HERBERT MORRISON TECHNICAL
INDUSTRIAL TECHNOLOGY DEPARTMENT
MECHANICAL TECHNOLOGY

Course Outline

Academic year: 2019 - 2020

Course: Mechanical Technology

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MONTH	SECTIONS	CONTENT	ASSESSMENTS
		Term #1	
September	SECTION 1 – FUNDAMENTALS OF INDUSTRY (cont'd)	**(c) Safety and maintenance standards**: Using equipment, tools and materials associated with electrical installation, electronics, building construction and metal work engineering: (i) rules and operating procedures for safe use of power, hand, and portable machine tools; (ii) safety rules for using and storing materials, tools and equipment; (iii) labelled drawings and sketches showing safety features and safe use of equipment and tools; (iv) maintaining workshop, worksite, equipment, materials and tools; - Types of maintenance in workshop/worksite activities (preventative, predictive, break down); - inspecting and analysing defects (vibration, wear and tear) in tools and machines; - using testing, measuring and safety devices; - developing and using maintenance schedules, checklists and duty roster; - using manufacturers' manuals (tools and machines).	**Practical #1** ✓ Housekeeping & Maintenance of machine **in MT lab.** **S.B.A #1 –** Machine project & Plan Sheet **Proposed projects:** ✓ **Parallel clamp** ✓ **Chipping hammer** ✓ **Vice** **S.B.A #2** – Plan sheet & Welding project **Proposed projects:** ✓ **Metal racks** ✓ **Basketball hoop** ✓ **Scoreboard system**

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		(v) carrying out risk assessments - use of a trained person (safety warden) with staff and students using safety inspection checklists, safety reports (strengths, weaknesses) and schedule of activities to address weaknesses.	**S.B.A #3** – Plan sheet & sheet Metal Project **Proposed projects:** ✓ **Letter box** ✓ **Tool box**
		MACHINE DEVICES	
October **Nov**		***4. Features and operating principles of simple machines:*** *(a) Types:* *(i) levers;* *(ii) pulleys;* *(iii) wheel and axel.* *(b) Operating principles:* *(i) levers;* *(ii) pulleys;* *(iii) wheel and axel.* ***5. Functions of special parts, accessories and processes*** *(a) Functions of different types of keys used in couplings:* *Types of keys:* *(i) square;* *(ii) gib-headed;* *(iii) tapered;* *(iv) woodruff.* ***(b) Types of couplings commonly used to transmit power from one machine to another:*** *(i) rigid;* *(ii) flexible;*	✓ **Assign. #1** – Machine devices ✓ **Paper & Pencil test #1** ✓ **Practical –** Construct a simple drive system**.** ✓ **Class Activity #1-** observe and maintain drive system on machine in the MT lab. ✓ **Class Activity #2-** Sketch devices

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Dec		*(iii) gears;* **(c) Types of commonly used seals:** (i) mechanical; (ii) gasket/synthetic; (d) Features and functions of each type of seals.	
Term #2			
Jan		**(e) Milling machine:** (i) safety guidelines, procedures and standards for operating vertical and horizontal milling machines operations; (ii) select cutter for simple operations – plain and end mill cutters, arbours;	✓ **Assign. #2** – Milling Operations
Feb		(iii) calculate and select cutting speed for size of cutter and material of work piece; (iv) calculate and select rates of feed; (v) mount and dismount cutters on spindle; (vi) mount work in vice and check for parallelism – use of dial indicator to test parallelism; (vii) adjust table for travel and depth of cut – use of calibrated dial; (viii) choose correct coolants and cutting fluids for different materials; (xi) surface-mill work on horizontal /vertical milling machines – up-cut (conventional) and down-cut (climb) milling); (x) calculate simple indexing – dividing head principle. **Surface grinder:** (a) safety guidelines, procedures and standards for performing grinding operations: (ii) working devices (chucks, grinding wheels); (iii) calculate speeds and feeds;	✓ **Paper & Pencil test #2** ✓ **Practical #2 –** Machine part on milling machine

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		(iv) select appropriate coolant.	
March	**SECTION 2: GRAPHIC COMMUNICATION AND DESIGN**	*1. steps in the Design process;* *2. samples of pictorial, multi-view, sectional and auxiliary drawings;* *3. design of a mechanism to satisfy an engineering need:* *(a) transmission Drive;* *(b) lifting mechanism;* *(c) provision of a report detailing the design process including conceptualisation and* *preliminary design indicating detailed drawings and other information.*	**Class Activity #3** ✓ **S**ketch design of **various mechanisms.**
April			• **Mock Exams**

MONTHLY ASSESSMENT MARKS ALLOCATION

QUIZ -10%

Project & Presentation -20%

TEST - 70%

Special Notes

- Students MUST be punctual at all times.
- **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).**
- At the end of this module learners will be required to complete a written and/or oral and practical internal assessment to demonstrate competence.
- 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.

READING ASSIGNMENT/QUIZZES/TESTS

1. 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.

2. Quizzes may be announced or unannounced. Quizzes cover the assigned reading material.
3. There will be periodic tests over sections of material covered in class lectures, reading and assignments.

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.