Wheaton High School
Biomedical & Engineering Application Programs

Ranked #26 in Maryland!
Focus in Math, Science and Biomedical/Engineering

Students in Down County Consortium (DCC) Middle School or live in DCC area AND have completed Algebra 1 by the end of 8th grade may apply

Cohort of 30 students in each program
  - Cohorted in 3-4 classes daily (math, science, biomedical/engineering)

Instruction includes hands-on, collaborative, technologically advanced approach to learning

Each cohort has the opportunity to design innovative solutions for 21st century challenges
What is the difference between an Application program and an Academy Program?

<table>
<thead>
<tr>
<th>APPLICATION-ONLY</th>
<th>APPLICATION-ONLY &amp; ACADEMY</th>
<th>ACADEMY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cohorted Classes</td>
<td>Extracurricular opportunities</td>
<td>More flexibility in a students schedule</td>
</tr>
<tr>
<td>Physics 1</td>
<td>PLTW curriculum</td>
<td>Easier to change programs</td>
</tr>
<tr>
<td>More math, science</td>
<td>Access to Internships</td>
<td>No math pre-rec</td>
</tr>
<tr>
<td>Depth and Pace of instructions is accelerated</td>
<td>Passionate teachers</td>
<td></td>
</tr>
</tbody>
</table>
What is Project Lead the Way (PLTW)?

- Engaging and relevant curriculum
- Hands-on instructional
- Problem-solving skills embedded
- Project-Based Learning -- communication and presentation of concepts
- In-depth teacher training
### College Acceptance for Graduates of Classes 2016-2019

<table>
<thead>
<tr>
<th>Air Force Acad</th>
<th>George Washington</th>
<th>Morehouse</th>
<th>Stevenson</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arizona State</td>
<td>Georgia Tech</td>
<td>Mount Holyoke</td>
<td>St. Mary’s</td>
</tr>
<tr>
<td>Adventist Univ</td>
<td>Goucher</td>
<td>Naval Academy</td>
<td>Syracuse</td>
</tr>
<tr>
<td>American Univ</td>
<td>Guilford</td>
<td>Univ of New Haven</td>
<td>Univ of Tampa</td>
</tr>
<tr>
<td>Andrews Univ</td>
<td>Hampton</td>
<td>Univ of N. Carolina</td>
<td>Temple</td>
</tr>
<tr>
<td>Cal Tech</td>
<td>Harvey Mudd</td>
<td>Northeastern</td>
<td>Tufts</td>
</tr>
<tr>
<td>Case Western</td>
<td>Hofstra</td>
<td>Ohio Univ</td>
<td>Tulane</td>
</tr>
<tr>
<td>Catholic Univ</td>
<td>Hollins</td>
<td>Oregon Univ</td>
<td>Vassar</td>
</tr>
<tr>
<td>Carnegie Mellon</td>
<td>Hood</td>
<td>Univ of Pittsburgh</td>
<td>Virginia</td>
</tr>
<tr>
<td>Univ of Chicago</td>
<td>Howard</td>
<td>Princeton</td>
<td>Commonwealth</td>
</tr>
<tr>
<td>Clemson</td>
<td>Johns Hopkins Univ</td>
<td>Rensselaer Polytech</td>
<td>Virginia Tech</td>
</tr>
<tr>
<td>Cornell</td>
<td>Lincoln</td>
<td>Univ of Rochester</td>
<td>Washington U St.</td>
</tr>
<tr>
<td>Davidson</td>
<td>Lehigh</td>
<td>Rochester Inst Tech</td>
<td>Louis</td>
</tr>
<tr>
<td>Elon</td>
<td>Lycoming</td>
<td>Rutgers</td>
<td>Washington College</td>
</tr>
<tr>
<td>Florida Inst of Tech</td>
<td>Univ of Maryland</td>
<td>Salisbury</td>
<td>West Virginia</td>
</tr>
<tr>
<td>Frostburg Univ</td>
<td>McGill</td>
<td>Simmons</td>
<td>Wooster</td>
</tr>
<tr>
<td>George Mason</td>
<td>Univ of Miami</td>
<td>Spellman</td>
<td>Worcester Polytech</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Yale</td>
</tr>
</tbody>
</table>

### Internships
- GWU, Georgetown Univ, UMCP, NIST, US CPSC, NIH

### Scholarships
- Offered to 134 magnet seniors: over $30 million
Wheaton High School Students

- Intel Finalist - 3rd place Translational Medicine category
- Science & Engineering Apprenticeship Program (SEAP)
- Johns Hopkins Applied Physics Lab
- Consumer Product Safety Commission
- UMD Bioengineering Lab
- UMD Engineering Labs
- Internships with Verizon
### Biomedical
- Criteria-based selection
- Explore a variety of careers in the medical and health industry.
- Use data acquisition software with which students monitor muscle movement, reflexes, voluntary action, and respiration.
- Conduct original graduate-sponsored research on a biomedical topic of their choice.
- Explore the prevention, diagnosis and treatment of disease in order to design innovative solutions for 21st century health challenges.
- Project Lead the Way
- 30 seats will be granted

### Engineering
- Criteria-based selection
- Explore multiple fields of engineering including aerospace, mechanical, civil, and electrical.
- First-hand use of the engineering design process
- Create inventions or innovations to solve real world problems.
- Use modern machinery including 3D printers to create original products.
- Participate in multi-disciplinary math experiences that emphasize real-world applications.
- Project Lead the Way
- 30 seats will be granted

### Wheaton/Edison
- Interest-based, lottery application
- Open to 16 middle schools in the lower part of the county
- 25 seat per program
- Students will be WHS students to complete all graduation requirements
- Four pathways aligned with our academies
  - Healthcare Professions
  - Construction Management and Architecture
  - Hospitality, Restaurant and Tourism Management
  - Information Technology and Cybersecurity
Biomedical Application Program

Provides...

• a cohort of highly motivated students.
• hands-on, collaborative approach to learning.
• ‘Project Lead the Way’ courses.

• Criteria based application
• Explore medical/health careers, conduct original graduate-sponsored research on a biomedical topic of your choice.
• Explore and solve problems in forensic science, cancer, DNA and proteins science.
<table>
<thead>
<tr>
<th>Grade 9</th>
<th>Grade 10</th>
<th>Grade 11</th>
<th>Grade 12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Principles of the Biomedical Sciences</td>
<td>Human Body Systems</td>
<td>Medical Interventions</td>
<td>Biomedical Innovations and Montgomery College Courses or Internship</td>
</tr>
<tr>
<td>Magnet Precalculus A/B</td>
<td>Magnet Precalculus C/D</td>
<td>AP Calculus AB or BC</td>
<td>AP Calculus BC or AP Statistics or Multivariable Calculus</td>
</tr>
<tr>
<td>AP Physics 1</td>
<td>Honors Chemistry and Honors Biology</td>
<td>AP Biology (double period)</td>
<td>AP Chemistry or AP Physics C</td>
</tr>
<tr>
<td>English 9/Honors</td>
<td>English 10/Honors</td>
<td>Honors English 11/AP</td>
<td>Honors English 12/AP</td>
</tr>
<tr>
<td>US History/Honors/AP</td>
<td>NSL/Honors/AP</td>
<td>Modern World History/Honors/AP</td>
<td>AP Social Studies electives</td>
</tr>
<tr>
<td>World Language</td>
<td>World Language</td>
<td>AP World Language</td>
<td>AP World Language</td>
</tr>
<tr>
<td>Fine Arts, P.E. or Tech Ed</td>
<td>Music, arts, drama, dance</td>
<td>Music, arts, drama, dance</td>
<td>AP Computer Science Principles</td>
</tr>
</tbody>
</table>
Engineering Application Program

Provides...

- a cohort of highly motivated students
- hands-on, collaborative approach to learning
- ‘Project Lead the Way’ courses

- Criteria based application program
- Explore fields of digital, electrical, mechanical & civil engineering
- First-hand use of the engineering design process to create innovations that solve real-world problems
- Participate in multidisciplinary math experiences that emphasize real-world applications
<table>
<thead>
<tr>
<th>Grade 9</th>
<th>Grade 10</th>
<th>Grade 11</th>
<th>Grade 12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Principles of Engineering and Introduction to Engineering Design</td>
<td>Digital Electronics</td>
<td>Aerospace Engineering or Civil Engineering</td>
<td>Engineering Design and Development and Mont. College Courses or Internship</td>
</tr>
<tr>
<td>Magnet Precalculus A/B</td>
<td>Magnet Precalculus C/D</td>
<td>AP Calculus BC (AP Calc AB w/tchr rec)</td>
<td>Multivariable Calculus</td>
</tr>
<tr>
<td>AP Physics 1</td>
<td>Honors Chemistry and Honors Biology</td>
<td>AP Chemistry or AP Biology</td>
<td>AP Physics C</td>
</tr>
<tr>
<td>English 9/Honors</td>
<td>English 10/Honors</td>
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<td>Honors English 12/AP</td>
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<td>US History/Honors/AP</td>
<td>NSL/Honors/AP</td>
<td>Modern World History/Honors/AP</td>
<td>AP Social Studies electives</td>
</tr>
<tr>
<td>World Language</td>
<td>World Language</td>
<td>AP World Language</td>
<td>AP World Language</td>
</tr>
<tr>
<td>Fine Arts or P.E. (Options for those w/ IED MS)</td>
<td>Music, arts, drama, dance</td>
<td>AP Computer Science Principles</td>
<td>AP Computer Science</td>
</tr>
</tbody>
</table>
Goal: To provide students with a rigorous math sequence that will set them up to have the opportunity to take multivariable calculus before they leave high school.

- Magnet Precalculus is a two year math class that will get the students ready for AP Calculus courses.
- In the Spring of Sophomore year, students will be introduced to Calculus and extended math topics.
- Students will choose between Calculus AB or BC for Junior year. (This decision is made in committee).
- During the senior year, biomedical students will take AP Statistics with Multi-Variable Calculus as a possible elective and engineering students will take Multi-Variable Calculus with AP Statistics as a possible elective.
Criteria Based Application
Math Sequence

8th Grade

- Algebra I
- Honors Geometry
- Honors Algebra II

9th Grade

- Honors Geometry (outside of course sequence)
- Magnet Precalculus A/B
- Magnet Precalculus A/B
Science Classes at Wheaton HS
Criteria Based Application

AP Physics 1 & C
Honors Biology
Honors Chemistry
AP Biology
AP Chemistry
Organic Chemistry (½ credit)

Courses in white are coholed
Student Panel

WHEATON
Provides...

- a cohort of highly motivated students
- hands-on, collaborative approach to learning
- Lottery-based application
- Opportunity to be a Wheaton Knight and be enrolled in programs at Thomas Edison High School of Technology
  - Healthcare Professions
  - Construction Management and Architecture
  - Hospitality, Restaurant Management and Tourism
  - Information Technology and Cybersecurity
# Healthcare Professions/Bioscience Academy

<table>
<thead>
<tr>
<th>Grade 9</th>
<th>Grade 10</th>
<th>Grade 11</th>
<th>Grade 12</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PLTW</strong>: Principles of Biomedical Science</td>
<td><strong>PLTW</strong>: Human Body Systems</td>
<td><strong>Academy of Health Professions</strong></td>
<td></td>
</tr>
</tbody>
</table>

# Construction Management & Architecture/Engineering Academy

<table>
<thead>
<tr>
<th>Grade 9</th>
<th>Grade 10</th>
<th>Grade 11</th>
<th>Grade 12</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PLTW</strong>: Introduction to Engineering Design</td>
<td><strong>PLTW</strong>: Principles of Engineering</td>
<td><strong>Architecture and CAD Technology</strong> or Carpenter, Construction Electricity, HVAC, Masonry or Plumbing</td>
<td></td>
</tr>
</tbody>
</table>
### Hospitality, Restaurant, and Tourism Management/Global Studies Academy

<table>
<thead>
<tr>
<th>Grade 9</th>
<th>Grade 10</th>
<th>Grade 11</th>
<th>Grade 12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global Issues</td>
<td>World Language Economics</td>
<td>Restaurant Management/Culinary Arts or Hospitality and Tourism Management</td>
<td>AP World Language AP Human Geography AP Psychology Student Leadership</td>
</tr>
<tr>
<td>Grade 9</td>
<td>Grade 10</td>
<td>Grade 11</td>
<td>Grade 12</td>
</tr>
<tr>
<td>----------------------</td>
<td>-----------------------------------------------</td>
<td>-----------------------------------------------</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>Code.org: AP Computer Science Principles</td>
<td>Computer Programming 1 or Website Development</td>
<td>AP Computer Science (JAVA)</td>
<td>CE Course/Guided Research/Computer Programming 3/Internship</td>
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<tr>
<td></td>
<td></td>
<td>Advanced Digital Tools</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Network Operations or Cybersecurity</td>
<td></td>
</tr>
</tbody>
</table>
How do I apply?

- Online application
- Personalized based on current school and address
- MyMCPS student portal
  - Document Library

Application deadline is Friday, Nov. 1.
What’s it take to apply?

- Personal Information
- Teacher Recommendations (Science and Math)
- Personal Statement
- Exam - Saturday, December 7

Application deadline is Friday, Nov. 1.
Important Dates

- Nov. 1 - Application Due
- Dec. 6 - Teacher Recommendations Due
- Dec. 7 - Take test
- Mid-Feb. - Notification
  - Invitation, Wait Pool, Decline
Welcome to Wheaton High School

DCC Academies Open House
October 10, 2019
7pm – 8:45pm
Bioscience Academy
Biotech – Medicine - Health

Engineering Academy
Civil – Aerospace - Digital

Academy of Information Technology
Programming – Website Development

Global Studies Academy
Humanities – Fine Arts
What are Academies?

- small learning communities
- career-focused
- offer many elective classes to build upon your interests
- support project-based learning
- part of the choice process

No application needed!
Just choose WHS on your choice form
How to Choose Wheaton HS

**DCC Choice Form**
- Choice forms are electronic this year.
  - Student/Parent Portal
  - Based on home address
- Choose WHS as your #1 choice
- Submit your choice form by Nov 1, 2019.
EXPLORE THE WORLD WITH THE GLOBAL STUDIES ACADEMY
What is the Global Studies Academy?

We are Wheaton’s Humanities Academy. The Global Studies Academy includes everything on the first and second floors - from Art, World Languages, History, PE, Theater, Social Sciences, English, Music, and much more. The Global Studies Academy motivates its students to explore the endless possibilities in our world, develop a global citizenship, prepare to be college and career ready, and be leaders in our global society.

Global Studies Academy Completer Requirements:
★ Complete at least 4 full credits of Global Studies Academy courses - not to include the required High School Graduation Requirements.
★ Expectation is the completion of Global Issues A & B (9th grade) and Student Leadership A & B (12th grade).
## Sample of the Global Studies Course Menu

<table>
<thead>
<tr>
<th>TV Production</th>
<th>Psychology</th>
<th>Latin American History</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yearbook</td>
<td>Peace Studies</td>
<td>Concert Orchestra</td>
</tr>
<tr>
<td>Piano</td>
<td>Ceramics</td>
<td>African American History</td>
</tr>
<tr>
<td>Global Issues</td>
<td>Law</td>
<td>Dance</td>
</tr>
<tr>
<td>Theater</td>
<td></td>
<td>Chorus</td>
</tr>
<tr>
<td>Creative Writing</td>
<td></td>
<td>Studio Art</td>
</tr>
<tr>
<td>AP World Languages</td>
<td></td>
<td>Advanced PE Courses</td>
</tr>
<tr>
<td>Economics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student Leadership</td>
<td></td>
<td>AP Human Geography</td>
</tr>
</tbody>
</table>

## Possible Careers Matched Up With Global Studies Courses

- **State Department Interpreter**
  - 4 yrs. of World Languages
  - Psychology
  - Peace Studies
  - Law
  - AP Psychology

- **Social Worker Therapist**
  - 2 yrs. of World Languages
  - Psychology
  - Peace Studies
  - Law
  - AP Psychology

- **Jazz Musician**
  - Draw & Design
  - Ceramics 1, 2, & 3
  - Studio Art
  - AP Studio Art
  - Creative Writing

- **Graphic Designer**
  - Digital Art
  - Psychology
  - Creative Writing
  - Draw & Design
  - Studio Art

- **Civil Rights Attorney**
  - Psychology
  - Law
  - African American History
  - Peace Studies
  - Law

- **MC Courses**
  - AP World Languages
  - Economics
  - Studio Art
  - Advanced PE Courses
  - AP Human Geography

- **AP Psychology**
  - Psychology
  - Law
  - African American History
  - Peace Studies
  - Law

- **AP World Languages**
  - Peace Studies
  - Law
  - AP World Languages

- **MC Courses**
  - Piano
  - Concert Band
  - Music & Technology
  - Jazz Band
  - Concert Orchestra
Want to change the world? Explore Engineering

Engineers envision, create and build the world around us by applying the principles of **math** and **science** to **innovate** and **invent** solutions to problems.

We Engineer Our Futures!
9th grade
Introduction to Engineering Design

10th grade
Principles of Engineering

11th grade
• Digital Electronics
• Civil/Architecture
• Aerospace

12th grade
Engineering Design and Development

Engineering Academy
Learning To Think Like an Engineer

**Introduction to Engineering Design**
- Engineering Design Process
- Computer Aided Design (CAD)

**Principles of Engineering**
- Applied Physics
- Explorations in the core fields of engineering

**Digital Electronics**
- Using electronic circuits to make logical decisions

**Civil Engineering Architecture** (elective)
- Design construction of residential & commercial structures
- Includes site (land) issues

**Aerospace Engineering** (elective)
- Wing design
- Physics of flight
- Navigation
- Flight physiology
- Propulsion systems

**Engineering Design and Development** (capstone)
- Develop, test & deliver an engineering solution to a problem
Engineering and STEM Clubs

- Architecture, Construction & Engineering (ACE)
- FIRST Robotics Competition (FRC) Team
- It’s Academic
- Science Bowl
- Science National Honor Society
- STEAM Competition Team
- Test of Engineering Aptitude Math and Science (TEAM) Team
- NSBE Jr.
AOIT students are producers of technology.
In the 9th Grade, students will take AP Computer Science Principles. In the 10th Grade, students will take Programming 1. In the 11th Grade, students will take AP Computer Science A. In the 12th Grade, students will take a Capstone Course.

AP Computer Science Principles
9th Grade

Programming 1
10th Grade

AP Computer Science A
11th Grade

Capstone Course
12th Grade

In the 9th Grade, students will take AP Computer Science Principles. In the 10th Grade, students will take Website Development. In the 11th Grade, students will take Advanced Digital Web Tools. In the 12th Grade, students will take a Capstone Course.

AP Computer Science Principles
9th Grade

Website Development
10th Grade

Advanced Digital Web Tools
11th Grade

Capstone Course
12th Grade
Accomplishments

- Internships: JHU APL, Verizon, Rockville Panic Room
- Partnership with KID Museum’s “Coding Corps”
- SAE CyberAuto Challenge Summer 2016
- Cyber Forensics Challenge Participants 2018
- 3rd Place Novice Division CodeQuest 2015
The Bioscience Academy Student

Career Oriented
Creative
Diverse
Engaged
Collaborative
Bioscience Courses your student will take:

**Principles of Biomedical Sciences 9th Grade**

- Investigate health conditions including heart disease, diabetes, sickle-cell disease, & infectious diseases.

**Human Body Systems 10th Grade**

- Interactions of human systems in identity, power, movement, protection, and homeostasis.

**Medical Interventions 11th Grade**

- Explore interventions involved in the prevention, diagnosis & treatment of disease.

**Biomedical Innovation 12th Grade Capstone**

- Design innovative solutions for the health challenges of the 21st century.

**The problem?**

- Determining what led to the death of a fictional person

**The problem?**

- Real world case studies & solving medical mysteries

**The problem?**

- “How-To” maintain overall health and homeostasis in the body while following the life of a fictitious family.

**The problem?**

- Challenging open-ended problems on clinical medicine, physiology, biomedical engineering, & public health.
A Bioscience Graduate will...

**Partnerships**

- NIH on Drug Abuse
- NIH Investigating to cure for leukemia & anemia
- Hopkins Applied Physics Lab
- National Institutes of Neurological Disorders & Stroke
- GW Biochemistry Department

Potential to earn 10+ college credits

**Accomplishments:** Bioscience has had 220 completers in the last 5 years.
Self-Guided Tours

- Three rotations (20 min each)
- Elevator by Auditorium
- NOTHING on the 2nd Floor
- Program
  - Front - Contact information
  - Back - Locations of Programs
- Booklet - All pathway options and description of courses
# Self-Guided Tours

<table>
<thead>
<tr>
<th>Program</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>AOIT</td>
<td>Media Center</td>
</tr>
<tr>
<td>Bioscience/Biomedical</td>
<td>3005-3008</td>
</tr>
<tr>
<td>Engineering</td>
<td>3101-3109</td>
</tr>
<tr>
<td>Global Studies Academy</td>
<td>Stairs/Balcony</td>
</tr>
<tr>
<td>Wheaton/Edison Partnership</td>
<td>1005</td>
</tr>
<tr>
<td>Criteria-Based Application Questions</td>
<td>1413</td>
</tr>
<tr>
<td>Knight Culture Table Fair</td>
<td>Cafeteria</td>
</tr>
</tbody>
</table>