Ministry of Higher Education
King Fahd University of Petroleum & Minerals
College of Applied and Supporting Studies
Preparatory Year Program

وزارة التعليم العالي
جامعة الملك فهد للبترول و المعادن
كلية الدراسات المساندة والتطبيقية
برنامج السنة التحضيرية

Course Name & Code: Preparatory Engineering Technology; PYP 004

- **Textbook: Lab Manual (PYP 004)** (Published by KFUPM Press)
- **Prerequisites**: none **Credit: One**
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PYP 004 COURSE PLAN

Courses:

1. Robotics 2. Auto car systems 3. Graphics and design 4. Pneumatics systems

ROBOTICS (3 weeks)

Objective: To design, assemble simple Robotics. Introduction to basic Robotics program

Week 1	Introduction to Robotics EV3 Brick, Large & Medium Motors and Basic programing
Week 2	Introduction of sensors, controlling the movement of robot through sensors like touch, color, gyro and ultrasonic sensors etc.
Week 3	Build and program a Robot to perform a specific task +Quizzes

AUTO-CAR SYSTEMS (3 weeks

Objective: To demonstrate the basic Auto car systems and terminologies with hands on practical experience

Week 1	Introduction to the basic car engine terminology like 4 stroke cycle, induction, compression, power and exhaust, length of stroke, bore, TDC & BDC Calculate the engine capacity
Week 2	The working principle of transmission, differential, steering, braking, suspension and electrical systems of 4-stroke car engine and wheel balancing machine
Week 3	To understand the basic principle of electrical systems, ignition, battery, coil, distributor, H.T. leads and spark plug To Connect the ignition components according to circuit diagram + Quizzes

GRAPHICS AND DESIGN BY AUTOCAD SOFTWARE (5 weeks)

Objective: To demonstrate basic manual and computer aided engineering drawing

Week 1	Introduction to basic manual engineering drawing and sketching To demonstrate the orthographic and isometric views, 3rd angle of projection
Week 2	Introduction to the AutoCAD software, setting up the drawing environment, drawing units, function keys and co-ordinate systems
Week 3	Application of draw toolbar and modify commands Draw lines, poly-lines, circles, rectangle, polygon, arc and ellipse etc.,
Week 4	Using modify toolbars like erase, copy, mirror, offset, array, move, rotate, stretch, trim, extend, chamfer, fillet and break+ Introduction to CAD/CAM
Week 5	Working with 3-D and 2-D, All Practice exercise given in the Lab Manual Draw Plan, front, and side view with all dimensions + Quizzes

PNEUMATICS SYSTEMS (3 WEEKS)

Objective: To demonstrate the basic mechanical automation (pneumatics) systems

Week 1	Introduction to the pneumatics systems , application of single & double acting cylinder, actuator, valves and compressors, dual pressure valve, shuttle valve , normally open & close valves, roller valves, 3 ports and 5 ports valves
Week 2	Application of fluid SIM software, design the circuit diagram, identify the errors in the design Identify low pressure and high pressure valves, Practice all assignments given in the manual
Week 3	Assembling of pneumatics systems (all assignments are given in the Lab manual) Test circuit by air pressure, Troubleshooting , identify the errors+ Quizzes