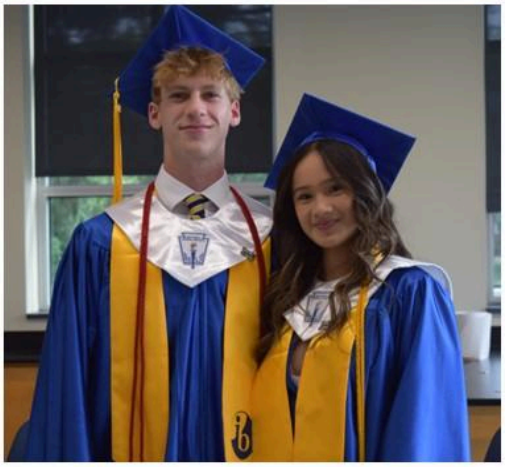
DOWNINGTOWN STEM ACADEMY

PROGRAM OF STUDY







2025

2026

TABLE OF CONTENTS	
COUNSELING AND ADMINISTRATIVE PERSONNEL	3
INTRODUCTION	4
WHAT'S NEW FOR 24-25?	5
MISSION STATEMENT	6
HABITS OF MIND	7
GRADUATION REQUIREMENTS	9
GRADE POINT AVERAGE	10
CLASS RANK	11
IB COURSE FEES	11
NCAA ELIGIBILITY	11
COURSE CHANGES	11
DUAL ENROLLMENT	12
ASSOCIATE'S DEGREE IN THE HIGH SCHOOL	12
CAREER AND TECHNICAL EDUCATION	12
ALTERNATIVE CREDIT	13
GIFTED EDUCATION	14
ENGLISH LANGUAGE DEVELOPMENT	14
SPECIAL EDUCATION	14
ACADEMIC HONESTY POLICY	14
INTERNATIONAL BACCALAUREATE PROGRAM	15
IB CORE REQUIREMENTS	15
ENGLISH LITERATURE	20
SOCIAL SCIENCES	22
MATHEMATICS	28
EXPERIMENTAL SCIENCES	32
WORLD LANGUAGES	37
HEALTH AND PHYSICAL EDUCATION	41
VISUAL ARTS	42
ENGINEERING AND TECHNOLOGY	44
BUSINESS EDUCATION	47
MUSIC EDUCATION	48
PATHWAYS	52
STEM PRACTICUM	57

COUNSELING AND ADMINISTRATIVE PERSONNEL

ADMINISTRATORS

Art Campbell	Principal
Katherine Cole	Assistant Principal
Troy Podell, Ed.D.	Supervisor of Teaching and Learning
Michael Sheehan	Assistant Principal

COUNSELING DEPARTMENT

Team	Counselor	Contact Information	Area of Focus
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	Leanne Glowik	lglowik@dasd.org ext. 43040	Post-Secondary Planning IB Program Academic Advising

INTRODUCTION

The purpose of the Program of Study Handbook is to help students plan an appropriate high school program. It contains a description of the courses offered, course content, graduation requirements and additional pertinent program and scheduling information. The course information is organized by department.

Planning is the combined responsibility of the student and parents/guardians. Appropriate course selections enable students to meet the district's requirements as well as their own personal goals.

Some areas that may be considered in making student course selection are:

- Individual career interests and educational goals
- Past achievements and performance
- District graduation requirements
- Course requirements and prerequisites
- Course credits
- IB Diploma Program requirements

WHAT'S NEW FOR 2024-25?

Department	New Offerings
Associate's Degree in the High School	**Associate's Degree Pathway (in association with DCCC)**
Technology Education	**The previous course of Communications Technology has been replaced with two courses - Static Media Design and Dynamic Media Design** **Introduction to Engineering has be renamed to Foundations of Engineering and Technology** **Robotics I,II,III has been renamed to Industrial Robotics and Automation I,II,III**

MISSION STATEMENT

The International Baccalaureate aims to develop inquiring, knowledgeable and caring young people who help to create a better and more peaceful world through intercultural understanding and respect. To this end the organization works with schools, governments and international organizations to develop challenging programs of international education and rigorous assessment. These programs encourage students across the world to become active, compassionate and lifelong learners who understand that other people, with their differences, can also be right.

In addition to fulfilling the International Baccalaureate mission statement the Downingtown STEM Academy aims to create inquiry learning and growth through the International Baccalaureate and STEM Pathways where innovative thinking with effort dictates success in an ever-changing world.



HABITS OF MIND

The Five Habits of Mind are a concrete way of developing our:

- Interaction skills with peers, teachers and administrators
- Character traits

There are many versions of the Habits of Mind. These are the five that every 9th grade student who has attended the STEM Academy since it opened in 2011 have learned and practiced.

1. **Respect** - This quality is fundamental to the character of a student at our school. They show integrity by upholding high ethical standards, always choosing to do what is right, even when faced with challenges or temptations. They are honest in their academic pursuits, respecting the work and ideas of others. They value trust and respect, treating their peers, teachers, and staff with dignity and fairness.

2. **Responsibility** - At our school, a student is expected to exhibit a strong sense of school spirit, demonstrate good individual and community citizenship, and actively engage in school activities. They take pride in their school and actively contribute to its positive atmosphere, showing support for their peers and the school community as a whole.

3. **Effort** - Our school often presents complex challenges that require students to be courageous, resilient, and determined. A student embraces these qualities, facing difficulties head-on and persevering through setbacks. They exhibit fairness in their interactions, valuing equal opportunities for all and advocating for justice. They understand that success requires persistence and a willingness to learn from failures.

4. **Compassionate Participation** - At our school, a student understands the importance of collaboration and teamwork. They are supportive of their classmates, offering help and guidance when needed. They exhibit kindness, compassion, and consideration towards others, creating a positive and inclusive learning environment. They understand that everyone has unique strengths and weaknesses and strive to create an atmosphere where everyone feels valued and supported.

5. **Engagement** - At our school, a student possesses a natural curiosity and a thirst for knowledge. They are constantly seeking new information, asking questions, and exploring innovative ideas. They are inventive and open-minded, willing to think outside the box and challenge conventional wisdom. They embrace the spirit of inquiry and are not afraid to take risks in their pursuit of knowledge and understanding.



IB learner profile

The aim of all IB programmes is to develop internationally minded people who, recognizing their common humanity and shared guardianship of the planet, help to create a better and more peaceful world.

As IB learners we strive to be:

INQUIRERS
We nurture our curiosity, developing skills for inquiry and research. We know how to learn independently and with others. We learn with enthusiasm and sustain our love of learning throughout life.

KNOWLEDGEABLE
We develop and use conceptual understanding, exploring knowledge across a range of disciplines. We engage with issues and ideas that have local and global significance.

THINKERS
We use critical and creative thinking skills to analyse and take responsible action on complex problems. We exercise initiative in making reasoned, ethical decisions.

COMMUNICATORS
We express ourselves confidently and creatively in more than one language and in many ways. We collaborate effectively, listening carefully to the perspectives of other individuals and groups.

PRINCIPLED
We act with integrity and honesty, with a strong sense of fairness and justice, and with respect for the dignity and rights of people everywhere. We take responsibility for our actions and their consequences.

OPEN-MINDED
We critically appreciate our own cultures and personal histories, as well as the values and traditions of others. We seek and evaluate a range of points of view, and we are willing to grow from the experience.

CARING
We show empathy, compassion and respect. We have a commitment to service, and we act to make a positive difference in the lives of others and in the world around us.

RISK-TAKERS
We approach uncertainty with forethought and determination; we work independently and cooperatively to explore new ideas and innovative strategies. We are resourceful and resilient in the face of challenges and change.

BALANCED
We understand the importance of balancing different aspects of our lives—intellectual, physical, and emotional—to achieve well-being for ourselves and others. We recognize our interdependence with other people and with the world in which we live.

REFLECTIVE
We thoughtfully consider the world and our own ideas and experience. We work to understand our strengths and weaknesses in order to support our learning and personal development.

The IB learner profile represents 10 attributes valued by IB World Schools. We believe these attributes, and others like them, can help individuals and groups become responsible members of local, national and global communities.

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GRADUATION REQUIREMENTS

	STEM Academy/ DASD Diploma Requirements
Core:	
English	4
Social Studies	4
Math	4
Science	5
World Language	4
	21 Credits - Core
Encore:	
Health & PE	0.68
Engineering	0.66
Pathways	1.0
Group 6 Electives	2.0 1 credit -grade 11 1 credit - grade 12
Theory of Knowledge	0.66
Minimum Credit Requirements	26
No Credit:	
	40 hours - Requirements of DASD Graduation Project
STEM Practicum	Required

GRADE POINT AVERAGE (GPA)

The GPA is calculated by dividing the total number of Quality points earned by the number of credits attempted. Quality Points are awarded depending upon the final grade earned and the credit value of the course. The credit value of the course is multiplied by quality points in the chart below. GPA can be viewed online as part of the electronic report card accessible through the parent portal. The student's GPA is recorded on transcripts.

All ***STEM*** courses that include PD or SL in the course name earn an additional 0.5 weight. All ***STEM*** courses that include HL in the course name earn an additional 1.0 weight.

Standard Course Quality Points	PD Courses International Baccalaureate SL Quality Points	International Baccalaureate Higher Level Quality Points
A = 4	A = 4.5	A = 5.0
B = 3	B = 3.5	B = 4.0
C = 2	C = 2.5	C = 3.0
D = 1	D = 1.5	D = 2.0
F = 0	F = 0	F = 0

For example:

Course	Final Grade	Quality Points (QP)	Credits Attempted (CA)	Quality Points X Credits Attempted	QP/CA=GPA
PD World Literature	A	4.5	1.0	4.5	
PD Algebra I	A	4.5	1.0	4.5	
PD Universal Physics	C	2.5	1.0	2.5	
PD Civics and Government	B	3.5	1.0	3.5	
PD Spanish 9	B	3.5	1.0	3.5	
Intro to Engineering	A	4.0	.66	2.64	
Recording Studio	A	4.0	.66	2.64	
Health & Wellness I	B	3.0	.33	.99	
TOTALS		29	6.65	24.77	24.77/6.65=3.72

Additional Information:

- Only grades from courses taken at Downingtown High Schools including the Downingtown Cyber Academy will be included in the calculation of a student's GPA. Courses, grades and credits from previous schools will be included in the DASD transcript indicating that the student earned these credits at a previous school.
- Alternative credits for original courses are reported on the official transcript but the grades are not calculated into the GPA.
- Alternative credit for either the 9th or 10th grade Health and Wellness course must meet all standards of the STEM Health and Wellness course and must be approved by the principal.

CLASS RANK

Students are ranked in order of their GPA at the beginning of each school year. Class rank is not recalculated during the school year. Class rank is available by written request to the counseling office administrative assistant from the student or parent; it is not reported on the official transcript.

IB COURSE FEES

There are a total of six fees that must be paid in full in order to complete the IB registration process. The total cost is determined by the IB during the Spring of the 11th grade year and is for ALL Academy seniors, both Course and Diploma candidates. Please understand that the IB Organization and not the Downingtown Area School District set these fees.

NCAA ELIGIBILITY

Students who intend to participate in Division I or II collegiate athletics are required to meet National Collegiate Athletic Association (NCAA) eligibility standards.

Only courses approved by the NCAA can count toward fulfilling these requirements. The NCAA determines eligibility of courses on an ongoing basis. Student athletes should check the DASD list of NCAA approved courses on the NCAA website at www.eligibilitycenter.org. Student athletes also are advised to consult with their high school counselor early in the course selection process.

COURSE CHANGES

Course Request Changes

- Course Request Changes submitted after the course selection process is complete and before the first student day of school are not guaranteed and are subject to course availability.
- Course request changes are submitted via an online survey provided by the counseling office.

Schedule Changes

- Any schedule changes requested after the start of school are not guaranteed and subject to course availability.
- Schedule changes are made for a change of course only and may only occur in the first 6 weeks of the school year.
- When a course change occurs, students are responsible for any work missed in the newly scheduled course prior to the change. Any grades from the dropped course will be included in the grade calculation of the new course.
- Requests are made via the online survey provided by the counseling office.

DUAL ENROLLMENT

In partnership with Delaware County Community College and Immaculata University, DASD offers juniors and seniors the opportunity to concurrently enroll in a college level course at a reduced cost. Students participating in dual enrollment coursework simultaneously receive high school credit at IB Higher Level weight and college credit.

The partnering dual enrollment college establishes admittance and other criteria for participation. Students will be responsible for tuition, fees and course materials. More information is available from the STEM Academy Counseling Department. Delaware County Community College has specific qualifying scores for participation in their programs.

When applying to colleges, students need to request a final transcript from the dual enrollment university upon completion of the coursework. Each university has policies for accepting credits from other universities. Students should investigate the feasibility of credit transfers from the dual enrollment partnering university to the student's post- high school university of choice.

Anticipated per credit costs for tuition for the 25-26 Academic Year:
DCCC: $145/credit
Immaculata University: $125/credit

ASSOCIATE'S DEGREE IN THE HIGH SCHOOL

In partnership with Delaware County Community College, Students at the Downingtown STEM Academy now have the opportunity to earn a college degree while enrolled in DASD. Over two years of academic study, students can earn an Associate's Degree in Liberal Arts, or an Associate's Degree in Engineering, and fulfill all of their DASD graduation requirements simultaneously.

To Apply:

1. Click the 'Apply Now' button beneath the video: https://www.dccc.edu/academics/programs/high-school-dual-enrollment
2. Fill out the application, and enter 'Engineering' or 'Liberal Arts' as your major.
3. Register for the appropriate Associate's Degree Course in Infinite Campus.
4. Email Dr. Podell at tpodell@dasd.org and indicate you have applied for the program.

CAREER AND TECHNICAL EDUCATION

The Technical College High School (TCHS), Brandywine Campus, is a public high school specializing in Career and Technical Education (CTE) and available for students in grades 11 through 12. Most of the CTE programs at the Brandywine Campus are designated as High Priority Occupations (HPO) by the Pennsylvania Department of Labor and Industry, and are aligned with the Pennsylvania State Academic Standards and National Industry certifications that provide students with a solid foundation to build their knowledge and skills.

Students should contact the school counselor for additional information.

ALTERNATIVE CREDIT

Downingtown students may acquire original credit through alternate means. All alternative credit sources need to be pre-approved by the principal. Students may not take courses designated in this Program of Study as Keystone Courses through alternate credit.

Alternative Credit Sources:

- College Level Courses (excluding Dual Enrollment courses)
- Online courses through district approved providers
- Teacher-Directed Independent Study

A minimum of seventy-five percent (75%) of a student's credit requirement in each category must come from traditional means of credit acquisition. Please be aware that more than one request in the same content area may not be approved. This is the determination of the high school principal. Original credit courses, taken alternatively through district approved providers, are reported on official transcripts and grades are calculated into the GPA. Courses must be aligned to the PA Core Standards (or national standards if PA standards do not exist) and parallel the DASD curriculum.

Process for Approval

1. It is the student's responsibility to research and identify the alternative credit opportunity and course.
2. The student obtains and completes the Alternative and Remedial Credit Application form.
3. The student meets with his/her school counselor who reviews the student's application.
4. The student submits the completed application, along with required accompanying information, to the high school principal. The principal reviews the application and approves or denies the request.

The following sources are considered for alternative credit; all require completion of the above process.

Teacher-Directed Independent Study

Independent Study is designed to meet the educational needs of students who are interested in pursuing a course of study beyond the requirements of high school graduation. Independent Study is intended for students who have demonstrated exceptional competence within a given discipline.Students who are interested in undertaking Independent Study must complete an alternative credit application available from the Counseling Department.

The maximum value for a single Independent Study Program is 0.5 credit. Independent Study programs cannot be substituted for required courses. The teacher must be a certified teacher approved by the Principal. The teacher's certification must be current and in the content area that relates to the topic of the Independent Study. It is expected that the student will complete the work independently and the teacher will provide guidance, oversight, and assign a grade. Independent Study applications must be completed and approved prior to student work commencing.

College Level Courses

With the exception of the three (3) required Keystone courses (Algebra I, Biology, and English 10 Literature), courses offered at an accredited post-secondary school may be taken to enrich the core curriculum. It is the student's responsibility to contact the post-secondary school and meet its requirements to register for courses. The student is also responsible to pay all associated costs as well as transportation. A final transcript from the college is necessary to receive the credit. One Downingtown credit is awarded for a three or four credit college course.

Online Courses

Students may take a summer course through the Downingtown Cyber Academy to enrich the core curriculum. Students can register on the DASD website starting in April. The student is responsible for all costs associated with taking the course.

Tutoring

A teaching professional holding a current PA certification in the content area must conduct the tutoring hours. The tutor needs to provide the school with a copy of the teaching certificate. All tutoring sessions need to be conducted

in direct contact with the student. The following is required for original credit:

1 credit - 44 hours
.5 credit - 22 hours
.33 credit - 15 hours

The student and the tutor will agree on the schedule and location of the tutoring sessions. It is expected that the tutor will assign work between tutoring sessions and grade the completed work. The entire curriculum must be covered including mid-term and final exams. The tutor will assign the final grade. Teachers are usually paid an hourly rate for tutoring, and all costs associated with the tutoring are the responsibility of the student.

GIFTED EDUCATION

Gifted education services are provided through specially designed instruction individually tailored to accelerate and/or to enrich a student's regular education courses. A Gifted Individualized Educational Plan (GIEP) is developed for students for whom gifted services are appropriate. Students should address questions about gifted education services with their gifted education teacher.

ENGLISH LANGUAGE DEVELOPMENT (ELD)

ELD classes are for speakers of other languages who qualify based on a state mandated English language proficiency screening test. During ELD classes, the ELD teacher provides students with structured opportunities to learn and practice all the domains of second language acquisition: listening, speaking, reading and writing. The students also develop content-based academic language as a prerequisite for success in academic programs. To exit from the ELD Program, the state requires: students to demonstrate proficiency on the yearly state WIDA ACCESS Test and establish adequate usage of language observed by content and ELD teachers, as measured by Pennsylvania Department of Education's Language Use Inventory.

SPECIAL EDUCATION

In order to meet the needs of students who have been identified as exceptional, Individual Educational Plans have been developed. Each IEP team will determine class offerings for identified students. The student's case manager will provide his/her students with an individual list of courses and their corresponding course numbers.

ACADEMIC HONESTY POLICY
IB ACADEMIC INTEGRITY*

Academic honesty must be seen as a set of values and skills that promote personal integrity and good practice in teaching, learning and assessment. It is influenced and shaped by a variety of factors including peer pressure, culture, parental expectations, role modeling and taught skills. Although it is probably easier to explain to candidates what constitutes academic dishonesty, with direct references to plagiarism, collusion and cheating in examinations, whenever possible the topic must be treated in a positive way, stressing the benefits of properly conducted academic research and a respect for the integrity of all forms of assessment for the Diploma Program.

Although candidates must be taught to appreciate the merits of academic honesty, there must be no uncertainty over the consequences of acting in a dishonest manner or failing to observe the standard academic practice of

acknowledging the work of another person. *To do so would be a breach of the general regulations and constitute malpractice, which may result in the disqualification and/or exclusion from participation in the IB Diploma Program at the Downingtown STEM Academy.*

Malpractice most commonly involves collusion or plagiarism. However, there are other ways in which a candidate may be in breach of regulations. For example, a candidate may:

- duplicate work to meet the requirements of more than one assessment component
- fabricate data for an assignment
- take unauthorized material into an examination room
- disrupt an examination by an act of misconduct, such as distracting another candidate
- exchange, support, or attempt to support, the passing on of information that is or could be related to the examination
- fail to comply with the instructions of the invigilator or other member of the school's staff responsible for the conduct of the examination
- impersonate another candidate
- steal examination papers
- disclose or discuss the content of an examination paper with a person outside the immediate school community within 24 hours after the examination
- use an unauthorized calculator during an examination.

Note that a candidate is likely to be found guilty of malpractice if unauthorized material (for example, an electronic device other than a permitted calculator, personal rough paper, notes, a mobile phone) is taken into an examination, regardless of whether any attempt is made to use that material.

For all cases of malpractice in relation to the examinations, the coordinator must send a report to the coordinator help desk at IB Cardiff.

It is the responsibility of Diploma Program teachers to support candidates in the preparation of their work for assessment and to ensure that all candidates' work complies with the requirements of the relevant subject guide. Therefore, teachers (or supervisors in the case of extended essays) are in the best position to judge whether a candidate's work is authentic. Ongoing support and guidance will help with the early detection of plagiarism and will dissuade candidates from deliberately copying another person's work without acknowledgement because they know their work is regularly subject to scrutiny. However, what is realistic and what can be achieved within the usual constraints of time and workload must be left to the discretion of individual teachers and the coordinator. Ultimately, the candidates are responsible for ensuring that the final version of any work is authentic. Candidates themselves must bear the consequences if they submit any work for assessment that is not their own, regardless of whether the plagiarism was deliberate or careless act. The same principle applies to collusion.

In regards to the use of artificial intelligence for IB coursework and assessments - Students should be aware that the IB does not regard any work produced—even only in part—by such tools, to be their own. Therefore, as with any quote or material from another source, it must be clear that AI-generated text, image or graph included in a piece of work, has been copied from such software. The software must be credited in the body of the text and appropriately referenced in the bibliography. As with current practice, an essay which is predominantly quoted will not get many, if any, marks with an IB mark scheme.

Please note that in addition to the IB guidelines for academic integrity students are expected to follow the guidelines outlined by the Downingtown Area School District within the Student Code of Conduct

INTERNATIONAL BACCALAUREATE DIPLOMA PROGRAM

The IB Diploma Program is a STEM Academy offering only

Designed initially for students who are internationally mobile, the IBDP offers access to higher education across the globe. Universities, including in the United States, regard the IB Diploma curriculum as outstanding preparation for college level work. Academy students complete courses in their 9th and 10th grade years to prepare them for the program in their 11th and 12th grade years.

Unlike AP courses, which are selected on an a-la-carte basis, IB courses are studied in the context of a unified educational experience. Since the IB is a diploma program, students take courses in all disciplines: a literature course; a language acquisition course; a social studies course; an experimental science course; a mathematics course; and an elective chosen from Visual Arts, Music, Business Management, Environmental Science, Sports, Exercise, and Health Science, Design Technology, or a second science or social studies course. IB students at the STEM Academy seek a balanced education connecting the liberal arts with STEM subjects.

To be eligible for the IB Diploma, students must complete the following requirements beyond the STEM graduation requirements:

- a course from each of the six groups
    - Group 1: Studies in Language and Literature
    - Group 2: Language Acquisition
    - Group 3: Individuals and Societies
    - Group 4: Sciences
    - Group 5: Mathematics
    - Group 6: The Arts (or a second choice from Groups 3 or 4)
- three of the six core courses must be completed at the higher level;
- successful completion of the 7 learning outcomes of CAS (Creativity, Activity, Service);
- complete a 4,000 word Extended Essay of original research;
- complete the Theory of Knowledge course (both Year 1 and Year 2)

Students choosing not to complete the above listed requirements are still viewed as IB students by colleges and universities, completing a rigorous and demanding course load. Students are able to decide on their IB Diploma status up until the spring of their 11th grade year.

The awarding of the IB Diploma is determined by criteria set by the IB Organization. This process is separate from the awarding of a student's high school diploma issued by the school district. An explanation of the IB criteria can be found on the IBO website (linked here).

IB CORE REQUIREMENTS

THEORY OF KNOWLEDGE

The TOK course, a flagship element in the Diploma Program, encourages critical thinking about knowledge itself, to try to help young people make sense of what they encounter. Its core content is questions like these: What counts as knowledge? How does it grow? What are its limits? Who owns knowledge? What is the value of knowledge? What are the implications of having, or not having, knowledge? What makes TOK unique, and distinctively different from standard academic disciplines, is its process. At the center of the course is the student as a knower. Students entering the Diploma Program typically have 16 years of life experience and more than 10 years of formal education behind them. They have accumulated a vast amount of knowledge, beliefs and opinions from academic disciplines and their lives outside the classroom. In TOK they have the opportunity to step back from this relentless acquisition

of new knowledge, in order to consider knowledge issues. These include the questions already mentioned, viewed from the perspective of the student, but often begin from more basic ones, like: What do I claim to know [about X]? Am I justified in doing so [how?]? Such questions may initially seem abstract or theoretical, but TOK teachers bring them into closer focus by taking into account their students' interests, circumstances and outlooks in planning the course and preparing students for the Extended Essay. Interdisciplinary connections are made between knowledge encountered in different Diploma Program subjects in preparation for the necessary foundational research skills for the Extended Essay.

*Completion of both Year 1 and Year 2 are required to maintain eligibility for the IB Diploma.

THEORY OF KNOWLEDGE YEAR 1 STANDARD LEVEL
*Please note that ST7711 is a DASD STEM Academy graduation requirement and must be completed successfully to gain a DASD diploma

ST7711	11th Grade	4 pds/cycle	.66 credit

THEORY OF KNOWLEDGE YEAR 2 STANDARD LEVEL

ST7712	12th Grade	4 pds/cycle	.66 credit

CAS - CREATIVITY, ACTIVITY, SERVICE

IB Diploma Student: 7 Learning Outcomes continuously over 18 months. Students may begin to address CAS Learning Outcomes the first day of junior year.

CAS, One of the core elements of the IB Diploma Program, is intended to help educate the whole person through experiential learning and is individualized according to student interests, skills, values and background. CAS activities fall into the following three strands: (1) creativity, (2) physical activity, and (3) community service. Students must distribute experiences reasonably across all three areas.

Overall a student's CAS experiences must address the seven CAS learning outcomes:

- Identify own strengths and areas for growth.
- Demonstrate that challenges have been undertaken, developing new skills in the process.
- Demonstrate how to plan and initiate a CAS experience
- Demonstrate the skills and recognize the benefits of working collaboratively.
- Show perseverance and commitment in CAS experiences.
- Demonstrate engagement with issues of global significance.
- Recognize and consider the ethics of choices and actions.

Students answer specific CAS reflection questions tied to the learning outcomes to assist them with reflection on their CAS experiences. CAS requires all diploma candidates to complete a variety of extra-curricular activities during the junior and senior years and allows students the opportunity to explore and demonstrate aspects of the IB learner profile in real, practical ways. CAS is intended to enhance a student's "personal and interpersonal development through experiential learning" (IBO, CAS Guide 2008).

Diploma candidates work to formulate plans for their experiences and are assessed during three required formal interviews. Additional opportunities for individual meetings are available to give students additional support where needed.

Additionally, diploma candidates must plan and initiate at least one project over a minimum of one month in duration. This project must be done in collaboration with a partner, a group of students, or with members of the wider community. The CAS project may encompass any of the three strands or may be a combination of strands. This project challenges students to show initiative, demonstrate perseverance, and develop skills such as collaboration, problem solving, and decision-making.

IB students choosing not to pursue the full IB Diploma are still required to meet the DASD Graduation project requirements. Students will fulfill this requirement through a 40 hour graduation project.

The Downingtown Area School District Graduation Project:

- Aligned with the vision and beliefs of the Downingtown Area School District's Comprehensive Plan;
- Gives students learning experiences beyond the classroom;
- Enhances a student's college and career resume.
- The project totals a minimum of 40 hours.
- School time may not be used to complete the project.
- Students must secure mentors (adults over 21 who are not relatives).
- Students complete required forms
- Students obtain project approval by the Graduation Project Teams at their high schools before beginning work.

EE - EXTENDED ESSAY

IB diploma student: 40 hours minimum over 12 months
Non-diploma students are not required to complete the EE.

The extended essay (EE) offers students an opportunity to investigate a self-chosen topic of interest and craft a maximum 4000-word research paper with guidance from an advisor and the EE Coordinator. The goal of the EE is for students to complete a self-directed, independent project similar to what is expected at a university level. Students begin the EE process during their junior year by choosing an IB approved subject area, conducting preliminary research, and formulating a specific research question. After receiving approval from the advisor, a student's responsibilities include managing assignment due dates and conducting intensive research to develop an organized, well supported, well written, thoroughly documented outline, draft, and final paper. It will be necessary for students to devote time over the summer to this assignment to remain on schedule. The student is also responsible for scheduling and attending three mandatory reflection and progress meetings with his/her advisor. Responsibilities of the advisor include approving the research question, asking pertinent questions during the required meetings, offering feedback on the outline, reading a full draft and providing verbal feedback and a completed rubric, providing support, and projecting a final score. The EE Coordinator will set benchmark completion dates and provide support and instruction on research and writing skills. EE's are marked by outside examiners. Along with the Theory of Knowledge course, successful students may gain an additional 1 – 3 points toward the IB diploma. Students must pass the EE to remain eligible for the IB diploma.

Extended Essay Timeline

Year 1 (11th Grade)

- January - Overview of Extended Essay process provided
- February - Students identify subject area and begin preliminary research
- March - Submit narrowed topic.
- April - Continue research. Submit Research Question
- May - Begin RRS and complete RPPF #1. Meet with advisor prior to the end of the month.
- June - August - Continue research, prepare outline, begin rough draft

Year 2 (12th Grade)

September - Submit outline with Research Question, thesis, and bibliography. Update RRS and complete RPPF #2. Schedule an appointment and meet with advisor prior to the end of the month.
October - No subject changes permitted after this date. Continue research/writing.
November - Submit rough draft of paper. Set up time with advisor to discuss rough draft.
Mid-November - January - Revise draft and finalize paper. Submit final draft, Complete RRS and RPPF #3. Schedule final meeting with advisor by the end of the month.

Note: Specific calendar dates will be shared directly with students by the EE supervisor.

ENGLISH LITERATURE

Required STEM Academy Courses:

9th Grade: PD World Literature

10th Grade: PD American Literature

11th Grade: IB Language A1 Literature Standard Level Year 1

12th Grade: IB Language A1 Literature Standard Level Year 2*

or

11th Grade: IB Language A1 Literature Higher Level Year 1

12th Grade: IB Language A1 Literature Higher Level Year 2**

Successful Completion of Related Standard Level Year One literature course required.
****Successful Completion of Related Higher Level Year One literature course required.***

PD ENGLISH: WORLD LITERATURE

The ninth grade English curriculum is designed to introduce students to literature that is concerned with our conceptions, interpretations and experiences of the world. It includes the study of various genres of literature, composition, and oral communication while developing students' grammar and vocabulary skills for improved communication and SAT preparation. The writing includes expression of ideas and arguments with clarity, coherence and structure in a sustained and logical way, which reinforces the five characteristics of effective writing (knowledge of topic, response, literary features, presentation, and use of language) and focuses on the three modes of writing (persuasive, informational and narrative). The literature units encompass key works for further study and include analyses of the novel, drama, short story and poetry.

ST1014	9th Grade	9 pds/cycle	1.0 credit

PD ENGLISH: AMERICAN LITERATURE

This is a PA Keystone required course. The tenth grade English curriculum is designed to introduce students to literature that are concerned with the conceptions and interpretations of the American experience. It includes the study of various genres of literature, composition, and oral communication while developing and improving students' grammar and vocabulary skills for improved communication and SAT preparation. The writing includes insightful expression of ideas and analytical arguments with clarity, coherence and structure in a sustained and purposeful manner, which reinforces, and demonstrates a significant command of, the five characteristics of effective writing (knowledge of topic, response, literary features, presentation, and use of language) and focuses on the three modes of writing (persuasive, informational and narrative). The course requires a formal MLA formatted research paper related to the study of literature. The literature units encompass key works for further study and include analyses of the novel, drama, short story and poetry.

ST1024	10th Grade	9 pds/cycle	1.0 credit

IB LANGUAGE A1 - LITERATURE IN ENGLISH

The Language A1 program is primarily a pre-university course in literature. It is aimed at students who intend to pursue literature or related studies, at university as well as students whose formal study of literature will not continue beyond this level. The former would normally follow the Higher Level (HL) program and the later Standard Level (SL).

The Language A1 program encourages students to see literary works as products of art and their authors as craftsmen whose methods of production can be analyzed in a variety of ways and on a number of levels. This is achieved through the emphasis placed on exploring the means used by different authors to convey their subjects in the works studied. It is further reinforced by the comparative framework emphasized for the study of these works in all parts of the program.

Standard Level includes a minimum of 9 works, over the course of two years, of literature from four genres, three periods and with not more than one author studied twice within a syllabus. In addition students must study at least three World Literature works (some works may be used for more than one group).

Higher Level includes a minimum of 13 works, over the course of two years, of literature from four genres, three periods and with not more than one author studied twice within a syllabus. In addition students must study five World Literature works (some works may be used in more than one group).

IB LANGUAGE A1 LITERATURE STANDARD LEVEL YEAR 1

ST1034	11th Grade	9 pds/cycle	1.0 credit

IB LANGUAGE A1 LITERATURE STANDARD LEVEL YEAR 2

ST1044	12th Grade	9 pds/cycle	1.0 credit

IB LANGUAGE A1 LITERATURE HIGHER LEVEL YEAR 1

ST1035	11th Grade	9 pds/cycle	1.0 credit

IB LANGUAGE A1 LITERATURE HIGHER LEVEL YEAR 2

ST1045	12th Grade	9 pds/cycle	1.0 credit

SOCIAL SCIENCES

Required STEM Academy Courses:

9th Grade: PD Civics and Government

10th Grade: PD United States History and the Modern World

Students choose any of the five Year 1 courses listed below followed by the subsequent Year 2.

11th Grade: IB History Year 1 – Standard Level or Higher Level
IB Economics Year 1 – Standard Level or Higher Level
IB Psychology Year 1 - Standard Level or Higher Level
IB Geography Year 1 - Standard Level or Higher Level
IB Global Politics Year 1 – Standard Level or Higher Level

12th Grade: IB History Year 2 – Standard Level* or Higher Level**
IB Economics Year 2 – Standard Level* or Higher Level**
IB Psychology Year 2 - Standard Level* or Higher Level**
IB Geography Year 2 - Standard Level* or Higher Level**
IB Global Politics Year 2 – Standard Level* or Higher Level**

*Successful Completion of Related Standard Level Year One social studies course required.
**Successful Completion of Related Higher Level Year One social studies course required.

PD CIVICS AND GOVERNMENT

History is the process of recording, reconstructing and interpreting the past through the investigation of a variety of sources that promote empathy for, and understanding of, people living in other societies and time periods. The 9th grade Social Studies curriculum is designed to develop a student's understanding of government, civics and the role of the individual in society. It will begin to frame a student's knowledge from the while providing a framework for future inquiry into the events of the 20th century. The course includes foundations of western democracy and society, the evolution of the American style of government, as well as further examination of the progression of historical and contemporary examples of major world governments and societies. This course requires students to engage in the exploration and research of primary and secondary historical sources and the works of individuals throughout history.

ST3014	9th Grade	9 pds/cycle	1.0 credit

PD UNITED STATES HISTORY AND THE WORLD

US History and the World builds on the skills and foundations established during the 9th grade course. Students continue to develop the skills of a historian but now focus on the involvement of the United States and its relationships with other countries. This is accomplished through the analysis of primary and secondary sources to help to frame a student's knowledge, while providing a framework for future inquiry into the events of the modern world. The course includes deeper explanations of western democracy and society, as well as the evolution of the American style of government, and its responses to issues around the globe.

ST3024	10th Grade	9 pds/cycle	1.0 credit

IB HISTORY OF THE AMERICAS

*****Can replace Group 6 requirement if two Group 3 courses are selected

History is a dynamic, contested, evidence-based discipline that involves an exciting engagement with the past. It is a rigorous intellectual discipline, focused around key historical concepts such as change, causation and significance.

History is an exploratory subject that fosters a sense of inquiry. It is also an interpretive discipline, allowing opportunity for engagement with multiple perspectives and a plurality of opinions. Studying history develops an understanding of the past, which leads to a deeper understanding of the nature of humans and of the world today.

The IB Diploma Program (DP) history course is a world history course based on a comparative and multi perspective approach to history. It involves the study of a variety of types of history, including political, economic, social and cultural, and provides a balance of structure and flexibility. The course emphasizes the importance of encouraging students to think historically and to develop historical skills as well as gaining factual knowledge. It puts a premium on developing the skills of critical thinking, and on developing an understanding of multiple interpretations of history. In this way, the course involves a challenging and demanding critical exploration of the past.

Students at standard level (SL) and higher level (HL) are presented with a syllabus that has a common core consisting of prescribed subjects and topics in world history. In addition, students at HL are also required to undertake an in-depth study of three sections from one of the HL regional options (The Americas). While many of the skills of studying history are common to both SL and HL, the difference in recommended teaching hours at SL and HL signals a clear distinction between the demands made on students, with the greater depth of study required for HL.

IB HISTORY STANDARD LEVEL YEAR 1

ST3034	11th Grade	9 pds/cycle	1.0 credit

IB HISTORY STANDARD LEVEL YEAR 2

ST3044	12th Grade	9 pds/cycle	1.0 credit

IB HISTORY (OF THE AMERICAS) HIGHER LEVEL YEAR 1

ST3035	11th Grade	9 pds/cycle	1.0 credit

IB HISTORY (OF THE AMERICAS) HIGHER LEVEL YEAR 2

ST3045	12th Grade	9 pds/cycle	1.0 credit

IB ECONOMICS

*****Can replace Group 6 requirement if two Group 3 courses are selected

Economics is an exciting, dynamic subject that allows students to develop an understanding of the complexities and

interdependence of economic activities in a rapidly changing world.

At the heart of economic theory is the problem of scarcity. While the world's population has unlimited needs and wants, there are limited resources to satisfy these needs and wants. As a result of this scarcity, choices have to be made. The economics course, at both Standard Level and Higher Level, uses economic theories to examine the ways in which these choices are made:

- at the level of producers and consumers in individual markets (microeconomics)
- at the level of the government and the national economy (macroeconomics)
- at an international level where countries are becoming increasingly interdependent through international trade and the movement of labor and capital (the global economy).

The choices made by economic agents (consumers, producers and governments) generate positive and negative outcomes and these outcomes affect the relative well-being of individuals and societies. As a social science, economics examines these choices through the use of models and theories. The Diploma Program economics course allows students to explore these models and theories, and apply them, using empirical data.

The Higher Level course in economics differs from the Standard Level course in economics in terms of the:

- extra depth and breadth required (extension material for Higher Level only)
- nature of the examination questions. Both Standard Level and Higher Level students develop quantitative skills, but Higher Level students will need to further develop these as appropriate, in analyzing and evaluating economic relationships in order to provide informed policy advice.

IB ECONOMICS STANDARD LEVEL YEAR 1

ST3134	11th Grade	9 pds/cycle	1.0 credit

IB ECONOMICS STANDARD LEVEL YEAR 2

ST3144	12th Grade	9 pds/cycle	1.0 credit

IB ECONOMICS HIGHER LEVEL YEAR 1

ST3135	11th Grade	9 pds/cycle	1.0 credit

IB ECONOMICS HIGHER LEVEL YEAR 2

ST3145	12th Grade	9 pds/cycle	1.0 credit

IB GEOGRAPHY

*****Can replace Group 6 requirement if two Group 3 courses are selected

Geography is a dynamic subject that is firmly grounded in the real world and focuses on the interactions between individuals, societies and physical processes in both time and space. It seeks to identify trends and patterns in these interactions. It also investigates the way in which people adapt and respond to change, and evaluates actual and possible management strategies associated with such change. Geography describes and helps to explain the similarities and differences between different places. These may be defined on a variety of scales and from the

perspectives of a different range of actors, with varying powers over decision-making processes.

Within individuals and societies subjects, geography is distinctive in its spatial dimension and occupies a middle ground between social or human sciences and natural sciences. The Diploma Program geography course integrates physical, environmental and human geography, and ensures that students acquire elements of both socio-economic and scientific methodologies. Geography takes advantage of its position to examine relevant concepts and ideas from a wide variety of disciplines. This helps students develop life skills and have an appreciation of, and respect for, alternative approaches, viewpoints and ideas

Students at both the Standard and Higher Level in geography are presented with a syllabus that has optional geographic themes and a common Standard and Higher Level core. Higher Level students also study the Higher Level core extension. The syllabus requires the development of certain skills, attributes and knowledge as described in the assessment objectives, which are externally assessed. Although the skills and activity of studying geography are common to both Standard Level and Higher Level students, Higher level students are required to acquire a further body of knowledge, to demonstrate critical evaluation and to further synthesize the concepts in the Higher Level extension.

IB GEOGRAPHY STANDARD LEVEL YEAR 1

ST3234	11th Grade	9 pds/cycle	1.0 credit

IB GEOGRAPHY STANDARD LEVEL YEAR 2

ST3244	12th Grade	9 pds/cycle	1.0 credit

IB GEOGRAPHY HIGHER LEVEL YEAR 1

ST3235	11th Grade	9 pds/cycle	1.0 credit

IB GEOGRAPHY HIGHER LEVEL YEAR 2

ST3245	12th Grade	9 pds/cycle	1.0 credit

IB PSYCHOLOGY
*****Can replace Group 6 requirement if two Group 3 courses are selected

Psychology is the systematic study of behavior and mental processes. Psychology has its roots in both the natural and social sciences, leading to a variety of research designs and applications, and providing a unique approach to understanding modern society. IB psychology examines the interaction of biological, cognitive and sociocultural influences on human behavior, thereby adopting an integrative approach. Understanding how psychological knowledge is generated, developed and applied enables students to achieve a greater understanding of themselves and appreciate the diversity of human behavior. The ethical concerns raised by the methodology and application of psychological research are key considerations in IB psychology.

The following extensions to the core approaches are studied at Higher Level only.

- The role of animal research in understanding human behavior
- Cognitive processing in a technological (digital/modern) world
- The influence of globalization on individual behavior

IB PSYCHOLOGY STANDARD LEVEL YEAR 1

ST3434	11th Grade	9 pds/cycle	1.0 credit

IB PSYCHOLOGY STANDARD LEVEL YEAR 2

ST3444	12th Grade	9 pds/cycle	1.0 credit

IB PSYCHOLOGY HIGHER LEVEL YEAR 1

ST3435	11th Grade	9 pds/cycle	1.0 credit

IB PSYCHOLOGY HIGHER LEVEL YEAR 2

ST3445	12th Grade	9 pds/cycle	1.0 credit

IB GLOBAL POLITICS

*****Can replace Group 6 requirement if two Group 3 courses are selected

The 21st century is characterized by rapid change and increasing interconnectedness, impacting individuals and societies in unprecedented ways and creating complex global political challenges. Global politics is an exciting, dynamic subject that draws on a variety of disciplines in the social sciences and humanities, reflecting the complex nature of many contemporary political issues. The study of global politics enables students to critically engage with different and new perspectives and approaches to politics in order to comprehend the challenges of the changing world and become aware of their role in it as active global citizens.

The Diploma Program global politics course explores fundamental political concepts such as power, equality, sustainability and peace in a range of contexts. It allows students to develop an understanding of the local, national, international and global dimensions of political activity and processes, as well as to explore political issues affecting their own lives. The course helps students to understand abstract political concepts by grounding them in real-world examples and case studies. It also invites comparison between such examples and case studies to ensure a wider and transnational perspective.

The core units of the course together make up a central unifying theme of “people, power and politics”. The emphasis on “people” reflects the fact that the course explores politics not only at a state level but also explores the function and impact of non-state actors, communities, groups and individuals. The concept of “power” is also emphasized as being particularly crucial to understanding the dynamics, tensions and outcomes of global politics. Throughout the course, issues such as conflict, migration or climate change are explored through an explicitly political lens: “politics” provide a uniquely rich context in which to explore the relationship between people and power.

Students of global politics at Standard Level and Higher Level are presented with a syllabus that has a common core. This common core consists of four compulsory units under the central unifying theme of “people, power and politics”. All Standard Level and Higher Level students are also required to undertake an engagement activity. In addition, Higher Level students are also required, through a case studies approach, to explore two Higher Level extension topics (global political challenges).

IB GLOBAL POLITICS STANDARD LEVEL YEAR 1

ST3334	11th Grade	9 pds/cycle	1.0 credit

IB GLOBAL POLITICS STANDARD LEVEL YEAR 2

ST3344	12th Grade	9 pds/cycle	1.0 credit

IB GLOBAL POLITICS HIGHER LEVEL YEAR 1

ST3335	11th Grade	9 pds/cycle	1.0 credit

IB GLOBAL POLITICS HIGHER LEVEL YEAR 2

ST3345	12th Grade	9 pds/cycle	1.0 credit

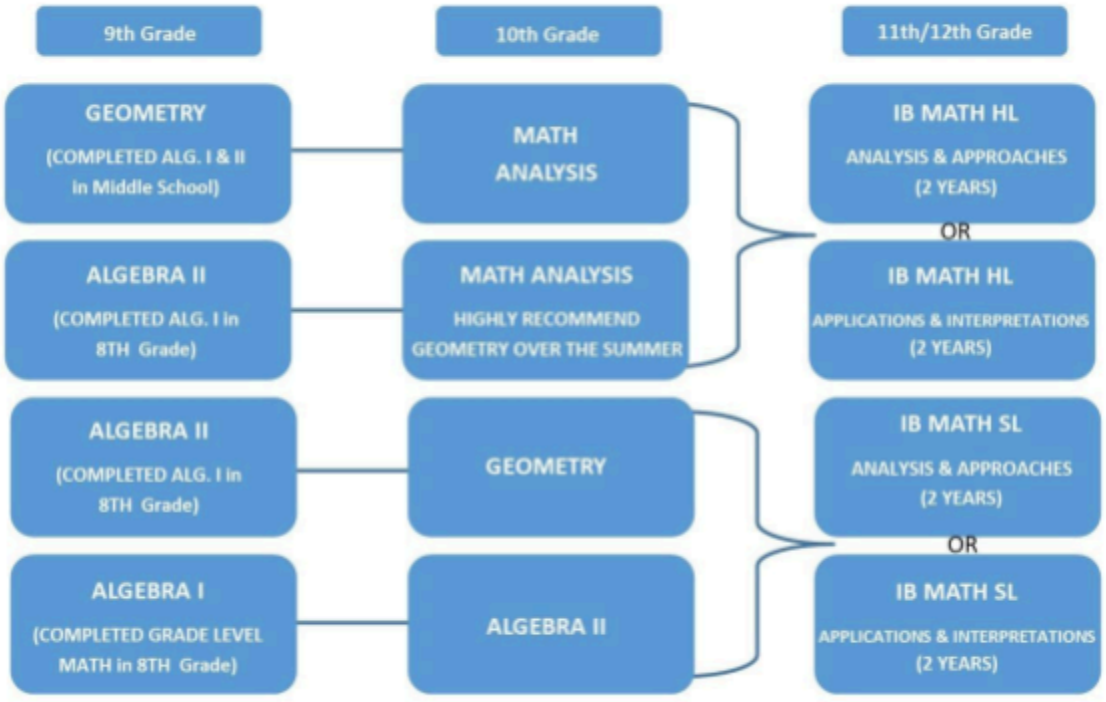
MATHEMATICS

Required STEM Academy Courses:

9th Grade:	PD Algebra I
	PD Algebra II
	PD Math Analysis
10th Grade:	PD Algebra II
	PD Math Analysis
11th Grade:	IB Mathematics Applications & Interpretations Year 1 Standard Level
11th Grade	IB Mathematics Applications & Interpretations Year 1 Higher Level++
11th Grade	IB Mathematics Analysis & Approaches Year 1 Standard Level+
11th Grade	IB Mathematics Analysis & Approaches Year 1 Higher Level ++
12th Grade:	IB Mathematics Applications & Interpretations Year 2 Standard Level*
12th Grade:	IB Mathematics Applications & Interpretations Year 2 Higher Level**
12th Grade:	IB Mathematics Analysis & Approaches Year 2 Standard Level*
12th Grade:	IB Mathematics Analysis & Approaches Year 2 Higher Level**

+Successful Completion of PD Algebra II Required
++Successful Completion of PD Math Analysis Required
*Successful Completion of Related Standard Level Year One mathematics course required.
**Successful Completion of Related Higher Level Year One mathematics course required.

MATHEMATICS COURSE PROGRESSION



PD ALGEBRA I

This is a PA Keystone required course. Algebra I is the first course in the series of academic math courses necessary for college admission as well as the satisfaction of state/national mathematics content standards. The course will include the following content: the real number system, solving one-variable equations and inequalities, linear equations and inequalities, systems of linear equations and inequalities, coordinate graphing, factoring polynomials, simplifying rational and radical expressions, properties of exponents, and answering questions based on data displays, statistical calculations, and probability. Students will work on problem solving and completing open-ended responses. At the end of this course, students will take the Algebra I Keystone exam. In addition, the Algebra I course will integrate the Geometry standards for the following concepts: points, lines, and planes; surface area; volume; similarity.

ST5013	9th Grade	9 pds/cycle	1.0 credit

PD GEOMETRY

Geometry is one in a series of academic math courses necessary for entry into the International Baccalaureate courses, state mandated assessments, and college admission. The course includes the systematic study of points, lines, planes, circles congruence and similarity of polygons (with a focus on triangles and quadrilaterals), as well as area and volume of solid figures. This course also studies deductive reasoning through the introduction of two-column proofs. In addition, the course requires students to calculate probability, using area and define geometric shapes algebraically and graphically.

ST5014	9th/10th Grade	9 pds/cycle	1.0 credit

PD ALGEBRA II

Algebra II is one course in the series of academic math courses necessary for entry into the International Baccalaureate courses, state mandated assessments, and college admission. The course includes functions, systems of equations, quadratic functions, polynomial functions, exponents, radical equations, rational functions, exponential functions, statistics, and probability. In addition, students are required to explore and apply matrix operations, logarithms, and conics. The primary goal of this course is the genuine working comprehension of the fundamental concepts of Algebra necessary for all higher-level math and science courses. In addition, the Algebra II course will integrate the Geometry standards for the following concepts: reasoning and proof; parallel and perpendicular lines; relationships within triangles; polygons and quadrilaterals; right triangle trigonometry; trigonometry; area of polygons; circles; and transformations.

ST5024	9th/10th Grade	9 pds/cycle	1.0 credit

PD MATH ANALYSIS

Math Analysis is a rigorous course designed to prepare students for the International Baccalaureate Higher Level Mathematics and college admission. The course begins with a review and extension of functions and their graphs, followed by proofs of theorems through mathematical induction. Trigonometry is introduced through circular functions and trigonometric functions of general angles. Practical applications are studied through right triangles,

law of sines and cosines, and area formulas. The course also requires students to study limits, sequences and series, exponential and logarithmic functions and functions emphasizing curve sketching and differentiation. A TI-83 or 84 series graphing calculator is highly recommended. TI-89 model calculators are not permitted on tests.

ST5124	10th Grade	9 pds/cycle	1.0 credit

IB MATHEMATICS APPLICATIONS & INTERPRETATIONS

According to the International Baccalaureate Organization this course is designed for students who enjoy describing the real world and solving practical problems using mathematics, those who are interested in harnessing the power of technology alongside exploring mathematical models and enjoy the more practical side of mathematics. This course is aimed at students who will go on to study subjects such as social sciences, natural sciences, statistics, business, some economics courses, psychology, and design.

The Higher Level Course will include new content, including statistics. It is intended to meet the needs of students whose interest in mathematics is more practical than theoretical but seek more challenging content and requires strong Algebra 2 skills.

IB MATHEMATICS APPLICATIONS & INTERPRETATIONS STANDARD LEVEL YEAR 1

ST5034	11th Grade	9 pds/cycle	1.0 credit

IB MATHEMATICS APPLICATIONS & INTERPRETATIONS STANDARD LEVEL YEAR 2

ST5044	12th Grade	9 pds/cycle	1.0 credit

IB MATHEMATICS APPLICATIONS & INTERPRETATIONS HIGHER LEVEL YEAR 1+

ST5035	11th Grade	9 pds/cycle	1.0 credit

IB MATHEMATICS APPLICATIONS & INTERPRETATIONS HIGHER LEVEL YEAR 2

ST5045	12th Grade	9 pds/cycle	1.0 credit

+Successful Completion of PD Algebra II and PD Math Analysis courses Required

IB MATHEMATICS ANALYSIS & APPROACHES

According to the International Baccalaureate Organization this course is intended for students who wish to pursue studies in mathematics at university or subjects that have a large mathematical content; it is for students who enjoy developing mathematical arguments, problem solving and exploring real and abstract applications, with and without technology. This course is aimed at students who will go onto study areas of substantial mathematics content such as mathematics itself, engineering, physical sciences, or some economics courses.

IB MATHEMATICS ANALYSIS & APPROACHES STANDARD LEVEL YEAR 1+

ST3334	11th Grade	9 pds/cycle	1.0 credit

IB MATHEMATICS ANALYSIS & APPROACHES STANDARD LEVEL YEAR 2

ST3344	12th Grade	9 pds/cycle	1.0 credit

IB MATHEMATICS ANALYSIS & APPROACHES HIGHER LEVEL YEAR 1+

ST3335	11th Grade	9 pds/cycle	1.0 credit

IB MATHEMATICS ANALYSIS & APPROACHES HIGHER LEVEL YEAR 2

ST3345	12th Grade	9 pds/cycle	1.0 credit

+Successful Completion of PD Math Analysis Required

EXPERIMENTAL SCIENCES

Required STEM Academy Courses:

9th Grade: PD Universal Physics

10th Grade: PD Biology **and** PD Chemistry

11th Grade: IB Biology Year 1 Standard Level
12th Grade: IB Biology Year 2 Standard Level*
OR
11th Grade: IB Biology Year 1 Higher Level
12th Grade: IB Biology Year 2 Higher Level**

11th Grade: IB Chemistry Year 1 Standard Level
12th Grade: IB Chemistry Year 2 Standard Level*
OR
11th Grade: IB Chemistry Year 1 Higher Level
12th Grade: IB Chemistry Year 2 Higher Level**

11th Grade: IB Physics Year 1 Standard Level
12th Grade: IB Physics Year 2 Standard Level*
OR
11th Grade: IB Physics Year 1 Higher Level
12th Grade: IB Physics Year 2 Higher Level**

*Successful Completion of Related Standard Level Year One science course required.
**Successful Completion of Related Higher Level Year One science course required.

PD BIOLOGY

This is a PA Keystone required course. The tenth grade PD Biology course will introduce students to fundamental concepts and experimental methods of modern Biology: structure and function, universality vs. diversity, equilibrium within systems and evolution. The course offers students the opportunity, through continued use of the scientific method, to investigate life at a molecular, cellular and organismal level. It will also require students to use this knowledge to think critically about the structure and function of living organisms, evolution, and the importance of equilibrium within chemical, biological and ecological systems.

ST4124	9th Grade	9 pds/cycle	1.0 credit

IB BIOLOGY
*Can replace Group 6 requirement if two Group 4 courses are selected

Biologists have accumulated huge amounts of information about living organisms, and it would be easy to confuse students by teaching large numbers of seemingly unrelated facts. In the Diploma Program biology course, it is hoped that students will acquire a limited body of facts and, at the same time, develop a broad, general understanding of the

principles of the subject. Although the Diploma Program biology course at Standard Level and Higher Level has been written as a series of discrete statements (for assessment purposes), there are four basic biological concepts that run throughout: Structure and Function, Universality v. Diversity, Equilibrium within Systems, and Evolution.

While the Standard Level and Higher Level Biology courses cover many of the same topics, the Higher Level requires a more intensive study of the content and labs that reflect the depth of knowledge required of the course curriculum.

IB BIOLOGY STANDARD LEVEL YEAR 1

ST4134	11th Grade	9 pds/cycle	1.0 credit

IB BIOLOGY STANDARD LEVEL YEAR 2

ST4144	12th Grade	9 pds/cycle	1.0 credit

IB BIOLOGY HIGHER LEVEL YEAR 1

ST4135	11th Grade	9 pds/cycle	1.0 credit

IB BIOLOGY HIGHER LEVEL YEAR 2

ST4145	12th Grade	9 pds/cycle	1.0 credit

PD CHEMISTRY

Chemistry is an experimental science that combines academic study with the acquisition of practical and investigational skills. It is called the central science, as chemical principles underpin both the physical environment in which we live and all biological systems. Topics addressed include atomic structure, periodicity, bonding, energetics, chemical reactions, acids and bases, measurement and data processing, and quantitative chemistry. In addition to addressing content, the course develops students' skills in several areas, including making detailed observations, elements of sound experimental design, and using inductive and deductive reasoning to critically evaluate data.

ST4224	10th Grade	9 pds/cycle	1.0 credit

IB CHEMISTRY
*****Can replace Group 6 requirement if two Group 4 courses are selected

This laboratory course covers in detail the mathematical, theoretical, and physical aspects of the composition and structure of matter. Topics covered include: measurement, atomic structure, chemical reactions, stoichiometry, solutions, periodicity, bonding, organic chemistry, energetics, kinetics, equilibrium, acids and bases, and oxidation-reduction reactions. Further, the course offers students the opportunity to develop inquiring minds and curiosity about science and the natural world, to develop skills of scientific inquiry to design and carry out scientific investigations and evaluate scientific evidence to draw conclusions and to communicate scientific ideas, arguments and practical experiences accurately in a variety of ways.

While the Standard Level and Higher Level Chemistry courses cover many of the same topics, the Higher Level requires a more intensive study of the content and labs that reflect the depth of knowledge required of the course curriculum.

IB CHEMISTRY STANDARD LEVEL YEAR 1

ST4234	11th Grade	9 pds/cycle	1.0 credit

IB CHEMISTRY STANDARD LEVEL YEAR 2

ST4244	12th Grade	9 pds/cycle	1.0 credit

IB CHEMISTRY HIGHER LEVEL YEAR 1

ST4235	11th Grade	9 pds/cycle	1.0 credit

IB CHEMISTRY HIGHER LEVEL YEAR 2

ST4245	12th Grade	9 pds/cycle	1.0 credit

PD UNIVERSAL PHYSICS

Physics is the most fundamental of the experimental sciences, as it seeks to explain the universe itself, from the very smallest particles to the vast distances between galaxies. The ninth grade physics course will introduce students to the world of physics. The course study includes using the scientific method to investigate the world around them. These investigations will entail the study of motion graphing, dynamics (forces and impulse), and applications of energy. Student driven investigations and research will develop the following skills: skeptical questioning, appropriate data collection and analysis, making scientific observations, drawing research supported conclusions. The course requires students to share their work, findings and ideas with local and global communities in verbal and written modes.

ST4014	9th Grade	9 pds/cycle	1.0 credit

IB PHYSICS

*****Can replace Group 6 requirement if two Group 3 courses are selected

IB Physics is based on theory and experiments undertaken by all students. They should complement one another naturally, as they do in the wider scientific community. The Diploma Program physics course allows students to develop traditional practical skills and techniques and increase facility in the use of mathematics, which is the language of physics. It also allows students to develop interpersonal skills, and information and communication technology skills, which are essential in modern scientific endeavors and are important life-enhancing, transferable skills in their own right.

Standard level includes topics such as mechanics, thermal physics, oscillations, electric currents, fields and forces, atomic and nuclear physics, and energy, power, relativity, rigid body dynamics, and thermodynamics. Higher level includes all the same topics as Standard level but also includes quantum physics, electromagnetic induction, motion

in fields, and wave phenomena.

IB PHYSICS STANDARD LEVEL YEAR 1

ST4034	11th Grade	9 pds/cycle	1.0 credit

IB PHYSICS STANDARD LEVEL YEAR 2

ST4044	12th Grade	9 pds/cycle	1.0 credit

IB PHYSICS HIGHER LEVEL YEAR 1

ST4035	11th Grade	9 pds/cycle	1.0 credit

IB PHYSICS HIGHER LEVEL YEAR 2

ST4045	12th Grade	9 pds/cycle	1.0 credit

IB ENVIRONMENTAL SYSTEMS AND SOCIETIES
*****Can replace Group 6 requirement

The prime intent of this course is to provide students with a coherent perspective of the interrelationships between environmental systems and societies; one that enables them to adopt an informed personal response to the wide range of pressing environmental issues that they will inevitably come to face. Students' attention can be constantly drawn to their own relationship with their environment and the significance of choices and decisions that they make in their own lives. It is intended that students develop a sound understanding of the interrelationships between environmental systems and societies, rather than a purely journalistic appreciation of environmental issues. The teaching approach therefore needs to be conducive to students evaluating the scientific, ethical and socio-political aspects of issues.

IB ENVIRONMENTAL SYSTEMS AND SOCIETIES LEVEL YEAR 1

ST4334	11th Grade	9 pds/cycle	1.0 credit

IB ENVIRONMENTAL SYSTEMS AND SOCIETIES STANDARD LEVEL YEAR 2

ST4344	12th Grade	9 pds/cycle	1.0 credit

IB SPORTS, EXERCISE AND HEALTH SCIENCE
*****Can replace Group 6 requirement

Sports, exercise and health science (SEHS) is an experimental science that combines academic study with the acquisition of practical and investigative skills. It is an applied science course with aspects of biological and physical science being studied in the specific context of sports, exercise and health. Moreover, the subject matter

goes beyond the traditional science subjects to offer a deeper understanding of the issues related to sports, exercise and health in the 21st century. Apart from being worthy of study in its own right, SEHS is a good preparation for courses in higher or further education related to sports fitness and health, and serves as a useful preparation for employment in sports and leisure industries.

The course incorporates the traditional disciplines of anatomy and physiology, biomechanics, psychology and nutrition, which are studied in the context of sports, exercise and health. Students will cover a range of core and option topics, and carry out practical (experimental) investigations in both laboratory and field settings. This will provide an opportunity to acquire the knowledge and understanding necessary to apply scientific principles and critically analyze human performance. Where relevant, the course will address issues of international dimension and ethics by considering sports, exercise and health relative to the individual and in a global context.

IB SPORTS, EXERCISE AND HEALTH SCIENCE STANDARD LEVEL YEAR 1

ST4434	11th Grade	9 pds/cycle	1.0 credit

IB SPORTS, EXERCISE AND HEALTH SCIENCE STANDARD LEVEL YEAR 2

ST4444	12th Grade	9 pds/cycle	1.0 credit

IB SPORTS, EXERCISE AND HEALTH SCIENCE HIGHER LEVEL YEAR 1

ST4435	11th Grade	9 pds/cycle	1.0 credit

IB SPORTS, EXERCISE AND HEALTH SCIENCE HIGHER LEVEL YEAR 2

ST4445	12th Grade	9 pds/cycle	1.0 credit

WORLD LANGUAGES

Required STEM Academy Courses:

9th Grade:	Spanish 9
	French 9
	German 9
10th Grade:	Spanish Level 10
	French Levels 10
	German Level 10
11th Grade:	IB Spanish Year 1 Standard Level+
12th Grade:	IB Spanish Year 2 Standard Level*
	OR
11th Grade:	IB Spanish Year 1 Higher Level++
12th Grade:	IB Spanish Year 2 Higher Level**
OR	
11th Grade:	IB French Year 1 Standard Level+
12th Grade:	IB French Year 2 Standard Level*
	OR
11th Grade:	IB French Year 1 Higher Level++
12th Grade:	IB French Year 2 Higher Level**
	OR
11th Grade:	IB German Year 1 Standard Level+
12th Grade:	IB German Year 2 Standard Level*
	OR
11th Grade:	IB German Year 1 Higher Level++
12th Grade:	IB German Year 2 Higher Level**

+Successfully completed two years of related language required before entering IB Language B Standard Level Year One.
++Successfully completed a minimum of three years of related language before entering IB Language B Higher Level.
*Successfully completed year one of the related IB Language B Year One Standard Level
**Successfully completed year one of the related IB Language B Year One Higher Level

9TH GRADE WORLD LANGUAGE

The Grade 9 World Language course continues to develop students' proficiency from previous years in essential language skills – listening, speaking, reading, and writing – with emphasis on the ability to communicate orally and in writing. In this course, students learn to function in real-life situations using more complex sentences and language structures. Students will read material on familiar topics and produce short writing samples and continue to explore as they study the themes of Home Life, Student Life, Leisure Time, and Vacation and Travel. Students will also comprehend the main ideas of the authentic language-specific materials that they read and hear and are able

to identify details. Students gain a deeper understanding of the world around them while studying the target language and culture.

PD SPANISH 9

ST2014	9th Grade	9 pds/cycle	1.0 credit

PD FRENCH 9

ST2114	9th Grade	9 pds/cycle	1.0 credit

IB GERMAN 9

ST2214	9th Grade	9 pds/cycle	1.0 credit

10TH GRADE WORLD LANGUAGE

Grade 10 World Language course builds from those skills, proficiencies and understandings from Grade 9 World Language where students continue to develop and refine their proficiency in essential language skills – listening, speaking, reading and writing – with emphasis on the ability to interact orally and in writing. They communicate using more complex language structures on a variety of topics, moving from concrete to more abstract concepts. This course provides more advanced levels of application and comprehension in the language, and prepares students for Higher Level International Baccalaureate Language B. Students develop more sophisticated communication skills in all areas of the language with emphasis on the ability to interact orally and in writing. Authentic language-specific reading selections are emphasized at this level. Students communicate using more complex language structures and express abstract ideas with reasonable fluency. They are also able to describe, summarize, analyze and evaluate current events, and literary, cultural and social topics.

PD SPANISH 10

ST2024	10th Grade	9 pds/cycle	1.0 credit

PD FRENCH 10

ST2124	10th Grade	9 pds/cycle	1.0 credit

IB GERMAN 10

ST2234	10th Grade	9 pds/cycle	1.0 credit

IB WORLD LANGUAGES

The focus of the Standard Level course is language acquisition and intercultural understanding. The syllabus covers the three core topics (Communication and Media; Global Issues; Social Relationships), as well as two of the five options (Cultural Diversity; Customs and Traditions; Health; Leisure; Science and Technology). By the end of the course, students are expected to demonstrate the following learning outcomes:

Receptive skills
- Understand straightforward recorded or spoken information on the topics studied.
- Understand authentic written texts related to the topics studied and that use mostly everyday language.
- Appreciate literary works in the target language. (Higher Level)

Productive skills
- Communicate orally in order to explain a point of view on a designated topic.
- Describe with some detail and accuracy experiences, events and concepts.
- Produce texts where the use of register, style, rhetorical devices and structural elements are generally appropriate to the audience and purpose.
- Produce clear and convincing arguments in support of a point of view. (Higher Level)

Interactive skills
- Demonstrate interaction that usually flows coherently, but with occasional limitations.
- Engage in conversations on the topics studied, as well as related ideas.
- Demonstrate some intercultural engagement with the target language and culture(s).

The focus of the Higher Level course is language acquisition and intercultural understanding. The syllabus covers the three core topics (Communication and Media; Global Issues; Social Relationships), as well as two of the five options (Cultural Diversity; Customs and Traditions; Health; Leisure; Science and Technology) in great depth. Additionally, the students will study two works of literature.

IB SPANISH STANDARD LEVEL YEAR 1

ST2034	11th Grade	9 pds/cycle	1.0 credit

IB SPANISH STANDARD LEVEL YEAR 2

ST2044	12th Grade	9 pds/cycle	1.0 credit

IB SPANISH HIGHER LEVEL YEAR 1

ST2035	11th Grade	9 pds/cycle	1.0 credit

IB SPANISH HIGHER LEVEL YEAR 2

ST2045	12th Grade	9 pds/cycle	1.0 credit

IB FRENCH STANDARD LEVEL YEAR 1

ST2134	11th Grade	9 pds/cycle	1.0 credit

IB FRENCH STANDARD LEVEL YEAR 2

ST2144	12th Grade	9 pds/cycle	1.0 credit

IB FRENCH HIGHER LEVEL YEAR 1

ST2135	11th Grade	9 pds/cycle	1.0 credit

IB FRENCH HIGHER LEVEL YEAR 2

ST2145	12th Grade	9 pds/cycle	1.0 credit

IB GERMAN STANDARD LEVEL YEAR 1

ST2234	11th Grade	9 pds/cycle	1.0 credit

IB GERMAN STANDARD LEVEL YEAR 2

ST2244	12th Grade	9 pds/cycle	1.0 credit

IB GERMAN HIGHER LEVEL YEAR 1

ST2235	11th Grade	9 pds/cycle	1.0 credit

IB GERMAN HIGHER LEVEL YEAR 2

ST2245	12th Grade	9 pds/cycle	1.0 credit

HEALTH AND PHYSICAL EDUCATION

HEALTH & PHYSICAL WELLNESS I

The first course of Physical Wellness in the 21st Century is designed to promote general health and physical activity as well as disease prevention as central components. The focus is on fitness for the purpose of beneficial experiences, attitudes, knowledge and skills that foster a lifelong active lifestyle. Students set personal goals and participate in physical activities that incorporate the health components of fitness through an inquiry and project based approach that emphasizes a broad scope of independent and collaborative projects designed to enhance cardiovascular fitness, muscular strength, endurance, flexibility and body composition. All lessons emphasize attention to the cognitive, affective and behavioral components of physical activity.

ST7811	9th Grade	2 pds/cycle	.34 credit

HEALTH & PHYSICAL WELLNESS II

This course expands upon the goals of Physical Wellness in the 21st Century I and continues to improve students' individual levels of fitness. Students are required to design and implement personal fitness programs in order to incorporate healthy components of fitness and wellbeing into their personal lives. Students will deepen their knowledge of human anatomy, exercise, physiology, diet and nutrition

ST7812	10th Grade	3 pds/cycle	.34 credit

DRIVER SAFETY EDUCATION

Driving a motor vehicle is a huge responsibility for a student. This course provides students with the knowledge needed to enter the traffic system as a vehicle operator. By assisting students with driving related decision-making, students learn to think critically and develop proper attitudes toward defensive driving. The course uses the Pennsylvania Enhanced Driver Education module and meets the state's requirement of 30 classroom instructional hours. The class includes vehicle maintenance, vehicle purchasing and automobile insurance information. This course, in combination with behind the wheel training, may enable students to receive lower insurance rates.

8397C	10th/11th/12th Grade	ONLINE	.33 credit

VISUAL ARTS

ART IN THE 21ST CENTURY I

Experience the creative process for personal enjoyment or for the pursuit of additional art courses. In context, training and practice of tools and materials in various media will jump-start students' imagination and understanding of the world around them. Areas of study include drawing, painting, graphic design, digital imaging and sculpture. Emphasis is on creative and critical thinking, problem solving and personal expression through inquiry and project based instruction.

ST6011	9th/10th Grade	6 pds/cycle	.66 credit

ART IN THE 21ST CENTURY II

This course is designed to inspire the student to build upon the skills, techniques and worldly perspective acquired in Art in the 21st Century I, and to reflect and demonstrate their abilities in a body of work for a portfolio. A wide range of materials and skills will be integrated into the curriculum through inquiry and project based instruction.

ST6021	10th Grade	6 pds/cycle	.66 credit

IB VISUAL ARTS

The IB Diploma Program visual arts course encourages students to challenge their own creative and cultural expectations and boundaries. It is a thought-provoking course in which students develop analytical skills in problem-solving and divergent thinking, while working towards technical proficiency and confidence as art-makers. In addition to exploring and comparing visual arts from different perspectives and in different contexts, students are expected to engage in, experiment with and critically reflect upon a wide range of contemporary practices and media. The course is designed for students who want to go on to study visual arts in higher education as well as for those who are seeking lifelong enrichment through visual arts.

The visual arts syllabus demonstrates a clear distinction between the course at SL and at HL, with additional assessment requirements at HL that allow for breadth and greater depth in the teaching and learning. The assessment tasks require HL students to reflect on how their own work has been influenced by exposure to other artists and for them to experiment in greater depth with additional art-making media, techniques and forms. HL students are encouraged to produce a larger body of resolved works and to demonstrate a deeper consideration of how their resolved works communicate with a potential viewer.

Requirements:

+Standard Level – No previous art experience necessary, but limited experience is helpful.
++Higher Level – Some previous high school level art experience necessary.
*Successful completion of IB Visual a Year One Standard Level a requirement
**Successful completion of IB Visual Arts Year One Higher Level a requirement

IB VISUAL ARTS STANDARD LEVEL YEAR 1+

ST6034	11th Grade	9 pds/cycle	1.0 credit

IB VISUAL ARTS STANDARD LEVEL YEAR 2*

ST6044	12th Grade	9 pds/cycle	1.0 credit

IB VISUAL ARTS HIGHER LEVEL YEAR 1++

ST6035	11th Grade	9 pds/cycle	1.0 credit

IB VISUAL ARTS HIGHER LEVEL YEAR 2**

ST4045	12th Grade	9 pds/cycle	1.0 credit

ENGINEERING AND TECHNOLOGY

FOUNDATIONS OF ENGINEERING AND TECHNOLOGY
(FORMERLY INTRODUCTION TO ENGINEERING)

This course provides an introduction to engineering and technology design processes. Students create ideas, designs, develop innovations and engineer practical solutions. It also provides students with the opportunity to apply technological concepts and processes in order to creatively solve problems and innovate designs. This course will utilize students' Mathematics and Science skills from concept to production and evaluation in all aspects of the processes.

ST7014	9th Grade	7 pds/cycle	.66 credit

STATIC MEDIA DESIGN

This course provides an in-depth look into digital media design and processes and requires students to create and use technology effectively and creatively to communicate through a variety of avenues. The course exposes students to photography, graphic design, and desktop publishing to inform, persuade, entertain, manage, and educate. The course provides a hands-on introduction to many forms of industry-standard software such as Photoshop, Illustrator, InDesign, and more.

ST7011	9th/10th Grade	6 pds/cycle	.66 credit

DYNAMIC MEDIA DESIGN

This course provides an in-depth look into digital media and processes, and requires students to create and use technology effectively and creatively to communicate through a variety of avenues. The course exposes students to video production, audio production and broadcasting for the purpose of informing, persuading, entertaining, managing and educating. The course provides a hands-on introduction to many forms of industry standard software such as Audacity, Adobe Primere, and more.

ST7012	9th/10th Grade	6 pds/cycle	.66 credit

COMPUTER PROGRAMMING JAVA

The course introduces the fundamentals of programming language, and is designed for students who have an interest in the sciences, mathematics or technologies. The course utilizes inquiry and project based instruction to introduce and develop the topics of input and output, strings, conditionals, loops, functions and procedures. The primary language of the course is Java.

ST5510	9th/10th Grade	6 pds/cycle	.66 credit

PRINCIPLES AND PRACTICES OF COMPUTER SCIENCE

This course will build on the fundamentals of computer programming by introducing intermediate concepts such as arrays, recursion and abstraction. Using a variety of object oriented languages and development environments, students will learn how to identify a need and develop an algorithm and solution that is most appropriate for the end user. Students will create mobile applications for the Android platform, as well as solutions coded in VBA as part of this course.

ST5514	9th/10th Grade	6 pds/cycle	.66 credit

ENGINEERING TECHNOLOGY

Engineering Technology will offer students the opportunity to understand and apply the knowledge and skills required to link science, technology, engineering, and mathematics together and apply it to solve problems. The course also provides students an opportunity to engage in real-world case studies and learning activities that focus on the engineering process and making the world a better place to live and work. This course will maintain a focus on how engineers apply their creativity, resourcefulness, mathematical, scientific, and technical knowledge and skills in the creation or refinement of technological products and systems. A key approach will be the use of a sequential and iterative design and development process to solve authentic engineering tasks and problems.

ST7024	9th/10th Grade	6 pds/cycle	.66 credit

IB DESIGN TECHNOLOGY

Diploma Program design technology aims to develop internationally minded people whose enhanced understanding of design and the technological world can facilitate our shared guardianship of the planet and create a better world. It focuses on analysis, design development, synthesis and evaluation. The creative tension between theory and practice is what characterizes design technology within the Diploma Program sciences group. Inquiry and problem-solving are at the heart of the subject. Diploma Program design technology requires the use of the design cycle as a tool, which provides the methodology used to structure the inquiry and analysis of problems, the development of feasible solutions, and the testing and evaluation of the solution. In Diploma Program design technology, a solution can be defined as a model, prototype, product or system that students have developed independently. Diploma Program design technology achieves a high level of design literacy by enabling students to develop critical-thinking and design skills, which they can apply in a practical context. While designing may take various forms, it will involve the selective application of knowledge within an ethical framework.

While the skills and activities of design technology are common to students at both SL and HL, students at HL are required to study additional topics and are required to meet two additional assessment criteria for internal assessment. The distinction between SL and HL is one of breadth and depth.

IB DESIGN TECHNOLOGY STANDARD LEVEL YEAR 1

ST7034	11th Grade	9 pds/cycle	1.0 credit

IB DESIGN TECHNOLOGY STANDARD LEVEL YEAR 2

ST7044	12th Grade	9 pds/cycle	1.0 credit

IB DESIGN TECHNOLOGY HIGHER LEVEL YEAR 1

ST7035	11th Grade	9 pds/cycle	1.0 credit

IB DESIGN TECHNOLOGY HIGHER LEVEL YEAR 2

ST7045	12th Grade	9 pds/cycle	1.0 credit

BUSINESS EDUCATION

IB BUSINESS AND MANAGEMENT

Business and management is a rigorous and dynamic discipline that examines business decision-making processes and how these decisions impact on and are affected by internal and external environments. It is the study of both the way in which individuals and groups interact in an organization and of the transformation of resources.

The Diploma Program business and management course is designed to develop an understanding of business theory, as well as an ability to apply business principles, practices and skills. The application of tools and techniques of analysis facilitates an appreciation of complex business activities. The course considers the diverse range of business organizations and activities and the cultural and economic context in which business operates. Emphasis is placed on strategic decision-making and day-to-day business functions of marketing, production, human resource management and finance.

Links between the topics are central to the course, and this integration promotes a holistic overview of business activity.

IB BUSINESS AND MANAGEMENT STANDARD LEVEL YEAR 1

ST7634	11th Grade	9 pds/cycle	1.0 credit

IB BUSINESS AND MANAGEMENT STANDARD LEVEL YEAR 2

ST7644	12th Grade	9 pds/cycle	1.0 credit

IB BUSINESS AND MANAGEMENT HIGHER LEVEL YEAR 1

ST7635	11th Grade	9 pds/cycle	1.0 credit

IB BUSINESS AND MANAGEMENT HIGHER LEVEL YEAR 2

ST7645	12th Grade	9 pds/cycle	1.0 credit

MUSIC EDUCATION

RECORDING STUDIO

After a thorough investigation of the song writing process, students will have the opportunity to create, perform, produce, and publish an original composition as a means of personal and communal identity. The rigorous and exploratory nature of this course can also be used to enter an International Baccalaureate music class.

RECORDING STUDIO I

ST6112	9th/10th Grade	6 pds/cycle	.66 credit

RECORDING STUDIO II

ST6122	10th Grade	6 pds/cycle	.66 credit

CONCERT CHOIR

Concert Choir is a choir of men's and women's voices. Its primary objectives are to develop the vocal instrument and sight-reading skills. Emphasis is placed on choral development through the study of the vocal anatomy (breathing, posture, vocal placement, etc.) and the sight-reading of music through the use of solfeggio syllables. Students focus on the performance of a cappella and accompanied compositions. Members are required to attend occasional evening rehearsals and all concerts. Students receive instruction on all aspects of vocal technique and sight-reading. Students will also work on particular areas of their concert music. A $50 fee may be assessed for uniforms, equipment, or transportation for students enrolled in this course. Students with financial concerns should speak to individual directors.

**Concert Choir taken during seminar only will earn 0.25 credits.

CONCERT CHOIR 9

ST6211	9th Grade	6 pds/cycle	.5 credit
ST6211S	9th Grade	3 pds/cycle (Seminar)	.25 credit

CONCERT CHOIR 10

ST6212	10th Grade	6 pds/cycle	.5 credit
ST6212S	10th Grade	3 pds/cycle (Seminar)	.25 credit

CONCERT CHOIR 11

ST6213	11th Grade	3 pds/cycle (Seminar)	.25 credit

CONCERT CHOIR 12

ST6214	12th Grade	3 pds/cycle (Seminar)	.25 credit

BLUE AND GOLD CONCERT AND MARCHING BAND

This organization will consist of members functioning together as both a concert band and marching band as determined by their respective performance schedules. Membership is open to all instrumentalists who have participated in Middle School Band, or successfully completed a required audition. All members are required to perform in all scheduled concerts, parades, football games, competitions, adjudications and other special events. In addition to the regularly scheduled band class periods, additional rehearsals outside of regular school hours are required, including Band Camp in August. This organization will include a $100 required District Activity Fee to be applied to all Band students. There may be additional fees which will be communicated to students prior to course selection.

**Marching Band taken during seminar only will earn 0.25 credits.

BLUE AND GOLD CONCERT AND MARCHING BAND 9

ST6511E	9th Grade (East Students)	6 pds/cycle	.5 credit
ST6211SE	9th Grade (East Students)	3 pds/cycle (Seminar)	.25 credit
ST6511W	9th Grade (West Students)	6 pds/cycle	.5 credit
ST6211SW	9th Grade (West Students)	3 pds/cycle (Seminar)	.25 credit

BLUE AND GOLD CONCERT AND MARCHING BAND 10

ST6512E	10th Grade (East Students)	6 pds/cycle	.5 credit
ST6212SE	10th Grade (East Students)	3 pds/cycle (Seminar)	.25 credit
ST6512W	10th Grade (West Students)	6 pds/cycle	.5 credit
ST6212SW	10th Grade (West Students)	3 pds/cycle (Seminar)	.25 credit

BLUE AND GOLD CONCERT AND MARCHING BAND 11

ST6213E	11th Grade (East Students)	3 pds/cycle (Seminar)	.25 credit
ST6213W	11th Grade (West Students)	3 pds/cycle (Seminar)	.25 credit

BLUE AND GOLD CONCERT AND MARCHING BAND 12

ST6214E	12th Grade (East Students)	3 pds/cycle (Seminar)	.25 credit
ST6214W	12th Grade (West Students)	3 pds/cycle (Seminar)	.25 credit

CHAMBER ORCHESTRA I/II

Chamber Orchestra provides committed students with an opportunity to excel and achieve higher musical goals through the development and application of skills, techniques and artistic styles in both a small ensemble and large string orchestra setting. Chamber Orchestra meets as a small ensemble 3 periods/cycle, the remaining 3 periods/cycle allows students the opportunity to play in the larger String Orchestra. Students will improve their comprehension and understanding of composition and theory, as well as gain greater depth of skill on their instrument. Orchestra members participate in two formal concerts per year (Winter and Spring), and the high school graduation ceremony. In addition, orchestra trips and competitions, and community performances may be scheduled throughout the year. Students also have the additional opportunities to participate in Vivace!, Chamber Ensemble, pit orchestra for the school musical and PMEA festivals (audition required for districts, regionals, and states). This program will include a $50 required District Activity Fee to be applied to all Orchestra students.

ST6311	9th Grade	6 pds/cycle	.5 credit
ST6312	10th Grade	6 pds/cycle	.5 credit

STRING ORCHESTRA

String Orchestra provides committed students with an opportunity to excel and achieve higher musical goals through the development and application of skills, techniques and artistic styles in an ensemble setting. In addition to the regularly scheduled String Orchestra class, individual assessment and technique lessons are required for each string student, a minimum of three times each marking period. Students will improve their comprehension and understanding of composition and theory, as well as gain greater depth of skill on their instrument. Orchestra members participate in two formal concerts per year (winter and spring), and the high school graduation ceremony. In addition, orchestra trips and competitions, and community performances may be scheduled throughout the year. Students also have the additional opportunities to participate in Vivace!, Chamber Ensemble, pit orchestra for the school musical and PMEA festivals (audition required for districts, regionals, and states). This program will include a $50 required District Activity Fee to be applied to all Orchestra students.

ST6411	9th Grade	3 pds/cycle (Seminar)	.25 credit
ST6412	10th Grade	3 pds/cycle (Seminar)	.25 credit
ST6413	11th Grade	3 pds/cycle (Seminar)	.25 credit
ST6414	12th Grade	3 pds/cycle (Seminar)	.25 credit

IB MUSIC

The Diploma Program Music course has been designed to prepare the 21st century music student for a world in which global musical cultures and industries are rapidly changing. The course is grounded in the knowledge, skills and processes associated with the study of music and offers a strengthened approach to student creativity through practical, informed and purposeful explorations of diverse musical forms, practices and contexts. The course also ensures a holistic approach to learning, with the roles of performer, creator and researcher afforded equal importance in all course components. The aims of the music course are to enable students to: explore a range of musical contexts and make links to, and between, different musical practices, conventions and forms of expression, acquire, develop and experiment with musical competencies through a range of musical practices, conventions and forms of expression, both individually and in collaboration with others and evaluate and develop critical perspectives on their own music and the work of others.

Music at higher level (HL) builds on the learning of musical competencies and challenges students to engage with the musical processes in settings of contemporary music-making. For the HL component, students plan and collaboratively create a project that draws on the competencies, skills and processes in all of the musical roles of the music course and is inspired by real-life practices of music-making.

IB MUSIC STANDARD LEVEL YEAR 1

ST6136	11th Grade	9 pds/cycle	1.0 credit

IB MUSIC STANDARD LEVEL YEAR 2

ST6137	12th Grade	9 pds/cycle	1.0 credit

IB MUSIC HIGHER LEVEL YEAR 1

ST6146	11th Grade	9 pds/cycle	1.0 credit

IB DESIGN TECHNOLOGY HIGHER LEVEL YEAR 2

ST6147	12th Grade	9 pds/cycle	1.0 credit

PATHWAYS

All students are required to take pathway courses throughout their junior and senior years.

NOTE: Senior year pathways will occur during the second and third marking periods. Seniors will report to an assigned revision period during the first marking period for the sole purpose of completing their extended essay, CAS logs, college applications and STEM Practicum Portfolio.

DESIGN ENGINEERING

DESIGN ENGINEERING I

This course provides an introduction to the field of design engineering, focusing on foundational principles, skills, and career opportunities. Students will explore the intersection of design and engineering, learning about the design process, problem-solving techniques, and the role of technology in creating innovative solutions. Through hands-on projects and real-world examples, students will develop critical thinking skills and gain insights into potential career paths in engineering.

ST7511	11th Grade (Fall Semester)	4 pds/cycle	.33 credit

DESIGN ENGINEERING II

Design Engineering II will provide a more specific focus in the chosen area of concentration from Design Engineering 1 while expanding on the planning completed in the previous semester and begin the prototyping and refining stages of the engineering and scientific processes. The course will ask students to create models of the designed solutions, experimentally test their effectiveness, analyze the data from the tests, and make revisions to the solution.

ST7512	11th Grade (Spring Semester)	4 pds/cycle	.33 credit

DESIGN ENGINEERING III

Design Engineering III will be the culmination of the engineering and scientific processes in each of the concentrations. The course will afford students the opportunity to finalize designs and construct a final product or model of the planned solution.

ST75123	12th Grade	4 pds/cycle	.34 credit

ROBOTICS

INDUSTRIAL ROBOTICS AND AUTOMATION I
(FORMERLY ROBOTICS I)

This introductory course provides students with a comprehensive overview of robotics and microcontrollers, covering fundamental concepts in electrical theory, programming, the history of robotics, modern applications, and career exploration in the field of robotic engineering. Through hands-on projects, discussions, and exploratory activities, students will develop essential skills and knowledge to understand, design, and work with robotic systems and microcontroller-based technologies.

ST7516	11th Grade (Fall Semester)	4 pds/cycle	.33 credit

INDUSTRIAL ROBOTICS AND AUTOMATION II
(FORMERLY ROBOTICS II)

This course builds on the knowledge from Industrial Robotics and Automation I to include the development of a robot that can complete more complex tasks such as increasing robot mobility and implementing manipulation equipment to have the robot interact with the environment.

ST7517	11th Grade (Spring Semester)	4 pds/cycle	.33 credit

INDUSTRIAL ROBOTICS AND AUTOMATION III
(FORMERLY ROBOTICS III)

This course probes students to further explore the limits of robotics. Students will be asked to develop robotic systems that interact with their environment at levels of autonomy beyond basic response to human command.

ST7518	12th Grade	4 pds/cycle	.34 credit

FORENSICS

FORENSICS I

Forensic Science I will introduce students to the legal process, proper isolation and documentation of a crime scene. Students will also be introduced to the basics of collection, storage and analysis of physical evidence such as but not limited to fingerprinting, fiber analysis and blood residue that may be left at a crime scene.

ST4501	11th Grade (Fall Semester)	4 pds/cycle	.33 credit

FORENSICS II

Forensic Science II builds upon the basic evidence collection and analysis skills from Forensic Science I to explore

the evidence that can be provided by the human body. This will include an overview of serology, toxicology, and entomology.

ST4502	11th Grade (Spring Semester)	4 pds/cycle	.33 credit

FORENSICS III

Forensic Science III further uses the evidence collection and analysis skills developed in Forensic Science II in order to introduce higher-level topics such as handwriting analysis, ballistics, arson, and criminal psychology.

ST4503	12th Grade	4 pds/cycle	.34 credit

BUSINESS

GLOBAL MARKETING

The Global Marketing course develops the knowledge and skills in students that are necessary when marketing products or services that have a universal demand. Marketing strategies will be explored in the process of identifying successful global product placement. Emphasis will be placed on the use of various technologies, including the use of social media as global marketing tools.

ST7612	11th Grade (Fall Semester)	4 pds/cycle	.33 credit

FINANCE

The Finance course focuses on the use of investments to increase personal wealth. It emphasizes return on investing, liquidity, risk, and the importance of diversification. Units on the stock market, fixed-income investments, and mutual funds as forms of personal and corporate investment strategies are included.

ST7613	11th Grade (Spring Semester)	4 pds/cycle	.33 credit

STEM, INC.

The STEM, Inc. course will develop students' entrepreneurial skills as they create a profitable business in partnership with the Exton Chamber of Commerce. The course provides student support along the way by local businesses and corporations as students develop their own businesses and market plans. The course will explore additional facets of business including financial plans, budgets and personnel management. All proceeds generated from STEM, Inc. will be donated to a charity of the students' choosing.

ST7614	12th Grade	4 pds/cycle	.34 credit

INFORMATION SCIENCE, SERVICES AND SYSTEMS

INFORMATION SCIENCE, SERVICES AND SYSTEMS I

Information Sciences, Services, and Systems I will introduce students to the IT development field with in-depth study in the roles of IT programmers, project managers, business analysts, and quality assurance engineers. Students will work to design software of the teacher/student's choice. Students will each fill a role of the design process with the opportunity to work with students from other pathways to develop a software application for production.

ST5631	11th Grade (Fall Semester)	4 pds/cycle	.33 credit

INFORMATION SCIENCE, SERVICES AND SYSTEMS II

Information Sciences, Services, and Systems II will continue to build upon the skills learned as well as with the design process from Information Technology I. Students will continue his/her work as a member of the design team with the opportunity to expand roles.

ST5632	11th Grade (Spring Semester)	4 pds/cycle	.33 credit

INFORMATION SCIENCE, SERVICES AND SYSTEMS III

Information Sciences, Services, and Systems III will be the culmination of the design process. This course will afford students the opportunity to finalize designs and a final product of the planned application.

ST5633	12th Grade	4 pds/cycle	.34 credit

HEALTH AND MEDICINE

HEALTH AND MEDICINE I

Health and Medicine I will expand upon student's knowledge of Biology to explore the medical applications of Biotechnology. Students will develop their critical thinking and research skills by examining the scientific method, what makes good science, and the current and potential use of Biotechnology in disease treatment and prevention. Students will also perform laboratories that use common molecular biology techniques and diagnostic tools.

ST4521	11th Grade (Fall Semester)	4 pds/cycle	.33 credit

HEALTH AND MEDICINE II

Health and Medicine II will provide a structured overview in the areas of Anatomy, Physiology, and Genetics. Students will use case studies, peer reviewed papers, and short research projects to examine current diagnostics and treatments in these areas. They will also continue to develop their critical thinking and presentation skills by identifying a specific disease, thoroughly researching what is known, creating a research plan to address the issue,

and communicating this plan to "colleagues." Students will have the option of creating cross-curricular projects with students from other Pathways Academies. Students will also perform laboratories that use common molecular biology techniques and diagnostic tools..

ST4522	11th Grade (Spring Semester)	4 pds/cycle	.33 credit

HEALTH AND MEDICINE III

Health and Medicine III will provide a structured overview in the areas of Cancer, Immunology, and Microbiology. Students will use case studies, peer reviewed papers, and short research projects to examine current diagnostics and treatments in these areas. They will have the opportunity to extend their project from H&M II or create a new one. Students will also perform microbiology laboratories that use common molecular biology techniques and diagnostic tools.

ST4523	12th Grade	4 pds/cycle	.34 credit

BIOTECHNOLOGY

BIOTECHNOLOGY I

BioTechnology I is designed for students who are interested in biological or environmental research. This course will expand upon student's knowledge of Biology to explore the expanding role of Biotechnology and Drug Discovery in modern society. Students will develop their critical thinking and research skills by examining the scientific method, what makes good science, and the ethical use of Biotechnology in scientific research and the development of new therapeutic drugs and treatments. They will also perform laboratories that use common molecular biology techniques and diagnostic tools.

ST4511	11th Grade (Fall Semester)	4 pds/cycle	.33 credit

BIOTECHNOLOGY II

BioTechnology II will provide a specific and structured research based study of the areas of Genetics, Genetics Engineering, and Environmental Sciences. Students will use case studies, peer reviewed papers, and short research projects to examine current diagnostics and treatments in Genetics. They will learn about and discuss current environmental challenges and will delve deeper into the process of genetic engineering for use in cloning, gene therapy, and drug discovery by simulating the process that scientists use. Students will also continue to hone the critical thinking and presentation skills needed to identify and define a valid problem in a pathogenic or genetic disease, thoroughly research the science, develop a plan to create a novel solution, and communicate their plan to potential "investors." They will also perform laboratories that use common molecular biology techniques and diagnostic tools.

ST4512	11th Grade (Spring Semester)	4 pds/cycle	.33 credit

BIOTECHNOLOGY III

BioTechnology III will provide a specific and structured medically based study of the area of Microbiology and other topics of class interest. Students will use case studies, peer reviewed papers, and short research projects to

examine the current level of research in these areas. They will have the opportunity to extend their project from Biotech 2 or create a new one. Students will also perform microbiology laboratories that use common molecular biology techniques and diagnostic tools.

ST4513	12th Grade	4 pds/cycle	.34 credit

IMEDIA

IMEDIA I

This course will introduce students to an overview of media systems and technologies utilized by humans to design and compose messages and information. Students will explore media systems such as graphic design, photography, video production, desktop publishing, and other selected methods for communicating information to inform, persuade, entertain, manage, and educate.

ST7411	11th Grade (Fall Semester)	4 pds/cycle	.33 credit

IMEDIA II

This course builds upon iMedia I and allows students to dive deeper into the media systems and technologies utilized by humans to design and compose messages and information. Students can choose to explore media systems such as graphic design, photography, video production, desktop publishing, and other selected methods for communicating information focusing on developing in-depth knowledge, skills, and tools.

ST7412	11th Grade (Spring Semester)	4 pds/cycle	.33 credit

IMEDIA III

This course will provide students with an opportunity to experience the design process with their own media-based project. The project will begin with a problem and media(s) of their choice. The course requires the students to investigate and research, a message through the lens of media. The research will guide students in the development of an innovative media product that incorporates appropriate uses of different media systems (graphics, desktop publishing, video, etc) as needed for the project's targeted audience and purpose. This course will culminate with a student exhibition to showcase their final media products.

ST7413	12th Grade	4 pds/cycle	.34 credit

ASSOCIATES DEGREE

In partnership with Delaware County Community College, students attending Downingtown STEM Academy have the opportunity to earn an Associate's Degree in Liberal Arts, or an Associate's Degree in Engineering. To apply, students will need to coordinate with their School Counselor. All credits earned through this program are awarded IB Higher Level weight.

STDC3Y1	11th Grade	60 pds/cycle	6.0 credits
STDC3Y2	12th Grade	60 pds/cycle	6.0 credits

STEM PRACTICUM

Each Academy culminates in the senior year with an individualized STEM Practicum in which students participate in a career exploration, independent research project or a university-accredited course. Below are the descriptions for Practicum options.

Career Exploration

Career Exploration is for students who wish to explore career opportunities in the STEM field of their choice that is not included in the traditional school curriculum. This program allows students to complete their academic requirements as well as participate in a career experience in their desired STEM field. Students may begin their Career Exploration as early as the end of their junior year. It is designed to help students simultaneously develop critical thinking while also gaining practical career skills. While participating in a Career Exploration, students will attend a partnership at an off-campus location in the community. This provides them with the opportunity to gain experience within our own community and make informed decisions regarding their future career choice in a specialized program to meet their individual needs.

Academy Independent Research Project

In conjunction with a faculty member, students who choose to complete an independent research project will select a specific topic for research in their areas of interest. A faculty member will serve as his/her advisor. This will include scheduling meeting times with the advisor, who, in turn, will assist in finding resources and opportunities for the execution of a defined project and define more completely the expectation for the quality of the final outcome that will serve as the basis for assessment of the independent research project.

Pathway College/University Course
Schedule Dependent upon Institution
College Credit to be Awarded by Institution

In partnership with local colleges/universities, the STEM Academy may offer students the opportunity to enroll in a college level course. Students participating in college coursework will receive college credit per the participating institution and Practicum recognition only. No credit for IB courses or other STEM courses will be awarded. The college establishes admittance and other criteria for participation. Students will be responsible for tuition, fees and course materials. Students should investigate the feasibility of credit transfers from partnering universities to the student's post- high school university of choice. Each university has processes, procedures and practices for accepting credits from other universities.