SPARK Academy

Chartered Public School

Charter School Application

Submitted To: New Hampshire Department of Education

Submitted By: Spark Academy of Advanced Technologies

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(A) Mission and Vision

Mission: To empower our students with opportunities to master technical skills, both practical and theoretical, in the context of a high school and early college program that emphasizes the dignity and value of work. Students will discover an appreciation for the power of the sciences combined with an understanding of the humanities. They will develop into innovative problem solvers ready to enter the technical careers of their choice upon graduation or through further study.

Vision: To provide our students with a high school and early college education based on problem-solving, real-world experience, and a sound work ethic. They will cultivate their skills, ingenuity, and character, ready to challenge the future with confidence, courage, and curiosity.

(B) Governance, Organizational Structure, and Plan

Board of Trustees

In accordance with *RSA 194-B:5,* Spark Academy will be governed by a Board of Trustees that has general supervisory control and authority over operations of the charter school. The initial Board of Trustees will be appointed by members of the sponsoring entity, *The Founders Academy Foundation*. All additional trustees will be selected by a majority Board member vote. Board members will be trained on governance, operations, and compliance procedures outlined by The National Charter School Resource Center. Day-to-day administration of the school will be the responsibility of the Executive Director. Trustee selection by a majority Board member vote will be based on personal and professional background and a commitment to the school's mission, support, and sustainability. Trustees shall represent a diversity of stakeholders and contributors. Experience in Business Management, Finance, Fundraising, Education, or Law/ Legal work is recommended.

The Board of Trustees shall maintain up to a nine (9) member board. The greater of 25% of these Board members will be from the Spark Academy parental population. The Parent Support Committee will nominate and submit parental Board member options to the existing Board of Trustees for a majority vote selection. The Board may also establish *ex officio* board members and/or advisors who will be non-voting members of the Board

Board of Trustees Members:
- Taylor McLeod, Chair - Advanced Regenerative Manufacturing Institute (ARMI)
- Dave Gambaccini, Treasurer - Fulcrum Associates, Inc.
- Dr. Susan Huard, Secretary - Former Interim Chancellor of CCSNH
- Ann Williams - Project Management/Business Analysis, TD Bank (ret.)
- Megan Conn - Vice President of Student and Community Development at Manchester Community College
- Donna Daneke, Esq. - Summit Packaging Systems, Inc.
- Tara Brackett - Parent
- Open - Parent
- Open - Parent

Board Purpose:

The purpose of the Board of Trustees is to nurture the school through oversight of the school's mission and to maintain a forward-looking vision. It will ensure the school's ongoing ability to adapt and grow to meet the needs of its current and future students. Those seeking membership on the Board should do so intending to be active participants in service to the school's mission to its students. A knowledgeable Board is an asset to every entity. The Board of Trustees shall use available resources regarding board conduct, non-profit board laws, charter school law, and other Board responsibilities. The training may be provided by a variety of sources including online resources, legal counsel, or professional workshops. The information will be shared with new Board members after they are seated.

Board Duties:

Membership/Appointments:
- Reviewing and approving significant contracts, e.g., for facilities and benefits programs;
- Designating the Executive Committee through the election of officers;
- Selecting the Executive Director;

Meetings:
- Meeting six times with school leadership to follow the prepared agenda. (September, November, January, March, April, May,)
- Conducting two meetings of the Chair, Vice-Chair, the Executive Director and the Advisory Board to discuss school status and set the agenda for upcoming Board meetings; (October, June)
- Organizing an annual on-site visit to the school emulating the state's charter renewal visit;
- Scheduling additional Board meetings for significant matters as needed; Following state legal requirements for 24-hour prior notification;
- Ensuring consistent training, attendance, and involvement on the part of Board members;
- Conducting the annual meeting in May to approve the next year's budget and review policy;
- Overseeing its annual performance review of the Executive Director;
- Authorizing any public statements and spokespersons (Board Chair or Executive Director) relative to Board discussion, positions and decisions.

Policy:
- Establishing school legal requirements for reviewing policies annually or upon the request of the Executive Director. The Board of Trustees will adopt all required policies and follow RSA 193-A. Please see the required policies below:
    1. Records Retention pursuant to RSA 189:29-a
    2. Reporting of Suspected Abuse or Neglect, pursuant to RSA 169-C:29.
    3. Sexual Harassment, as detailed in ED 303.02 (j) and (k).
    4. Pupil Safety and Violence Protection, pursuant to RSA 193-F

     5. Limited Uses of Child Restraint Practices, pursuant to RSA 126-U

     6. Developmentally Appropriate Daily Physical Activity, pursuant to ED 310 and RSA 189:11a, V-VI.

- Conforming to NH's Right to Know Law

Finance:

- Forming the accounting and finance policy;

- Authorizing and receiving annual finance audits or reviews;

- Developing an annual financial timeline for the school, including budget development, internal financial reports, and financial reports to the state.

Community Outreach:

- Acquiring the knowledge of the total school experience needed to represent the school well to the greater community, thus providing the foundation for versatile community relations and school publicity;

- Creating a systematic fundraising plan and disseminating information to attract potential students.

Oversight/Regulatory:

- Complying with all state and federal requirements relative to oversight, legal requirements, and reporting.

- Creating a school structure that creates a safe environment for students on MCC's campus.

Advisory Board: The Board of Trustees will form an Advisory Board for Spark Academy. The Advisory Board will be composed of community leaders, business owners, and parents who will actively promote and assist the school through raising funds and strategically advising the Board of Trustees.

Executive Director

Duties of the Executive Director will include but are not limited to:

- Communication with the Board, department heads, teachers, students, parents, districts, and the public
- Staff management
- Curriculum development
- Disciplinary issues and school culture
- Human resources
- Professional development
- Operational management
- School safety
- Coordination with sending districts
- Implementation of day-to-day operations and procedures
- Presentation of reports to the Board at each official meeting including a review of all aspects of school operations and financial dashboard prepared by the business manager

• Presentation to the Board annual performance reviews of all faculty and staff. •
Relations with the NH DOE and NHBOE

(C) Methods by which trustees and their terms are determined

The terms of trustees will be staggered to profit from experienced, veteran board members
while also welcoming a diversity of opinion and fresh perspectives that new members may
offer. Trustees will be appointed for one, two, or three-year terms to establish initial staggered
terms and enhance governance stability. The Board may appoint a trustee to fill a vacancy, but
that Board member will only be allowed to serve until the original date expires. Board members
may serve consecutive terms if voted by a Board majority.

The Board of Trustees, will select and appoint future trustees by majority Board vote, define
future board terms, and vote policies for board governance. In conducting business, the Board
will follow the New Hampshire Right to Know Law, *RSA 91-A*. For purposes of lawful meetings,
official decisions will be made by a majority Board member vote. Records and meeting minutes
will be kept in accordance with statutory guidelines. The Executive Director will be a non-voting
member of the Board. Employees or relatives of employees may not become members of the
Board but may participate in ad-hoc committees.

(D) Potential Location of Facility

In accordance with *RSA 194-B:8, II*, any facility chosen will be brought up to code to comply
with all state and federal health and safety laws, rules, and regulations, including but not
limited to fire safety, HVAC, plumbing, electrical, and the requirements of *ED 321.23(u)* and *(v)*.
Upon approval of the charter by the New Hampshire Board of Education, initial trustees will
arrange facility options with Manchester Community College. At full capacity, Spark Academy
may utilize approximately 8 classrooms for their core Spark or Running Start courses with the
general goal of maintaining a student-teacher ratio of 15:1. In addition, the Manchester
Community College will provide applicable Early College classes in their facilities.

**(E) Maximum number, grade or age levels, and, as applicable, other information about pupils
to be served.**
Spark Academy will accept up to 30 students each year. Maximum enrollment at full capacity
shall be 120 students. Should the number of potential students exceed the available spots, a
blind lottery will be conducted to determine enrollment.

Spark Academy- Projected Enrollment				
Grade	**2023**	**2023**	**2024**	**2025**
9	30	30	30	30
10	30	30	30	30

11	30	30	30	30
12	14	30	30	30
Total	104	120	120	120

(F) Graduation Requirements and Learning Objectives

Graduation Requirements & Certificate or Skills Training:
Spark Academy will update graduation requirements to comply with state regulations as needed.

Content Area/Credits

Humanities	8.0
Mathematics	3.0
Physical Sciences	1.0
Biological Sciences	1.0
Physical Education	1.0
Electives	10.0
Total	**24.0**

Instructional Philosophy:

The educational philosophy of Spark Academy centers on a belief in the interrelatedness of all knowledge. While students are focusing on an experiential, project-based exposure to many technical fields, they will also be studying all areas of human history and creativity, and the connections between innovations in various fields of learning. There will be continual opportunities to seek relationships, understand common functioning principles, solve problems, come to personal conclusions, and develop new ideas.

This multi-discipline instruction is outlined in subsequent sections. (See (G) Schedule and Plan Elements, (H) Curriculum Plan, and Appendix A)

Grading Philosophy:

Our belief in dignity and the importance of hard work will govern our requirements for course completion and grading. Completion of course work will be a requirement for a good grade. Persistent and exceptional effort will be equally rewarded. "Work hard, don't give up, learn by persisting, demonstrate what you have learned."

Grading System Understandings:

A - The student has exceeded expectations as to the completion of assigned work and has demonstrated a superior knowledge of the content in a manner which challenges the scope of the course curriculum, i.e., the student's knowledge and initiative extend beyond the curriculum.

B - The student has met all expectations as to the completion of assigned work and has demonstrated a thorough knowledge of the content.

C - The student has met expectations as to the completion of assigned work, has at times struggled to complete assigned work correctly yet has persisted with that work, and is able to demonstrate sufficient knowledge of the content to progress to the next level with ongoing reinforcement.

D - The student has either (1) failed to complete assigned work or (2) struggled with content knowledge at a level which calls into question the student's ability to progress to the next level without the addition of significant tutoring.

F - The student has demonstrated an inability to persist and complete assigned work and demonstrate knowledge of content to a level which would prevent the student from moving to the next level without significant intervention and a re-taking of the course or an approved alternative.

SMART Goals for individual students:

Three goals will be established for each student entering school, based on prior achievement and standardized testing. Spark Academy strongly encourages a Learning Agreement with the individual student and parents. The three areas reviewed with the family for the establishment of student goals include:

- Personal ability
- Motivation
- Study habits, study skills, and organization

SMART goals will be annually assessed through:

- PSAT/SAT testing- After enrollment, Spark Academy students will take a placement test that will provide a base for longitude assessment. The PSAT/SAT achievement tests administered in the following years will show the progression of the students. • ALEKS ongoing assessment
- Prior student assessments
- An annual student SMART goal assessment and adjustment will take place at or near the conclusion of each semester. These goals will be based on course rubrics and standardized test results, and NH Course Level Standards.

School-Wide SMART goals:

- Spark Academy's program goals will be established as the result of data points collected when students enter the school. The patterns of need will be demonstrated through the students' prior testing and prior assessment.
- Spark Academy will adjust the course objectives based on data points • Spark Academy offers individualization of student instruction and assessment. The instructors will establish individual student goals for each course and rubrics. • Demonstrated student effort will be an

integral element of student assessment. • Course assessment will include a portfolio (especially in humanities) and content-based testing for math, science, and technology.

Methodology/Pedagogy:

• A multiple intelligence approach will be incorporated into Spark coursework wherever possible. Toward the end, experiential learning will be an integral element of the learning process, culminating in the student of advanced technologies through the MCC program and leading to certification and/or an associate's degree.

• Mathematics and science will include hand-on practices in various labs and projects to be included in portfolio assessment.

• Humanities units will always include experiential elements as students explore the impact and interconnectedness of the various human endeavors that make up the human experience. Art, literature, music, math, science, geo-political changes, and technology all culminate in a vast record of our human journey and provide the students with much latitude to explore their individual interests while developing their skills through reading, discussion, and writing.

• As students prepare to enter Manchester Community College courses, they must meet the criteria established in prerequisites where prerequisites are required. Matriculation into MCC courses will be decided on individual student preparedness and will be made on a course by course basis. PSAT and SAT testing will be used to assess individual student growth and program success in addition student assessment. Grades achieved in MCC courses will added to the student's transcript.

(G) Schedule and Plan Elements

• Curriculum studies are divided into four department studies at every grade level. The four main departments are Math, Science, Humanities and Technical Field Study. These departments incorporate both the high school curriculum that meets or exceeds NH state standards and the CCSNH courses. These department studies may also include Running Start options.

• The average school week will operate on a rotating schedule.
 1. Four school days every week will include four 90-minute block classes in the four main department studies.
 2. During one school day per week (Innovation Day), department heads will augment studies through activities, projects, community leadership sessions, and/or field trips. Department heads will regularly meet to plan integrated lessons.
 3. At every grade level, the students will be divided into two groups that will work together as a unit on various projects and activities.

School Group Schedule:

Groups	1st period	2nd period	Lunch break	3rd period	4th period
Group A	Humanities	Technical Field Study		Science	Math
Group B	Math	Humanities		Technical Field Study	Science
Group C	Science	Math		Humanities	Technical Field Study
Group D	Technical Field Study	Science		Math	Humanities

(H) Curriculum Plan:

During the initial period of research, Spark Academy consulted experts in various fields to discover how best to serve the students, parents, and community in this particular region. The basic premise of this inquiry was to create a holistic educational model for visual and kinesthetic learners that would broaden their prospective career options and encourage perseverance in worthy life pursuits. In addition, Spark Academy gained specific workforce insight from meeting regional business, trade and technical leaders, visiting other educational institutions, attending NH events (NH Tech Alliance, ARMI, Manchester and Concord Chambers of Commerce, Forum on the Future, NH MEP, Manchester Young Professionals, etc.) and reading NH publications (The Union Leader, NH Business Review, Business NH Magazine). Spark Academy will continue to utilize advisors from their areas of expertise including finance, charter school and curriculum development, trade and technical fields, etc.

Advisors for curriculum development include:

Dan Larochelle (Technical Field Study)- Manchester Community College's Department Chair for Manufacturing and Robotics

Landis Brown (Humanities)- Spark Academy Teacher

Dr. Raina Eckhardt (Math)-MCC's Mathematics Program Coordinator

Open (Science)-

Scientific Research and Resources for Choosing Curriculum:

- "*The Assessment of Knowledge in Theory and in Practice*" by Jean-Claude Falmagne (University of California) and Jean-Paul Doignon (University of Brussels).

- "*The Logic of Interdisciplinary Studies*" by Sandra Mathison and Melissa Freeman

- "*Comparing the Impacts of a Problem-based Computer-Assisted Instruction and the Direct-Interactive Teaching Method on Student Science Achievement.*" Chang, Chun-Yen *Journal of Science Education and Technology*, v10 n2 p147-53 Jun 2001

"*Abstract: Explores the effects of a Problem-based Computer-Assisted Instruction (PBCAI) on students' earth science achievement in Taiwan. One hundred and fifty-nine 10th grade students enrolled in four sections of a mandatory earth science course participated in this pretest posttest control group experiment. A significant difference was found between the instructional methods used.*"

- *Problem-Based Learning and High School Macroeconomics: A Comparative Study of Instructional Methods* Nan L. Maxwell, John R. Mergendoller and Yolanda Bellisimo The Journal of Economic Education, 2005, vol. 36, issue 4, 315-329

"*Abstract: The authors examined the potential differences between problem-based learning (PBL) and traditional instructional approaches in building knowledge of macroeconomic concepts and principles in high school students. Using data from 252 economics students at 11 high schools and controlling for individual characteristics, most notably verbal ability, they found modest evidence that, in the aggregate, PBL increased learning of macroeconomics at the high school level as compared with traditional classes. They found strong evidence of an instructional interaction with teachers such that, for some teachers, students' learning of macroeconomics increased using PBL but, for others, learning increased using more traditional instructional methods. Still other teachers saw no significant difference in learning under the two instructional strategies. The results suggest that problem-based instruction can improve student learning if instructors who are well trained in both the PBL technique and economics implement it.*"

- *Meeting Standards Through Integrated Curriculum-* Book by Susan M. Drake and Rebecca C. Burns

- "*Inquiry-Based Science Instruction—What Is It and Does it Matter? Results from a Research Synthesis*" *Journal of Research in Science Teaching, 47(4), 474-496.* Minner, D.D., Levy, A.J., and Century, J. (2010).

Early College program as outlined by Manchester Community College:

"Manchester Community College has established an Early College initiative that specifically allows NH high school students to take MCC credit-bearing courses. The credits students earn through Early College at Manchester Community College can be applied to a degree at MCC or possibly transfer to another college or University."

Mathematics:

Dr. Raina Eckhardt, Advisor

Spark Academy will utilize Manchester Community College's ALEKS mathematics program for Algebra and Geometry, both of which support the development of mathematics as determined by the New Hampshire Department of Education through correlation with the ACT College Readiness Standards. The ALEKS program aligns with Manchester Community College's Math Department standards and provides the necessary prerequisite for their Early College math classes. The Early College math classes will be taught in CCSNH classrooms by CCSNH adjuncts or professors.

Clarification outlined by ALEKS:

"ALEKS is the practical realization of Knowledge Space Theory – the result of ground-breaking research in mathematical cognitive science initiated by Professor Jean-Claude Falmagne at New York University (NYU) and the University of California, Irvine (UCI) and Professor Jean-Paul Doignon at the University of Brussels. The core mathematical theory was created between 1983 and 1992 with the financial support of several National Science Foundation (NSF) grants to Falmagne at NYU and UCI. (Learn more about the National Science Foundation at www.nsf.gov.)

Knowledge Space Theory is authoritatively set forth in Falmagne and Doignon's monograph, Knowledge Spaces, published by Springer in 1999. A brief list of key scientific research publications is available.

Other scientists joined the efforts to investigate Knowledge Space Theory, and currently more than three hundred scientific papers and several books have been published on this subject. A bibliographical database is maintained by Cord Hockemeyer at the University of Graz in Austria: http://liinwww.ira.uka.de/bibliography/Ai/knowledge.spaces.html

In 1992, Professor Falmagne obtained a large NSF grant for the development of the ALEKS educational software based on Knowledge Space Theory. To this end, he assembled at UCI a team of software engineers, cognitive scientists and mathematicians. Among them, Nicolas Thiery, Eric Cosyn and Damien Lauly are current officers of ALEKS Corporation. The Corporation was founded in 1996 by Falmagne and key members of his development team to implement, maintain, and further develop the software on the internet and make it available to K-12 and college students. The ALEKS software has been granted by UCI

to ALEKS Corporation under an exclusive, worldwide, perpetual license.

The complex educational software based on Knowledge Space Theory is capable of efficiently and accurately assessing knowledge in various disciplines, ranging from mathematics and the natural sciences to selected topics in business and the social sciences.

In contrast to standardized tests, which typically result in numerical measures of achievement or "aptitude", the outcome of an ALEKS assessment consists in (i) the precise and comprehensive delineation of an individual's competence in a subject in the form of his or her knowledge state describing all the types of problems mastered by that individual, and (ii) a comprehensive list of the topics the individual is ready to learn (referred to in Knowledge Space Theory as the outer fringe of that individual's knowledge state)."

Level One:

Integrated Math program:
(also called *Foundations for College Mathematics*-Math 090 at MCC)

This program uses web-based technology for the self-paced ALEKS program and includes Algebra and Geometry. According to the MCC course description, "Students may take this course over multiple semesters until all the concepts have been mastered."

This developmental program will be augmented through additional applied math lessons. These applied math lessons will illustrate algebraic and geometry concepts through projects and activities. Upon completion of this program, the Community College System of New Hampshire will allow the students to take dual credit math classes that will count toward both their high school and college graduation requirements.

Level Two:

Statistics: The students will enroll in Statistics or another similar course through Manchester Community College after they complete the high school Integrated Math program.

Entrepreneurship and Economics: The knowledge the students gain through studying both practical and theoretical economic structures will transition toward microeconomics and entrepreneurial skills. In this course, students will create a micro-business concept that could be feasible in a real-world setting. {Resources may include Thomas Sowell's *Basic Economics*, Booker T. Washington's *Up from Slavery*, Daniel H. Pink's *Drive,* Peter H. Diamandis' *Abundance: The Future is Better Than You Think*}

Levels Three and Four:
Students will have the option to take additional math courses through CCSNH. These Running Start or Early College courses will count toward their college certificate or associate's degree requirement. Credits necessary for graduation will be funded through Spark Academy.

Humanities :

Landis Brown, Advisor

The Humanities Program will emphasize the New Hampshire standards through the development of students' abilities to demonstrate an understanding of history as the growth of human endeavor in social, governmental, political, cultural (literature and art), mathematical, scientific, and technological terms. The skills of reading, writing, research, hands-on application, and presentation will be the cornerstones of student activity as they work to move from observation of correlation to demonstration of causality through individual, group student work, and exhibition. The interconnectedness of human endeavor will lead the students to study humanity as the sum of all its parts. The fundamental principles of research and communication will lead to greater emphasis on more advanced application of these tools as the students' progress through the Humanities Program. Students will focus on human advancements in technology and the trades through their History and English studies.

Levels One through Three:

Cycle One	Cycle Two	Cycle Three
Ancient History to the Fall of Rome Middle Ages to the Renaissance	Explorers to 1815 U.S./ NH History and Government	Modern History (U.S. History included)

English resources include:
- Edutopia
- New Tech Network (student success rate: 94% graduate high school and 83% persist in college)
- *Launch: Using Design Thinking to Boost Creativity and Bring Out the Maker in Every Student* by AJ Juliani and John Spencer
- *The Successful Highschool Writing Center* by Dawn Fels
- *A Guided Inquiry Approach to Teaching the Humanities Research Project* by R. Schmidt, E. Giordano, and G. Schmidt
- *Project-Based Writing: Teaching Writers to Manage Time and Clarify Purpose* by Liz Prather

Sample History (Cycle One) Resources for the Instructor:
- *Epic of Gilgamesh*
- *The Sumerians: The History, Culture, and Character* by Samuel Noah Kramer •

The Odyssey by Homer
- *The Histories* by Herodotus
- *I, Claudius* by Robert Graves
- *The Murder of Tutankhamen* by Bob Brier
- *Helen of Troy* by Bethany Hughes
- *Persian Fire* by Tom Holland
- *Carthage Must Be Destroyed* by Richard Miles
- *Augustus: The Life of Rome's First Emperor* by Anthony Everitt
- *Rubicon: The Last Years of the Roman Republic* by Tom Holland
- *The Fires of Vesuvius: Pompeii Lost and Found* by Mary Beard
- *Temples, Tombs & Hieroglyphs: A Popular History of Ancient Egypt* by Barbara Mertz • *Ghost on the Throne: The Death of Alexander the Great and the War for Crown and Empire* by James Room
- *The Hemlock Cup: Socrates, Athens and the Search for the for the Good Life* Bettany Hughes
- *Aeneid* by Virgil
- *Jerusalem: The Biography* by Simon Sebag Montefiore
- *The Far Traveler: The Voyages of a Viking Woman* by Nancy Marie Brown • *1066: The Year of the Conquest* by David Howarth
- *The Swerve: How the World Became Modern* by Stephen Greenblatt
- *The Vikings: A History* by Robert Ferguson
- *The Maid and the Queen: The Secret History of Joan of Arc* by Nancy Goldstone • *Queen Emma: A History of Power, Love, and Greed in 11th Century England* by Harriet O'Brien
- *Becoming Charlemagne: Europe, Bagdad, and the Empires of A.D. 800* by Jeff Sypeck • *Agincourt: The King, The Campaign, The Battle* by Juliet Barker
- *Queen of the Conqueror: The Life of Matilda, Wife of William* by Tracy Borman
- *The Troubadour's Song: The Capture and Ransom of Richard the Lionhearted* by David Boyle
- *The Norman Conquest* by Marc Morris
- *Beowulf*
- *The Time Traveler's Guide to Medieval England* by Ian Mortimer
- *The Great Mortality: An Intimate History of the Black Death* by John Kelly

Level Four:
Humanities Study
- CCSNH Humanities elective to meet associate's degree requirements, if applicable. • CCSNH Composition I (mandatory)

Science:

The Physical Science, Biology, Health and Chemistry course will be predicated upon the development of the requirements outlined by the New Hampshire Department of Education.

These courses may include Running Start or Early College options.

Level One:
  1. Physical Science
      Resources may include the following curriculum:
        • *Tillery's Physical Science*
        • *Pearson's Physical Science: Concepts in Action*
        • *Conceptual Physical Science*

  2. Chemistry
      Resources may include the following textbooks:
        • *Chemistry: A Molecular Approach* by: Nivaldo Tro, PH.D
        • *Chemistry: The Central Science*

Level Two:
  1. Biology- Resources may include *Campbell Biology*
  2. Health-
        Course topics may include:
        • First Aid and Safety
        • Prevention of Drug, Tobacco, and Alcohol Abuse
        • Nutrition and Fitness
        • Basic Hygiene
        • Environmental Health
        • Mental Health
        • Safe interactions with humans (including family, community or other
            relationships).

Level Three and Level Four: At these levels, students have the option to take additional science or other academic courses through CCSNH.

Technical Field Study:
Dan Larochelle, Department Chair

Each student will learn a trade and/technical skill and be workforce ready upon graduation. The student majority will earn both a high school diploma through Spark Academy and a certificate or an associate degree through CCSNH. If a student's chosen field does not require a certificate or associates degree, qualifications may be acquired through an apprenticeship program running parallel with Spark Academy's high school curriculum. Students must complete their trade and/or technical training before graduating from Spark Academy of Advanced Technologies. These courses may include Running Start or Early College options.

Level One:
  • Computer Aided Design (CAD): This course, a prerequisite for many technical fields, will
      incorporate both the art and computer NH high school requirements to aid
      manufacturing, construction, and other industry studies.
  • Makerspace Workshop: Spark Academy students will delve into projects involving

woodworking, laser cutting, 3-D printing, electronics and other tools.
- Coding: This course is an introduction into computer programming as a universal language.

Levels Two through Four:
Spark Academy will concentrate on Early College CCSNH courses including the following options:

Advanced Manufacturing Technology
- Advanced Manufacturing Degree
- Computer Aided Design (CAD) Certificate
- Mechatronics Certificate
- Robotics Certificate

Potential jobs in this field include:
- Automation Technician
- Engineering Technician
- Mechanical Engineering Tech
- Robotics Operator
- Manufacturing Technician
- Robotics Technician
- R&D Technician

Students may transfer to a four-year program through the Mechanical Engineering Technology, Mechatronics or Robotics CCSNH pathways.

Computer Science
- Computer Science and Innovation Degree
- Programming Certificate
- Web Programming Certificate

Potential jobs in this field include:
- Web Developer
- Software Engineer
- Networker
- Mobile App Developer
- IoT Developer
- Web Designer

Cybersecurity
- Cybersecurity Investigations Degree
- Programming Certificate
- Web Programming Certificate

Potential jobs include:

- Cybersecurity Investigator
- Intrusion Detection Specialist
- Mobile Device Data Recovery
- Network Security Specialist
- Data Recovery Specialist
- Computer Technician
- Systems Analyst
- Computer Forensic Analyst

Heating, Ventilation and Air Conditioning (HVAC)
- Heating, Ventilation and AC Degree
- Advanced HVAC Certificate
- AC & Refrigeration Certificate
- Heating Services Certificate

Potential jobs include HVAC contractors, fuel providers, mechanics, installers, etc.

Electrical Technology
- Electrical Technology Degree
- Electrical Technology Certificate

Potential jobs include:
- Electrician
- Electrical Maintenance Tech
- Electrical Research Tech
- Electrical Distribution Sales
- Electrical Relay Technician
- Electronics Troubleshooter

Welding
- Welding Technology Degree
- Welding Technology Certificate

Potential jobs include:
- Cutter
- Machine Setter
- Solderer and Brazer
- Machine Operators
- Machine Tenders
- Welder

Physical Education: Physical Education classes and events will be offered at Spark Academy. Activities (30-60 minutes a day) may include student recess, intramural sports, hikes, and field days. During the high school years, each student will participate in an annual physical assessment. In addition, Spark Academy will encourage an active lifestyle outside the classroom to enhance holistic well-being and personal responsibility.

Spark Academy will use the SHAPE America high school curriculum as a resource.

Internship Program (not required for graduation):

Level One:
- **Community Service-** Students will benefit the community with a project or activity while developing personal growth, social skills and initiative. Ideally, the students will choose a community service option that will complement their career goals and purposeful passions.

Level Two:
- **Community Service and Internship Training-** Spark Academy believes the Community Service and Internship Training opportunities will cultivate self motivated, capable individuals who will become assets to their families, their societies, and themselves.

Level Three:
- **On-Site Internships-** Students will gain pertinent work experience and constructive insight through their involvement with regional companies and businesses.

Extended Learning Opportunities (ELO): Spark Academy will offer the NHDOE standards for Extended Learning Opportunities through apprenticeships, internships, community service, independent study, online learning, etc.

Sample Outline of Block Classes for Each Department:

Block Classes:	Level One	Level Two	Level Three	Level Four
Math	Integrated Math	CCSNH Statistics*	CCSNH Course	CCSNH Course
	Applied Math (Coding)	Business Economics & Entrepreneurship	1* CCSNH Course 2*	1* CCSNH Course 2*

Humanities	History	History	History	CCSNH
	English	English	English	Composition I*
				CCSNH Humanities elective *
Science	Physical Science Chemistry	Biology CCSNH Course*	CCSNH Course* CCSNH Course*	CCSNH Course 1* CCSNH Course 2*
Technical Field Study	CAD* Coding Makerspace Workshop	CCSNH Course* CCSNH Course*	CCSNH Course 1* CCSNH Course 2*	CCSNH Course 1* CCSNH Course 2*

*CCSNH Early College Classes

(I) Achievement tests and other assessments to measure pupil goals and accomplishments

In accordance with *RSA 194-B:8 V*, Spark Academy will administer New Hampshire's current statewide standardized test as provided in *RSA 193-C*. State assessments include American Institute for Research (AIR) for Science and College Board School Day SAT for ERW and Mathematics. Spark Academy may use other supplemental testing methods such as the NorthWest Evaluation Assessments (NWEA).

Spark Academy will evaluate student achievement using a range of methods including portfolio assessments, projects and exhibitions, and oral presentations. In addition, students will fulfill prerequisite requirements for their CCSNH courses and earn transferable college credits through their technical program.

(J) Staffing Overview:

Staffing

Spark Academy is committed to recruiting staff with a diverse range of skills, teaching and administrative experience, and cultural and ethnic backgrounds. Other desired qualities and qualifications include:

- a commitment to the mission and vision of the school;
- an ability to work effectively on a team with colleagues, students, families, and community members;
- experience with a variety of instructional approaches, including project-based learning; • interest or expertise working with a diverse student population;
- a commitment to their own professional growth.

Executive Director

Qualifications:

● Meet all NH regulations for eligibility and teacher certification, preferred;

● Master's Degree from an accredited university, preferred;
● Minimum of 5 years teaching and/or school administration experience, preferred;
● Experience with administrative duties;
● Background in high school education;
● Demonstrated leadership and management experience;
● Other qualifications as the Board may find appropriate.

Duties of the Executive Director will include but are not limited to:

- Communication with the Board, department heads, teachers, students, parents, districts, and the public
- Staff management
- Curriculum development
- Disciplinary issues

- School culture
- Human resources
- Professional development
- Operational management
- School safety
- Coordination with sending districts
- Implementation of day-to-day operations and procedures
- Presentation of reports to the Board at each bi-monthly meeting to include a review of all aspects of school operations, including a financial dashboard to be prepared by the business manager;
- Presentation to the Board annual performance reviews of all faculty and staff. • Relations with the NH DOE and NHBOE

ELO Coordinator:
(Bachelor's degree in a pertinent field, preferred)

Preferred qualifications:
- Experience with websites and social media
- Involved with the community, networking and fundraising events
- Experience with high school instruction and/or leadership
- Experience with organizing parent groups

Duties of the Director of Community and Student Affairs will include:
- Community involvement, networking, and fundraising;
- Scheduling local business owners and technical/trade experts to give Leadership Presentations to the students;
- Organizing the Community Service and Internship Program;
- Planning student exhibitions, field trips, project and school activities, and oral presentations;
- Supervising the school's website and social media presence.

Faculty Department Heads/ Instructors: Mathematics, Science, Humanities, and Technical Field Study:
(Bachelor's degree in the related educational field, preferred)

In accordance with *RSA 194-B: 14 IV*, no less than 50% of teachers employed by the school will have New Hampshire teaching certificates or have three years teaching as required by New Hampshire Charter School statute. Spark Academy anticipates that many of the instructors will also be MCC faculty or adjuncts.

Preferred qualifications for positional duties:
- Experience with coordinating and presenting student lesson plans, activities, and projects;
- Proficiency in formulating a cohesive educational goal for each student; • Experience teaching in their designated department and/or proof of knowledge in the subject they will teach:

- Possessing skills for collaboration with CCSNH adjuncts and professors over curriculum and other objectives.
- Bachelor's Degree and NH Department of Education Certification: preferred • Evidence of lifelong learning
- Flexibility regarding the need to develop new skills and content standards • Evidence of involvement in creative/inventive endeavors
- Willingness to join a dynamic learning community focused on the mission and purpose as stated in school documents.
- Expressed versatility with respect to the tasks needed to foster a continuing cycle of institutional and personal improvement
- The ability to serve as a good role model to the students

Guidance Counselor:

Spark Academy will hire a Guidance Counselor who has gained experience in school counseling and has met NH standards for this field.

Preferred qualifications and experiences may include:
- Teaching in a classroom;
- Demonstrating skills in partnering with families;
- Demonstrating effective written and oral communication;
- Meeting the needs of a diverse student population;
- Adhering to a high level of professional and ethical standards.

Spark Academy will accommodate the IDEA and CCSNH Special Education standards and meet with the sending districts to coordinate pathways for SPED services. Faculty may receive ongoing professional development training in pedagogy, assessment, IEP implementation, and classroom management from the Executive Director and the Guidance Counselor.

Additional pertinent faculty and staff will be added as needed. Spark Academy sets a goal of one teacher for each classroom. Spark Academy will conduct school employee and volunteer background investigations in accordance with RSA 189:13-a.

Resources for Faculty and Staff training in best practices will include:
- Charlotte Danielson's Framework for Teaching
- "Teach Like a Champion" by Doug Lemov

(K) Personnel Compensation Plan

Salary

The Executive Director, Teachers, and Administrative Staff of Spark Academy will be paid a salary. The salaries of full-time or part-time personnel shall be paid on a bi-weekly basis. Part time employees can be paid on an hourly rate or monthly rate, whichever is deemed appropriate by the Executive Director. All independent contractors, whether full-time or part

time, will be paid on fixed price contracts based on negotiated rates. See budget for salary expectations.

Vacation and Sick Leave

Spark Academy will publish an annual calendar of holidays and vacations during which the School will officially be closed. The calendar will generally coincide with the school district where the Spark Academy facility shall reside. Full-time employees will also receive a maximum of ten days of paid time off per year. Time off must be used during the school year in which they are accrued and may not roll over or accumulate. Spark Academy does not differentiate between personal leave and sick time. Employees may use the 10 days at their discretion and according to the handbook. Personal business is officially defined as something that cannot be done at any time other than a school day, during school hours or used to care for family members who are ill. No justification is required for the paid ten-day benefit.

The Director may require an employee to verify the claimed reason for any absence and the employee shall be obligated to verify the claim with an official Doctor's note if absences exceed ten days and impact school hours of operation. These additional absences will be unpaid.

Spark Academy intends to participate in an official 401k retirement plan. Participation in a retirement program is subject to availability and cost. The school will strive to provide matching funds, but this will be determined by available funding and budgetary restrictions.

(L) Pupil Transportation

Spark Academy will comply with charter law provisions that govern student transportation under *Section 194-B:2,* which states:

"Attendance at a chartered public school for the purposes of transportation shall not constitute assignment under the provisions of RSA 189:6 and RSA 189:8. Pupils who reside in the school district in which the chartered public school is located shall be provided transportation to that school by the district on the same terms and conditions as provided for non-chartered public schools in the district and utilizing the same regular bus schedules and routes that are provided to pupils attending non-chartered public schools within that district."

Students attending the charter school who reside in the host school district shall ride direct transportation.

"For the purposes of open enrollment, neither the sending nor the receiving school district shall be obligated to provide transportation services for pupils attending an open enrollment school outside the pupil's resident district. No transportation will be provided by a sending school district or receiving charter school for students whose residence is other than where the school program is located."

Spark Academy anticipates that students will come from many different communities around New Hampshire. We will help to assist parents and students who wish to coordinate personal transportation from outside the district in which the charter school is located.

Additional CCSNH Early College classes or Extended Learning Opportunities (not mandatory) may be offered outside Spark Academy's regular school schedule. In those particular cases, the students will be responsible for their own transportation. However, Spark Academy will work with CCSNH to coordinate feasible Early College class schedules for Spark Academy's students. Spark Academy may partner with the sending school districts for extracurricular activities and allow for early release for these activities.

For further clarification on pupil transportation, see p.29 **(S) School Calendar arrangement and the number and duration of days pupils are to be served pursuant to RSA 194-B:8, III**.

(M) Statement of Assurances Related to Non-discrimination

Spark Academy will not discriminate on the basis of race, color, religion, national or ethnic origin, age, sex, sexual orientation, gender identify, disability, socio-economic or marital status in the selection of students or staff or in the administration of the school or in any other way that is prohibited by law. The Board of Trustees will develop and adopt a policy of open acceptance and will create administrative procedures to address any discriminatory concerns. Spark Academy will comply with the federal discrimination law as stated in Title IX by the U.S. Department of Education's Office for Civil Rights. The CCSNH will also adhere to the following non-discrimination standards for their Early College program:

- Title VI and VII of the Civil Rights Act of 1964
- The Age of Discrimination Act of 1967 (ADEA)
- Title IX of the Education Amendment of 1972
- Section 504 of the Rehabilitation Act of 1973
- The Americans with Disabilities Act of 1990 (ADA)
- Section 402 of the Vietnam Era Veteran's Readjustment Assistance Act of 1974 • NH Law Against Discrimination (RSA 354-A)

(N) Method of Coordinating with a Pupil's Local Education Agency (LEA) for Matters Pertaining to Special Education Programs or Services

As a state authorized open enrollment school, Spark Academy will accept applications from any student who is a New Hampshire resident. In accordance with New Hampshire law *RSA 194-B:8*, Spark Academy will not discriminate against any student with a disability as defined in RSA 186-C. Under New Hampshire's charter school statute, *RSA 194-B:11, III*, when a child with disabilities attends a chartered public school, all current options available to the parent and the school district are retained. Spark Academy will operate in compliance with all state and federal laws.

Pursuant to *RSA 194-B:11, III*, the decision-making responsibility for the special education process for children with disabilities attending a public charter school, remains with the students' sending school districts. Spark Academy's Special Education Coordinator will work with the students' Local Education Agencies (LEA) to foster the highest level of effectiveness and collaboration for the benefit of the students. In addition, *RSA 194-B:11, III* provides that the

sending school districts remain responsible for the funding for children with disabilities attending a chartered public school. Spark Academy will work closely with each student's LEA to ensure a smooth transition and will review all documentation pertaining to the individual student's educational needs. In the event that a student comes with a 504 Accommodation Plan or an Individualized Education Plan, the Executive Director or designated staff, will meet with the LEA's special education team at scheduled meetings to review and adjust educational goals. The sending district will be required to provide the school with a complete copy of each student's IEP for implementation and monitoring purposes.

See section (J) for more details concerning the Guidance Counselor and plans.

(O) Admission and Enrollment Policy and Procedures

Spark Academy is committed to building a strong and diverse community of students and teachers. Admission to the charter school shall be open to any student who resides in the State of New Hampshire. Methods of admission shall not be designed, intended or used to discriminate or violate individual rights in any manner prohibited by law. For the success of the school and its students, Spark Academy will help educate prospective families on the benefits and challenges of attending a public charter school. Spark Academy will hold multiple, pre enrollment information sessions, in an effort to allow prospective families to learn more about the school and the public charter school experience.

Admission Procedures:

Spark Academy will follow the basic method of admissions that defines charter schools nationwide:
Admission shall be blind; Should the number of applicants exceed capacity, students will be chosen by a lottery system, with a wait list developed from the lottery overflow.

Admissions Process Overview

Prospective students and their families will be strongly encouraged to attend at least one informational meeting at which our educational approach and school expectations of students and their families will be explained, prior to enrollment;

Spark Academy will produce application packets for prospective students about the school, its philosophy and expectations of attending students, their families. These and other student related policies will be posted and available to the public, online;

Parents will be asked to sign an agreement indicating their understanding of the School's Mission, and other expectations as part of the admission process;

Interested families will submit their application;

A committee will review applications for completeness;

Should applicants exceed the number of spaces available, a blind lottery, organized by grade and will be held. Those not accepted in the lottery will be placed on a waiting list in the order

determined by the lottery;

All accepted students will receive notification. Those who have been wait-listed will be notified;

Soon after the enrollment process is complete, Spark Academy will hold meetings for admitted students and their families and provide an orientation for students and families.

Completed applications received after deadline will be added to the waitlist according to timestamp requirements.

Enrollment Provisions

Spark Academy *will* offer automatic re-enrollment to its students. Families will be asked to sign a letter of intent to re-enroll by a stated date preceding the lottery.

Spark Academy will admit students from the wait-list should space become available after the lottery.

Siblings of children already enrolled at the school will be exempt from lottery, space permitting.

The Board reserves the right to give preference in enrollment to the children of Spark Academy's and Manchester Community College's faculty and staff and Spark Academy's Board of Trustee members.

Spark Academy will reserve up to five spots for the children of Spark Academy's and Manchester Community College's faculty and staff.

(P) Philosophy of student governance and discipline, and age-appropriate due process procedures to be used for disciplinary matters including suspension and expulsion. Commitment to conflict mediation and dispute resolution

This school's philosophy of student discipline is built upon the origin of the word that includes learning and understanding to establish the order needed to achieve our goals.

The school's rules exist for a variety of reasons:
- to fulfill legal requirements
- to maintain a safe environment
- to establish ethical standards
- to develop respectful atmosphere
- to create order for the attainment of our core purpose to educate

The thoughtful establishment of rules and thorough explanation of those rules is intended to provide the basis upon which our students will become more self-disciplined and incorporate leadership into that self-discipline.

Since we strive to provide an academically appropriate and challenging environment, Spark Academy will build the pillars of respect, responsibility, and achievement in all we do. Student government will be empowered to develop a code of student conduct stemming from these pillars and will be asked to join the administration and faculty in recommending program based

on these pillars to educate all students. Students will not be asked to adjudicate disciplinary matters, but through student government, will be invited to share the perspectives of the student body with the administration. In this manner, students will always have an opportunity to inform the administration as to the way discipline is understood by the students. If our goal is to develop understanding through discipline, we must always invite our students to respond to our actions.

While it is true that some transgressions are of an egregious nature requiring just consequences, it is our belief that most behaviors may become opportunities to help our students learn the importance of their individual actions.

For several reasons, Spark Academy does not punish its students with suspension for infractions and violations of the school code of conduct or of the rules of the school.

1. Studies have shown that school suspensions harm both the suspended students and those who have not been suspended. A punitive school environment and the missing of classes by some students are harmful to all students.
2. Suspensions are punishments not related to a violation. Spark believes in consequences related to the violation, not punishments. For instance, a student who steals or destroys an object belonging to the school or to another student would apologize to those who have been harmed and replace the object.
3. Consequences have a healing effect on all stakeholders involved in a violation or infraction, through apologies and making amends. Suspensions do not.

Spark Academy does reserve the right to remove a student from school on the basis of the student's own health and safety or the health and safety of others. When this happens, it is not considered to be a punishment, however, but a necessary measure to restore order. The student sent home, may or may not receive consequences for his actions upon his return to school. But the home interval is a necessity, not a punishment.

Philosophy of discipline:
All too often students become the object of a teacher's attention due to behavioral issues. Far less frequently do we provide our students with attention for positive behavior and achievement. For this reason, Spark Academy promotes an atmosphere of positive and restorative reinforcement as the foundation for the personal discipline we wish to engender in our students. While a positive atmosphere cannot preclude all behavioral issues, it can do much to reduce behavioral problems while encouraging students to be their best.
To the extent possible, negative student behavior will be addressed privately with the student, though in some cases, this is not possible as in incidents of major disruption or dangerous behavior.
The general premise for Spark Academy's approach to negative student behavior will be to address problem behavior privately while praising positive behavior publicly, thus sparing the student public embarrassment while providing public and esteem-building public praise. The venue for public praise may simply involve acknowledgement of positive behavior before a student's peers in class or at school-wide activities/events. The process of establishing and maintaining positive classroom and school-wide discipline: teachers

and administrators promote a positive school atmosphere by providing positive reinforcement for positive behavior and promoting achievement as an ongoing objective for lesson planning and in all interactions with the students.

Addressing negative student behavior:

• Discipline issues often begin with lesser infractions which, when unaddressed, become greater issues.

• When lesser negative behaviors occur, i.e., tardiness, speaking/acting in a manner incongruent with school/class activities, the behaviors will be addressed through private discussion with the student by removing him or her from peers just outside the classroom or after class so that the student is not humiliated by teacher direction.

• Chronic problem behavior and/or more significant behavioral issues will be addressed after consultation with the director who will meet with the student to attempt resolution. This meeting may result in an improvement plan with the student who will, at that time, become accountable with the director regarding his or her behavior. For lesser transgressions, parents will not be contacted so as to work toward building self-control and self-discipline in the student. This is an age-appropriate approach for lesser transgressions.

• Should the student fail to meet the expectations established in the improvement plan, parents will be contacted for reinforcement from home so as to assist the school in its efforts. Sanctions may be imposed with the student depending upon the nature of the problem behavior and the extent to which the improvement plan has not been followed.

• Should the student continue to demonstrate problem behavior, a meeting with the parents/guardians will be required. Should the parents/guardians refuse to meet, the student will receive greater sanctions, i.e., restriction from school activities and school-related service. The parents/guardians may be required to withdraw the student from the school as refusal to meet with the director will constitute failure on the part of the parents/guardians to support the school's mission and purpose.

• As our students will rely heavily on bus transportation and as many parents do not have the ability to take students home from school, detention will not be employed.

• Resolution of problem behavior will always result in a student's full ability to continue without any stigma. The ability to begin anew in integral to making discipline a matter of finding teachable moments and thus leading to the true development of the student's self-discipline.

• Dangerous behaviors will result in the contacting of law enforcement and the appropriate documentation. For these behaviors, the school will follow all mandated legal requirements.

Spark Academy will comply with all state-reporting requirements. As part of its discipline procedures, Spark Academy plans to adopt (among others as required) policies on:

• Student Due Process, according to RSA 193:13, that will be printed in the Student Handbook, according to RSA 189:15;

• Assault, defined in RSA 362, which may include a necessity for a student to leave school for a period not exceeding 10 days and notification to the Chairman of the Board of Trustees;

• Child Restraint, which will be adopted in accordance with Section Ed 1113.04,

Ed 1114.07 and RSA 126-U;
  • Anti-Bullying and Cyberbullying, in accordance with RSA-193F.

(Q) Method of administering fiscal accounts and reporting, including a provision requiring fiscal audits and reports to be performed by an independent certified public accountant.

Spark Academy will follow NH public school accounting guidelines and will put in place internal accounting controls necessary to safeguard its assets and to prevent and detect financial statement misstatements. The School will maintain accurate financial records in accordance with Generally Accepted Accounting Principles (GAAP) for non-profit corporations. A bookkeeper will provide a financial report at every official Board meeting. An annual audit will be conducted by an independent certified public accountant according to state requirements.

The Board of Trustees will appoint a Treasurer to provide the oversight necessary for monitoring the financial status of the School. The Treasurer shall report the financial status of the School to the Board of Trustees at the regularly scheduled board meetings. The Board shall also adopt policies for the financial management of the School, including policies on conflicts of interest for Board members, Administration, and Faculty.

The Board will approve accounting policies and internal controls and procedures to be followed by all employees, contractors and Board members to ensure the proper tracking and use of school funds. A general account will be set up for the administration of funds, and the Treasurer and named members of the Board of Trustees will have check-writing authority. Each individual with check-writing authority will be covered by a fidelity bond in accordance with the guidelines of the New Hampshire Department of Revenue Administration.

Except for emergency purchases approved by the School's authorized personnel (up to a maximum to be established by the Board of Trustees), all expenditures and contracts will be handled through an approved system of internal control and procedures for status of account balances.

The accounting will be handled by a bookkeeper approved by the Foundation. The Foundation will assist with all items related to budgeting, accounts payable, accounts receivable, and audit preparation.

Annual Audit
Spark Academy will comply with all required reporting requirements specified in NH charter school section, (RSA 194-B:10, I-V). Section 194-B:10, I-V requires that all public charter schools issue an annual report, perform annual financial audits, program audits, and participate during the annual school budget process. The School will also comply with all requirements set forth in ED 318.07 regarding the contents of its annual report.

As required by law, the annual report will be provided to the State Board of Education and any person who requests it. In addition, a summary version of the annual report and periodic reports will be made available to the parent or guardian of each student and the public via electronic access. The Board will select an external, independent audit firm to complete the

required annual audit and report. The audit will address accounting practices and review the School's internal controls. The audit will be conducted in accordance with applicable generally accepted accounting principles. It is anticipated that the annual audit will be completed within a timely manner and meet the deadline of the Department of Education. The administration and Board of Trustees will review and respond to the audit report and management letter, if necessary, and include the audit results in its annual report.

(R) Annual budget, including all sources of funding (also include a proposed five-year budget containing revenue and expenditures).

Spark Academy will use the state's charter school per pupil aid as a basis for shaping its own budget. Spark Academy will apply for a federal charter school startup grant which will be used in accordance with U.S. DOE guidelines pertaining to proper charter school startup expenditures.

The Spark Academy Foundation recognizes that the financial sustainability of a charter school requires a long-term fiscal plan, especially after the expiration of the federal grant. The Spark Academy Foundation is committed to working with the Board of Trustees to seek a diverse portfolio of revenue sources to establish and guarantee long-term fiscal sustainability. Enclosed to this application in Appendix B is the proposed 5-year annual budget plan for the school outlining the use of budget and startup grant, as well as donated funds.

Fiscal Issues

The Executive Director will work closely with the Treasurer and bookkeeper to review the new budget. Spark Academy Board of Trustees will review and approve each budget prior to each fiscal year. Annual budgets will contain adequate reserves and will be submitted to the appropriate State Offices, and any other entities as required by law.

Spark Academy may receive funding in accordance with NH State and Federal law and will opt to receive funding directly from the State. These funds may include, but are not limited to, general purpose block grants, categorical block and non-block grants; charter school funding from the New Hampshire Department of Education, the federal government or other sources; and any other available or mutually agreeable sources of funding for programs. Spark Academy expects that any funds received by the charter authorizer and due to the school will be forwarded to Spark Academy in a timely fashion.

(S) School calendar arrangement and the number and duration of days pupils are to be served pursuant to RSA 194-B:8, III

Spark Academy will follow, at a minimum, a 180-day school year in accordance with the *RSA 194-B:8, III*. Spark Academy may allow students to complete "blizzard bags" when necessary. Spark Academy will follow the calendar of the district in which the charter school is located as closely as possible to best coordinate transportation services and better serve multi-student households. It is expected that days will begin at approximately 8:00 am and end at 3:00 pm, though some flexibility may be required to meet our host district's bus route schedule.

Early College classes are separate from Spark Academy and will follow CCSNH protocol. However, Spark Academy will make necessary travel arrangements for Manchester students through the Manchester School District when the Early College classes are required for high school graduation but deviate from the regular Spark Academy schedule. The Manchester school district has already set a precedent working with the local charter schools on this particular issue. When a charter school must operate outside the regular Manchester school district schedule, that charter school can arrange to pay for additional transportation. These arrangements include charter school field trips and other ELO activities.

The core Spark and Running Start classes required for high school graduation will align with the Manchester School District schedule. All first-level and second-level classes will follow this schedule. Spark Academy is working with MCC to create an Early College class schedule that fits inside Spark Academy's schedule perimeters. MCC has the flexibility to accommodate this schedule. A lull of class activity currently exists in MCC's afternoon schedule. For the convenience of both MCC and Spark Academy, the Early College classes for Spark students can occur during this specific interval.

When the Spark Academy schedule differs from the MCC schedule, the Spark students can use that time for projects at Spark Academy, internships or other Extended Learning Opportunities (ELO). Spark Academy anticipates these schedule gaps for some third-level and all fourth-level classes. During these schedule gaps, Spark students can utilize their learned skills through Spark Academy's partnerships with the community and local businesses.

(T) Provision for Evidence of Adequate Insurance Coverage

Pursuant to *RSA 194-B:1*, Spark Academy will be a public school afforded the same protections as all other public schools under *RSA 507(b)*, which provides for limited general liability for the charter school and its agents. The Board will procure and provide evidence of adequate insurance coverage as required by the State, including but not limited to general liability for the School, workman's compensation, board errors and omissions, and faculty coverage. The insurance program will be in place as the first Board of Trustees begins its duties.

(U) Identity of Consultants to be Used for Various Services

During the period of startup and development, Spark Academy may require tasks addressed and conducted by specialists in certain fields. However, no consultants have been identified at this time. Spark Academy anticipates contracting with an individual or company that provides services such as computer IT setup, school guidance & counseling, special education, and school health. As enrollment grows, Spark Academy believes that some of these positions may become permanent employees. While we cannot identify any particular contract at the time of this application, all candidates will be required to show sufficient evidence of past experience and expertise in the specified role, including, but not limited to formal education in the specified field, work history and references.

(V) Philosophy of parent involvement and related plans and procedures

Charter schools are schools of choice for parents and their children. Parental support and participation are key to the success of a charter school. Spark Academy of Advanced Technologies welcomes parental participation in several forms.

Parents may serve in several different capacities:
- A minimum of twenty-five percent of the Spark Academy Board of Trustees will include parent members. The Board of Trustees will select these members within the first year of the school's initial opening. (See Board Governance, p.5)

- A parent support committee will meet on a monthly basis to discuss different ways parents can be involved. The Board will announce its meetings and the parents who attend will participate in creating its structure. Subcommittees will meet the needs of the school in various areas as enumerated above. Ideal voting membership is a minimum of one parent per level minimum. A parent Board member will chair the committee.

Parent Support Committee

Parents are an integral part of Spark Academy. Without their input and help, the school will not reach its potential.

The Director will ask a parent Board Member to assume responsibility for forming a Committee to help the school in many ways:
- Nominate parents to membership on the Board.
- Sending a notice to the parental population when parent seats become available.
- Share responsibility with the Board and administration for the Annual Fund. Spark will be operating on a fiscally responsible budget and will need parents to help with certain operating expenses and supplies through Annual Fund.
- Organize special events for teachers and parents, such as a talk by an expert on maximizing home and school study skills.
- Organize special events for students, such as a Fall Festival, parties and dances, etc.
- Work with the administration developing a parent list to substitute for absent teachers. This is crucial to the effective functioning of the school, which will have scarce funds to pay for professional substitutes.
- Develop surveys for parent feedback with administration.
- Share ideas for school improvement and safety procedures. Spark will welcome all constructive suggestions.
- Create other ideas and activities for the Committee, according to interests and needs.
- Committee will serve until the end of each school year.

Parent volunteers are needed in many important areas: development of the annual fund, participation in special activities such as school field days and trips. Parents will also play a part

in maintaining a friendly, constructive relationship between Spark Academy and New Hampshire's Community College System.

(W) A plan to develop and disseminate information to assist parents and pupils with decision-making about their choice of school.

To ensure that all residents have an equal opportunity to apply to Spark Academy, an extensive and widely broadcast marketing effort will be initiated. Information will be widely broadcast through newspapers, websites, libraries and other public places and social media to ensure that families are aware of Spark Academy as a choice available to them. As students from lower income or minority families may suffer disproportionately due to a lack of access to technology or to an advanced curriculum, attention will be paid to reaching those students through their schools, communities, and other public services to ensure their families are aware of Spark Academy as a choice available to them.

Information will be disseminated through bulletins, advisories, social media and posting on informational websites. Materials for a major informational outreach program will be disseminated to public school administrators, school personnel, parents, businesses, and foundations. Spark Academy will develop informational brochures describing the school, its mission, its approach to education, and the expectations and opportunities the program hopes to provide. Informational brochures may be distributed to businesses, parents, residents, and school faculty by appropriate means.

Strategy for Student Recruitment:

Charter schools in New Hampshire are public schools that are open to all New Hampshire students. They admit students on a first-come-first-serve basis, creating a lottery for later applying applicants. Therefore, the strategy for recruitment must be to spread the word about Spark Academy widely and allow interested students to come to us.

There will be advertisements in all the Manchester area local newspapers, announcing the opening of Spark Academy in September 2019.

Spark will have an application on its web site, www.SparkAcademyNH.org, that may be processed on-line.

Spark has a Facebook page, which interested applicants and their parents may join.

Ads will be placed in local papers announcing these sessions. There will also be notifications on Facebook and the web site.

Every effort will be made to disseminate the news of Spark's existence as widely as possible, with visits to every neighborhood in Manchester and every town in the surrounding area.

(X) Global Hold Harmless Clause

In accordance with *RSA 194-B: 3, II(x)*, Spark Academy, its successors, and assigns, covenants and agrees at all times to indemnify and hold harmless any other school district which sends its students to the charter school, and their school boards, officers, directors, agents, employees, all funding districts and sources, and their successors and assigns, (the "indemnified parties") from any and all claims, demands, actions and causes of action, whether in law or in equity, and all damages, costs, losses, and expenses, including but not limited to reasonable attorneys' fees and legal costs, for any action or inaction of the charter school, its board, officers, employees, agents, representatives, contractors, guests and invitees, or pupils.

(Y) Severability provisions and statement of assurance that any provision of the charter school contract found by competent authority to be contrary to applicable law, rule, or regulation shall not be enforceable.

If any part of the charter contract is determined to be invalid or illegal by a court of competent jurisdiction, such invalidation or illegality shall not affect the remaining portions of the charter contract, which shall remain in full force and effect. Any provision of the charter school contract found by competent authority to be contrary to applicable law, rule, or regulation shall not be enforceable.

(Z) Provision for Dissolution of the Charter School Including Disposition of its Assets

Should Spark Academy cease operation or have its charter revoked by its authorizer, the Board shall consult with an attorney and the Department of Education to assure that contractual and financial obligations are met. Upon the dissolution of the School, the assets remaining after the payment of all its liabilities, and the return of any loaned items to rightful owners, shall be distributed to such organizations or organizations operated exclusively for charitable or educational purposes that qualify as an exempt organization within the meaning of 501(c)(3) of the Internal Revenue code.

(AA) In the case of the conversion of a public school to a charter conversion school.

NOT APPLICABLE

(BB) A plan for the education of the school's pupils after the charter school may cease operation.

A plan for each student's continued education, should the school cease to exist, will be determined individually with each student and his/her parent or legal guardian. Likely options would be 1) reintegration into the student's assigned public school, 2) application to a different chartered public school, if available, or 3) other available options based on parent and student priorities. Upon cessation of operation, the records of all the students would be transferred in a timely manner to the receiving school, and the staff and trustees would work with the receiving

school, parents, and students to assure smooth and timely transitions.

(CC) In addition to an application, each charter school applicant, in consultation with the local school board, shall prepare a proposed contract.

NOT APPLICABLE

(DD) An outline of the proposed accountability plan which clarifies expectations for evaluating the school's program and which contains an acknowledgement that a full accountability plan shall be developed and ready to implement prior to the date of opening

- Annual Progress Report -according to the NH educational requirements outlined in RSA 194-B:10, I and II, this report will answer the following key questions:
    1. Is the charter school making progress toward achieving its mission?
    2. Is the charter school responsibly using public funds?
    3. Is the charter school promoting student attainment of expected knowledge and skills?
    4. Is the school sustainable?
- Board minutes-These minutes will follow the guidelines from the Right-to-Know Law, RSA 91-A:2 and RSA 91-A:3, II.
- Certificate of Insurance Coverage- Spark Academy will outline evidence following NH standards, RSA 194-B:3, II (t)
- Certificate of Occupancy for School Facility and Fire & Life Safety Inspection -This certificate and inspection will be obtained by the Fire Department and NH Division of Fire Safety.
- Health Inspection Report (submitted per state requirements)-The local Town Health Officer will conduct the school inspection.
- Independent Financial Audit - The NH DOE Audit Department will review this audit. •
Quarterly Financial Report -submitted per state requirements.

Spark Academy will develop all required policies prior to opening, including, but not limited to:
- Records retention;
- School safety procedures such as reports of suspected abuse and neglect, policy in regard to sexual harassment, as detailed in Ed 303.01 (j) and (k), pupil safety and violence prevention (RSA 193-F), and limits on the use of child restraint practices (RSA 126-U);
- Daily physical activity plan pursuant to Ed 310.

Appendix A

Humanities Unit 1: Prehistoric Humanity

HISTORY TIMELINE	TECHNOLOGY / SCIENCE/ MEDICINE	MATHEMATICS	ART AND ARTS	MUSIC	LITERATURE/ PHILOSOPHY AS IT MIGHT RELATE TO INNOVATION	OTHER
10 MIL YRS AGO	HUMANS MAKE FIRST TOOLS					
1-2 MIL YRS AGO	HUMANS DISCOVER FIRE					
500,000 BCE	FIRST HUMAN SPEECH					

Year One; Unit One:

Objectives:

I. Introduce the students to the fundamental process employed in the humanities program:
    A. Encouraging students to learn through:
        1. application of their imaginations
        2. collaborative thought and projects
        3. group and individual experiences
        4. artistic endeavor
        5. research
        6. logic
        7. group and individual written reports
        8. group and individual presentation

Anticipated Outcomes:
I. development of curiosity as the primary means of motivating student learning II. positioning of everyone in the class, including the teacher, as co-learners through the process of exploration and shared learning III. development of a school culture that values:
    A. deep questioning
    B. in-depth research
    C. analysis
    D. well-articulated communication, both written and oral
    E. appreciation for all contributions and perspectives
    F. exploration driven by ongoing curiosity

G. greater understanding of the shared experiences of all humanity, i.e., the human experience.

Appendix A

Unit 1: Humans First Create Tools:

Lesson 1:

I. Each student will write a pre-investigation reflection on this human advancement by contemplating the following questions and perhaps adding questions to be considered by the entire class:

A. What needs do you think those tools were fulfilling?

B. Based on these needs, what do you think those first tools might have been? C. What would we learn about early human life by knowing which tools were the first to be created?

I. The students will be expected to think and write individually about the answers to these questions prior to conducting any research, thereby constructing hypotheses. II. The students will continue individual thinking and writing as out-of-class assignments. III. By writing their thoughts, students will experience the process of clarifying their individual hypotheses.

Lesson 2: Class discussion:

I. This class is based on the students' individual thoughts after a period of reflection on the questions introduced by the prior classroom discussion.

II. Active listening will be taught by requiring students to:

A. take notes of peer hypotheses

B. construct questions to help test initial hypotheses

I. Openness and respect will be modeled by the teacher by:

A. modeling respect for all contributions

B. acting as a catalyst for classroom questions

C. assisting the students to discover common "threads" in the various hypotheses D. connecting individual thoughts to develop a unified hypothesis where possible
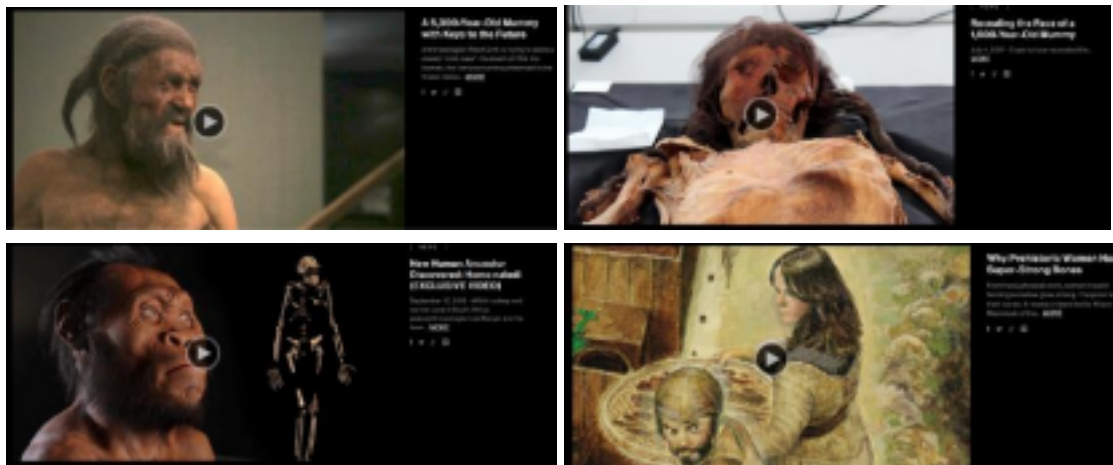
Lesson 3:

Appendix A

I. Though media such at that found on the National Geographic and PBS websites, the teacher's mission is to excite the students' imaginations. These media will present various artifacts and hypotheses which the students will compare to individual and group hypotheses

II. The students will be asked, once again, the questions that began the unit: A. What do you think those first tools might have been?

B. What needs do you think those tools were fulfilling?

III. At this time, the students will be asked an additional question: "What might we learn about early human life by knowing which tools were the first?" so as to introduce students to questions relative to the human condition.

IV. The lesson will end in class discussion with the teacher pointing out how the class' perspective has developed since the first discussion and the extent to which the students were able to anticipate the hypotheses presented in media materials, thus demonstrating to the students their own ability to apply critical thinking to the development of valid hypotheses.

Lesson 4:

I. The students will present with wood and stone materials similar to those from which early tools were made. With all the appropriate protective gear, the students will find themselves in a "lab" situation wherein they must produce tools as our ancestors did.

II. The student will be expected to take notes on this process and write a statement explaining how this hands-on process better informed them of the actual experience that ancient humans underwent as they struggled to better their lives through the creation of tools.

III. This "lab" will conclude with a report very similar to a science lab report as the students will be expected to:

A. record details carefully

B. provide data relevant to the knowledge gained through the hands-on experience

C. assess the hands-on process with a focus on improving that process for future investigations

Lesson 5: Enactment

I. The students will be allowed to enhance their unit grades by writing and performing small group skits to be performed before the entire class.

II. This performance will:

A. provide an introduction to the element of exhibition which will be an integral part of the entire charter school humanities experience

B. provide students with a creative means of approaching and understanding course content

C. provide additional enjoyment to the learning experience, thus making it a more memorable one

Appendix A

Assessment:

I. Each student activity described above will include assessments based upon the guiding
   principles for assessment described in the charter.

II. A final assessment for the unit will consist of individual student essays:

    A. summarizing the unit

    B. presenting the individual students' hypothesis

    C. defending that hypothesis in a thorough and critical manner

Note: The subsequent units on the discovery of fire and development of speech will utilize the process described for Unit One.

Spark Academy Humanities Curriculum/Pedagogy Overview

The Spark Academy graduate will be able to gather, comprehend, evaluate, synthesize, and communicate information relevant to essential questions using original research and authoritative sources to test hypotheses, solve problems and recommend new hypotheses and solutions to problems. These essential questions will be produced through overviews presented by the instructor to the students to prompt the essential questions that are at the root of who we are as human beings and how we have journeyed through history as revealed by the primary artifacts of that journey: original documents, music, literature, art, mathematics, science and technology.

The NAEP Literary and Informational Frameworks will be used to guide the blend of reading with which the students will be engage so as to prepare them for the challenges of both college and workforce.

Appendix A

Distribution of Communicative Purposes by Grade in the 2011 NAEP Writing Framework

Grade	To Persuade	To Explain	To Convey Experience
4	30%	35%	35%
8	35%	35%	30%
12	40%	40%	20%

Source: National Assessment Governing Board. (2007). *Writing framework for the 2011 National Assessment of Educational Progress, pre-publication edition.* Iowa City, IA: ACT, Inc.
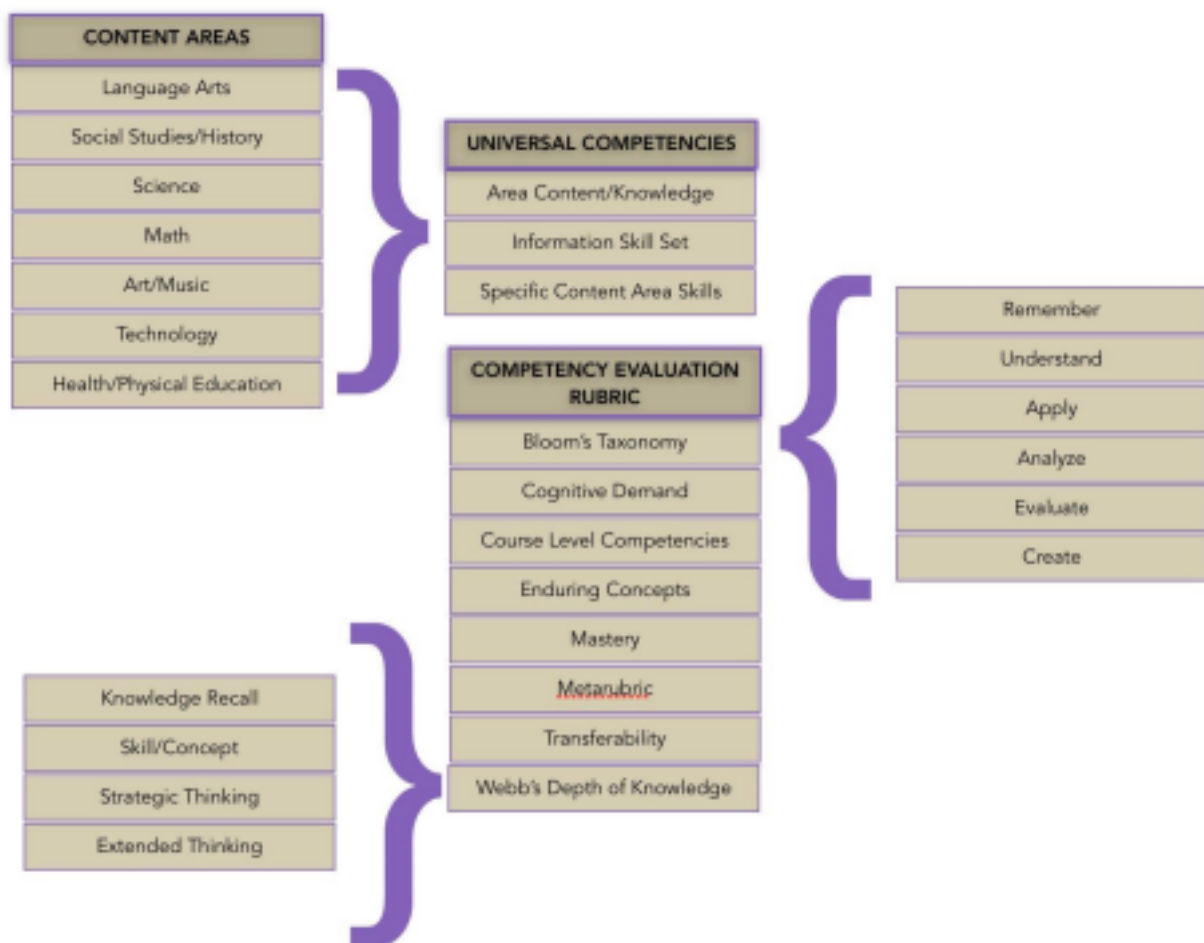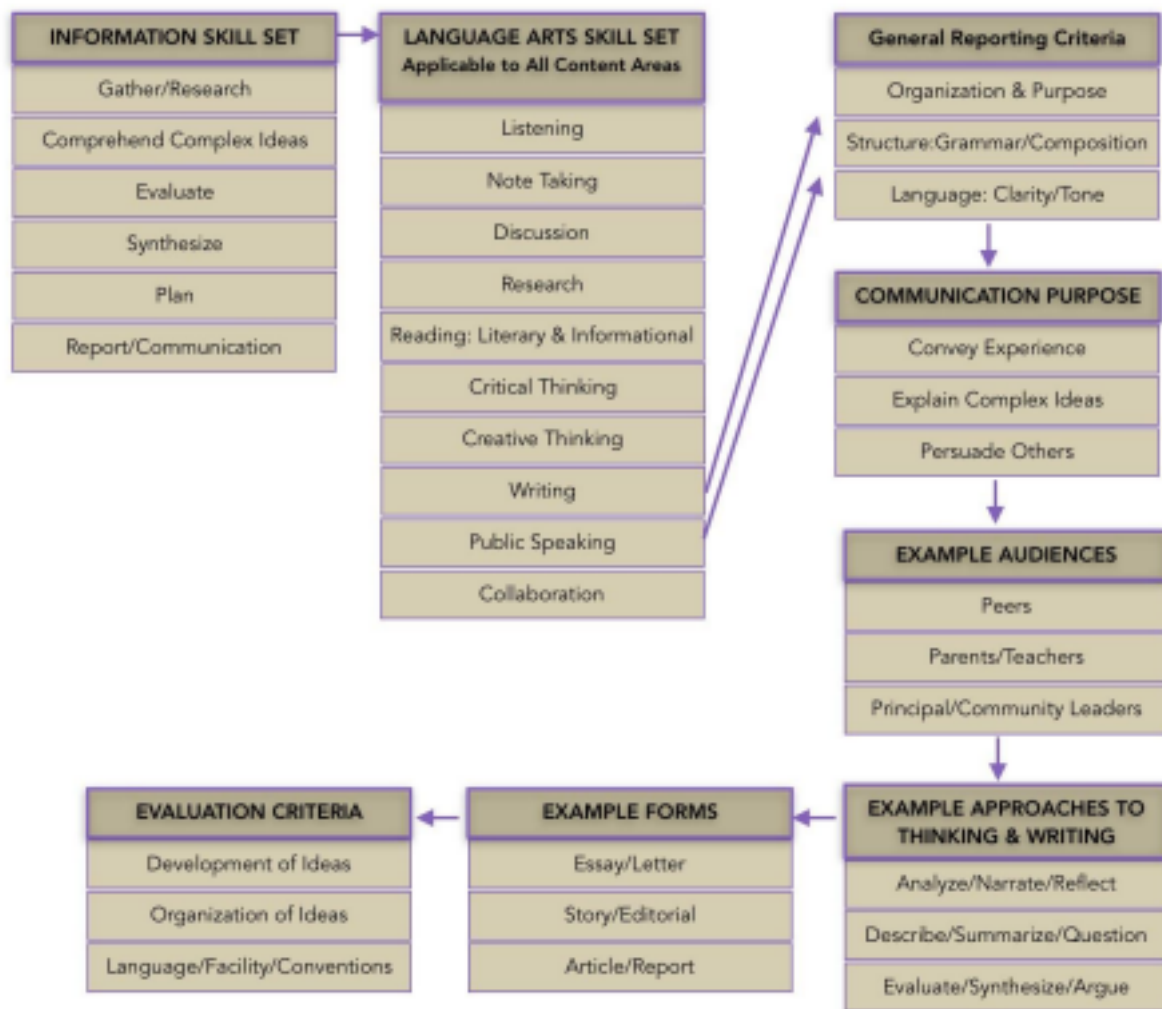
Language Progressive Skills, by Grade

The following skills, marked with an asterisk (*) in Language standards 1–3, are particularly likely to require continued attention in higher grades as they are applied to increasingly sophisticated writing and speaking.

Standard	Grade(s)							
	3	4	5	6	7	8	9-10	11-12
L.3.1f. Ensure subject-verb and pronoun-antecedent agreement.	X	X	X	X	X	X	X	X
L.3.3a. Choose words and phrases for effect.	X	X	X	X	X	X	X	X
L.4.1f. Produce complete sentences, recognizing and correcting inappropriate fragments and run-ons.		X	X	X	X	X	X	X
L.4.1g. Correctly use frequently confused words (e.g., to/too/two; there/their).		X	X	X	X	X	X	X
L.4.3a. Choose words and phrases to convey ideas precisely.*		X						
L.4.3b. Choose punctuation for effect.		X	X	X	X	X	X	X
L.5.1d. Recognize and correct inappropriate shifts in verb tense.			X	X	X	X	X	X
L.5.2a. Use punctuation to separate items in a series.†			X					
L.6.1c. Recognize and correct inappropriate shifts in pronoun number and person.				X	X	X	X	X
L.6.1d. Recognize and correct vague pronouns (i.e., ones with unclear or ambiguous antecedents).				X	X	X	X	X
L.6.1e. Recognize variations from standard English in their own and others' writing and speaking, and identify and use strategies to improve expression in conventional language.				X	X	X	X	X
L.6.2a. Use punctuation (commas, parentheses, dashes) to set off nonrestrictive/parenthetical elements.				X	X	X	X	X
L.6.3a. Vary sentence patterns for meaning, reader/listener interest, and style.‡				X	X	X	X	
L.6.3b. Maintain consistency in style and tone.				X	X	X	X	X
L.7.1c. Place phrases and clauses within a sentence, recognizing and correcting misplaced and dangling modifiers.					X	X	X	X
L.7.3a. Choose language that expresses ideas precisely and concisely, recognizing and eliminating wordiness and redundancy.					X	X	X	X
L.8.1d. Recognize and correct inappropriate shifts in verb voice and mood.						X	X	X
L.9-10.1a. Use parallel structure.							X	X

The ability to find and internalize information must be accompanied by one's ability to convey experience, explain complex ideas, or persuade others. The following rubrics will be applied to communications of all forms, written and non-written, traditional and non-traditional.

As indicated in the N.H. Department of Education materials on standards and in the framework of the National Assessment of Educational Progress (NAEP), special emphasis is needed on complex informational texts in a variety of content areas so as to prepare them for both college and for the workforce. The following charts indicates the information and communication competencies which will be an integral part of lesson planning, pedagogy, and assessment for all content areas.

Appendix A

CONTENT AREAS
Language Arts
Social Studies/History
Science
Math
Art/Music
Technology
Health/Physical Education

UNIVERSAL COMPETENCIES
Area Content/Knowledge
Information Skill Set
Specific Content Area Skills

COMPETENCY EVALUATION RUBRIC
Bloom's Taxonomy
Cognitive Demand
Course Level Competencies
Enduring Concepts
Mastery
Metarubric
Transferability
Webb's Depth of Knowledge

Remember
Understand
Apply
Analyze
Evaluate
Create

Knowledge Recall
Skill/Concept
Strategic Thinking
Extended Thinking

Appendix A

INFORMATION SKILL SET

- Gather/Research
- Comprehend Complex Ideas
- Evaluate
- Synthesize
- Plan
- Report/Communication

LANGUAGE ARTS SKILL SET
Applicable to All Content Areas

- Listening
- Note Taking
- Discussion
- Research
- Reading: Literary & Informational
- Critical Thinking
- Creative Thinking
- Writing
- Public Speaking
- Collaboration

General Reporting Criteria

- Organization & Purpose
- Structure:Grammar/Composition
- Language: Clarity/Tone

COMMUNICATION PURPOSE

- Convey Experience
- Explain Complex Ideas
- Persuade Others

EXAMPLE AUDIENCES

- Peers
- Parents/Teachers
- Principal/Community Leaders

EXAMPLE APPROACHES TO THINKING & WRITING

- Analyze/Narrate/Reflect
- Describe/Summarize/Question
- Evaluate/Synthesize/Argue

EXAMPLE FORMS

- Essay/Letter
- Story/Editorial
- Article/Report

EVALUATION CRITERIA

- Development of Ideas
- Organization of Ideas
- Language/Facility/Conventions

The Language Arts curriculum will include both literary and informational texts. Social Studies, Math, Science, Technology, Art, and Music reading will be informational. In all areas of the curriculum, the fundamental skills of finding/developing sound data, organizing data, and sharing data in an organized, clear, and meaningful manner will be a uniting set of competencies be implemented through meaningful lesson planning which incorporates guidance from the well-known Charlotte Danielson model Framework for Teaching.

The following summary of the Danielson Model will provide faculty in all content areas with a starting point for common professional development experience to help foster not only the meeting of all state competencies but to do so in a manner that brings metacognition to Spark Academy's pedagogical approach.

Domain 1: Planning and Preparation
    I. Demonstrating Knowledge of Content and Pedagogy

Appendix A
      A. content knowledge
      B. prerequisite relationships (student to content) C.
      content pedagogy

II. Demonstrating Knowledge of Students
   A. child development
   B. learning process
   C. special needs
   D. student skills, knowledge, and proficiency E.
   interests and cultural heritage
III. Setting Instructional Outcomes
   A. value, sequence, and alignment
   B. clarity
   C. balance
   D. suitability for diverse learners
IV. Demonstrating Knowledge of Resources
   A. for classroom
   B. to extend content knowledge
   C. for students
V. Designing Coherent Instruction
   A. learning activities
   B. instructional materials and resources
   C. instructional groups
   D. lesson and unit structure

Domain 2: The Classroom Environment
   I. Creating and Environment of Respect and Rapport
         A. teacher interaction with students
   B. student interaction with students
II. Establishing a Culture for Learning
   A. importance of content
   B. expectations for learning and achievement C.
   student pride in work
III. Managing Classroom Procedures
   A. instructional groups
   B. transitions
   C. materials and supplies
   D. non-instructional duties
   E. supervision of volunteers and paraprofessionals IV.
Managing Student Behavior
   A. expectations
   B. monitoring behavior
   C. response to misbehavior
V. Organizing Physical Space A. safety and accessibility B.
arrangement of furniture and resources

Appendix A
Domain 3: Instruction
   I. Communicating with Students
   A. expectations for learning

B. directions and procedures

C. explanations of content

D. use of oral and written language

II. Using Questioning and Discussion Techniques

A. quality of questions

B. discussion techniques

C. student participation

III. Engaging Students in Learning

A. activities and assignments

B. student groups

C. instructional materials and resources

D. structure and pacing

IV. Using Assessment in Instruction

A. assessment criteria

B. monitoring of student learning

C. feedback to students

D. student self-assessment and monitoring

V. Demonstrating Flexibility and Responsiveness

A. lesson adjustment

B. response to students

C. persistence

Domain 4: Professional Responsibilities

I. Reflecting on Teaching

A. accuracy

B. use in future teaching

II. Maintain Accurate Records

A. student completion of assignments

B. student progress in learning

C. non-instructional records

III. Communicating with Families

A. about instructional program

B. about individual students

C. engagement of families instructional program IV.

Participating in a Profession Community

A. relationships with colleagues

B. participation in school projects

C. involvement in culture of professional inquiry D.

service to the school

V. Growing and Developing Professionally

A. enhancement of content knowledge/pedagogical skill

Appendix A

B. receptivity to feedback from colleagues C.

service to the profession

VI. Showing Professionalism

A. integrity/ethical conduct

B. service to students

C. advocacy

D. decision-making

E. compliance with school/district regulation

Physical Science Unit Sample: An Introduction into Astrophysics

Unit Outline:

1. The Sun
2. Nuclear Energy
3. Classifying the Stars in the Universe// Variable Stars
4. Galaxies// An Expanding Universe
5. Projects and Experiments

Unit Prerequisite: Prior to this unit the students will study light energy.

Lesson One: The Sun

1. Learn what makes this star unique to our solar system and compare this solar system with other systems in the universe.
2. Explore the four regions of sun and the different properties.
3. Study the effects of hydrogen gas that causes the gravitational field, the pressure the hydrogen atoms experience and examples of nuclear fusion that occurs on the sun.
4. Discuss Einstein's Theory of Relativity here.
5. Ask "What happens to this energy?" and discuss concepts of radiative zone, convection zone, photosphere, and solar flares

Lesson Two: Nuclear Energy

1. Compare nuclear fusion from the sun to the nuclear fission that we use to produce some electricity on earth.
2. Describe the process of nuclear fission in nuclear bombs and power plants. For this section, learn about chain reactions and critical mass.
3. Discuss potential future technology that could eliminate the danger of a meltdown in a nuclear power plant.

Lesson Three: Classifying the Stars

Appendix A
1. Learn about the tools that scientists use to study the universe and how they

classify stars. For this lesson, understand the functions spectroscopy, spectral letters, absolute magnitude, and apparent magnitude.

2. Create a graph like the Hertzsprung-Russell Diagram to plot the various types of stars and their temperatures.

3. Learn about variable stars including pulsating variables, novas, and supernovas that cannot be placed on a H-R Diagram.

4. Measure the distance between stars through the parallax method and apparent magnitude method. Ask "Which method is more reliable?"

Lesson Four:

1. Classify the different types of galaxies. Discover which one is the Milky Way. 2. Explore the Expanding Universe and the history of how this was observed by scientists. This lesson will include defining spectral lines and the red shift. 3. Recall the Doppler effect from a previous unit study and discuss Edwin Hubble's observation.

Experiments and projects: Create a model showcasing one or two of the many possible ways the universe could be expanding. Model options may include an artistic journal entry visually describing this study, a dramatic oral report with an experiment presentation, or an exhibition project.

Appendix A

Manchester Community College

COURSE SYLLABUS – Fall Semester 2017

Course Name: Robotics Design **Credits:** 3 **Course Number**: ROBO 211 **Instructor:** Dan

Larochelle **CRN:** 24232 **Contact Information:** See Canvas **Semester/Year:** Spring 2018

Course Details: Course Delivery Method: Hybrid
 Meeting Days/Times/Room Number(s): Lecture and Lab - Room 246 Tuesday 6 PM
                                                                          to 10:10 PM
 Semester Parameters: Jan 16th – May 4th

_____
_ _____

Catalog Description:

Students will design a robot according to specifications for the functions and tasks the robot needs to complete. This will involve many critical features of the robot needed to meet the specified requirements. The course will cover the entire design processes, such as defining the problem, researching and designing, creating a prototype, building a robot, programming and testing, and finally the evaluation of the robot design to the specifications.

Course Pre-requisites/Co-requisites:

MATH 090 with a C or better

Learning Objectives:

  1. Apply knowledge of mathematics, science, technology and design.
  2. Demonstrate techniques, skills, and knowledge necessary to use and maintain technological
      products and systems.
  3. Demonstrate strategies for identifying, formulating and solving technological problem 4. Design
  and construct experiments along with analysis and interpretation of data. **5.** Develop and maintain
  good working relationships with supervisors and peers. Work as part of a
      team to achieve mutual goals by using behaviors and/or actions that best support the team and
      lead toward the accomplishment of tasks.

Outline of Topics:
  1. Explain the stages of the design cycle, the role that each stage plays and the nature of
      an iterative process.

Appendix A
  2. Determine types of structural fasteners, the properties each, and how those properties
      relate to mechanical connections and structural integrity. Evaluate fastener
      effectiveness and make design or fastener modifications as appropriate to rectify

issues/problems.

3. Select drive train components such as motors, shafts, gears, wheels, casters, lock collars, spacers, bearings and mounting hardware. Describe the role of each in drive train construction. Construct, test and debug a drive train following plans or directions.

4. Explain the robot controller and its role with respect to robot functioning. Identify a variety of electrical connections and describe basic features of each. Identify components and properties of DC power systems.

5. Identify design constraints in adding components to a robot. Describe why some designs may be more advantageous than others.

6. Describe a complex task as a series of discrete, sequenced steps or processes (process analysis).

7. Describe the steps in a programming sequence: create, edit, compile, download, run. 8. Observe robot performance, compare observations to program statements. Compare program statements to data collected from motor behavior, use mathematical methods to modify program statements to achieve a different but related motor behavior, and analyze and account for discrepancies between expected and actual performance. Use observations of robot performance to identify and analyze discrepancies between intended and actual robot behavior.

9. Design a gear train resulting in mechanical advantage. Design a drive train to allow the robot to deliver maximum power for a given task.

10. Create, edit, compile, download and execute a robotic program that uses sensors to allow the robot to respond to its environment. Create and test a reusable subroutine that provides greater precision in controlling robot behavior.

11. Relate understanding of degrees of freedom of a robotic arm to the manufacturing process.

12. Relate lifting capacity of a robotic arm to the applied movement.

13. Personal Effectiveness Competencies

    i. Integrity – displaying accepted social and work behaviors;

    ii. Motivation – demonstrating a willingness to work;

    iii. Dependability/Reliability – displaying responsible behaviors at work; iv. Willingness to Learn – understanding the importance of learning new information for both current and future problem-solving and decision-making. 14. Foundation Academic Competencies

    i. Applied Science – using scientific rules and methods to solve problems; Basic Computer Skills – email, word processing, spread sheets, etc.

    ii. Applied Mathematics/Measurement – using math to solve problems;

iii. Reading for Information – understanding written sentences in
work-related documents;

iv. Business Writing – using standard business English; Listening to and
Following Directions;

v. Locating and Using Information;

vi. Speaking/Presentation – communicating with co-workers and supervisors.

Required Textbooks /Reading/Companion Website:

Online VEX Curriculum http://curriculum.vexrobotics.com
Robot C video tutorials
http://education.rec.ri.cmu.edu/products/cortex_video_trainer/index.html

Supplemental Materials:
- VEX Robotic Design Kits will be provided in the lab.
- A bound notebook to be used as an Engineering Notebook.
- A USB Drive for Robot C programs
- A laptop or Home computer for Robot C software

Teaching Philosophy & Methods of Instruction:

The approach for this class will be PBL (Problem Based Learning). This means a problem/project
will be assigned and students will research the information needed to complete the task.
Assistance will be provided by the instructor as needed. There will be group participation for
these projects on the solutions, but each student will do their own individual project.

This course will rely heavily on online learning resources. Course theory will be self-directed
study though a series of course modules. In-class time will be dedicated to hands-on lab
activities, required in-class assessments, team projects, and as needed material review.

Methods of Testing /Evaluation/Assessment:

40% Assignments and Lab Reports
20% Engineering Notebook
20% Final Project
20% Lab and Project Participation

Course Grading:

Letter	Numeric	Letter	Numeric
A	93.33-100	C	73.33-76.66

Appendix A

A-	90.00-93.32	C-	70.00-73.32
B+	86.67-89.99	D+	66.67-69.99
B	83.33-86.66	D	63.33-66.66
B-	80.00-83.32	D-	60.00-63.32
C+	76.67-79.99	F	Below 60

Incompletes: An Incomplete Grade (I) indicates that a student has not completed a major course assignment (usually a final exam or culminating final assessment) due to extraordinary circumstances, such as serious illness, death in the family, etc. The grade is applied only in those instances where the student has a reasonable chance of completing the outstanding work and passing the course. It is not intended to give an extension of time for a student delinquent in meeting major course responsibilities. The grade is applied at the instructor's discretion and must be approved, in advance, by the Department Chair.

Tuition Refund Policy: The last date to drop courses with a full refund is:

Course/Instructor Policies:

- 16 week courses: 1/29

1. SAFETY FIRST!!!
2. No fooling around in the Lab at any time.
3. If you miss a lab you will have to make up the missed work during regular scheduled lab time or get permission to use the lab from the instructor who is in the lab.
4. Lab is to be cleaned up at the end of class and tools put back in the proper storage location.
5. If you break something, tell us about it so it can be fixed/replaced for the next class.

Faculty Response Time:

E-mail Questions from Students: Within 24 hours or less

Homework Returned: Not graded but will be reviewed each week

Lab Assignments Graded: See below.

Other Assignments Graded/Returned: This will be done within a week in most cases.

Late Work/Late Submissions Policy:

It is the student's responsibility to get the work to the instructor in a timely manner if it is late. (i.e.. Timely manner is no more than 2 weeks!) Late assignments will automatically be reduced by 15 points.

Attendance Policy

The MCC Academic Catalog states the following:

"MCC requires an instructor to have a published attendance policy. . .the Instructor will be responsible for informing students of the attendance policy at the beginning of each course"

This is a lab intensive course and attendance is mandatory. If you going to miss a lab, please contact me prior to the class. It is your responsibility to fulfill all course requirements and complete all assignments. The College requires faculty to verify student attendance twice within a term: at the first class meeting of each term and at the conclusion of the Add/Drop period.

Participation (20%)

Student is highly active in discussions and with their engagement. Contributes multiple ways: timely homework, initiates discussion topics, actively and appropriately responds to comments, and completes substantive agenda/preparation sheets. Participation adds new information, questions, and considerations. Contributions from the student are based on class readings, personal and work experiences, and again, are appropriate.

Academic Integrity/Student Conduct:

Please refer to the published MCC Student Handbook and Code of Conduct for behavior expectations, standards for academic honesty, and sanctions that may result:

> http://www.mccnh.edu/pdf/StudentHandbook.pdf
> http://www.mccnh.edu/pdf/StudentCodeofConduct.pdf

Title IX Protections and Reporting: Manchester Community College is committed to providing a safe and secure environment where each student is able to learn, grow, and prosper. One manner in which MCC demonstrates this commitment is through our various policies prohibiting all forms of sex discrimination, misconduct, sexual violence, assault, or harassment. These policies conform to Title IX of the Education Amendments Act of 1972. Title IX is the

federal law that prohibits sex discrimination, including sexual harassment, domestic and dating violence, sexual assault, and stalking. For additional details about these policies, reporting points of contact, and other local resources, please see the College's Title IX information page at http://www.mccnh.edu/pdf/TitleIX_Flyer.pdf. Additional information regarding MCC's

conduct policies may be found under the "Policies and Student Responsibilities" tab of the College's website at http://www.mccnh.edu/current-students.

As your instructor, I am available if you would like to speak to me about an incident of sexual harassment or assault that occurred while you are a student at MCC. However, it is important to note that all college faculty members are subject to mandatory reporting requirements under Title IX. If you disclose a personal experience to me involving conduct covered under Title IX, I have a responsibility to report my knowledge of the incident to the Title IX coordinator, Terry Chisholm: tchishom@ccsnh.edu or at 603-206-8177.

Please note that free confidential resources are also available through the YWCA 24-hour Crisis Line: 603-668-2299.
Additional information, including resources, can be found at:
New Hampshire Coalition Against Domestic and Sexual Violence: http://www.nhcadsv.org/Catchment%20map(1).pdf

In addition, as a mandated reporter, I have a duty to report when a student discloses behavior or a willingness to engage in behavior that may involve harm to self or others; including the abuse of minors, the elderly, or persons with disabilities. Such disclosures, whether verbal or written, will be reported to the appropriate authorities.

Academic Adjustments: Under the Americans with Disabilities Act (ADA) of 1990 and Section 504 of the Rehabilitation Act of 1973, individuals with disabilities are entitled to academic adjustments with appropriate documentation. Students wishing to discuss services should contact the Academic Success Center. If you have approved accommodations and would like them implemented, please alert me as your instructor the first week of class. Please note that accommodation plans are not retroactive.
Canvas/E-mail Usage Policy:

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(*) Please note that MCC requires students to utilize their @students.CCSNH.edu accounts

Faculty: All MCC Instructors are required to use the Canvas Grade Center for the posting of Assignment grades, **instructor contact and syllabus.**

Canvas Use:

Appendix A
All assignments and projects must by uploaded and submitted through Canvas. Emailed submissions will not be accepted for credit.

Cancellations: A variety of methods are used to alert the MCC community to college cancellations and closures. MCC Alerts can send notice of closures and cancellations directly to your cell phone (via text and voice messages), landlines, and/or e-mail systems. You must register for this service by going to http://www.mccnh.edu/accounts/alerts You may also tune in to local TV and radio stations for cancellation reports. Cancellations are usually announced by 6 AM for day classes and 3 PM for evening classes. You can also contact the college at 603-206-8206 for information on class cancellations. Please DO NOT call the main campus number

The Academic Success Center offers a variety of academic support services to MCC students including peer and professional tutoring. There is no charge to students for these services. Visit: http://www.mccnh.edu/services/academic-success-center

Manchester Community College

COURSE SYLLABUS – Spring Semester 2019

Course Name: Introduction to Engineering Design **Credits:** 4
      & Solid Modeling

Course Number: ADMT 112 **Instructors:** Dan Larochelle Frank Xydias

CRN: 23227 and 23228 **Contact Information:** See Canvas **Semester/Year:** Spring 2019

Course Details: Course Delivery Method: Hybrid
    Meeting Days/Times/Room Number(s): Lecture - Room 253 Lab – Room

Section 1 – Tuesday 6 PM to 10:10 PM
Section 2 – Thursday 8 AM to 12:10 PM

Semester Parameters: Jan 22th – May 10th

_____

_____

Catalog Description:

This problem-based learning course covers the knowledge and skills needed to explore the engineering design process. Individual projects, team projects and laboratory exercises will be used to continually hone the student's interpersonal skills, creative abilities and understanding of the design process. Everyday products will be examined for historical, societal, design, safety, and manufacturing perspectives. Topics include ideation, sketching, design constraints, solid modeling, decision making, statistical quality control, manufacturing methods, and engineering analysis. Students will develop an appreciation for good design and the ability to communicate design ideas via 3D modelling, written and oral reports. There are lectures, demonstrations, and a series of lab exercises designed to reinforce what the student has learned. This course uses the latest version of the Solidworks design software. Prerequisites: MATH090M with a grade of "C" or better.

Course Pre-requisites/Co-requisites:

MATH 090 with a C or better

Learning Objectives:

1. Apply the engineering design process to an open-ended problem.

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Appendix A
2. Learn to see products from the multiple perspectives of user, designer and manufacturer.
3. Develop 3D visualization skills.
4. Formulate good specifications for a product and identify design constraints based on user feedback and available resources.
5. Practice good teamwork while solving open ended engineering problems.
6. Create manual sketches, CAD models and 3D prototypes to express ideas and concepts to solve problems.
7. Interpret orthographic multiview projection drawings and apply this knowledge to create engineering documents using ANSI, ISO, and Industry Standards.
8. Develop a proficiency with Solidworks Computer Aided Design (CAD) software. 9. Write an engineering report using analysis from Solidworks and other engineering design tools. 10. Apply engineering notebook standards and protocols when documenting their work.

Outline of Topics:
1. Ideation, sketching and brainstorming
2. Parametric modeling and design

3. Multiview sketching
4. Modeling for refinement
5. Tolerances
6. Decision process and thinking outside the box
7. CAD system transformations
8. Solid modeling
9. Pictorial sketching – Isometric
10. Interpreting Multiview Drawing
11. Dimensioning
12. Geometric dimensioning and tolerancing
13. Analysis and prototyping
14. Engineering notebook
15. Reverse Engineering

Required Textbooks /Reading/Companion Website:

Engineering Design with SOLIDWORKS 2018 & Video Instruction
Author – Planchard
ISBN #9781630571474

Supplemental Materials:

USB Drive for Solidworks files
Laptop or Home computer capable of running Solidworks 2018.

Teaching Philosophy:

The approach for this class will be PBL (Problem Based Learning). This means a problem/project will be assigned and students will research the information needed to complete the task.

Appendix A
Assistance will be provided by the instructor as needed. There will be group participation needed for these projects and their solutions, but each student will do their own individual project.
Methods of Instruction:

In-class time will be dedicated to hands-on lab activities, required in-class assessments, team projects, and as needed material review.

Methods of Testing /Evaluation/Assessment:

Assessment	Weight	Total
Participation	10%	
In Class Exercises	10%	
Assignments	40%	

Projects	40%	
		100

Course Grading:

Letter	Numeric	Letter	Numeric
A	93.33-100	C	73.33-76.66
A-	90.00-93.32	C-	70.00-73.32
B+	86.67-89.99	D+	66.67-69.99
B	83.33-86.66	D	63.33-66.66
B-	80.00-83.32	D-	60.00-63.32
C+	76.67-79.99	F	Below 60

Incompletes: An Incomplete Grade (I) indicates that a student has not completed a major course assignment (usually a final exam or culminating final assessment) due to extraordinary circumstances, such as serious illness, death in the family, etc. The grade is applied only in those instances where the student has a reasonable chance of completing the outstanding work and passing the course. It is not intended to give an extension of time for a student delinquent in meeting major course responsibilities. The grade is applied at the instructor's discretion and must be approved, in advance, by the Department Chair. **Instructors must complete an incomplete contract, have it signed by their department chair, and submit it to the Registrar's office when grades are due.**

Appendix A

College Calendar – Important Dates for Spring 2019:

Tuesday January 22	**Classes Begin**
Monday Feb 4	**Last day to drop full semester classes with a full refund**
Monday Feb 18	Presidents' Day Holiday – No Classes and Offices Closed

Monday April 1	**Last day to withdraw with grade of "W" from full semester classes**
Friday May 10	**Classes End**

Course/Instructor Policies:

6. SAFETY FIRST!!!
7. No headsets in ears – sounds are very important in a machine area for performance and safety!
8. No fooling around in the Lab at any time!
9. If you miss a Lab for an excused reason you will have to make up the missed work during regular scheduled Lab time or get permission to use the lab from the instructor who is in the Lab 10. Lab is to be cleaned up at the end of class and tools put back in the proper storage location. 11. If you break something, tell us about it so it can be fixed/replaced for the next class.

Faculty Response Time:

E-mail Questions from Students: Within 24 hours or less

Homework Returned: Not graded but will be reviewed each week

Assignments Graded: See below.

Other Assignments Graded/Returned: This will be done within a week in most cases.

Submissions Policy:

It is the student's responsibility to get all the work submitted to the instructor in a timely manner. This included homework, tooling U, lab reports and other assignments given by the instructor.
Late submission Policy:

Time	Max Grade
On time	100%
One week late or less	85%
Two weeks late or less	70%
After two weeks late	0%

Appendix A
Attendance Policy

The MCC Academic Catalog states the following:

> "MCC requires an instructor to have a published attendance policy. . .the Instructor will be responsible for informing students of the attendance policy at the beginning of each course"

This is a lab intensive course and attendance is mandatory. If you going to miss a lab, please contact me prior to the class. It is your responsibility to fulfill all course requirements and complete all assignments. The College requires faculty to verify student attendance twice within a term: at the first class meeting of each term and at the conclusion of the Add/Drop period.

Participation (30%)

The student contributes in multiple ways: timely homework, initiates discussion topics, actively and appropriately responds to comments, and completes substantive agenda/preparation sheets. Participation adds new information, questions, and considerations. Contributions from the student are based on class readings, personal and work experiences, and again, are appropriate.

There will be a <u>weekly participation grade</u> given based on the participation expectations listed above. If you are going to be late for class, please contact the professor prior to the class starting as a courtesy to the instructor and fellow students. This is a lab intensive course, missing labs and or being late will directly affect your participation grade.

Time	Max Grade
On time	100%
More than 10 min	70%
More than 30 min	50%
More than 60 min	0%

Academic Integrity/Student Conduct:

Please refer to the published MCC Student Handbook and Code of Conduct for behavior expectations, standards for academic honesty, and sanctions that may result:

http://www.mccnh.edu/pdf/StudentHandbook.pdf
http://www.mccnh.edu/pdf/StudentCodeofConduct.pdf

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manner in which MCC demonstrates this commitment is through our various policies prohibiting all forms of sex discrimination, misconduct, sexual violence, assault or harassment. These policies conform to Title IX of the Education Amendments Act of 1972.

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Students may contact Terry directly and/or find free confidential resources through the YWCA 24-hour Crisis Line: 603-668-2299. Additional information, including resources, can be found at: https://www.ywcanh.org/. There is also an app that can be downloaded onto your phone: "usafeUS.org" and look for "Manchester Community College."

As mandated reporters, faculty have a duty to report when a student discloses behavior or a willingness to engage in behavior that may involve harm to self or others; including the abuse of minors, the elderly, or persons with disabilities. Such disclosures, whether verbal or written, will be reported to the appropriate authorities. – Laurie, I updated this with the new wording from the task force.

Academic Adjustments: Under the Americans with Disabilities Act (ADA) of 1990 and Section 504 of the Rehabilitation Act of 1973, individuals with disabilities are entitled to academic adjustments with appropriate documentation. Students wishing to discuss services should contact the Academic Success Center. If you have approved accommodations and would like them implemented, please alert me as your instructor the first week of class. Please note that accommodation plans are not retroactive.

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Appendix A
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Account Code Account Name-Number of Students 60.00 120.00 180.00 240.00 300.00 Income 300000 Local School District Revenue 0.00 0.00 0.00 0.00 0.00 Income 300001 State Revenue 423,000.00 846,000.00 1,269,000.00 1,692,000.00 2,115,000.00 Income 300002 State & Fed Start Up Grant 0.00 100,000.00 150,000.00 150,000.00 0.00 Income 300003 Other Grants 0.00 5,000.00 5,000.00 5,000.00 5,000.00 Income 300004 Annual Fund 5,000.00 5,000.00 7,500.00 15,000.00 20,000.00 Income 300005 Entrepreneurial Revenue 0.00 0.00 0.00 0.00 0.00 Income 300006 Gifts & Philanthropic Contributions 55,000.00 96,400.00 10,000.00 10,000.00 10,000.00 Income 300007 Carry-Over Revenue 0.00 0.00 0.00 0.00 0.00 Income 300008 Other Revenue 0.00 0.00 0.00 0.00 0.00 Income 300009 Fundraising 1,000.00 2,000.00 5,000.00 10,000.00 15,000.00 Income 300010 Student Activities Income 0.00 0.00 0.00 0.00 0.00 Income 300011 Square 0.00 0.00 0.00 0.00 0.00 Income 300012 After School Activities 0.00 0.00 0.00 0.00 0.00 Income 300013 Summer School 0.00 2,000.00 [1] 3,000.00 4,000.00 5,000.00 Income 300014 In Kind Contributions 4,000.00 [2] 4,500.00 4,500.00 4,500.00 4,500.00 Income 300016 Paypal 0.00 0.00 0.00 0.00 0.00 Income 300018 Due from State 0.00 0.00 0.00 0.00 0.00 Income 300021 School Lunch Fundraiser 500.00 1,000.00 1,500.00 1,500.00 2,000.00 Income 300022 State Title 1A 0.00 2,500.00 3,500.00 5,000.00 6,500.00 Income 300023 State Title 2A 0.00 1,000.00 1,500.00 2,000.00 4,000.00 Income 30028 State Title 4 0.00 0.00 0.00 0.00 10,000.00 Income 300024 Endowment 500.00 500.00 500.00 500.00 500.00 Income 300027 Bus Tickets 0.00 0.00 0.00 0.00 0.00 Income 300029 Field Trips 0.00 0.00 0.00 0.00 0.00 Income 300031 Testing/Assessments 900.00 [3] 1,800.00 2,700.00 2,700.00 2,700.00 Income 300035 Matching Company Donations 500.00 500.00 1,000.00 2,000.00 3,000.00 Income 300036 District Services Reimbursement 0.00 [4] 0.00 0.00 0.00 0.00 Income 9300.004 Robotics 0.00 0.00 0.00 0.00 0.00 Income 9300.006 School Fundraiser 0.00 0.00 0.00 0.00 0.00 Income 9300.008 School Store 0.00 0.00 0.00 0.00 0.00 Income 9300.017 Girls Who Code 0.00 0.00 0.00 0.00 0.00 Income 9300.018 Yearbook Club 0.00 0.00 0.00 0.00 0.00 Income 9300.024 Raffle Ticket Fundraiser 0.00 0.00 0.00 0.00 0.00 Income 9300.025 Mathcounts Club 0.00 0.00 0.00 0.00 0.00 Income 93001.1 Donations Unrestricted 50,000.00 5,000.00 10,000.00 10,000.00 10,000.00

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Instructional 0.00 14.50 21.75 21.75 21.75 Expense 1100.253 NH SUI - ER 0.00 0.00 0.00 0.00 0.00 Expense 1100.254 Taxes Employee Portion - Instuctional 0.00 0.00 0.00 0.00 Expense 1100.256 Unemployment Payments 0.00 0.00 8,000.00 16,000.00 24,000.00 Expense 1100.26 Workers Compensation - Instructional 684.00 1,368.00 2,154.60 3,009.60 4,104.00 Expense 1100.3 Purchased Services 2,000.00 2,000.00 2,000.00 2,000.00 2,000.00 Expense 1100.321 Contracted Long Term Sub 0.00 0.00 0.00 0.00 0.00 Expense 1100.54 Advertising 500.00 500.00 500.00 500.00 500.00 Expense 1100.55 Printing 0.00 0.00 0.00 0.00 0.00 Expense 1100.593 Music Program Activities 0.00 0.00 0.00 0.00 250.00 Expense 1100.61 Instructional Cost 8,850.00 16,125.00 22,875.00 29,625.00 36,375.00 Expense 1100.611 Band & Chorus Supplies 0.00 0.00 0.00 0.00 0.00 Expense 1100.612 Supplies Science 2,000.00 1,000.00 1,500.00 2,000.00 2,500.00 Expense 1100.613 Art Supplies 1,000.00 1,000.00 1,500.00 1,500.00 2,000.00 Expense 1100.614 Supplies Lang Arts 1,000.00 1,000.00 1,000.00 1,000.00 1,000.00 Expense 1100.615 Supplies Math 1,000.00 1,000.00 1,000.00 1,000.00 1,000.00 Expense 1100.616 Supplies History 1,000.00 1,000.00 1,000.00 1,000.00 1,000.00 Expense 1100.64 Books and Printed Matter 0.00 0.00 0.00 0.00 0.00 Expense 1100.641 Text Books/Core Program Materials 2,500.00 2,500.00 1,500.00 1,500.00 1,500.00 Expense 1100.73 Equipment & Furnishings 5,000.00 5,000.00 10,000.00 [10] 5,000.00 5,000.00 Expense 1100.734 Computer Equipment 25,000.00 5,000.00 [11] 15,000.00 [12] 15,000.00 10,000.00

Expense 1100.738 Replacement Computers 0.00 0.00 10,000.00 [13] 10,000.00 1,000.00 Expense 1100.739 Employee Health Ins Contribution 0.00 0.00 0.00 25,000.00 35,000.00 Expense 1100.75 Admin Software 35,000.00 7,500.00 8,000.00 8,500.00 9,000.00 Expense 1100003 Copier 4,000.00 4,000.00 4,000.00 6,000.00 6,000.00 Expense 1110.3 Contracted IT Services Network 2,000.00 [14] 2,000.00 8,000.00 12,000.00 12,000.00 Expense 1110.61 IT Supplies 1,500.00 1,500.00 5,000.00 5,000.00 5,000.00 Expense 1110.734 Computer 0.00 0.00 0.00 0.00 0.00 Expense 1110.738 Replacement Computers 0.00 0.00 0.00 0.00 0.00 Expense 2100.1 Salary Student Services 15,000.00 35,000.00 [15] 45,000.00 [16] 107,000.00 [17] 110,000.00 [18] Expense 2100.101 Guidance Admin 0.00 20,000.00 30,000.00 38,000.00 40,000.00 Expense 2100.102 SPED Services 0.00 0.00 0.00 0.00 0.00 Expense 2100.214 Workers Compensation-Student Services 1,000.00 1,500.00 1,800.00 2,000.00 2,200.00 Expense 2100.25 Fed SocSec-ER 892.50 3,272.50 4,462.50 8,627.50 8,925.00 Expense 2100.251 Fed Medcare-ER 208.50 764.50 1,042.50 2,015.50 2,085.00 Expense 2100.252 Fed FUTA 85.50 313.50 427.50 826.50 855.00 Expense 2100.253 Student Services Taxes Employee Portion 0.00 0.00 0.00 0.00 0.00 Expense 2100.254 Para Professional Salaries 0.00 0.00 0.00 0.00 0.00 Expense 2100.255 Fed SocSec- Para Prof 0.00 0.00 0.00 0.00 0.00 Expense 2100.256 Fed Medicare - Para Prof 0.00 0.00 0.00 0.00 0.00 Expense 2100.257 Fed FUTA - Para Prof 0.00 0.00 0.00 0.00 0.00 Expense 2100.258 Taxes Employee Portion - Para Prof 0.00 0.00 0.00 0.00 0.00 Expense 2100.259 Workers Compensation - Para Prof 0.00 0.00 0.00 0.00 0.00 Expense 2120.32 Contracted Services, Guidance/Counseling 5,000.00 5,000.00 5,000.00 5,000.00 5,000.00 Expense 2120.37 Testing/Assessments 900.00 1,800.00 2,700.00 2,700.00 2,700.00 Expense 2120.643 Information Access Fee 250.00 250.00 250.00 250.00 250.00 Expense 2130.12 Homeless Student 1,000.00 1,000.00 1,000.00 1,000.00 1,000.00 Expense 2130.3 Purchased Services 2,000.00 3,000.00 4,000.00 5,000.00 6,000.00 Expense 2130.61 Supplies 100.00 150.00 200.00 250.00 300.00 Expense 2222.641 Books & Printed Matter 0.00 0.00 0.00 0.00 0.00 Expense 2222.643 Electronic Information 200.00 200.00 200.00 200.00 200.00 Expense 2223.73 Equipment 500.00 500.00 500.00 1,000.00 1,000.00 Expense 2223.738 Replacement Equipment 0.00 0.00 0.00 500.00 1,000.00 Expense 2310.21 Board E&O Insurance 1,800.00 2,000.00 2,200.00 2,400.00 2,600.00 Expense 2310.3 Legal 10,000.00 10,000.00 25,000.00 25,000.00 25,000.00 Expense 2310.331 Auditing 16,000.00 16,800.00 17,640.00 18,520.00 19,500.00 Expense 2310.332 Board Training 0.00 0.00 1,000.00 1,000.00 1,000.00

Expense 2400.001 Accounting Fee's-Reporting 25,000.00 30,000.00 35,000.00 40,000.00 45,000.00 Expense 2400.003 Administration Depreciation 0.00 0.00 0.00 0.00 0.00 Expense 2400.1 Administration Salaries 60,000.00 62,000.00 110,000.00 115,000.00 180,000.00 Expense 2400.115 Additional Compensation 0.00 0.00 0.00 0.00 0.00 Expense 2400.2 Support Staff Salaries 35,000.00 75,000.00 80,000.00 140,000.00 150,000.00 Expense 2400.201 Additional Compensation 0.00 0.00 0.00 0.00 0.00 Expense 2400.202 Contracted Positions 0.00 0.00 18,000.00 20,000.00 20,000.00 Expense 2400.205 Support Staff Fed SocSec-ER 2,082.50 4,462.50 4,760.00 8,330.00 8,925.00 Expense 2400.206 Support Staff Fed Medcare-ER 486.50 1,042.50 1,112.00 1,946.00 2,085.00 Expense 2400.207 Support Staff FUTA 199.50 427.50 456.00 798.00 855.00 Expense 2400.209 Support Staff Taxes Employee Portion 0.00 0.00 0.00 0.00 0.00 Expense 2400.21 Temp Support Staff 0.00 0.00 0.00 0.00 0.00 Expense 2400.211 Health Insurance Support Staff (Employer) 0.00 0.00 0.00 10,000.00 15,000.00 Expense 2400.212 Workers Compensation - Support Staff 199.50 427.50 456.00 798.00 855.00 Expense 2400.214 Workers Compensation 342.00 353.40 627.00 655.50 1,026.00 Expense 2400.215 Support Staff Employee Retirement Contribution 0.00 0.00 0.00 0.00 0.00 Expense 2400.24 Staff Development 1,000.00 1,000.00 1,000.00 1,000.00 1,000.00 Expense 2400.249 Admin Employee Retirement Contribution 0.00 0.00 0.00 0.00 0.00 Expense 2400.25 Fed SocSec-ER - Admin 3,720.00 3,844.00 6,820.00 7,130.00 11,160.00 Expense 2400.251 Fed Medcare-ER - Admin 870.00 899.00 1,595.00 1,667.50 2,610.00 Expense 2400.252 Fed FUTA - Admin 4,590.00 4,743.00 8,415.00 8,797.50 13,770.00 Expense 2400.253 NH SUI-ER 0.00 0.00 0.00 0.00 0.00 Expense 2400.254 Administration Health Insurance 0.00 0.00 0.00 0.00 0.00 Expense 2400.255 Taxes Employee Portion - Admin 0.00 0.00 0.00 0.00 0.00 Expense 2400.257 Heath Insurance -Admin (Employer) 0.00 0.00 0.00 15,000.00 20,000.00 Expense 2400.3 Purch Prof/Tech Srvs 3,000.00 4,000.00 5,000.00 6,000.00 7,000.00 Expense 2400.534 Postage 500.00 500.00 1,000.00 2,000.00 4,000.00 Expense 2400.58 Travel & Conferences 0.00 0.00 0.00 0.00 0.00 Expense 2400.61 Supplies 1,000.00 1,000.00 1,000.00 1,000.00

1,000.00 Expense 2400.643 Software Lic. Fee's 1,000.00 1,000.00 1,000.00 1,000.00 10,000.00 Expense 2400.734 Equipment 1,500.00 500.00 1,500.00 500.00 1,500.00 Expense 2400.735 Replacement equipment 0.00 1,000.00 0.00 1,000.00 0.00 Expense 2400.81 Dues & Fees 250.00 250.00 250.00 250.00 250.00 Expense 2400.9 School Lunch Fundraiser Expense 0.00 0.00 0.00 0.00 0.00 Expense 2600.52 Comm/Prop Liab 153 4,000.00 5,000.00 15,000.00 16,000.00 17,000.00 Expense 2600.521 Commercial Umbrella 2,000.00 2,200.00 2,400.00 2,600.00 2,800.00

Expense 2600002 School Website 1,500.00 1,600.00 1,700.00 1,800.00 1,900.00 Expense 2610.117 Custodial, contracted 0.00 0.00 35,000.00 40,000.00 45,000.00 Expense 2620.411 Water and Sewer 1,000.00 1,000.00 2,000.00 2,500.00 3,000.00 Expense 2620.421 Disposal Service 1,000.00 1,500.00 3,000.00 3,500.00 4,000.00 Expense 2620.43 Upkeep Building and Grounds 1,000.00 1,000.00 7,500.00 8,000.00 8,500.00 Expense 2620.44 Rent 55,000.00 96,400.00 125,000.00 [19] 130,000.00 135,000.00 Expense 2620.52 Property Liability Insurance 6,500.00 7,000.00 9,000.00 10,000.00 11,000.00 Expense 2620.53 Telephone service 1,200.00 1,200.00 1,200.00 1,200.00 1,200.00 Expense 2620.532 Data Communications 12,000.00 12,000.00 20,000.00 21,000.00 22,000.00 Expense 2620.61 Supplies, Building and Grounds 1,000.00 1,000.00 2,000.00 2,000.00 2,000.00 Expense 2620.622 Electricity 0.00 0.00 30,000.00 35,000.00 45,000.00 Expense 2620.623 Electrical Repair/Maint 0.00 0.00 2,000.00 2,000.00 2,000.00 Expense 2620.624 Heating Gas 0.00 0.00 15,000.00 16,500.00 18,000.00 Expense 2620.625 Landscaping 0.00 0.00 1,500.00 1,500.00 1,500.00 Expense 2700.002 Student Bus Transportation HS 0.00 0.00 0.00 0.00 0.00 Expense 2700.51 Busing/insurance/maintenance 0.00 0.00 0.00 0.00 0.00 Expense 2725.519 Field Trips 0.00 0.00 0.00 0.00 0.00 Expense 2725.52 Insurance 0.00 0.00 0.00 0.00 0.00 Expense 2725.525 Fees & Registrations 0.00 0.00 0.00 0.00 0.00 Expense 2725.602 Motor Vehicle Maintenance 0.00 0.00 0.00 0.00 0.00 Expense 2725.626 Gasoline 0.00 0.00 0.00 0.00 0.00 Expense 3000.89 IRS Fees 300.00 300.00 300.00 300.00 300.00 Expense 4000.4 Building Readiness/Repairs 1,500.00 1,500.00 5,000.00 [20] 5,000.00 5,000.00 Expense 4000.401 HVAC Maintenance Contract 0.00 0.00 5,000.00 5,000.00 5,000.00 Expense 4000.402 Security System 0.00 0.00 400.00 400.00 400.00 Expense 4000.403 IT Maintenance (Website) 3,000.00 3,000.00 4,000.00 [21] 4,500.00 5,000.00 Expense 4000.404 Sprinkler Testing Contract 100.00 100.00 300.00 400.00 500.00 Expense 4000.405 Fire Testing 0.00 0.00 550.00 550.00 550.00 Expense 4000.406 Building Reserve 0.00 0.00 5,000.00 10,000.00 15,000.00 Expense 9800.019 Mathcounts Club 0.00 0.00 0.00 0.00 0.00 Expense 9800.02 Spring Fling 0.00 0.00 0.00 0.00 0.00 Expense 98002009 Robotics 0.00 0.00 0.00 0.00 0.00 Expense 98002014 School Lunch Fundraiser 0.00 0.00 0.00 0.00 0.00 Expense 98002016 Dance Club 0.00 0.00 0.00 0.00 0.00 Expense 98002018 Raffle Ticket Fundraiser 0.00 0.00 0.00 0.00 0.00 Expense 9800.025 Girls Who Code 0.00 0.00 0.00 0.00 0.00

Expense 9800.026 Yearbook Club 0.00 0.00 0.00 0.00 0.00 Expense 9901.001 Bank Service Charges 0.00 0.00 0.00 0.00 0.00 Expense 9901.003 ADP Service Fee 2,000.00 2,000.00 3,000.00 3,000.00 3,000.00 Expense 9901.007 MCSB Fees 0.00 0.00 0.00 0.00 0.00 Expense 9901.008 MCSB Interest 0.00 0.00 0.00 0.00 0.00 Expense 9901002 Other Expenses 500.00 1,000.00 1,500.00 2,000.00 2,500.00 Expense 9901004 Instructional Supplies Reimbursement 0.00 0.00 0.00 0.00 0.00 Expense 9901005 Student Activities Expenses 0.00 0.00 0.00 0.00 0.00 Expense 9901006 Paypal Fee 0.00 0.00 0.00 0.00 0.00 **Expense Expense Sub Total (-Dr/Cr) 521,270.50 764,865.90 1,302,156.60 1,742,360.10 2,152,719.50 Grand Total (-Dr/Cr) 19,129.50 308,334.10 172,543.40 171,839.90 60,480.50**

[1] 20 Kids @100 per

[2] Audit fee

[3] Assuming PSAT 9 & 10 offered. SAT free

[4] This is a net zero after paying contractors

[5] 6 Fac. Avg 40K each

[6] 9 avg 42K each

[7] 12 Fac. avg 44K

[8] 18 FT/46K avg

[9] Assume 7 of 9 need HI/avg 350 match for each person. No families, just employee 50% [10] Assuming buliding needs outfitting

[11] Assume still in MCC with little need for additional computers, just faculty [12] Outfit new building

[13] Replace student/faculty or adding new for additional people

[14] Assume college handles most

[15] 120 students/assump. 30 hour wk

[16] assume FT at 180 students

[17] assume 1FT + 1PT for dept.

[18] 1 SS Dept Ch.
1 FT counselor
1 FT admin
[19] Land lease TBD + 5% each yr. [20] Assump. new building [21] IT contract in building