

## SCHOOL PROFILE



*The Berrien County Math & Science Center (BCMSC) provides an accelerated academic program that delivers challenging, accelerated educational experiences to students that are capable of benefiting from highly rigorous, integrated and laboratory-based courses in science, math and computer science. BCMSC's high school program serves over 100 talented students selected from 14 school districts in Berrien and Cass Counties.*

Students attend BCMSC, hosted on the campus of Andrews University in Berrien Springs, for half of their school day. The program is directed by Berrien RESA and serves public and private school districts in a 750 square mile area of rural Southwest Michigan. BCMSC is one of the founding members of the National Consortium of Secondary STEM Schools (NCSSS), and continues to have representation on their Board of Directors. The Center began operation in the fall of 1991.

The Berrien County Math & Science Center faculty is comprised of professors with advanced degrees in their disciplines and extensive experience as teachers. Eighty percent of BCMSC's instructors hold doctorates in their academic fields. Additionally, students have the opportunity to take electives and core courses for credit within the University. A University transcript for college credits earned is available upon request. Andrews University is fully accredited through the North Central Association of Colleges and Schools for programs through the doctoral level.

*Berrien County Math & Science Center students are expected to excel in fast-paced, in-depth STEM courses. Each year, classes cover the content of their course textbook in its entirety, as well as auxiliary materials. Andrews University courses are heavily lab-based, and students are encouraged to utilize professional-level research equipment in their projects, such as electron microscopes and nuclear magnetic resonance spectroscopy machines. Students take part in off-campus learning excursions, including biochemistry and environmental studies at Great Smoky Mountains Institute in Tremont, physics and engineering at Six Flags Great America, and student research symposiums at the state and national level.*

*The academic year is divided into two semesters. All students take mathematics, science and technology courses taught by Andrews University professors. Students are graded on a 4.0 scale. BCMSC's academic credits become part of a student's home high school transcript. On the student's transcript, all courses coded AH (and some coded AP) are part of this program, and should be considered Advanced Honors courses. Graduation requirements, class rank, and accreditation are those of the home school.*

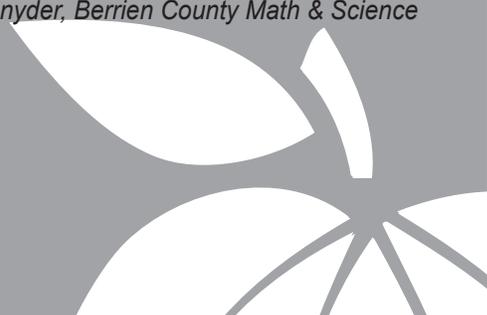
### **Admission**

*Criteria for admission is competitive. Students from across Berrien and Cass counties apply to BCMSC in their 8th grade year; only the top 30 are invited to join the freshman class. Admission decisions are based on student writing samples, teacher recommendations, grades, and test scores, including the SAT.*

### **Contact Information**

*Additional information can be found online at [berrienresa.org/bcmsc](http://berrienresa.org/bcmsc). Specific questions may be directed to Tonya Snyder, Berrien County Math & Science Center Program Coordinator:*

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## **Course Descriptions: All Students are required to complete the following courses. All science courses are research and laboratory-based.**

### **AH Integrated Geometry (AH GEOM) - grade 9**

This project oriented course provides a rich, rigorous foundation in geometry, uniquely blended with set theory, probability and statistics, and further work in algebra. Problem solving and technology, including computers and graphing calculators are integrated into each of these topics.

### **AH Research Biology (AH BIO) - grade 9**

Topics include cell biology, genetics, structure and function of plant and animal kingdoms, comparative anatomy and physiology, and ecology/environmental studies. An interdisciplinary approach combines meaningful field and laboratory experiences to develop the student's ability to recognize and solve scientific problems. Hands-on time with sophisticated instrumentation and procedural techniques culminate in a research project.

### **AH Computer Science I (AH COM SCI I) - grade 9**

This course introduces the student to the computer as a tool for writing and studying. Students master Microsoft Word, Excel and Access. Basic knowledge of how computers work and of common computer terminology, including the understanding of the various applications of computers is included. Students learn Web page and multimedia design using HTML and commercial development packages. Students complete a project in introductory robotics.

### **AH Integrated Algebra II (AH ALG II) - grade 10**

The major component of this course is advanced topics in algebra. The students continue the study of Probability/Statistics including probability distribution and linear regression. The course integrates geometry, algebra, statistics, discrete mathematics, polynomial functions, and problem solving with graphing calculators/computers.

### **AH Analytical Chemistry (AH CHEM) - grade 10**

This course is the study of the composition of substances. The course includes a broad range of chemical concepts producing a well balanced preparation for college classes. Classroom instruction is integrated with meaningful laboratory experiences in order to develop each student's knowledge of analytical chemistry itself.

### **AH Computer Programming (AH COM SCI II) - grade 10 (CPTR 151 credit option)**

This course emphasizes computer problem solving using structured design and programming methodologies in the C++ programming language. Students learn to approach problems systematically and approach solutions using well known techniques of proven effectiveness. Students create modular programs using current programming languages.

### **AP Statistics (AP STATS) – grade 10-12**

The Advanced Placement Statistics course follows the Advanced Placement syllabus and students may take the AP test in May. Course study will include exploring data, planning a study, modeling patterns using probability and simulation, and statistical inference. (AP Statistics offered by invitation only).

### **AH Pre-Calculus (AH PRE CAL) - grade 11 (MATH 168 college credit option)**

The course topics include college algebra, advanced trigonometry, and analytic geometry of two and three dimensions. Students experience a thorough analysis of all elementary functions and curve-sketching. Selected discrete mathematics topics, including normal probability distributions and testing hypotheses, are explored. Practice with proofs, such as mathematics induction are included. Experiences with computer software and graphing calculators are incorporated.

### **AH Physics - Concepts & Applications in Physics - grade 11 (PHYS 107/108 credit option)**

Identifying and quantifying physics concepts that organize daily experience, selected from mechanics, waves, thermodynamics, electromagnetism, optics, and modern physics. Includes individual and collaborative development of abstract and practical problem solving skills and applications in the classroom and integrated laboratory experience. Intended to lay a foundation for pre-professional and calculus-based introductory physics courses.

### **AP Calculus AB (AP CAL-AB) - grade 12**

The Advanced Placement Calculus AB course follows the Advanced Placement syllabus and students may take the AP test in May. Course study will include properties of functions, limits, differential calculus, and integral calculus.

### **AP Calculus BC (AP CAL-BC) - grade 12**

AP Calculus BC is available as an optional elective to students that have successfully completed AP Calculus AB. Following the Advanced Placement syllabus, concepts are presented using graphical, numerical, and symbolic representation. This course covers two semesters of college calculus.

### **AH Biology II & AH Chemistry II - grade 12 (BIOL 105/ CHEM 195 credit option)**

These joint courses are designed and developed to give seniors a full year of coordinated seamless collaborative research. This chemistry first-biology next sequence is an early introduction to authentic interdisciplinary research that allows students to first synthesize and analyze molecules in chemistry then use them in biology to probe and investigate their effects on biological systems. Students become engaged and immersed in all aspects of scientific research including project selection, literature searching, lab safety and waste management, experimentation using chemical and biological techniques and instrumentation, documentation, data analysis, and dissemination.

This capstone research experience requires students to prepare a: (i) technical final report, (ii) nontechnical popular-science style article, (iii) research poster and (iv) research video. All students are required to give an oral research presentation and to display their poster at the annual Michigan High School Research Symposium.

## **PROGRAM SPOTLIGHT: STUDENT RESEARCH**

Research is an integral part of each student's experience. Students are required to do a research project in their first year at BCMSC. Each project is exhibited at the Berrien County International Science & Engineering Fair. Seniors complete a year-long project that includes original research in organic chemistry, as well as the creation of biological compounds. This creation and study in biology and chemistry culminates in a scientific research paper, a poster presentation, and an oral presentation. All seniors present their research at the Michigan High School Student Research Symposium.

### **Highlights: Class of 2018**

**Class Size: 26**

**100%** College Enrollment

**Over half** of the class served as their high school's valedictorian, salutatorian, or were in the top 10.

**69%** National Honor Society Members

**Average ACT Score: 31.5**

**100%** earned college credit

**Awarded over \$3.5 Million** in cumulative scholarships

**3** National Merit Finalists

### **Summer Academies, Science Internships, Other Scholastic Experiences**

- BEST Early Research Symposium
- First Robotics League
- International Science and Engineering Fair
- Internships at:
  - Google
  - Laser Interferometer Gravitational-Wave Observatory
  - Microsoft
  - U.S. National Park Service
  - Whirlpool
- Michigan High School Math & Science Symposium
- Michigan Mathematics League (Regional First Place)
- National Consortium of Secondary STEM Schools Research Symposium
- National Consortium of Secondary STEM Schools Student Conference
- National Ocean Sciences Bowl
- National Youth Leadership forum on Medicine
- People to People
- Physics Bowl
- RealWorld-InWorld NASA Engineering Design Challenge
- Science Olympiad
- Summer Youth Programs at:
  - Harvard University
  - Johns Hopkins University
  - Michigan Technological University
  - University of Notre Dame
  - Stanford University



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