Course Outline

Academic year: 2020 - 2021

Course: Mechanical Technology (**Grade 9**)

Teacher: Mr. K. Coke & Mr. B. Streete

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MONTH	SECTIONS	CONTENT SUMMARY	ASSESSMENTS
		Term #1	
September		**Mechanical drive systems** ○ Simple machines ▪ Machine devices ✓ Gears ✓ Pulleys ✓ Belts	**Practical activity #1** ✓ Mark-out & cut-out car body ✓ Build car body & chassis ✓ Analyze and select simple machines drive system ✓ Assemble mechanical drive system in animated toy car
		Sources of and use of energy ○ Sources of energy ○ Forms of energy ○ Conversion of energy **Mechanical, heat, sound, light, electrical and chemical** **Electrical drive systems** ○ Basic components of a circuit ○ Circuit configuration ○ DC motors ○ LED Lamps	**Practical activity #2** ✓ Connect circuit in series and parallel ✓ Solder connection ✓ Connect electrical system in car ✓ Test car for racing completion

MONTH	SECTIONS	CONTENT SUMMARY	ASSESSMENTS
		Decoration and finish ▪ Use line and symmetry ▪ Forms and function ▪ Preparation of surfaces and materials ▪ Application and procedures ▪ Colour and lighting ▪ Aesthetics appreciation	▪ Use artistic skills to decorate car. ▪ Racing competition
October	SECTION 1 – FUNDAMENTALS OF INDUSTRY	**Occupational levels and their functions in the construction and manufacturing industries** **(a) Semi-skilled.** (b) Skilled. (c) Technician supervisory. (d) Technologist/Master Craftsman. (e) Professional.	
November Dec		**4. Career paths and qualifications in the construction and manufacturing industries** (a) Construction industries: (i) craftsmen /tradesmen - carpenters, electricians, electronics technicians, masons, plumbers, furniture makers, woodcrafters, upholsterers, painters; welders, machine operators and fitters; (i) technical workers - technicians, technologists, finishing technicians; drafting and design technicians; (ii) professional workers - electrical, mechanical, construction structural, civil and building service engineers, architects, quantity surveyors, construction project managers planners,	▪ **Assignment #1** ▪ Great Engineers of the 21st century.

MONTH	SECTIONS	CONTENT SUMMARY	ASSESSMENTS
		(d) ***Standards for fire prevention and response:*** (i) rules for fire prevention in the workshop and on a worksite; (ii) types of fires - class A, class B, class C, class D; (iii) rules for handling the different types of fires; (iv) types of fire fighting equipment and their storage - fire extinguishers, fire hydrants, fire alarms, hoses, fire blankets (asbestos-free); (v) fire extinguishers.	▪ **Assignment** # 2 Extinguishers • **Paper & Pencil Test #1**
	Term #2		
	SECTION 3: PRODUCTION ENGINEERING	**6.1 Performing Sheet Metal operations**	
Jan		b) **Cutting sheet metal:** Safety guidelines, procedures and standards for: (i) cutting sheet metal using hand shares or snips and foot-operated shears; (ii) cutting a notch or corner; (iii) punching holes in sheet metal; (iv) cutting metal with a saw; (v) cutting irregular shapes.	• **Paper & Pencil Test #2** • **Assignment #3-** Sheet metal cutting machines ▪ **Practical #1** – Cutting sheet metal
Feb		(a) **Layout and develop pattern for sheet metal work**: (i) safety guidelines, procedures and standards; (ii) principles of pattern development for making simple templates; - Radial line, parallel lines, simple triangulation; (iii) layout from a datum and centre line; (iv) layout and develop patterns for cylindrical and conical work; (v) layout rectangular ducts; (vi) layout pattern for transitional pieces;	**Practical activity #2** • Mark-out dust pan • **Quiz #1**
March			

MONTH	SECTIONS	CONTENT SUMMARY	ASSESSMENTS
		(vii) cutting templates; - template designs; - safety procedures; - waste control strategies.	
		(c) **Bending and forming sheet metal:** Safety guidelines, procedures and standards for bending and forming sheet metal by hand and on a brake: (i) making angular bends; (ii) bending metal on the bar folder; (iii) forming bends with bending machine (iv) forming cylinders and cones on the slip-roll forming machine; (v) forming metal using stakes.	• **Assignment #4**– Sheet metal forming machines • **Practical #3** – Bending sheet metal
April		(d) **Sheet Metal Fabrication**. Safety guidelines, procedures and standards for fabricating sheet metals: (i) designing and producing simple industry and household products in rectangular, cylindrical and conical shapes; (ii) calculating allowance for making seams and wired edges, length of material for edge; (iii) making seams and wired edge seams - lap, riveted, soldered, grooved, cap strip, standing, elbow, corner double; (v) making bottom seams – lap, insert, single, double bottom; (vi) fastening sheet metal using: - soldering (seams or joints); - riveting (use of mechanical fasteners: bolts, nuts, pins, rivets; - joining (spot welding);	• **Assignment #5** – Types of Rivets • **Paper & Pencil Test #3** • **Practical #4** – Fabricating project • **Practical #5** • Spray tools box or dust pan

MONTH	SECTIONS	CONTENT SUMMARY	ASSESSMENTS
		- polishing, colouring and protection of the product.	
Term 3			
May		❖ Project Planning - Plan Sheet	
June	Revision End of year exams		

ASSESSMENT PROCEDURES

Assignments & Test -20%

Practical -10%

Presentations -10%

Final Examination - 60%

Special Notes

- Students MUST be punctual at all times.
- Student's involvement in discussions during each session is an important aspect of the course. All students should expect to fully participate in class discussion and activities during all sessions.
- There are a number of reference texts and support materials used for this class. Each student is expected to read the assigned reading in full, before the class, as stated on the outline.

READING ASSIGNMENT/QUIZZES/TESTS

1. Quizzes may be announced or unannounced. Quizzes cover the assigned reading material.
2. There will be periodic tests over sections of material covered in class lectures, reading and assignments.
3. **Assignments** should be handed in on the **specified due date**. Failing to comply with the specified date will result in a fifty **percent (50%)** reduction in the marks for each outstanding day. Assignments that are more than **2 days** late will receive **zero (0).**
4. At the end of this module learners will be required to complete a written and/or oral and practical internal assessment to demonstrate competence.

REQUIREMENTS FOR PRACTICAL CLASSES

1. **ALL** students are expected obtain their own **Personal Protective Equipment (PPE'S)** prior to practical classes.
2. The sharing and borrowing of PPE'S and tools will **NOT** be permitted.
3. Students will **NOT** be allowed to leave their PPE'S and tools in the labs.
4. **All** students are expected to clean their work area and tools after practical lesson.
5. **Face shields are mandatory for practical classes.**
6. Students will work in groups of Three (3) but individual reports MUST be submitted.

CHEATING, DISHONESTY AND PLAGIARISM

Any form of cheating is sufficient for an automatic zero. The facilitator is willing and available to help any student who seeks assistance. Cheating, dishonesty, plagiarism, copying portions of another student's assignment etc. are totally unaccepted. Assignments are given to aid in the development of competency and acquisition of knowledge. Spend extra time to do your assignments with as little help from others as possible.

Resources:

- Krar, S.F., Oswald, J.W. (1990). Technology of Machine Tools 4th edition, Glencoe/McGraw-Hill. Peoria, Illinois.
- G.H THOMAS
- Sackey, J.K.N., Amoakoheme S.K. (1996). THE MOTIVATE SIRIES, Macmillan Publishers ltd.

Note: Dates are subject to change.

Signature: _____