



WOLMER'S BOYS' SCHOOL

Industrial Arts Department

4th Form

Technical Drawing (TD)

Course Outline 2023-2024

RATIONALE:

Technical Drawing is a visual means of communicating clearly and concisely all the information (drawings, dimensions, notes, specifications) necessary to transfer an idea or concept into reality. It is based on the principles of projection in two-dimensional and three-dimensional representations. Technical Drawing plays an indispensable role in determining the quality and competitiveness of finished products in the design process. It is, therefore, an important prerequisite and an essential companion for the CSEC Industrial Technology programmes which provide the foundational competencies in manufacturing and industrialisation in the Caribbean.

The syllabus focuses on the development of competencies in geometric construction, descriptive geometry, engineering designs and graphics, electrical, mechanical, manufacturing and construction drafting. These are geared toward the development of students' spatial visualisation, technical communication, interdisciplinary and employability skills. These skills are useful for careers in drafting, architecture, surveying, civil engineering, interior designing, design engineering and in the general construction and manufacturing industries. In addition, the programme of studies in the syllabus caters for those students who will seek entry level employment in related fields.

With the introduction of AUTOCAD, students should be able to transfer drawing principles from manual drawing to computer drawings. The aim of the introduction to CAD is to enhance students drafting knowledge, aid in completing their SBAs to CSEC 2020 requirements and be equipped with the practice in skill to compete in the modern workforce.

GOALS:

The syllabus aims to:

1. enable students to acquire an understanding of the relationship of design and drawing in manufacturing and industrialisation;
2. provide students with the competencies required for understanding, interpreting and producing technical drawings aligned with established standards, conventions and technology;
3. develop students' critical thinking, quality standards and teamwork skills in the production of drawings using traditional methods or design software packages;
4. develop students' appreciation of creativity, imagination and aesthetics in designs and drawings;
5. provide students with foundation competencies in entrepreneurial skills for employment creation and economic development.

CHRISTMAS TERM: 2023

W e e k	Module	Topics	Lesson/Method of Delivery	Use of ICT	Student Assessment
1	Fundamentals of Technical Drawing Topic: 1	Safety, health and welfare standards <ul style="list-style-type: none"> Occupational health and safety 	Sensitize students of the importance of safety in the workplace.	Videos, pictures and PDFs showing safety in the workplace	Classwork, Homework
2	Topic 2: Topic 3:	Safety resources Fires and fire-fighting equipment	Show the importance of safety equipment (personal protective equipment PPE) and classification of fire and extinguishers.	Videos, pictures and PDFs showing safety gears and classes of fire and extinguishers	Classwork, Homework and research
3	Topic 4: Topic 5:	Accident, injury and emergency First Aid	Students will learn how to write accident reports providing pertinent details and how to care for injuries using a first kit.	Videos and research	Classwork, Homework, PowerPoint
4	Topic 6:	Hazards and hazardous substances	What is a hazard and hazardous substance that are found in the workplace	Videos, pictures and PDFs showing hazardous substance	Classwork and Homework
5	Topic 7:	International standards	What are the standards that we use to design products	Presentation showing standards in the industries	Homework

W e e k	Module	Topics	Lesson/Method of Delivery	Use of ICT	Student Assessment
6	Topic 8:	Getting Started with AutoCAD	Students will learn how to: <ul style="list-style-type: none"> - open and launch the CAD programme. - Set unit and limits. - Set layers. - Status bar, such as snap, polar, ortho, grid, OSNAP, otracking, lineweight, model and paper space. 	Computer learning, Practical use of the AutoCad Software.	Participation and research
7	Topic 9	Using CAD principles:	Students will learn how to: <ul style="list-style-type: none"> - Locate and use tool bars dimensions, draw, layers, modify, text, zoom, viewport, standard, properties - Use of command lines, keyboards. - Dimensioning. - Viewports, scales and scale factors. - Save file. - Print/plot. 	Computer learning, Practical use of the AutoCad Software.	Participation research and cooperative learning
8	Topic 10:	Basic Drawing & Editing Commands, Creating Basic Shapes	<ul style="list-style-type: none"> - Drawing commands- Line, Circle, Object snap, Chamfer, Trim, Extrude, Pull, Offset, Extend, Tangents. 	Computer learning, Practical use of the AutoCad Software.	Participation research and cooperative learning

Week	Module	Topics	Lesson/Method of Delivery	Use of ICT	Student Assessment
			Shapes- Rectangle, arcs, circles, Cones.		
9	Plane Geometry Topic 11:	Tangents <ul style="list-style-type: none"> • Definition. • Properties. • Tangency of circles, arcs and straight lines. • Internal and external tangents, centres and tangency points. 	Demonstrate how to draw tangents to circles and lines.	Computer learning, Practical use of the AutoCad Software.	Research and homework

EASTER TERM- JANUARY 2024 – APRIL 2024

Week	Module	Topics	Lesson/Method of Delivery	Use of ICT	Student Assessment
10-13	Plane Geometry Topic 2:	Analytic geometry <ul style="list-style-type: none"> • <i>Definition, properties, characteristics and construction of ellipse, parabola and hyperbola.</i> • <i>Constructing an ellipse using the concentric circle methods.</i> • <i>Constructing a parabola using the locus and rectangular methods</i> • <i>Constructing the tangents and normal to the curves.</i> • <i>Constructing an Archimedean spiral</i> • <i>Constructing an involute</i> 	PowerPoint presentation will be shown on these engineering curves (locus) and also the definition	Computer learning, Practical use of the AutoCad Software.	Classwork and homework
14-16	Topic 2:	Pictorial drawings Types of pictorial drawings <i>Characteristics and uses of each type.</i>	PowerPoint presentation will be shown on how to draw isometric blocks and circles, perspective and oblique drawings in AutoCAD.	Videos, pictures and PDFs showing application of each and steps and procedures Computer learning, Practical use of the AutoCad Software.	Classwork and homework

Week	Module	Topics	Lesson/Method of Delivery	Use of ICT	Student Assessment
17-20	Topic 3	Orthographic Projection <i>First and third angle projections</i>	PowerPoint presentation will be show the difference between first and third angle projection. Interactive website with orthographic projection worksheet.	Videos, pictures and PDFs showing application of each and steps and procedures Computer learning, Practical use of the AutoCad Software	Classwork and homework

SUMMER TERM: 2024

Week	Module	Topics	Lesson/Method of Delivery	Use of ICT	Student Assessment
21	Building Drawing	Topic 1: Standards: <ul style="list-style-type: none"> • BSI • ISO • Cubic • Local Standard 	Organize work attachments with agencies of Government, drafting/architectural firms, Fabrication/construction companies to give students an opportunity to observe the application of the various standards and compare the practices observed with the documented standards and expectations. Students can present their findings in class.	Videos and research	Classwork and research
22-23	Topic 2:	Types of drawings used in the building industry <ul style="list-style-type: none"> • <i>Types, site plan, location plans, building plans elevations and sectional views.</i> • <i>Uses and characteristics of each type of plan.</i> • <i>Labelled sketches of each type of plan.</i> 	Arrange site visits (Virtually) so students can see and understand what it is they are drawing.	Videos and research	Classwork and research
24-26	Topic 3	Types of architectural drawings <i>site plans, general location plans,</i>	Show students an actual floor plan set consisting all the drawings that are needed.	Videos and research	Classwork and research

Week	Module	Topics	Lesson/Method of Delivery	Use of ICT	Student Assessment
		<i>foundation plans, floor plans, building plans; and, elevations and sectional views.</i>			
27-30		Architectural drawings <ul style="list-style-type: none"> • <i>Preparing a drawing sheet, Selecting paper size, Checking alignment, Drawing border line,</i> • <i>Preparing title block, Line characteristics, Lettering and dimensioning.</i> 	Show students an actual floor plan set consisting all the drawings that are needed.	Blueprint / floor plan set Videos and research	Classwork and research
31-33	Engineering Drawing	Topic 1 Engineering materials <i>(a) Metals.</i> <i>(b) Non-metals.</i>	Research on engineering materials, the characteristics of each metal and non-metal material and advantages and disadvantages of metal and non-metal material.	Videos, pictures and PDFs showing application of each and steps and procedures	Classwork and research
34-35		Engineering drawings	Students will be able to sketch engineering components, preparing orthographic drawings dimensioning drawings, sections and preparing assembly drawings.	Videos, pictures and PDFs showing application of each and steps and procedureS	Classwork and research

Week	Module	Topics	Lesson/Method of Delivery	Use of ICT	Student Assessment
36 - 38	Building and Mechanical Drawing ***Both groups will do this topic	<i>Entrepreneurship and wage employment</i> <i>Principles of entrepreneurship</i> <i>Preparing a small business plan</i>	Expose students to the world of business by encouraging them to be entrepreneurs and to learn how to formulate a business plan.	Research basic requirements of a business plan.	Classwork and homework. SBA assignment

MAJOR ASSIGNMENT:

TD Encyclopedia

READING LIST:

Morling, K. *Geometric and Engineering Drawing*, Third Edition, Graduate of the Institution of Mechanical Engineers.