The Tennessee Governor’s School for Scientific Models and Data Analysis

June 1 through July 3, 2008

Annual Report to the Governor and the People of the State of Tennessee

Dr. Jack Rhoton, Director

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Prepared by:
Dr. Jack Rhoton and Ms. Angela Haga, Executive Coordinator
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COMMENTS: Opinions of scholars

Overall Program Evaluation

Comments
Tennessee Governor's School for Scientific Models and Data Analysis Program Summary and Evaluation for 2008

I. The People: Leadership Team, Faculty and Staff, Counselors and Students

A. Leadership team: The year-round work of preparation for the 2008 Tennessee Governor’s School for Scientific Models and Data Analysis was carried out by the director, Dr. Jack Rhoton, and the executive coordinator Ms. Angela Haga.

B. Faculty and staff: The for-credit faculty consisted of two (2) full-time East Tennessee State University faculty members: one from the Department of Mathematics, one from the Department of Biology. The faculty and staff biographies are in Appendix A.

C. Counselors: Five East Tennessee State University students served as resident counselors. Since they have more contact with the Scholars than any other staff member, the counselors are a crucial part of the GSSM&DA program. Each of the five (5) counselors was responsible for five (5) scholars with one counselor acting as a resident “counselor at large”. The biographies of the counselors are in Appendix B.

D. Students: The 30 Scholars who attended represented 15 Tennessee counties. There were 17 females and 13 males. Fifteen of the students were rising seniors and 15 were rising juniors. A statistical breakdown of the student body, including the counties from which the Scholars came, may be found in Appendix C.

II. The Program: Courses, Seminars and More

A. Academic courses: There were two (2) academic courses offered, one at 9:15-12:00 noon and one in the afternoon 1:15-3:00pm. The curriculum was designed to expose the Scholars to a rich selection of mathematics and science courses consisting of general biology, symbiosis, and probability and statistics; descriptions of all of the courses are in Appendix D. The cumulative average for the group was 3.727 (23 A’s at 76.6% and 7 B’s at 23.4%). Scholars had a range of GPA’s: 2 scholars 3.129, 1 scholar 3.30, 4 scholars 3.429, 4 scholars 3.60, 11 scholars 3.829, and 8 scholars 4.0.

B. Plenary sessions: The plenary sessions consisted of Dr. Rhoton, Ms. Haga, the counselors, and the GS scholars. The sessions started at 8:30am and were completed by 9:00am. The sessions were on Monday- Friday of the five (5) week period.

C. GSSM&DA Web site: The GSSM&DA Web site, which was created in January 2008, is still a work in progress. Ms. Haga is in charge of the website and she is updating it periodically with pertinent information regarding the 2008 Governor’s School and the upcoming 2009 Governor’s School.
III. The Rest of the Experience: Culture, Fun, Competition and Even a Little Science

A. Scholars had the opportunity to participate in the following field trips: The Gray Fossil Site in Gray, TN, Warriors Path State Park (Spider Study) in Kingsport, TN, the ETSU Medical School Labs, Oak Ridge National Laboratories in Oak Ridge, TN, Historic Jonesborough in Jonesborough, TN, Roan Mountain State Park in Roan Mountain, TN, the Eastman Chemical Company Laboratories in Kingsport, TN, Fun Expedition in Johnson City, TN, the Basler Activity Center (ETSU Campus), Bays Mountain State Park in Kingsport, TN, and the Carter Fold in Hiltons, VA.

B. The staff worked hard to create a learning community, putting students together with each other as well as with the staff and GSSM&DA faculty in informal settings such as project group meetings, open time, activities with counselors, and the plenary meetings.

C. The food services provider, Sodexho, prepared meals while scholars were on campus (breakfast, lunch, dinner). The opening and closing banquets also contributed a sense of formality and accomplishment to the program; three Scholars spoke at the closing banquet which was held at the Millennium Centre Ballroom here in Johnson City.

D. An ice cream and cake party celebrating the Scholar birthdays falling within the School provided a brief escape from the students’ studies.

E. The GSSM&DA competed with the GSSE&TH in a game of Ultimate Frisbee in which the teams of Scholars engaged in a competition to see who would win the ultimate prize. It was well-received.

F. A memory “Yearbook” featuring pictures taken throughout the Governor’s School program created by Ms. Haga and was given to all of the Scholars and counselors for a keepsake at the closing luncheon.

G. Ms. Haga also compiled the pictures that were taken during the five (5) week Governor’s School program onto a CD that she will be mailing to all the graduating scholars.

IV. The Results: Scholar Evaluations

The Scholars’ satisfaction with the 2008 GSSM&DA program is reflected in the overall rating of the program, with 90 percent of the Scholars rating the program as either “excellent” (5) or “very good” (4)—a cumulative rating of 4.37 out of 5. Evaluations of various aspects of the program were rated as follows:

A. Overall Program: 4.37 / 5

B. Academic component/workload: 2.83 / 3

C. Faculty/courses: 4.00 / 5

D. Counselors: 2.70 / 3

E. On-Campus meals: 3.83 / 5

F. Dormitory Lodging: 2.93 / 3
Student Evaluation comment results are attached as Appendix E. Virtually all of the Scholars wrote specific responses to the “overall feedback” question on the evaluation. A complete, unedited text of those comments is attached, with the numerical specifics, as Appendix F.

V. The Strengths: Four Keys to Successful Outcomes

A. A dedicated, talented, and interested faculty and staff who enjoyed working with these gifted and talented rising juniors and seniors.

B. Highly motivated students. All thirty (30) Scholars’ who began the program completed it. Each of those thirty (30) earned the full seven (7) hours of credit.

C. The successful Inaugural class for Scientific Models and Data Analysis was a for-credit program, which included academic and interpersonal/social components. A full 90 percent of the students thought the balance of activities were “Excellent” or “Very Good,” and the university courses offered were carefully selected as likely to “count” as part of the general education requirements at virtually any institution the students might later attend.

D. The work of the executive director Dr. Jack Rhoton, the coordinators, counselors and, especially, the GSSM&DA executive coordinator Angela Haga.

VI. Conclusion

This 2008 Inaugural Governor’s School for Scientific Models and Data Analysis program was highly successful. We had a challenging curriculum, an enthusiastic faculty and staff, and a gifted and talented group of Scholars. The Governor’s Schools are among Tennessee’s best investments, and the entire Scientific Models and Data Analysis team is already looking forward to an even better program in 2009.

Submitted by,

Dr. Jack Rhoton
Director

Created and Compiled by,

Ms. Angela Haga
Executive Coordinator
Primary Instructors

Karl Joplin
Karl Joplin is an Associate Professor in the department of Biological Sciences, College of Arts and Sciences at East Tennessee State University (ETSU). He received his BS from the University of Washington, his MS in Entomology and his Ph.D. in the Molecular, Cellular and Developmental Biology program at the Ohio State University. He did postdoctoral research at OSU before joining the faculty at ETSU. Karl's undergraduate instructional experience is at a primarily undergraduate institution and includes 1) non-majors biology, 2) General Biology for Majors I and II, 3) General Entomology, 4) Recombinant DNA Laboratory, 5) Evolution, and 6) Honors Great Ideas in Science. His research interests involve Molecular and Physiological Aspects of Diapause in insects, Respiratory Physiology during insect development, and developmental and environmental effects on insect behavior. He has chaired 7 MS projects. He is currently the program director of a HHMI grant SYMBIOSIS: An Introductory Integrated Mathematics and Biology Curriculum. This is a three semester introductory level course that gives the students credit for biology, statistics and calculus.

Jeff Knisley
Jeff Knisley is an Associate Professor in the department of Mathematical and Statistical Sciences, College of Arts and Sciences at East Tennessee State University (ETSU). He received his BA degree from Carson Newman College, and his MS and Ph.D. degrees in Operator Theory and Applied Mathematics from Vanderbilt University. His work experience includes the Oak Ridge National Laboratory, where he was part of a team that developed applications of neural networks and artificial intelligence. Jeff's undergraduate instructional experience is at a primarily undergraduate institution, although he frequently offers graduate courses such as Applied Math and Operations Research. His research interests are in computational neuroscience and its applications, although he also has publications in bioinformatics, signal processing, and operator theory. He has experience in Java, C++, LaTeX, Maple, Mathematica, and web development using JavaScript, CSS, ASP, and PHP. He has written or co-written several software packages and applications, including ArborVT with Lee Glenn, a neuroscience data analysis tool whose development was funded by the NIH. He is currently a PI on the HHMI grant SYMBIOSIS: An Introductory Integrated Mathematics and Biology Curriculum, and the NSF grant Talent Expansion in Quantitative Biology. knisleyj@etsu.edu http://faculty.etsu.edu/knisleyj/
Support Faculty and Staff

Several ETSU math and science faculty as well as other resource individuals provided special learning sessions that enhanced and enriched the classroom studies. All of the ETSU faculty provided “experimental design” sessions in which they shared their research and the experimental design they used to carry out the research. These sessions provided excellent background information for students as they designed and carried out their own research projects. The students also experienced an array of off-campus trips ranging from studies at the Gray Fossil Site to the Oak Ridge Laboratories. The individuals who led these sessions are also included. A brief bio for each of these individuals is provided below.

Jennifer Bauer

Born in Baltimore, Maryland, I relocated to beautiful East Tennessee not long after graduating from high school. I soon became immersed in the beauty and the biology of the S. Appalachian Mountains and found myself wanting to learn all I could about this very diverse environment. East Tennessee State University is my alma mater, three times over, completing a Bachelor’s Degree in Biology and Art, followed by an MS in Science Education, and an MA in Teaching. Writing soon became a passion and I have now authored 4 books; A Naturalists’ Teaching Manual; Roan Mountain: A Passage of Time 1st and 2nd Editions; and Wildlife, Wildflowers, and Wild Activities—Exploring S. Appalachia. I am also a frequent contributor to the Tennessee Conservationist magazine. I am employed as a Park Manager at Sycamore Shoals State Historic Area in Elizabethton, beginning my career in the role of Park Interpretive Specialist at Roan Mountain State Park for 21 years prior to promotion. Of the utmost importance to me in my professional and personal life, is becoming a good environmental and cultural educator, coupled to a strong belief in the importance of conservation and preservation. I am in my 4th year of serving on the board of directors of the Elizabethton/Carter County Chamber of Commerce. The first weekend of May, each year, I direct and organize the Roan Mountain Spring Naturalists Rally, 2008 being its 50th year. In my “spare” time, I find myself weaving, learning the banjo, watercolor painting, clogging, and being outdoors as much as possible. Most importantly, I love to spend as much time as possible with my two daughters, a 2 year old granddaughter, and my husband.

Ken Childress

Mr. Childress is the contact person at Bays Mountain State Park in Kingsport, TN. He was responsible for arranging our tour and scheduling the viewing of the wolves and raptors habitats, the GS scholars, the counselors, and Dr. Rhoton’s participation on the barge ride across the lake to view the area fauna and flora, and in attending the nature program.

Sandy Harris

Mrs. Harris is the contact person for the Eastman Chemical Company—Eastman Laboratories in Kingsport, TN. She had a vital role in arranging our field trip to the Eastman Laboratories. Sandy scheduled our visit to the Biotech Lab, the Polymer Synthesis Lab, and the Physical Testing Lab. She also arranged the bridge building contest, and lunch at the Eastman visitor center.

Gary Henson

Dr. Gary D. Henson has been involved in astronomy research and education for over 25 years. As a research astronomer, he has studied Variable Stars using observatories in New Mexico, Arizona, Oregon, and at ETSU. As an educator he has taught not only at the university level, but has contributed much to public outreach programs throughout his career. He currently serves as the director of both the ETSU Harry D. Powell Observatory and ETSU Planetarium and received the 2004 Distinguished Faculty Award for Service at ETSU. Dr. Henson is the Assistant Professor, ETSU Faculty since 1989, B.S. - University of Central Arkansas, M.S. - University of New Mexico, Ph.D. - University of Oregon (1989).
Professional Interests: Visible & infrared photometry and polarimetry of variable stars.  E-mail: hensong@etsu.edu  Phone: 423-439-6906 (Brown Hall 216)

John Hyatt
Dr Hyatt was born in Kentucky and grew up in Virginia. He received his BS degree from Wake Forest University and a PhD from Ohio State University, where he did organic photochemistry under J. S. Swenton. After a postdoctoral year with Nobel laureate R. B. Woodward at Harvard University, where he worked on the total synthesis of erythromycin A, Dr. Hyatt joined the Eastman Chemical division of Eastman Kodak Company, where he was head of exploratory organic chemistry research. In 2004 he retired as Research Fellow at Eastman and joined the staff of Yassoo Health as Director of Research; he is concurrently Research Professor of Chemistry at East Tennessee State University. His principal research interest is the synthesis of complex organic molecules and the chemistry of the tocopherol family of chromosomes.

Richard Ignace
Richard completed his Bachelor’s in Astronomy at Indiana University, followed by a Masters in Astronomy, Masters in Physics, and Doctorate in Astronomy all from the University of Wisconsin, completing the latter degree in 1996. Ignace was then a postdoctoral researcher at the University of Glasgow for three years. He spent the next three years as a Visiting Assistant Professor at the University of Iowa followed by one year as an Assistant Scientist at the University of Wisconsin before coming to East Tennessee State University. Ignace is currently an Associate Professor in the Department of Physics and Astronomy, finishing his fifth year at ETSU. With a focus on massive stars and their winds, Ignace has been successful at winning grants to model and observe these interesting systems, with recent awards from various NASA programs and the NSF. Ignace regularly teaches astronomy courses at ETSU, and serves the broader community through public presentations and as participant in different outreach programs that promote the sciences.

Thomas Jones
Thomas C. Jones is currently working in the biological sciences department at East Tennessee State University and specialized in Behavioral Ecology, Neuroethology, and Science Education. In 1990 Dr. Jones received his B.S. in Biology from the Cleveland State University, and in 1993, he received his M.S. in Biology. In 2000, Dr. Jones received his Ph.D. in Evolution, Ecology, and Evolutionary Biology from the Ohio State University. Dr. Jones has a broad-based research program in the areas of animal behavior, ecology, population genetics, and neuroethology. Specifically, he is interested in the evolution of cooperation, sociality and dispersal strategies.

Thomas E. Kwagiroch, Ph.D.
Dr. Kwagiroch is the Associate Dean for Student Affairs. He is responsible for overseeing the daily operations of Financial Services, Admissions and Records, Student Support Services and special outreach initiatives with minority and disadvantaged populations. Kwagiroch is Director of the Medical Human Gross Anatomy and the Anatomical Gifts Program at the College of Medicine. In addition to these duties, Dr. Kwagiroch is a full time Professor in the Department of Anatomy and Cell Biology. He was graduated from Niagara University with a degree in Biology, earned his Ph.D. from the University of Virginia, and completed his Postdoctoral Fellowship at the Institute für Toxikologie und Embryonalpharmakologie, Freie Universitat Berlin, West Germany. Kwag is available for students to provide academic and personal counseling. He can be reached at 423-439-2019 or kwagiro@etsu.edu
Tim McDowell
Dr. McDowell is a botanist and faculty member in the Department of Biological Sciences of East Tennessee State University. He directs the ETSU Arboretum (the campus living tree collections) and the John C. Warden Herbarium (the museum of dried plant specimens). Tim's recent research includes studies of Appalachian wildflower species, the effect of fire on moist forest vegetation, and the local spread of Hemlock Woolly Adelgid among Carolina hemlocks. He recently co-wrote with David Kirschke Guide to the Wildflowers of Buffalo Mountain Park. Dr. McDowell's alma maters are UNC-Chapel Hill (BA) and Duke (Ph.D.). He has worked as a plant collector for the Smithsonian in Guyana, South America, and he has specialized in taxonomy and evolutionary studies of various tropical trees and shrubs in the coffee-quinine family.

Hugh Miller
Hugh A. Miller III earned his bachelor degree in Microbiology from ETSU in 1979. In 1986 he earned a Ph. D. in biochemistry from the University of Tennessee at Knoxville. After a postdoctoral fellowship at the Medical University of South Carolina, he joined the faculty of the Biological Sciences Department in 1988. While at ETSU, Dr. Miller has mentored several undergraduates and graduate students. In addition, he has been involved with curriculum issues by serving on both the College and University Curriculum committees. During academic year 2005/2006, he served the department of Biological Sciences in the capacity of Interim Chair. Recently, he has been involved in several funded educational grants including the NSF funded ATE grant, NSF funded Talent Expansion in Quantitative Biology, and the HHMI funded Symbiosis grant. Also, he serves the department one of two undergraduate advisors. During the Governor’s School, Dr. Miller was responsible for organizing and running the laboratory component of the Symbiosis course.

Diane R. Nelson
Dr. Nelson is Professor Emerita of Biological Sciences at East Tennessee State University, having retired in May 2003 after 35 years of service. In 1993, she received the ETSU Distinguished Faculty Award, the university’s highest award for combined achievements in teaching, research, and service. In April 2000 she was selected by the Association of Southeastern Biologists as the recipient of the Meritorious Teaching Award, the society’s most prestigious award. Although she “officially” retired from ETSU, she continues to conduct research, teach workshops, and provide service to her profession. She teaches Marine Biology occasionally at ETSU and gives programs for the Johnson City Hands-On Museum as well as for numerous civic organizations, churches, and public schools in the Tri-Cities area. She is also Curator of Invertebrates and Science Education Consultant for the ETSU and General Shale Brick Natural History Museum at the Gray Fossil Site.

Jack Rhoton
Dr. Jack Rhoton has dedicated nearly 20 years at East Tennessee State University, building a nationally recognized professional development program for science education, K-16. Prior to joining ETSU in 1987, Rhoton had 15 years of experience in public school settings in which he served as a high school science teacher and K-12 science supervisor. Known for his creative approaches to investigating science education issues, his work focuses on the preparation of pre-service and in-service teachers of science and mathematics. His efforts have impacted university faculty members; K-12 teachers; and elementary, middle and high school students. He has received nearly six million dollars in grant funding to support math and science education in Northeast Tennessee. A prolific science education author, he has published five books and sixty journal articles, and he has made numerous presentations at the local, state, and national levels. Further, thousands of students have been positively affected as a result of his many endeavors. Rhoton has served as president of the National Science Education Leadership Association (NSELA), Tennessee Academy of Science (TAS), and the Tennessee Science Teachers Association (TSTA). He has also served as program chair for the National Science Teachers Association (NSTA) area Conferences and as an NSTA board member, editor of a series of NSTA/NSELA
publications, including the Science Educator Journal. He has received many honors, including the National Science Education Leadership Outstanding Science Education Leadership Award, National Science Teachers Association Distinguished Service Award, East Tennessee State University Distinguished Faculty Award, Tennessee Academy of Science Outstanding Science Teacher Award, and the Tennessee Science Teachers Association Distinguished Educator of the Year Award.

**Mitch Robinson, Ph.D.**
Dr. Robinson is the Associate Dean for Graduate Studies. He is currently Associate Dean for Graduate Studies and Professor of Biochemistry and Molecular Biology and at the James H. Quillen College of Medicine. He is a native of western North Carolina and holds a B.S. degree from the University of North Carolina at Chapel Hill and a Ph.D. from Wake Forest University. As Associate Dean, he oversees admissions, curriculum and all academic activities in the M.S. and Ph.D. graduate programs in the College of Medicine. Dr. Robinson is active in teaching a variety of subjects in both the graduate and medical curriculum including intermediary metabolism, lipid metabolism, biochemistry and scientific ethics. He currently serves as the course director for the Medical Biochemistry course taught to all first year medical students. He can be reached at 423-439-2028 or robinson@etsu.edu

**Phillip Scheuerman**
Dr. Scheuerman was born in Ohio and grew up in Florida. He received his BS Degree from the University of Florida in Microbiology and his MS and Ph.D degrees from the University of Florida in Environmental Engineering Sciences. Dr. Scheuerman spent a year as a postdoctoral research associate at the Center for Wetlands at the University of Florida; he then spent a year as a postdoctoral researcher in Martin Alexander’s laboratory at Cornell University. He came to ETSU in 1986 as an assistant professor of environmental health and director of the Environmental Health Sciences Laboratory. Dr. Scheuerman became interim chair of environmental health in 1999 and chair in 2000. His research interests include identification of water pollution sources and risk assessment of exposure to water pollutants.

**Fred Strohl**
Mr. Strohl is the tour coordinator at Oak Ridge National Laboratory and has worked in ORNL’s Communications and Community Outreach Directorate since February 1995. Prior to that time, he worked in newspapers and broadcasting for 24 years -- most of that time spent in East Tennessee. Mr. Strohl is a 1976 graduate of Maryville College with a Bachelor of Arts degree in political science. He is married with four children.

**Doug Taylor**
Mr. Taylor is the Assistant Dean of Admissions & Records. He oversees the day-to-day operation of Admissions and Records and has been in Admissions for many years and is not only exceptionally qualified, but also eager to offer his assistance. He can be reached at 423.439.2033 or sacom@etsu.edu

**Steven Wallace**
Steven Wallace always had an interest in skeletal anatomy and entered college hoping to become a high school science teacher. Paleontology combined both his fascination with skeletal anatomy, and his new interest in geology. With his BS in geology, Wallace moved to Fort Hays, Kansas to work on a MS under Dr. Richard Zakrzewski. Wallace is known for his dissertation work on the Pleistocene voles, which included the utilization of schmelzmuster (enamel microstructure) and morphometrics to identify species specific characters within the genus *Microtus*. Wallace began at East Tennessee State University (ETSU) in 2001 to oversee the excavations at the newly discovered (late Miocene) Gray Fossil Site in NE Tennessee. His scholarly work includes 12 peer-reviewed articles and 7 government contract reports published in journals such as Nature, Journal of Vertebrate Paleontology, Journal of Mammalogy,
Current Research in the Pleistocene, Journal of Archaeological Science, Palaeogeography/ Palaeoclimatology/ Palaeoecology, Fort Hay Studies, and Surveying & Land Information Science; and 31 papers presented at professional meetings such as the Society of Vertebrate Paleontology, Geological Society of America, American Congress on Surveying and Mapping, National Speleological Society Convention, and the American Zoo and Aquarium Association Eastern Regional Workshop involving some aspect of the Gray site. Wallace was appointed as the center’s Director in July of 2005. Although in its infancy, the Center of Excellence is already attracting researchers from around the country and throughout the world. Currently Wallace is an Associate Professor within the newly created Department of Geosciences and continues to serve as Director of the Don Sundquist Center of Excellence in Paleontology (now housed in the new Museum).

Michael Zavada
Dr. Zavada was born and raised in Bridgeport, Connecticut. He received his B.S. and M.S. degree in Botany / Palynology from Arizona State University, Tempe. He received a B.A. in Slavic Languages, and a Ph.D. in Ecology and Evolutionary Biology from the University of Connecticut, Storrs. He spent one year as a Fulbright Scholar in Skopje, Macedonia at the Geologic Institute, and the Center for Foreign Languages. He did post-doctoral work at Indiana University, Bloomington, and Ohio State University, Columbus. He has served on the faculties of The University of the Witwatersrand, Johannesburg, South Africa, The University of Louisiana-Lafayette, was Professor and Chairman of the Department of Biology at Providence College, Providence, RI, and is currently the Chairman of Biological Sciences at East Tennessee State University and a member of the Center of Excellence in Paleontology. His field research has taken him throughout North America, South America, and Africa, including Madagascar. He has received over $1.7 million in grants including grants from the National Science Foundation, National Institute of Health, NASA, American Philosophical Society, and National Geographic Society. He has published over 75 papers. In addition to his academic interests, he played baseball at Arizona State University, participates in a variety of sports, and outdoor activities, enjoys travel, and is an instrument rated private pilot.
APPENDIX B

2008 Counselor Bios
The Tennessee Governor’s School for Scientific Models and Data Analysis

Leah Darnell
Leah was raised in Kingsport, Tennessee. She is currently attending East Tennessee State University. She will be graduating with a Bachelor of Arts in English and Secondary Education this December. In her spare time Leah volunteers for Big Brother/Big Sister of Kingsport. She also enjoys spending time outdoors, reading, and is recently learning how to cook. Leah has plans to move to Knoxville, Tennessee when she graduates to pursue a Masters degree in Media Specialty.

Aprele Fitzgerald
Aprele recently graduated with a bachelor’s degree in Biology, Aprele plans on pursuing a master’s degree at the University of Central Florida. She is passionate about teaching science and mathematics. For Governor’s School, she served as the academic counselor during which some of her tasks included tutoring subjects and monitoring students’ academic progress. This experience has had a positive influence on her future since it has made her consider teaching high school science. In addition to goals, some of Aprele’s hobbies include hiking, rock climbing, caving, gaming, drawing, and biking. She is also a devoted naturalist, studying plant and animal life and volunteering as a wildlife keeper.

Rachael Griffin
Rachael is a 24 year old graduate from the University of Tennessee with a B.S. in Communications with a concentration in performance news journalism. She currently resides in Bristol, TN with her three dogs and cat. Rachael spends much of her free time fundraising for area philanthropies and attending social events.

Kylee Ann Merendino
Kylee grew up in Bristol, TN, and is a graduate of Tennessee High School. After graduating valedictorian of her class, she attended East Tennessee State University in Johnson City, TN. She received her Bachelor of Science in Psychology and Marketing in May, 2006, and she is currently working on her Master of Arts in Teaching. Her interests are skiing, snowboarding, tennis, running, fashion, and travelling. Her goals for the future are to enter a doctoral program and teach in an elementary school classroom.

Adam Parks
Adam calls Virginia home and for the most part has spent most of his time in both the density of Richmond and the small town atmosphere of Abingdon. He went to undergraduate school at Emory and Henry College to reconnect to his small town roots and play football. There, he received his Bachelor of Arts and majored in both History and Geography. Adam is currently in his final semester of the Master of Arts in Teaching program at ETSU, and will be student teaching in Sullivan County this fall at Sullivan South High School and Colonial Heights Middle School. He hopes to teach high school social studies and coach somewhere in Southwest Virginia.
APPENDIX C

2008 Statistical Summary
The Tennessee Governor’s School for Scientific Models and Data Analysis
(30 attendees/57 applicants)

GENDER:  FEMALES- 17/25
          MALES - 13/32

CLASS 2008-2009:  JUNIORS- 15/24
                    SENIORS- 15/33

ETHNIC BREAKDOWN:
AFRICAN-  1/1
AFRICAN-AMERICAN- 0/1
ASIAN-  4/5
ASIAN-AMERICAN- 5/18
CAUCASIAN - 16/25
HISPANIC- 2/2
MULTI-RACIAL- 0/1
NO RESPONSE -2/4

HIGH SCHOOLS REPRESENTED:  23/43

COUNTIES REPRESENTED:  15/25  (95 Counties in Tennessee)

ANDERSON -1/2
BRADLEY- 0/1
CARTER- 0/1
CHEATHAM- 0/1
CROCKETT- 0/1
CUMBERLAND- 0/1
DAVIDSON-0/1
FAYETTE- 1/1
FRANKLIN- 1/2
GREENE- 1/1
HAMILTON- 1/1
HUMPHREYS- 1/1
KNOX- 2/7
MARION -1/1
MAURY- 1/1
MONROE -0/1
MONTGOMERY -4/4
RUTHERFORD- 2/5
SHELBY- 4/6
SULLIVAN -3/3
SUMNER- 0/1
WASHINGTON- 6/8
WEAKLEY -1/1
WILLIAMSON- 0/4
WILSON- 0/1
APPENDIX D

2008 Course Offerings
The Tennessee Governor’s School for Scientific Models and Data Analysis

Goal and Objectives
The overarching goal of the Governor’s School in Scientific Models and Data Analysis was to broaden the student’s appreciation and knowledge of biology and mathematics through exposure to and integration of a wide range of contemporary biological and mathematical topics. In each case, model building and data analysis will played a critical role and was interwoven in a statistical and biological context. Students were engaged in the scientific method via hands-on research experiences. Resources from ETSU’s strong undergraduate science and mathematics program, research laboratories, and local schools were used to accomplish these objectives. In addition, the program made use of resources from industry, governmental agencies, and academic science establishments. Thus the school provided a series of courses, laboratories, projects, field trips, seminars, lectures, and other activities centered on mathematics, statistics, and biology. The curriculum consisted of courses BIOL-1110-1111 (4 credits, biological science for majors) and MATH 1530 (3 credits, probability and statistics), which were taught in the integrated fashion. The activities of the Governor’s School covered the approved syllabi for these courses and met the required number of contact hours, while extending the scholars’ intellect in directions not possible during a regular school year.

Course Work
We are guided by the conviction that today’s students are attracted to science and mathematics when these are seen as interconnected fields rather than as separate bodies of knowledge. Thus, thirty talented rising juniors/seniors from across the state were immersed in scientific instruction and inquiry in several interdisciplinary fields of science. These included: biology, bioinformatics, mathematics, statistics, and systems ecology. Second, connections between these fields were seen through the ubiquity of mathematical modeling, data analysis, and the need for high level computation. Last but not least, students gained a healthy respect for many disciplines and thus have a variety of career choices to consider as they get ready to enter college. In a nutshell, the students experienced a renaissance style Governor’s School that prepared them for many possible career options. Specific courses are described below:

9:30-12:00pm Course

Math 1530--Probability and Statistics (3 hrs.)
Prerequisite (s): Two years of high school algebra. Descriptive statistics and its relevance, including probability, experimentation, measurement, sampling and survey, informal statistical inference, and hypothesis testing are included.

1:00-3:00pm Course

BIOL 1110--Biology for Science Majors- Lecture I (3 hrs.)
Core requisite: BIOL 1111. The principles of molecular and cellular biology, including metabolism and genetic inheritance. Designed for biology majors, minors, and others who plan to take upper-level courses for which this is a pre requisite. This course contains three (3) hours of lecture and two hours of lab. A common grade will be given in BIOL 1110/11.
**BIOL 1111 -- Biology for Science Majors- Lab I (1 hr.)**
Core requisite(s): BIOL 1110. Laboratory exercises to gain the ability to identify and use the processes of biological science with materials corresponding to Biology for Science Majors Lecture I. This course contains one (2) two-hour lab per week. A common grade will be given in BIOL 1110/11.

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**East Tennessee State University**
**Department s of Biological Sciences and Mathematics**
**Course:** IBMS 1100 SYMBIOSIS I  
Number of credits 6- (3 for Biology, 3 for Statistics)  
Number of hours per week: 5 hours of lecture and 2 hours of lab

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**Objectives:**
*To present Biology as a science that is dependent on quantitative analysis of data.* The course covers aspects of biology such as Introduction to the cell and cell growth, effects of size increase on organisms, Mendelian genetics, DNA replication and genomic content and how these characteristics can change over time by Evolutionary processes. *To introduce probability, descriptive statistics and statistical inference in the context of the study of Biology.* The course covers the typical content of an introductory statistics course plus some additional topics. The notion of statistical inference is introduced very early in the course by means of randomization tests and the exact sampling distribution of the sample proportion based on the Binomial distribution. The examples in probability are mainly oriented toward topics of interest in genetics and bio-informatics at an elementary level.

**IBMS 1100** is the first course in a 3 course sequence that integrates biology, statistics, and mathematics. As a result, the mathematics and statistics is introduced, explored, and developed in biological contexts, including surface area to volume ratios, isometric and allometric scaling, fractals in biology, and difference equations and discrete systems in genetics, evolution, and the study of DNA. Pre-calculus concepts and limits are also introduced and developed in IBMS 1100, both due to the natural contexts which arise for doing so (such as log-log plots) and because a major goal of the Symbiosis project is to spread the coverage of calculus I across 2 semesters as a way of promoting greater student success in both calculus comprehension and skill development.

**Teaching method:** Lectures were prepared mainly in power-point. Hands-on class activities and data analysis in the computer lab were used when appropriate on addition to the wet/dry lab component.

**Textbook:** Complete class notes, on addition to power point presentations, were written for this course by the instructors under a grant from HHMI, they are available from the D2L platform.

**Statistical software:** Minitab, R, Maple, Java Applications, Image J, Web-based Applets and Activities

**Module 1. - The Scientific Method**
The study of Biology is introduced. Aspects of what hypotheses are and how they are tested leads into statistical inference. Examples of hypothesis testing such as von Helmont’s plant growth test and Stanley Prussiner’s Prion Hypothesis are discussed. An introduction of Arbovirus infection of Yellow Fever leads to a discussion of viruses and definition of life. The hypothesis of whether AIDS can be transmitted by mosquitoes is used as an example of the use of quantitative biology. The five themes of biology are introduced as the thread of further modules.
What is Statistics? Role of statistics in the scientific method. An introduction to the role of mathematics and statistics in science in general. Randomization test to test the hypothesis of equal means (medians, variances) of two populations based on experimental data. Why do we study probability? Basic definitions: random experiment, sample space, event. Definitions of probability: classical, relative frequency, axiomatic definition and its consequences; independent events; replicates of a random experiment; Pascal triangle and basic combinatorics. Types of random variables, mass or probability function and density functions. Discrete probability distributions; binomial distribution; applying the binomial distribution to do test of hypothesis about a population proportion. First glance at the limit concept (probability as limit of a relative frequency, along with difficulties in using such a definition). First glance at mathematical models.

Module 2. - The Cell and Statistics
Introduction to the cell. What is the cell and why are they small? What is the concept of multicellularity? The organization of the cell and what are the consequences of the components functions. TANSTAAFL (There ain’t no such thing as a free lunch), a more wide ranging discussion of consequences starting from the more formally known Second Law of Thermodynamics. The transmission of information into and out of the cell. The cell cycle and mitosis as a consequence of cell growth, repair and quiescence. Data production: observational studies and experiments. Basic definitions: population, sample, individual, variables (categorical & quantitative). Displaying and summarizing data for categorical variables, tables and graphs, relative risk, odds ratio, measuring agreement in matched-pairs situations. Displaying and summarizing data for quantitative variables, tables and graphs for one, two and several variables at the time. What are the data telling us? How to decide between the different statistical graphs? Location (mean vs. median, five number summaries) and variability statistics. Sources of variability. Looking at paired data. Correlation. What is statistical inference? Introducing the idea of sampling variability and sampling distribution. Exact sampling distribution of a sample proportion (based on the Binomial distribution) and its application to hypothesis testing and estimating with confidence. Bootstrapping to do inference about a population mean. Randomization or permutation test to test hypotheses about a parameter (mean, median or variance) in two populations.

Module 3.-Size and Scale
What happens to an organism as it grows bigger? Can ants really toss locomotives off the tracks? Can King Kong jump off the Empire State Building? Can Tyrannosaurus rex really run at 80 kph? This module examines the functions that describe what happens when organisms grow (or shrink). Included are organism size as a determining factor in shape, the differences between isometry and allometry, problems with isometric scaling in biology, bacteria size, shape, organization, cell wall structure, and other characteristics. Exponential growth of bacterial populations. Biological models with mass as the independent variable. Area, volume, and surface area to volume ratio. Isometric scaling, slope, equations of lines, allometry and power laws. Limits as tools for approximation. The exponential function. Logarithms. Linear regression and transformed variables. Normal distribution, Fractal Geometry as it relates to biological organisms and the surface area to volume ratio.

Module 4- Mendelian Genetics
Why was Gregor Mendel able to elucidate the laws that determine how organisms pass genetic information from one generation to the next? This crucial process was discovered and then ignored for almost 40 years and yet was the key that Darwin was missing to explain Evolution. The data and
processes that Mendel used to determine these principles are examined. In this context, Meiosis is described as the cellular equivalent of Mendelian Laws. A coin model to understand genotypes and phenotypes for all combinations of homozygous and heterozygous parents. Punnett squares and probability trees, ‘back-testing’. Comparing experimental results with the expected results under an assumed model: Chi-square test of goodness of fit. Review of probability basics. Chi-square test of independence. Fisher’s exact test. Test of homogeneity. Describing dependence with relative risk and odds ratio. Conditional probability and Bayes rule. Discrete distributions, expected value and variance, discrete uniform, Bernoulli, Binomial and its use to test hypotheses about a population proportion. Power of a test. Determining sample size based on the desired power for a test. Poisson distribution, binomial and normal approximations to the Poisson distribution. Introduction to sampling: population, sampling frame, sampling size, sampling methods (simple, systematic, cluster, two-stage, stratified), transect sampling, sampling and non-sampling error, capture/recapture and distance sampling.

Module 5 - DNA genetics
Mendelian Laws describe how information is passed from generation to generation, but the molecular processes were not determined until the nature and structure of DNA was described. The structure of this molecule and the consequences of replication are covered. Is DNA the same in different organisms? Quantitative tools to look at the composition of the information are developed. DNA as nucleotide sequences, nucleotide frequency, GC content. Independence and conditional probability in the DNA environment. Transition matrix, graph to represent transition matrices. Probability of a given sequence of nucleotides, repeats of a single nucleotide, length of the repeat, geometric distribution. Palindromes, probability of any palindrome and of specific palindromes, space in between palindromes. Comparing two sequences of nucleotides. Similarities that happen just by chance. Random walks (and their use in testing for similarities). Sampling distribution of the sample mean and its use in confidence interval estimation and hypotheses testing. Approximated distribution (normal) of the sample proportion and its use in confidence interval estimation and hypotheses testing. Necessary sample size calculation in the case of estimation based on desired precision and confidence and the case of testing hypothesis based on the desired power. The t-student distribution and its application to inference for the sample mean.

Module 6 - Evolution
“Nothing in Biology makes sense, except in the light of Evolution” by Theodosius Dobzhansky is the quote that sums up the importance of Evolution to Biology. The genetic basis of Evolution has been described and the applications of these principles to examples are covered, i.e. applications of probability and statistics to populations. Evolution as it relates to population size and density. The Wright-fisher model with the Hardy-Weinberg equations as a special case: rigorous development of the limit concept; continuity; discrete dynamical systems; effect of sample size in the Chi-square test; an introduction to graphs and their use in genetics.
Governor’s School Projects

Students had the opportunity to be engaged in a variety of research projects. The projects centered around the following topics: Flies, Spiders, SIR, Bootstrap, Neural networks and the Mars Rover, Cells, Micro Array, and Pure Math. In each project, model building and data analysis played a critical role and was interwoven in a statistical and biological context. Listed below is a brief description of each project as well as the names of students involved in the research. The students reported their research findings to their parents and university faculty on the last day of the Governor’s School.

Dr. Joplin (Flies)
Andrew
Ashley
Rhyann
Victoria

The life history of organisms demonstrates that different factors influence their life span. A mortality study was conducted showing the different survivorship curves that male and female flesh flies, Sarcophaga crassipalpis, exhibit during their life span. The hypothesis is that they will show a similar rate of mortality during their life span. The data suggests that females have a very different ‘S’ curve than males. Data collection and statistical analysis were performed by the students.

Dr. (TJ) Jones (Spiders)
Brittany
Nick
Patrick
Marion
Zoe

The distribution of the variably social spider, Anelosimus studiosis, may have a bearing on the distribution of sociality. Students conducted a transect survey of a shoreline habitat at Warriors State Park in Kingsport, Tennessee. Distances between webs and the volume of each web were recorded. The data were analyzed by nearest neighbor analysis, correlations between web volume and distance and sociality.

Dr. Knisley (SIR)
Daniel McGregor

The scientific method is used in determining which vector is responsible for a given epidemic. The goal was to revisit the work of Walter Reed and Carlos Finlay in their quest to determine the cause of yellow fever.

Dr. Knisley (Bootstrap)
Pooja

When data is not distributed according to a bell curve or any other known distribution, then the data itself can be used to suggest an empirical distribution. The process for doing this is called bootstrapping, and in this presentation, it is applied to some non-bell shaped curve data in anthropology.
Dr. Knisley (Neural networks and the Mars Rovers)
Corey
Rafey
Holla
Pedro
Oliver

The Mars Rovers, Spirit and Opportunity, are too far away to be controlled effectively. Instead, they were given their own artificial “brains,” which are known as neural networks, so that they could make their own decisions as they explore the surface of Mars. Likewise, students were given a neural network and the task of training the network so that it could navigate an artificial “terrain”, thus reproducing the artificial intelligence of the Mars Rovers.

Dr. Miller (Cells)
Kristie Burk
Clarissa
Krystie Arrison
Tara
Sheila
Angie

A lymphoma cell line called U937 appears to have heterogeneous sizes. The students tried to answer the question; does the size of U937 cells change as the cells age in culture? Cells that had been cultured for various times were applied to microscope slides and images of random fields were captured. Cell areas were analyzed using the ImageJ software.

Dr. Miller/Dr. Joplin (Micro array)
Daniel Kasper
Cho
Sheridan
Jessica

Students were introduced to microarray data from a study of diapausing and non-diapausing flesh flies, Sarcophaga crassipalpis. The data were normalized and examined for genes that are diapause up- or down-regulated during this developmental state. Genes were then identified using the GenBank dataset.

Dr. Knisley (Pure math)
Rouke
Amie
Richard
Becca

The process of Mark/Recapture is frequently used to estimate the size of a population of animals, people, cells, etc. However, the Mark/Recapture method has many shortcomings, not the least of which is that it has an infinite expected value and a huge variation, thus causing estimates to vary from the actual population by hundreds or thousands. A modification of the naïve Mark/recapture method, however, is shown mathematically to have a finite expectation – in fact, the expected value is the actual population size itself. Mathematically, it is also shown that the variation in the modified estimates has much less variation.
APPENDIX E

2008 Student Evaluation Results
The Tennessee Governor’s School for Scientific Models and Data Analysis

I. Overall Program
Cumulative Rating (out of 5): 4.37

Your overall rating of the 2008 Governor’s School for Scientific Models and Data Analysis Program is that it was:

- Excellent------------------------ 14/30 47%
- Very good----------------------- 13/30 43%
- Good---------------------------- 03/30 10%
- Fair----------------------------- 00/30 00%
- Unsatisfactory/poor ---- 00/30 00%

II. Academic Component/Workload
Cumulative Rating (out of 5): 2.83

The opportunity to earn six hours of university academic credit was:

What is the level of your satisfaction with the Governor’s School Program offered as a university credit program?

- The for-credit aspect is very important to me---------------------------------- 25/30 83%
- I am neutral on the for-credit aspect------------------------------------------ 05/30 17%
- I would have preferred that the program be offered on a non-credit basis------ 00/30 00%

III. Core Educational Program

Did you find the material covered interesting?

- All of the time---------------------- 04/30 13%
- Most of the time------------------- 19/30 63%
- Some of the time------------------- 07/30 23%
- Occasionally---------------------- 00/30 00%
- Not at all------------------------- 00/30 00%

Do you think the textbook was useful to your learning the course material?

- All of the time------------------- 08/30 27%
- Most of the time------------------ 07/30 23%
- Some of the time----------------- 04/30 13%
- Occasionally-------------------- 00/30 00%
- Not at all-------------------- 11/30 37%
The division of time spent on classroom lectures, team projects and homework was well-balanced:

- All of the time: 04/30, 13%
- Most of the time: 16/30, 53%
- Some of the time: 09/30, 30%
- Occasionally: 01/30, 03%
- Not at all: 00/30, 00%

In general, did you have enough time (in and out-of class) to finish all of your homework and project assignments:

- Yes: 25/30, 83%
- No: 05/30, 17%

Weekly tests appropriately covered material presented in class and in-class learning exercises:

- All of the time: 07/30, 23%
- Most of the time: 16/30, 53%
- Some of the time: 05/30, 17%
- Occasionally: 01/30, 03%
- Not at all: 01/30, 03%

You feel that the scores you earned on tests reflected the actual extent to which you mastered course material:

- Very closely: 08/30, 27%
- Somewhat: 16/30, 53%
- Not very much: 03/30, 10%
- Not at all: 03/30, 10%

The assigned team design projects were interesting and contributed to your learning experience:

- All of the time: 15/30, 50%
- Most of the time: 08/30, 27%
- Some of the time: 04/30, 13%
- Occasionally: 02/30, 07%
- Not at all: 01/30, 03%

IV. **On-Campus Meals**

Cumulative Rating (out of 5): **3.83**

You feel that the food served on-campus was of good variety and quality:

- Always: 00/30, 00%
- Most of the time: 08/30, 27%
- Some of the time: 11/30, 37%
- Not very often: 05/30, 17%
- Never: 06/30, 20%
V. Dormitory Lodging
Cumulative Rating (out of 3): 2.93

You feel that your stay in the Governor’s Hall dormitory was:

- Excellent accommodations and enjoyable: 27/30 (90%)
- OK accommodations but not great: 02/30 (07%)
- Not satisfactory: 01/30 (03%)

VI. Faculty (Professor)/Courses
Cumulative Rating (out of 5): 4.00

The teaching effectiveness and general helpfulness of the professors (Dr. Karl Joplin and Dr. Jeff Knisley) was:

- Excellent: 08/30 (27%)
- Very good: 13/30 (43%)
- Good: 08/30 (27%)
- Fair: 01/30 (03%)
- Poor: 00/30 (00%)

VII. Resident Counselors
Cumulative Rating (out of 3): 2.70

The effectiveness and helpfulness of the five Governor’s School Counselors (as a group) in providing dormitory oversight and in accompanying you on group activities were:

- Very effective/helpful: 22/30 (73%)
- Usually/somewhat effective/helpful: 07/30 (23%)
- Not very effective/helpful: 01/30 (03%)

VIII. Special Activities

The following activities included in the 2008 Governor’s School for Scientific Models and Data Analysis Program were of substantial value and should be repeated in future programs:

- Visit to Gray Fossil Site, Experimental Design (Dr. Steve Wallace) 20/30 (67%)
- Visit to Gray Fossil Site, Paleontology Dig (Dr. Michael Zavada) 15/30 (50%)
- Visit to Warriors Path State Park for Spider Study (Dr. Thomas T.J. Jones) 13/30 (43%)
- Visit to ETSU Campus Arboretum (Dr. Tim McDowell) 05/30 (17%)
- Visit to ETSU Medical School Laboratory (Dr. Mitch Robinson) 21/30 (70%)
- Visit to Oak Ridge National Laboratories (Fred Strohl/Ms. Angela Haga) 17/30 (57%)
- Visit to Historic Jonesborough, Jonesborough, TN (Dr. Jack Rhoton) 14/30 (47%)
- Visit to Roan Mountain State Park, Roan Mountain, TN (Jennifer Bauer) 17/30 (57%)
- Visit to Eastman Chemical Company, Kingsport, TN (Ms. Angela Haga) 08/30 (27%)
- Visit to Bays Mountain State Park, Kingsport, TN (Dr. Jack Rhoton) 26/30 (87%)
- Visit to the Carter Fold, Hiltons, VA (Dr. Jack Rhoton) 24/30 (80%)
- Off-campus meal events 09/30 (30%)
- Activities at the ETSU main library 05/30 (17%)
APPENDIX F

2008 Comments (Field Trips)
The Tennessee Governor’s School for Scientific Models and Data Analysis

COMMENTS: Opinions of scholars

Overall opinion of field trips
Comments:

- Most of them were very exciting and I enjoyed them all.
- They were all fun.
- Fun!
- I loved Bays Mountain and Roan Mountain the most.

Visit to Gray Fossil Site, Experimental Design (Dr. Steve Wallace)
Comments:


Visit to Gray Fossil Site, Paleontology Dig (Dr. Michael Zavada)
Comments:

- Very nice, would love to go again!

Visit to Warriors Path State Park for Spider Study (Dr. Thomas T.J. Jones)
Comments:

- Very informative and cool!

Visit to ETSU Campus Arboretum (Dr. Tim McDowell)
Comments:

- I suppose a reason I wasn’t crazy about the Arboretum tour was that it was hot and we had to carry around our stuff. Perhaps better preparation would have made the experience more enjoyable.
Visit to ETSU Medical School Laboratory (Dr. Mitch Robinson)
Comments:
  ❖ Amazing!
  ❖ Very exciting and on the edge.
  ❖ The best!

Visit to Oak Ridge National Laboratories (Fred Strohl)
Comments:
  ❖ The best of the bunch!

Visit to Historic Jonesborough, Jonesborough, TN (Dr. Jack Rhoton)
Comments:
  ❖ A lot of fun.

Visit to Roan Mountain State Park, Roan Mountain, TN (Jennifer Bauer)
Comments:
  ❖ The greatest field trip, incredibly beautiful.
  ❖ Amazing!
  ❖ My personal favorite. Loved the mountains!

Visit to Eastman Chemical Company, Kingsport, TN (Ms. Angela Haga)
Comments:
  ❖ Enjoyed it immensely.
  ❖ Great tour!

Visit to Bays Mountain State Park, Kingsport, TN (Dr. Jack Rhoton)
Comments:
  ❖ Had a great time. Love the park.
Visit to the Carter Fold, Hiltons, VA (Dr. Jack Rhoton)
Comments:
  ❖ Loved it! It was amazing.
  ❖ Very fun.

Off-campus meal events
Comments:
  

Activities at the ETSU main library
Comments:
  

Visit to Fun Expedition in Johnson City, TN with counselors
Comments:
  ❖ Very good, worth a repeat!

What other activities would you have liked to be included in the Governor’s School Program?
Comments:
  ❖ Tour of the Vanderbilt University labs.
  ❖ Should have more non-educational trips that are meant to be fun.
  ❖ More sports related activities.
  ❖ A mathematical institution.
  ❖ Whatever makes the kids happy?
  ❖ Chattanooga Aquarium
  ❖ Tremont
  ❖ A day in the Gatlinburg area might facilitate an interesting cultural experience.
Overall Program Evaluation

Comments:

- The program was wonderful. I feel like I came here blind and naïve and am leaving as a whole new person. This experience will last with me for a lifetime.

- This program really opened my eyes to the college experience. Governor’s School is a wonderful program which aids driven kids with a great educational program. ETSU is a wonderful campus, which is striving to be the best regional state college in the region. Other college campuses are not reaching for higher standards. There wasn’t a moment where I didn’t feel like I wasn’t learning something new. The roommate selections were exceptionally great.

- Don’t have so many fire alarms!

- Too much time spent on mandatory activities.

- 3 hours is pretty long at a stretch in the classroom. The 5 minute breaks every hour definitely helped.

- Loved the new dorm with a bathroom in the room.

- Great roommate!

- Got tired of the same meals every day in the cafeteria. Need more vegetarian options.

- Class was hard, but, an eye opener. I have definitely learned and grown from this experience!

- I wish we had more options on whether or not we have a lecture and a test for example. Maybe they could be more flexible and we could have more time to do homework, etc.

- I felt like we may have been more productive had we gotten our projects earlier.

- We spent so many hours in class and sometimes had little time to do homework. Possibly increase program for more weeks w/less class time daily.

- Phone line was out and they didn’t get it fixed until a week late in my dorm room.

- Loved the dorms with a shower in each room.

- Too many fire alarms in the middle of the night!

- Don’t have so many fire alarms.

- Put ice in ice machines in Governor’s Hall.

- One trip to Gray Fossil Site is enough.
- Something more hands-on than just tours.
- Dormitory was nice and clean with adequate furniture and the big plus was the bathroom.
- Everything was great!
- The counselors were amazing!!!!
- No FIRE ALARMS! (it was bad)
- Less time should be spent on classroom seminars and lab w/computers.
- Counselors were very helpful.