Flow Chart of Mathematics Courses
offered at TJHSST during 2016-2017
for Class of 2018 and younger
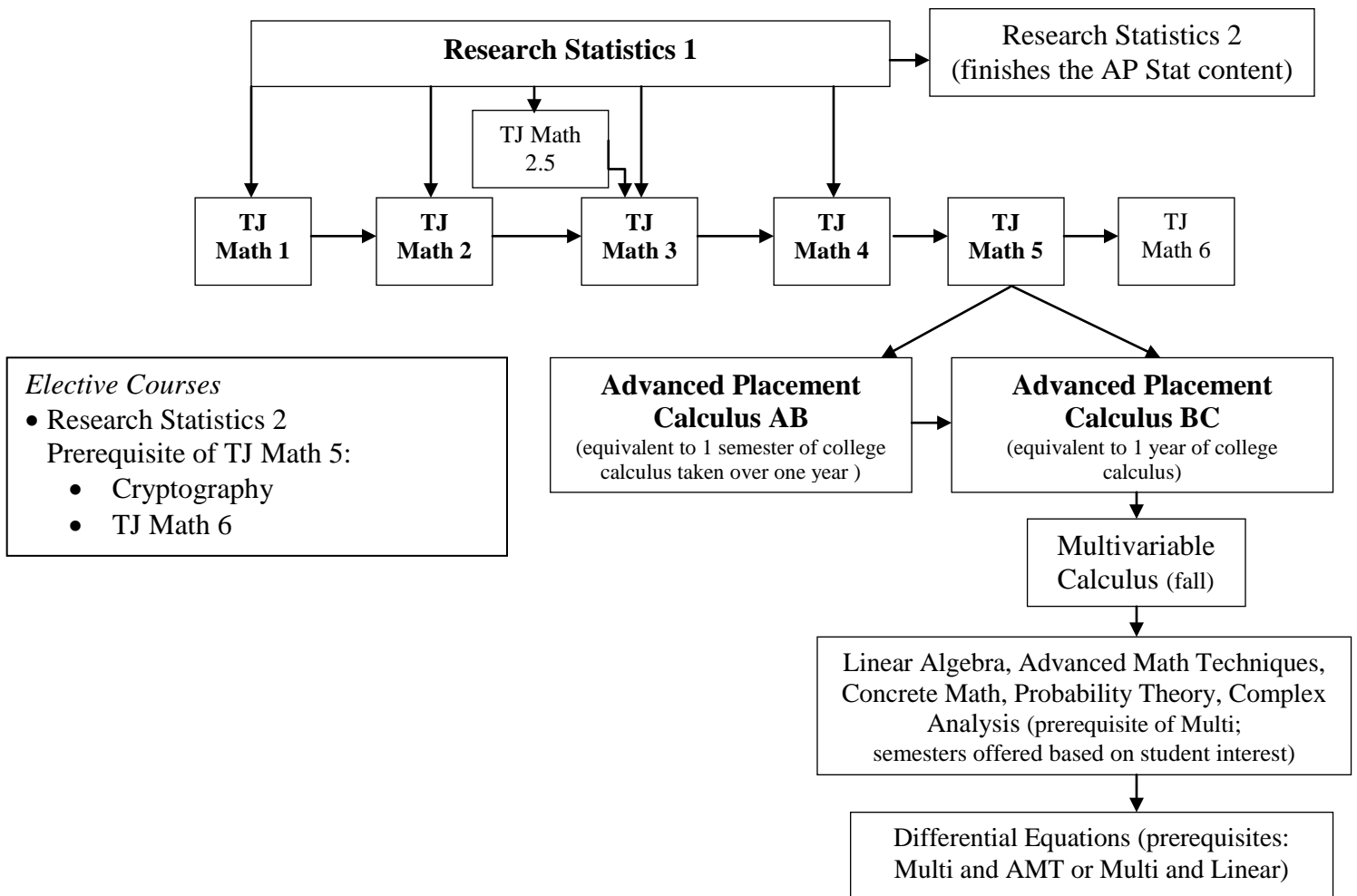### http://www.tjhsst.edu/research-academics/math-cs/math/index.html

The courses listed in bold face are the required core courses for graduation.
All other courses are Math elective courses.
Four credits of high school math beyond Algebra 1 are required for graduation.
Either AP Calculus AB or AP Calculus BC fulfills the graduation requirement.

Research Statistics 1	→	Research Statistics 2 (finishes the AP Stat content)

TJ Math 2.5

TJ Math 1	→	**TJ Math 2**	→	**TJ Math 3**	→	**TJ Math 4**	→	**TJ Math 5**	→	TJ Math 6

Elective Courses
- Research Statistics 2
  Prerequisite of TJ Math 5:
    - Cryptography
    - TJ Math 6

Advanced Placement Calculus AB (equivalent to 1 semester of college calculus taken over one year) → **Advanced Placement Calculus BC** (equivalent to 1 year of college calculus)

Multivariable Calculus (fall)

Linear Algebra, Advanced Math Techniques, Concrete Math, Probability Theory, Complex Analysis (prerequisite of Multi; semesters offered based on student interest)

Differential Equations (prerequisites: Multi and AMT or Multi and Linear)

8th period Activities and Clubs: JV and Varsity Math Team

Course Weightings:
Research Statistics, TJ Math 1 – 6, and Cryptography are semester courses weighted as Honors Courses.
AP Calculus, Research Statistics 2, and other post-AP courses are weighted as AP courses.

Graphing Calculator Information:

Geometry, Algebra II SOL exams	TI-83+, TI-84 or equivalent
AP Calculus exams	TI-83+, TI-84, TI-89 or equivalent
AP Statistics exam	TI-83+, TI-84 or equivalent

Course Title: Research Statistics 1 - <u>Unit of Credit:</u> ½, <u>Grade Level(s):</u> 9, <u>Prerequisite:</u> Algebra 1
<u>Course Description:</u>
Students study basic probability and statistics with an emphasis on applications to scientific research. Topics studied include combinatorics, probability, descriptive statistics, and statistical distributions. The course culminates with an introduction to inferential statistics and applications of t-tests. Use of technology is integrated throughout the course.

Course Title: TJ Math 1 - <u>Unit of Credit:</u> ½, <u>Grade Level(s):</u> 9, <u>Prerequisite:</u> Algebra 1
<u>Course Description:</u>
Students will study geometric topics in depth, with a focus on building critical thinking and reasoning skills. Topics of study include inductive and deductive reasoning, understanding logic statements, writing proofs, parallel and perpendicular lines and their properties, congruent triangles and similarity, properties of triangles, and quadrilaterals, circles, and ellipses. The process standard focus will be Reasoning.

Course Title: TJ Math 2 - <u>Unit of Credit:</u> ½, <u>Grade Level(s):</u> 9-10, <u>Prerequisite:</u> TJ Math 1
<u>Course Description:</u>
Students continue the study of geometric topics, with a focus on transitioning to algebraic methods for solving problems. Topics of study include transformations, right triangle trigonometry, area of polygons and circles, surface area and volume, vectors in 2D (including component form and unit vector topics), solving equations and inequalities, linear systems up to 3D, and basic matrix algebra. Use of technology is integrated throughout the course. The process standard focus will be Representation.

Course Title: TJ Math 2.5 - <u>Unit of Credit:</u> ½, <u>Grade Level(s):</u> 9-10, <u>Prerequisite:</u> Algebra 1, Geometry
<u>Course Description:</u>
This course is designed to strengthen problem solving skills using algebraic and geometric concepts previously encountered by students. An emphasis on depth, rigor, context, and metacognition will be the highest priority in the class. The goal is to have all students be able to think abstractly, integrate multiple concepts into a single problem, and consider the reasonableness of their solutions. Students will encounter familiar content in unfamiliar circumstances, and will present their results in a written and oral format. The pragmatic usage of technology is integrated throughout the course.

Course Title: TJ Math 3 - <u>Unit of Credit:</u> ½, <u>Grade Level(s):</u> 9-10, <u>Prerequisite:</u> TJ Math 2
<u>Course Description</u>
Students examine functions and relations, to include quadratics, polynomials, power and square root functions, rational functions, logarithmic and exponential functions, and conics. Students study characteristics of each family of functions, such as graph sketching, transformations, and applications. Introductory linear algebra topics, such as matrices and determinants, are introduced in relation to systems of equations and inequalities. Extensions on basic function topics include factoring techniques and the Binomial Theorem. Emphasis is on modeling, logic, and interpretation of results. The process standard focus will be Problem Solving. Graphing utilities, especially graphing calculators, are integral to the course.

Course Title: TJ Math 4 - <u>Unit of Credit:</u> ½, <u>Grade Level(s):</u> 9-11, <u>Prerequisite:</u> TJ Math 3
<u>Course Description:</u>
Students study right triangle relationships, identities and equations, the unit circle and graphing. Class includes modeling and application problems. Topics include finding values of trigonometric functions, finding exact trigonometric values of special angles in degrees and radians, finding exact angles of inverse trigonometric functions, trigonometric identities, transformations and finding domain, range, amplitude, period, and shifts, graphing inverse trigonometric functions, solving trigonometric equations and inequalities, solving practical problems using the law of sines and cosines, vectors applications, polar coordinate system, using De Moivre's theorem with complex numbers, and three-dimensional modeling and applications. The process standard focus will be Connections.

Course Title: TJ Math 5 - <u>Unit of Credit:</u> ½, <u>Grade Level(s):</u> 9-11, <u>Prerequisite:</u> TJ Math 4
<u>Course Description:</u>
The study of Advanced Functions includes an extension of topics first introduced in algebra. All parent function graphs and their transformations are a focus as well as the important features of graphs such as symmetry, concavity, extrema and end behavior. Operations on functions are studied, especially composition, and finding appropriate domains is stressed. Specific functions such as exponential and logarithmic are explored and used for graphing, solving equations, and applications. Other topics of study include sequences and series, proof by math induction, and the exploration of conic sections and their applications and an introduction to the fundamentals of calculus, including limits, continuity, and the concept of the derivative. The process standard focus will be Communication. Upon conclusion of TJ Math 5, students will be advised as to which level of AP Calculus they should take the following school year.

Course Title: TJ Math 6 - <u>Unit of Credit:</u> ½, <u>Grade Level(s):</u> 9-11, <u>Prerequisite:</u> TJ Math 5
<u>Course Description:</u>
Semester introduction to calculus providing an overview of limits, derivatives, and applications related to those topics.