**APPLIED Science & Technology (STA406) Curriculum Mapping 2018-2019**

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|  | **Topic** | **Depth** | **Time** | **Comments** Dates based on 2015-2016 |
| Intro | **Demo:** Petroleum Ether ramp |  |  |  |
| **TERM 1** | **Chapter 5**Electricity* Electrical charge
* Static Electricity & electrical conductivity
* Ohm’s law
* Circuits
* Power & electrical energy

Magnetism* Attraction & repulsion
* Magnetic field of a live wire
* Magnetic field of a solenoids
* Electromagnetic induction
 | Detailed with calculations of V=IR, and Power and Energy. | Sept (statics & electricity calculations)mid-Oct(electro-magnetism) | **Assignments:**Assignment #1 – Statics (Sept. 10)Assignment #2 – Using formulae (Sept. 18)Assignment #3 – Magnets, electromagnets & compasses (Oct. 18)Extra worksheets for in-class work**Labs/Demo:****Static & Dynamic Electricity**-Van der Graaf-Activity: Building a battery-Build circuits with light bulbs, switches and circuit boards with increasing difficultyLab #1 Circuit Board investigation (Sept. 30)Lab #2 Reading resistors lab (Oct. 6)Lab #3 Finding strength of unknown resistor. (Oct. 15)**Electromagnet demos/labs:**-Magnetic field with iron fillings.-Lab with straight line conductors & electromagnets to show compass direction and electromagnets with increasing strength-Field induction Demo**Project:** Building a Scrap Metal Collector Due end October mark 🡪 term1. (Oct 30)**Quizzes**: Quiz #1 static (Sept. 11)Quiz #2 Dynamic electricity (Oct. 3)**Tests:** Test #1 Statics (Sept 23)Test #2 Electricity & magnetism(Oct 16) |
|  | **Halloween demo : starch + metabisulfite** |
| **TERM 2** | **Chapter 14**Electrical Engineering* + Power supply
	+ Conduction, insulation & protection
	+ Typical controls
	+ Resistor colour bands
	+ Transformation of energy in a light bulb and stove element
	+ Other functions
 | Quick overview, mostly covered in Chapter 5 | End- Oct/Nov | **Assignments**:Assignment #0 - Match the symbols optional Assignment #1 – Electrical engineering (Nov. 6)**Labs:**Lab #1 Breadboard basics (Nov. 4)Lab #2 “circuits” from Tracy \* needs fixing but good, done without circuit board.Lab #3 Remote control tested with breadboards (enrichments activity)Series of labs: Start with LEDs finish with complex circuits (LED, Buzzer, etc)**Quiz** Electrical Engineering (Nov. 6)**Tests:** Electrical Engineering (Nov 14) |
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|  | **Chapter 3**Energy* Law of conservation of energy
* Energy efficiency formula
* Heat vs temp

Motion & Forces & Fluids* Force
* Type of force
* Equilibrium of two forces
* Relationship between constant speed, distance & time
* Mass & weight
* Archimedes’ principle
* Bernoulli’s principle
* Pascal’s law
 | Focus on calculations of energy efficiency.Detailed with calculations of forces and v=d/t | NovDec | **Chapter 3****Labs**:Energy Lab. Demo in lab of different types of energy. Energy effic. Lab with heating coil. optionalLab #1Build a “boat” out of aluminum foil (mid/end Nov)Lab #2 Cartesian diver (Pascal’s & Archimedes) (mid/end Nov)**Lab #3 Bernoulli –Walk behind gliders****Assignments**:Assignment #1 – Ch 3 Velocity, Force & efficiency. (Nov. 23 & 29)**Quiz**  Ch 3 Nov 24**Test** – Ch 3 only Dec 8 |
| Christmas Break |
|  | **Chapter 4**Changes in Matter* Chemical changes (combustion & oxidation)
* Methods to prevent rusting

Particle model |  | Mid Dec | **Chapter 4**Assignment #1 – Ch 4 Changes in Matter (Dec 17)**Quiz Ch 4 Dec 17****Test – did not test on Ch4 included in ch 12 test** (Jan. 15)**Labs**: Lab #1 Chemical reactions lab (Dec anytime depending on availability) |
| Mock ~ Jan 28Last week of Jan – Exam review |
| Exams |
| **TERM 3** | Technical World**Chapter 12**Materials* Constraints (deflection & shearing)
* Characteristics of mechanical properties
* Heat treatments
* Types & properties (plastics, ceramics, composites)
* Modification of properties (degradation, protection)

Manufacturing* Shaping (characteristics of drilling, tapping, threading & bending)
* Measurement & inspection (direct measurements, control, shape & position)

Graphical Language* Multiview orthogonal projection
* Functional dimensioning
* Developments
* Standards & representations
 | Very qualitative and descriptive, Do not spend too much time on “types of materials” or “manufacturing”Need a workshop to demonstrateDetailed, spend time drawing technical objects | JanCan be started before exams. | **Chapter 12****Labs & Demos:**Examples of wood, modified wood, metals, ceramics etc.Lab #1 Classification of plastics lab (optional)Plastics versus paper bag debateDrawing assignments in class, lots of practice**Assignment:**Assignment #1 – constraints & properties (Jan. 15)**Quiz** (varies in Jan if combined with ch 4 if not Feb. 20 depending on placement of midyear)**Tests** – Ch12 (end Jan. or after midyear)**Project**: Building of Windmill in shop. Done when shop is available usually March/April |
| **TERM 3** | **Chapter 13**Mechanical Engineering* Adhesion & friction of parts
* Linking of mechanical parts
* Degrees of freedom
* Guiding controls
* motion transmission & transformation systems
* Speed changes (gear ratios)
* Resisting torque & engine torque
 | Detailed on links and motion transformation and transmission and gear ratios | Feb/March(finish before break) | **Chapter 13** use bicycle as example links practical test**Assignment**– Ch 13 (March 15)**Labs:**Lab #1 Gear ratios varies \*\*\*MUST ADD MORE COMPOUND GEARS!Lab #2 Build a wind turbine + assessmentLinks Lab test (March 8)**Quiz** – Ch 13 links, degrees of freedom, gears (end Feb. early March)**Test**  – ch13 March 18**Projects:** Poster: Mouse Trap Racers need 4-5 classesDone in April while doing ch6 (mostly review from previous grades) |
|  | **Chapter 6**Lithosphere* Minerals and rocks
* Energy resources
* Contamination

Hydrosphere * + Catchment area
	+ Energy resources
 | QualitativeFocus on energy resources | March (after break)April  | **Chapter 6****Assignments**: varies according to exam info doc**Quiz** lithosphere & Mohs scale (April 13)**Test** – lithosphere & hydrosphere April 14 can be combined with Ch 7**Labs**Rock identification (optional) **Project idea (optional)**PowerPoint presentations of energy resources and/or jobs in Science.**Field trip to Aviation Museum “Let’s talk energy” April 27** |
|  | **Chapter 7**Atmosphere* Air mass
* Cold front/warm front
* Cyclone & anticyclone
* Energy resources

Space* + Solar energy flow
	+ Earth-moon system (gravitational effect)
	+ Tides and tidal energy
 | Focus on energy resources | End April | **Chapter 7**Gravitational effect and moon/tidesTidal generatorDebate on energy resources**Assignment** #1 – atmosphere (April 19)Atmospheric layers poster (optional)**Test** – atmosphere & space April 28**Demo Cloud chamber** |
|  | **Chapter 8, 10**Dynamics of Ecosystems* Disturbances
* Trophic relationships
* Primary productivity
* Material & energy flow
* Decomposers
* Chemical Recycling
* Factors that influence distribution of biomes
* Ecosystems
 | Focus on levels Energy lossReading websVery qualitative |  | **Chapter 8, 10****Depth covered depends on Exam Information document received in Feb.**Outside study (section off area of forest)Pond studyRotting log study**Owl pellets ?????**Water filter lab**Assignment**  Ecosystems (May 5)No Test  |
| **Exam** | *Lab Exam – based on Ch5**"MEES” Exam* | **3-4 weeks practice and review****3 mock exams are marked** |