

Engineering Technology
Level III Outline

Unit I: Review of Shop Rules / Shop Safety

- Student agenda book
- General overview of course and requirements
- General shop safety rules and procedures
- Location and use of shop safety equipment
- Physics: Describing Motion

Unit II: Engineering Materials

- Review of stress/strain fundamentals
- Cast irons and ferrous metals
- Carbon steel
- Nonferrous metals
- Plastics
- Rubber

Unit III: Fasteners

- Keys, splines and serrations
- Pin fasteners
- Retaining rings
- Springs
- Rivets
- Welded fasteners
- Adhesive fastenings

Unit IV: Plastic Injection Mold Technology

- Mold Print Reading
- Mold Base Technology
- Mold/Cavity Materials
- Runner/Gate Design
- Mold Finishing/Polish
- Mold Heating/Cooling
- Mold Action
- Injection Molding

Unit V: Power Transmissions, Couplings, Bearings and Seals

- Belt drives
- Chain drives
- Gear drives
- Rack and pinion
- Power transmitting capacity of spur gears
- Bevel gears
- Worm and worm gears
- Couplings and flexible shafts
- Bearings
- Lubricants and radial seals
- Static seals and sealants
- Cams, linkages and actuators
- Plate cams
- Positive motion cams
- Drum cams
- Indexing
- Linkages
- Ratchet wheels

Unit VI: Electrical/Electronic/Control Design Topics

- Electrical and electronic drawings
- Schematic diagrams
- Wiring (connection) diagrams
- Printed circuit boards
- Block and logic diagrams

Unit VII: Rapid Prototyping

- Brief history of rapid prototyping
- Available rapid prototyping technologies
- Limitations of rapid prototyping

Engineering Technology
New Jersey Student Learning Standards (NJSLS)

NJSLS CTE.9.3

CONTENT AREA:	9.3 CAREER AND TECHNICAL EDUCATION
SCIENCE, TECHNOLOGY, ENGINEERING & MATHEMATICS CAREER CLUSTER®	
Number	Standard Statement
By the end of Grade 12, Career and Technical Education Program completers will be able to:	
CAREER CLUSTER®:	SCIENCE, TECHNOLOGY, ENGINEERING & MATHEMATICS (ST)
9.3.ST.1	Apply engineering skills in a project that requires project management, process control and quality assurance.
9.3.ST.2	Use technology to acquire, manipulate, analyze and report data.
9.3.ST.3	Describe and follow safety, health and environmental standards related to science, technology, engineering and mathematics (STEM) workplaces.
9.3.ST.4	Understand the nature and scope of the Science, Technology, Engineering & Mathematics Career Cluster and the role of STEM in society and the economy.
9.3.ST.5	Demonstrate an understanding of the breadth of career opportunities and means to those opportunities in each of the Science, Technology, Engineering & Mathematics Career Pathways.
9.3.ST.6	Demonstrate technical skills needed in a chosen STEM field.
PATHWAY:	ENGINEERING & TECHNOLOGY CAREER PATHWAY (ST-ET)
9.3.ST-ET.1	Use STEM concepts and processes to solve problems involving design and/or production.
9.3.ST-ET.2	Display and communicate STEM information.
9.3.ST-ET.3	Apply processes and concepts for the use of technological tools in STEM.
9.3.ST-ET.4	Apply the elements of the design process.
9.3.ST-ET.5	Apply the knowledge learned in STEM to solve problems.
9.3.ST-ET.6	Apply the knowledge learned in the study of STEM to provide solutions to human and societal problems in an ethical and legal manner.
PATHWAY:	SCIENCE & MATHEMATICS CAREER PATHWAY (ST-SM)
9.3.ST-SM.1	Apply science and mathematics to provide results, answers and algorithms for engineering and technological activities.
9.3.ST-SM.2	Apply science and mathematics concepts to the development of plans, processes and projects that address real world problems.
9.3.ST-SM.3	Analyze the impact that science and mathematics has on society.
9.3.ST-SM.4	Apply critical thinking skills to review information, explain statistical analysis, and to translate, interpret and summarize research and statistical data.