

CORE ENGINEERING 2
COURSE CODE: 6371
STUDENT PROFILE

STUDENT'S NAME:		TEACHER'S NAME:			
School Year/Semester:		Grade:			
Begin Date:		Date Completed:			
<p>Directions: Document student's progress using the applicable rating scales below: Enter date of completion under the appropriate column.</p> <p>0 - Has not received instruction in this area / no experience or knowledge of this task (N/A)</p> <p>1 – Can apply and perform independently (80-100)</p> <p>2 – Can perform the task completely with limited supervision (70-79)</p> <p>3 – Requires additional instruction and or close supervision (60-69)</p>					
A. SAFETY		0	1	2	3
1	Review school safety policies and procedures.				
2	Review classroom safety rules and procedures.				
3	Review safety procedures for using equipment in the classroom.				
4	Identify major causes of work-related accidents in office environments.				
5	Demonstrate safety skills in an office/work environment.				
B. STUDENT ORGANIZATIONS		0	1	2	3
1	Identify the purpose and goals of a Career and Technology Student Organization (CTSO).				
2	Explain how CTSOs are integral parts of specific clusters, majors, and/or courses.				
3	Explain the benefits and responsibilities of being a member of a CTSO.				
4	List leadership opportunities that are available to students through participation in CTSO conferences, competitions, community service, philanthropy, and other activities.				
5	Explain how participation in CTSOs can promote lifelong benefits in other professional and civic organizations.				
C. TECHNOLOGY KNOWLEDGE		0	1	2	3
1	Demonstrate proficiency and skills associated with the use of technologies that are common to a specific occupation				
2	Identify proper netiquette when using e-mail, social media, and other technologies for communication purposes.				
3	Identify potential abuse and unethical uses of laptops, tablets, computers, and/or networks.				

4	Explain the consequences of social, illegal, and unethical uses of technology (e.g., cyber bullying; piracy; illegal downloading; cyberbullying; licensing infringement; inappropriate uses of software, hardware, and mobile devices in the work environment).				
5	Discuss legal issues and the terms of use related to copyright laws, fair use laws, and ethics pertaining to downloading of images, photographs, Creative Commons, documents, video, sounds, music, trademarks, and other elements for personal use.				
6	Describe ethical and legal practices of safeguarding the confidentiality of business-related information.				
7	Describe possible threats to a laptop, tablet, computer, and/or network and methods of avoiding attacks.				
D. PERSONAL QUALITIES AND EMPLOYABILITY SKILLS		0	1	2	3
1	Demonstrate punctuality.				
2	Demonstrate critical thinking and problem-solving skills				
3	Demonstrate initiative and self-direction.				
4	Demonstrate integrity.				
5	Demonstrate work ethic.				
6	Demonstrate conflict resolution skills.				
7	Demonstrate listening and speaking skills.				
8	Demonstrate respect for diversity.				
9	Demonstrate customer service orientation.				
10	Demonstrate teamwork.				
E. PROFESSIONAL KNOWLEDGE		0	1	2	3
1	Demonstrate global or “big picture” thinking.				
2	Demonstrate career and life management skills and goal-making.				
3	Demonstrate continuous learning and adaptability skills to changing job requirements.				
4	Demonstrate time and resource management skills.				
5	Demonstrates information literacy skills.				
6	Demonstrates information security skills.				
7	Demonstrates information technology skills.				
8	Demonstrates knowledge and use of job-specific tools and technologies.				
9	Demonstrate job-specific mathematics skills.				
10	Demonstrates professionalism in the workplace.				
11	Demonstrates reading and writing skills.				
12	Demonstrates workplace safety.				

F. SIMPLE MACHINES AND MECHANISMS		0	1	2	3
1	Identify the six types of simple machines and their parts.				
2	Calculate work and power.				
3	Calculate ideal mechanical advantage.				
4	Calculate actual mechanical advantage.				
5	Calculate mechanical system efficiency.				
6	Calculate variables of gear-driven systems such as angular velocity, torque, gear ratios, number of teeth, and direction of rotation.				
7	Calculate variables of belts-driven systems such as angular velocity, diameters, and torque.				
8	Design, build, and evaluate a compound machine.				
G. STATICS AND STRUCTURAL ANALYSIS		0	1	2	3
1	Identify and apply Newton's Three Laws of Motion.				
2	Calculate the centroid of simple shape.				
3	Calculate the centroid of a complex shape.				
4	Calculate the moment of inertia for a rectangular shape				
5	Calculate beam deflection.				
6	Calculate modulus of elasticity.				
7	Understand vector notation.				
8	Analyze a vector and calculate component forces.				
9	Create a free body diagram for a system.				
10	Calculate moments about an axis.				
11	Calculate reaction forces for a structure.				
12	Calculate tensile and compressive forces in a truss.				
13	Calculate strength to weight ratio.				
14	Design, build, test, and analyze a simple truss.				
H. ELECTRONICS AND CIRCUITS		0	1	2	3
1	Identify electrical hazards.				
2	Understand and demonstrate safety procedures.				
3	Calculate work and power.				
4	Explain and classify a material as either a conductor or insulator.				
5	Identify and measure electrical components in a circuit.				
6	Distinguish between conventional current and electron current flow.				
7	Distinguish between AC and DC current.				
8	Distinguish between analog and digital.				
9	Define Ohms law.				

10	Define Kirchhoff's current and voltage laws.				
11	Explain the relationship between voltage, current, and resistance.				
12	Calculate electrical properties using Ohm's law and Kirchhoff's laws.				
13	Identify, create, and analyze series, parallel, and simple combination circuits.				
I. MACHINE DESIGN AND CONTROL SYSTEMS		0	1	2	3
1	Differentiate between open and closed loop systems.				
2	Identify and select appropriate inputs, outputs, and sensors.				
3	Design, build, program, and test an automated system/robot to perform a task.				
J. MATERIALS SCIENCE		0	1	2	3
1	Demonstrate knowledge of classes of materials and their properties.				
2	Justify material choices for a product in terms of availability, cost, manufacturing methods, application, and environment.				
3	Identify and choose appropriate processes for manufacturing, such as casting, milling, turning, forming, and grinding (additive versus subtractive processes).				
4	Explain how raw materials are transformed into finished products including the product life cycle (disposal, recycling, and environmental impacts).				
5	Calculate stress and strain.				
6	Evaluate properties of a metal from a stress/strain curve.				
7	Perform a destructive test on a metal (physically or virtually).				
K. KINEMATICS		0	1	2	3
1	Identify forces acting upon a projectile.				
2	Calculate firing angle, initial velocity, and range.				
3	Understand concepts of position, velocity, and acceleration.				
4	Design, build, test, and evaluate a ballistic device.				
L. THERMODYNAMICS (OPTIONAL)		0	1	2	3
1	Identify and explain the three methods of heat transfer (conduction, convection, and radiation)..				
2	Calculate rate and amount of heat transfer in thermodynamic systems				
3	Analyze a structure for heat transfer using R-values.				
4	Identify and explain the laws of thermodynamics.				
5	Design, build, test, and analyze a simple thermodynamic system for heat loss.				

L. FLUID DYNAMICS (OPTIONAL)		0	1	2	3
1	Identify the types and applications of fluid power systems.				
2	Calculate work and power.				
3	Compare pneumatic versus hydraulic systems.				
4	Calculate properties of a fluid power system using Pascal's Law.				
5	Calculate temperature, pressure, and volume using ideal gas laws.				
6	Design, build, test, and analyze a fluid power system.				