

All current juniors will fall under the following five scheduling options.

Scheduling Options for Senior Year:

<b><u>Scheduling Option</u></b>	<b><u>Current Junior Year Classes</u></b>	<b><u>Senior Year Classes</u></b>	<b><u>Elective Credits</u></b>	<b><u>Elective Options</u></b>
A	IB Math 11 Spanish 3 IB History	IB Math 12 IB Spanish	10 credits	- Four 2.5 credit courses - One 5 credit & two 2.5 credit courses
B	IB Math 12 Spanish 3 IB History	AP Calc BC IB Spanish	10 credits	- Four 2.5 credit courses - One 5 credit & two 2.5 credit courses
C	IB Math 12 IB Spanish	AP Calc BC IB History	7.5 credits	- Three 2.5 credit courses
D	IB Math 11 IB Spanish IB History	IB Math 12	15 credits	- Two 5 credit & two 2.5 credit courses - One 5 credit & four 2.5 credit courses
E	IB Math 11 IB Spanish IB History	IB Math 12	15 credits	- Two 5 credit & two 2.5 credit courses - One 5 credit & four 2.5 credit courses

Student Name: \_\_\_\_\_

## Course Preferences for Senior Year 2015-2016

Rate the following electives with 1 being your lowest interest and 7 being your highest interest. Only use each ranking level once. Six classes should not be ranked.

### Reminders:

- 1) If you are Scheduling Option C, do not rank any 5 credit courses.
- 2) If you are Scheduling Option D or E, your top choice **MUST** be a 5 credit elective.
- 3) Only IB Physics students may take Advanced Topics in Chemistry.

Advanced Experimental Design (AED)	1	2	3	4	5	6	7	Not Ranking
Advanced Topics in Chemistry	1	2	3	4	5	6	7	Not Ranking
Anatomy & Physiology (5 credits)	1	2	3	4	5	6	7	Not Ranking
AP Spanish (5 credits)	1	2	3	4	5	6	7	Not Ranking
BioBusiness	1	2	3	4	5	6	7	Not Ranking
BioEngineering	1	2	3	4	5	6	7	Not Ranking
BioMedical Engineering	1	2	3	4	5	6	7	Not Ranking
Computer Science	1	2	3	4	5	6	7	Not Ranking
Developmental Biology (5 credits)	1	2	3	4	5	6	7	Not Ranking
Environmental Biotechnology	1	2	3	4	5	6	7	Not Ranking
Forensic Analysis	1	2	3	4	5	6	7	Not Ranking

Genomics & Proteomics & Bioinformatics	1	2	3	4	5	6	7	Not Ranking
Independent Research	1	2	3	4	5	6	7	Not Ranking
Neuroscience & BioPsychology	1	2	3	4	5	6	7	Not Ranking
Public Speaking	1	2	3	4	5	6	7	Not Ranking

**\*Please keep in mind that your #1 choice elective is not guaranteed. We try to accommodate all student to the best of our ability, but there are many scheduling considerations, including teacher availability, student enrollment, course times, etc.**

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Student Signature

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Date

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Parent Signature

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Date

## **Elective Course Descriptions for 2015 - 2016**

### **5 Credit Courses:**

#### **Anatomy and Physiology - 5.0 Credits (SENIORS ONLY)**

Anatomy & Physiology focuses on selected body systems that are not covered in IB Biology. The course begins with a review of the fundamentals of anatomical vocabulary and then an in depth study of cell, tissues, and homeostasis of the human body. The units that follow include detailed studies of the integumentary, endocrine, lymphatic, skeletal, and muscular systems. Throughout the course, the relationship between structure and function is emphasized. Biotechnology is integrated into the curriculum by incorporating current technological advances in the diagnosis and treatment of various diseases and disorders associated with each body system mentioned. Dissection is an integral part of this course.

#### **Developmental Biology - 5.0 Credits**

Developmental biology is a fascinating field of study that closely relates to many disciplines in the biological sciences, including, Anatomy, Environmental Biology, Genetics, Biochemistry, Cell Biology, and Cancer. In this class, we use model organisms like sea urchins, fish, frogs and chickens to understand the basics of embryonic development from fertilization to birth. The focus is on cell biology and genetic mechanisms of creating the body and specialized tissues. Such topics as therapeutic uses of stem cells, human genetic testing, specification of cell types and development of organs will be included. This course also provides a framework in which the student can explore the current biological literature and observe the applications of techniques that have been learned throughout the BTHS curriculum in a related field.

#### **AP Spanish - 5.0 Credits (SENIORS ONLY)**

In this course, students will analyze works of art, literature, and film in the target language. We will draw comparisons between the cultures in which these products were created and our own culture here in the United States. There will be a variety of assessments including essays, projects, presentations, and quizzes. Class will be conducted entirely in Spanish. Students are eligible for this course if they receive a 6 or higher on the IB Spanish Exam, as well as a 92 or above on the IB Spanish Final. Students may choose this as an elective prior to scores being received, and will officially be registered once they meet the grading requirements.

### **2.5 Credit Courses:**

#### **Advanced Experimental Design - 2.5 Credits (Instructor Topic Approval)**

This course is designed to strengthen experimental design skills and provide students with background, and practical, hands-on experience for working with 2 model organisms common to Biotech laboratories. During this course, students will learn the basics of handling *Arabidopsis thaliana* (a plant model organism), *C. elegans* (a nematode model organism). Students will learn to master the basic handling of these organisms, read, analyze and critique primary literature using these organisms, and then perform independent research projects using these organisms. In addition, this course will focus on preparation of written scientific proposals, valid experimental design, preparation of materials (abstracts, and forms) for submission of projects to local science fairs/competitions, and formal presentation of data.

#### **Advanced Topics in Chemistry - 2.5 Credits**

This course is available to BTHS students who took their IB concentration in Physics and would like to take an elective course in Chemistry. (IB Chemistry students cannot register for this course). After a quick review of symbols, formulas, measurements and dimensional analyses, students will get hands on experience observing the interaction of substances, the changes they undergo when mixed together. The course will show how Chemistry is central to most of science and technology, blending at one extreme into physics, math, and biology.

### **BioBusiness - 2.5 Credits**

BioBusiness focuses on many aspects of business within the biotechnology industry. The course will focus on the importance of business concepts to decision-making in the biotechnology world, with a focus on real-life examples. Therefore, students enrolled in this course will be expected to actively participate in discussions and group work in order to maximize their learning. Students will also develop an appreciation for the possibilities and limitations associated with the business of biotechnology both on the domestic and international levels. In addition, students will consider the social, ethical, and economic implications of decisions made in the biotechnology business world. Areas of concentration include the biotechnology business concept and development, biotechnology regulations, funding, and marketing. Case studies will be used to illustrate successful and failed biotechnology businesses and products.

### **BioEngineering - 2.5 Credits**

The aim of the Bioengineering course is to provide students with an introduction to engineering and a familiarity with its elements through the experience of participating in the engineering process. Engineering is primarily directed towards the creation of solutions to human problems and the development of technology to improve human life. Students will learn and practice problem-solving skills common to all engineering disciplines, as well as learn about the range of applicability of the major fields of engineering. Important skills and issues common to all engineering disciplines will be explored. These common elements will be applied in engineering projects in the areas of mechanical, civil, electrical, robotic, and biological engineering. The major project at the end will focus on a problem in biological engineering.

### **BioMedical Engineering (BioEngineering is a prerequisite) - 2.5 Credits**

BioMedical Engineering deals with the application of engineering principles to biological and medical problems. Thus, this course strongly supports both the STEM and Health Science career clusters towards which BTHS guides students. BioMedical Engineering is a multi-disciplinary field drawing on many other engineering specialties (e.g., chemical engineering, electrical engineering, mechanical engineering, materials engineering, etc.) together with biological knowledge to solve medical and health problems for improving human life. Various aspects of BioMedical Engineering include biomechanics, pharmaceuticals, neuroengineering, medical imaging, biomaterials, rehabilitation, clinical applications, biological nanotechnology, fluid dynamics, and implantable medical devices. Many biomedical engineers specialize in one of the traditional areas of engineering, which they then combine with biological knowledge to produce engineering solutions to problems. This course will build upon the students' science, math, biological and research backgrounds to introduce some basic concepts of biomedical engineering. It is intended to be taken following a course in biological engineering, by students who have decided that engineering is a potential career path for them. As part of this sequence, students will be able to make an informed decision if a biomedical engineering career is appropriate and/or interesting to them.

### **Communication Techniques and Technology (Public Speaking) - 2.5 Credits**

The purpose of this course is to introduce students to the communication process and to the expectations of the business world for the transmission of information. The course includes an overview of the communication paradigm, presentation skills in small group and large, audience analysis, and the technology of information delivery. The course also addresses scientific and technical writing, with hands-on opportunities to test what has been written. Students will analyze in a comprehensive way the need for effective visuals, vocalization, appearance, writing, and organization in all methods of communication, whether one-to-one or one-to-many.

### **Computer Science - 2.5 Credits**

Computer Science will lead students to develop the skills needed to create apps for mobile devices, automate tasks in a variety of languages, and find patterns in data. Students will collaborate to create and present solutions that can improve people's lives, and weigh the ethical and societal issues of how computing and connectivity are changing the world. The course will also introduce students to the following skills and knowledge: computer programming and graphical user interfaces such as Scratch™,

App Inventor®, Python®, C++, etc.; relationships among web languages, including JavaScript™, PHP®, and SQL; principles of cybersecurity and cyberhygiene applied to program creation; and impact of computer science on other fields.

### **Environmental Biotechnology - 2.5 Credits**

Your friends will be green with envy that your classroom is OUTDOORS! But they won't be as *GREEN* as you. Take Environmental Biotechnology to conduct outdoor field investigations, collect data for an IB Environmental & Social Systems Extended Essay, explore Monmouth County through field trips, and learn about current global environmental issues. Field trips include a Beach Clean Up, a visit to MAST @ Sandy Hook, an afternoon at the Rutgers Agricultural Extension, and regular trips to the "backyard" of BTHS. You could even do a project that could be used for FFA AgriScience Fair and join us in Kentucky for Nationals!

### **Forensic Analysis - 2.5 Credits**

The course is an introduction to the application of scientific methods for the examination of physical evidence in the criminal justice system; an overview of the forensic analysis of firearms, fingerprints, drugs, blood, hair, fibers, paint, glass, arson debris, etc. The course topics include historical development of the theories and principles in forensic science and case simulations. Topics from the disciplines of biology, biotechnology, physics and chemistry will give an understanding of the scientific principles of forensics. In this course, students will enhance their ability to apply the scientific method and their skills in data collection and analysis, and problem solving. Laboratory research experiments and use of modern technology, such as spectrophotometry will be an integral part of the course curriculum.

### **Genomics and Proteomics and Bioinformatics - 2.5 Credits (SENIORS ONLY)**

This computer-based course is designed to explore current technological advances in genome research and how these advances are impacting society. What this new information reveals about topics such as evolution, race, infectious disease, aging, athletics and behavior, and how the mapping and sequencing of the human and other genomes is revolutionizing the life sciences, engineering and medicine. The bioinformatics portion will cover protein and molecular modeling; gene prediction; phylogenetic analysis; biological database and data mining methods.

### **Independent Research (A.E.D. is a prerequisite) - 2.5 Credits (BY PERMISSION OF THE INSTRUCTOR ONLY)**

In this course, students will work individually to explore an independent laboratory-based research project of their own design. Students are expected to choose an area of interest, related to biotechnology, devise their own research question, design an experimental procedure to test their question and perform this analysis. Students will write proposals and laboratory reports to present their data.

### **Neuroscience and BioPsychology - 2.5 Credits (SENIORS ONLY)**

Neuroscience and BioPsychology is a laboratory- and project-based course that investigates themes in neurobiology, cognitive science, behavioral science, and biology-oriented aspects of psychology. Topics covered will include the structure and function of the brain and neural systems, techniques in cognitive and behavioral sciences, and the link between the mind and body. To align with the theme of the school, emphasis will be placed on the impact of new technology and research methodologies in the field of neurobiology and cognitive science. Extension and application of learning will be achieved through a variety of higher-level readings and discussions, group projects, laboratory experiments, skill-based learning, and review of current technology.