevant Extracurriculars

Varying years

- Sigma Pi Sigma Physics and Astronomy Honors Society - Vice President
- Society of Physics Students - Secretary 2023-2024, Vice President 2024-Present
- Swashbucklers Tenor-Bass A Cappella - Director 2022-2024, President 2024-Present
- ETSU Marching Bucs - Sousaphone Section Leader
- MATE Underwater Robotics
- ETSU Student Government Association - Junior Senator
- ETSU Abstract Algebra Club
- Appalachian Chordsmen Barbershop Quartet

## SKILLS

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1. Technical Writing, Mathematical and Scientific Communication
2. Proficient in  $\text{\LaTeX}$ , with some experience in R and Python

## SERVICE TO THE PROFESSION

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### Conferences Attended

- Joint Mathematics Meetings 2024
  - Presented the following at Contributed Paper Session on Combinatorics, V
    - deBruijn Cycles: A Novel Approach
    - Rose Conjecture: Total Acquisition on Diameter Two Graphs
- Society of Physics Students Spring 2024 Zone 8 Meeting
- Mathematics Association of America 2024 Southeast Section Meeting
  - Presented the following at Special Session: Theory of Integer Sequences
    - Universal Cycles of Integer Partitions and Compositions
- Society of Physics Students Fall 2024 Zone 8 Meeting
  - As an officer of the SPS chapter hosting the conference, I assisted in the planning process by filling out paperwork to request meeting spaces at our university, and helping plan events such as physics jeopardy, a pumpkin drop and a paper airplane contest.
- American Physical Society 2024 Southeastern Section Meeting
- 2024 Math Alliance Field of Dreams Conference

### Professional Organization Memberships

- Society of Physics Students
- Sigma Pi Sigma Physics and Astronomy Honors Society
- American Physical Society
- American Astronomical Society
- Mathematical Association of America
- Math Alliance
- Society for the Advancement of Chicanos and Native Americans in Science