H.H. Arnold High School
Electronics and Technology Education
Frank C. Pendzich

ASSIGNMENT CHECK-LIST
Generated: 08/25/02

Course #	Course Title
VEE406	**Robotics/Industrial Technology**

Area	Competency	Category
A	**ELECTRICITY/ELECTRONICS COURSE ORIENTATION**	**VOCATIONAL**

Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
0	**Electricity/Electronics Orientation - (Theory)**	(/ /)	(/ /)

The student will demonstrate their knowledge of the rules and requirements for successfully completing an electricity and electronics course. They will fill out a job application and successfully complete a computer proctored test. Finally, the student will sign a statement professing their awareness of their obligations to this class.

Sub	Init	Code	Type of Task	Task Description
a	( )	**A0a**	**Reading Assignment**	Student Orientation Packet
b	( )	**A0b**	**Homework Assignment**	The Student Record
c	( )	**A0c**	**Assignment Sheet**	Accepted Use Agreement
d	( )	**A0d**	**Assignment Sheet**	Student Record of Counseling
e	( )	**A0e**	**Notebook**	Notebook Review
f	( )	**A0f**	**Performance Test**	Using the Local Area Network
g	( )	**A0g**	**Performance Test**	Using Electronic Mail
h	( )	**A0h**	**Performance Test**	The Assignment Check-List
i	( )	**A0i**	**Performance Test**	The Student Progress Report
j	( )	**A0j**	**Performance Test**	Navigating The Tech Ed Web Page
k	( )	**A0k**	**Computer Test**	Electricity/Electronics Orientation

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Subtasks are to be initialled by the instructor as they are completed. Indicate the task start and completion dates. Submit this form when each task is done.

Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
1	**The Technical Report**	(/ /)	(/ /)

The student will complete a model of a technical report on the technical report process. The student will use the correct tools to write an objective statement, describe the procedure, devise a table and graph, and create a diagram of the technical report process. Finally, the student will write a conclusion statement about the theory and operation of the technical report.

Sub	Init	Code	Type of Task	Task Description
a	( )	**A1a**	**Technical Report**	The Technical Report

Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
2	**The Homework Assignment**	(/ /)	(/ /)

The student will complete a technical report about the homework process. They will use the correct tools to write an objective statement, describe the procedure, complete a table and graph of pertainent information, and create a diagram of the homework process. Finally, the student will write a conclusion statement about the theory and operation of the homework assignment.

Sub	Init	Code	Type of Task	Task Description
a	( )	**A2a**	**Technical Report**	The Homework Assignment

Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
3	**How to Access the Local Area Network (LAN)**	(/ /)	(/ /)

The student will complete a technical report about how to access the Local Area Network (LAN). The student will use the correct tools to write an objective statement, describe the procedure, devise a table and graph containing pertainent information, and create a diagram of the LAN access process. The technical report will include information about the login process and accessing E-Mail. The student will also write a conclusion statement about the theory and operation of using the LAN. Finally, the student will demonstrate how to login to and logout of the LAN, change their LAN password, and access their E-Mail account. While using their E-Mail account, the student will read and reply to a message, prepare and send a message, delete excess messages from their inbox, change their E-Mail password, print a message, and read the Daily Bulletin from the bulletin board. Finally, the student will show how to access the computer tutorials and exams for their course.

Sub	Init	Code	Type of Task	Task Description
a	( )	**A3a**	**Technical Report**	How to Access the Local Area Network

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Course #	Course Title
VEE406	**Robotics/Industrial Technology**

Area	Competency	Category
B	**GEARS, LEGOS, AND SIMPLE MACHINES**	**VOCATIONAL**

Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
1	**Gears, LEGOs, and Simple Machines (Theory)**	(/ /)	(/ /)

Upon completion of this task, the student will be able to identify and apply the component parts of their LEGO kits while making simple
machines. These machines will incorporate levers, gears, wheels, belts, and pulleys. They will also construct machines from LEGOs to solve simple problems.

Sub	Init	Code	Type of Task	Task Description
a	( )	**B1a**	**Reading Assignment** **Source:** Building Simple Machines with LEGOs	Building Simple Machines with LEGOs
b	( )	**B1b**	**Homework Assignment** **Source:** Building Simple Machines with LEGOs	Questions
c	( )	**B1c**	**Homework Assignment** **Source:** Building Simple Machines with LEGOs	Exercises
d	( )	**B1d**	**Performance Test** **Source:** Gears, Wheels, and Moving Machines **Unit:** 10 **Page:** 4 **Min. Score:** 85%	LEGO Design Problems
e	( )	**B1e**	**Computer Test**	Gears, LEGOs, and Simple Machines
f	( )	**B1f**	**Notebook**	Notebook Review
g	( )	**B1g**	**Exercise**	LEGO 1030, 1032, and 1092 Inventory

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Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
2	**Levers**	(/ /)	(/ /)

The student will be able to recognize levers and apply them to solve a variety of problems. To complete the task, the student must describe each model in terms of: How it works, its similarity to real life examples, and when they use this type of machine. They will also compile a simple chart containing this information.
The student will investigate the effects of various modifications on each of the models by: Moving the axle, Lenghtening the bar, and Moving the mass. Finally the student will demonstrate their knowledge of this subject by constructing a letter balance using LEGOs. They will modify the balance so different loads can be wieghed.

Sub	Init	Code	Type of Task	Task Description		
a	( )	**B2a**	**Lab Experiment**	Levers		
			Source:	LEGO dacta Technic I - 1031 Activity Cards		
			Unit: 4	**Page:**	**Min. Score:**	100%
b	( )	**B2b**	**Performance Test**	Letter Balance (Modified)		
			Source:	LEGO dacta Technic I - 1031 Activity Cards		
			Unit: 4	**Page:** Back Page	**Min. Score:**	100%

Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
3	**Friction and Resistance**	(/ /)	(/ /)

The student will demonstrate how to overcome friction and resistance when moving loads using mechanisms. They will construct several conveyor belt systems using LEGOs and contrast and compare their operation. Finally they will construct an arial railway and modify it so the block can be moved back and forth across the gap by use of a mechanism. They will also construct a conveyor that can move objects around a corner.

Sub	Init	Code	Type of Task	Task Description		
a	( )	**B3a**	**Lab Experiment**	Sliding and Rolling		
			Source:	LEGO dacta Technic I - 1031 Activity Cards		
			Unit: 11	**Page:**	**Min. Score:**	100%
b	( )	**B3b**	**Performance Test**	The Arial Railway (Modified)		
			Source:	LEGO dacta Technic I - 1031 Activity Cards		
			Unit: 11	**Page:** Back Page	**Min. Score:**	100%
c	( )	**B3c**	**Lab Experiment**	Conveyor Belts		
			Source:	LEGO dacta Technic II - 1033 Activity Cards		
			Unit: 18	**Page:**	**Min. Score:**	100%
d	( )	**B3d**	**Performance Test**	Conveyor Belts (Modified)		
			Source:	LEGO dacta Technic II - 1033 Activity Cards		
			Unit: 18	**Page:** Back Page	**Min. Score:**	100%

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Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
4	**Belts and Gears**	(/ /)	(/ /)

The student will demonstrate how belt and gear drives work in a variety of machines. They will contrast and compare their operation and determine their proper application. They will also calculate gear ratios and determine the effect that the gear ratio has on torque and the rate of rotation in a machine. Demonstrating their knowledge of gears and gear trains, the student will construct simple machines using: a belt transmission, gear train, a compound gear train, and a worm gear transmission. They will also build a model of a hand drill (then modify it to be an eggbeater), 2-speed gear-box, power drill, hand mixer, vice and window wiper (then modify it for two wipers), model helicopter (then modify it to include a tail rotor), and a turnable crane. The crane will be modified so the jib can be raised and lowered by a mechanism. Finally, the will build a walking robot.

Sub	Init	Code	Type of Task	Task Description			
a	( )	**B4a**	**Lab Experiment**	Belt Transmissions			
			Source:	LEGO dacta Technic I - 1031 Activity Cards			
			Unit:	5	**Page:**	**Min. Score:**	100%
b	( )	**B4b**	**Performance Test**	Belt Transmissions			
			Source:	LEGO dacta Technic I - 1031 Activity Cards			
			Unit:	5	**Page:** Back Page	**Min. Score:**	100%
c	( )	**B4c**	**Lab Experiment**	Gear Trains			
			Source:	LEGO dacta Technic I - 1031 Activity Cards			
			Unit:	6	**Page:**	**Min. Score:**	100%
d	( )	**B4d**	**Performance Test**	Complicated Gear Trains			
			Source:	LEGO dacta Technic I - 1031 Activity Cards			
			Unit:	6	**Page:** Back Page	**Min. Score:**	100%
e	( )	**B4e**	**Lab Experiment**	Angular Transmission			
			Source:	LEGO dacta Technic I - 1031 Activity Cards			
			Unit:	7	**Page:**	**Min. Score:**	100%
f	( )	**B4f**	**Performance Test**	Hand Drill (Eggbeater Modification)			
			Source:	LEGO dacta Technic I - 1031 Activity Cards			
			Unit:	7	**Page:** Back Page	**Min. Score:**	100%
g	( )	**B4g**	**Lab Experiment**	Gearing Up and Down			
			Source:	LEGO dacta Technic I - 1031 Activity Cards			
			Unit:	12	**Page:**	**Min. Score:**	100%
h	( )	**B4h**	**Performance Test**	Compound Gear Train			
			Source:	LEGO dacta Technic I - 1031 Activity Cards			
			Unit:	12	**Page:** Back Page	**Min. Score:**	100%
i	( )	**B4i**	**Lab Experiment**	Gear Transmission			
			Source:	LEGO dacta Technic II - 1033 Activity Cards			
			Unit:	9	**Page:**	**Min. Score:**	100%
j	( )	**B4j**	**Performance Test**	2-Speed Gear-Box			
			Source:	LEGO dacta Technic II - 1033 Activity Cards			
			Unit:	9	**Page:** Back Page	**Min. Score:**	100%

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Sub	Init	Code	Type of Task	Task Description
k	( )	**B4k**	**Lab Experiment**	Compound Gearing
			Source:	LEGO dacta Technic II - 1033 Activity Cards
			Unit: 10	**Page:** **Min. Score:** 100%
l	( )	**B4l**	**Performance Test**	Power Drill
			Source:	LEGO dacta Technic II - 1033 Activity Cards
			Unit: 10	**Page:** Back Page **Min. Score:** 100%
m	( )	**B4m**	**Lab Experiment**	Worm Gear
			Source:	LEGO dacta Technic II - 1033 Activity Cards
			Unit: 11	**Page:** **Min. Score:** 100%
n	( )	**B4n**	**Performance Test**	Hand Mixer
			Source:	LEGO dacta Technic II - 1033 Activity Cards
			Unit: 11	**Page:** Back Page **Min. Score:** 100%
o	( )	**B4o**	**Lab Experiment**	Hand/Motor Driven Wench
			Source:	LEGO dacta Technic II - 1033 Activity Cards
			Unit: 12	**Page:** **Min. Score:** 100%
p	( )	**B4p**	**Performance Test**	Vice and Window Wiper (Modified)
			Source:	LEGO dacta Technic II - 1033 Activity Cards
			Unit: 12	**Page:** Back Page **Min. Score:** 100%
q	( )	**B4q**	**Lab Experiment**	Transmission Through a Right Angle
			Source:	LEGO dacta Technic II - 1033 Activity Cards
			Unit: 13	**Page:** **Min. Score:** 100%
r	( )	**B4r**	**Performance Test**	Helicopter with Right Angle Drive (Mod)
			Source:	LEGO dacta Technic II - 1033 Activity Cards
			Unit: 13	**Page:** Back Page **Min. Score:** 100%
s	( )	**B4s**	**Lab Experiment**	Self-Propelled Turnable Crane
			Source:	LEGO dacta Technic II - 1033 Activity Cards
			Unit: 17	**Page:** **Min. Score:** 100%
t	( )	**B4t**	**Performance Test**	Crane (Jib Modified So It Can Be Raised)
			Source:	LEGO dacta Technic II - 1033 Activity Cards
			Unit: 17	**Page:** Back Page **Min. Score:** 100%
u	( )	**B4u**	**Lab Experiment**	Walking Dog Robot
			Source:	LEGO dacta Technic II - 1033 Activity Cards
			Unit: 20	**Page:** **Min. Score:** 100%
v	( )	**B4v**	**Performance Test**	Walking Robot
			Source:	LEGO dacta Technic II - 1033 Activity Cards
			Unit: 20	**Page:** Back Page **Min. Score:** 100%

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Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
5	**Pulleys**	(/ /)	(/ /)

The student will demonstrate the use of pulleys in simple machines. They will apply the concept of the block and tackle, together with gears and levers to build machines that will lift heavy loads. They will build a model crane, scissors table, and crane/hoist. To demonstrate the knowledge of this subject, they will modify the crane/hoist to move the load sideways as well as lift it.

Sub	Init	Code	Type of Task	Task Description		
a	( )	**B5a**	**Lab Experiment**	Pulley Crane		
			Source:	LEGO dacta Technic I - 1031 Activity Cards		
			Unit: 15	**Page:**	**Min. Score:**	100%
b	( )	**B5b**	**Performance Test**	Scissors Table		
			Source:	LEGO dacta Technic I - 1031 Activity Cards		
			Unit: 15	**Page:** Back Page	**Min. Score:**	100%
c	( )	**B5c**	**Lab Experiment**	Crane/Hoist		
			Source:	LEGO dacta Technic I - 1031 Activity Cards		
			Unit: 16	**Page:**	**Min. Score:**	100%
d	( )	**B5d**	**Performance Test**	Crane/Hoist - Three Pulley (Modified)		
			Source:	LEGO dacta Technic I - 1031 Activity Cards		
			Unit: 16	**Page:** Back Page	**Min. Score:**	100%

Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
6	**Forms of Motion**	(/ /)	(/ /)

The student will demonstrate the various forms of motion that effect the operation of machines and how to change from one form of motion to another. They will construct models of a windshield wiper, flywheel, toothed bar, and merry-go-round. To demonstrate their knowledge of this subject they will construct models of a railway signal (then modify it by replacing the link with string), oil pump, piston engine, and speed governor.

Sub	Init	Code	Type of Task	Task Description		
a	( )	**B6a**	**Lab Experiment**	Windshield Wipers		
			Source:	LEGO dacta Technic I - 1031 Activity Cards		
			Unit: 8	**Page:**	**Min. Score:**	100%
b	( )	**B6b**	**Performance Test**	Railway Signal (Modified)		
			Source:	LEGO dacta Technic I - 1031 Activity Cards		
			Unit: 8	**Page:** Back Page	**Min. Score:**	100%
c	( )	**B6c**	**Lab Experiment**	Flywheel		
			Source:	LEGO dacta Technic I - 1031 Activity Cards		
			Unit: 9	**Page:**	**Min. Score:**	100%
d	( )	**B6d**	**Performance Test**	Oil Pump		
			Source:	LEGO dacta Technic I - 1031 Activity Cards		
			Unit: 9	**Page:** Back Page	**Min. Score:**	100%

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Subtasks are to be initialled by the instructor as they are completed. Indicate the task start and completion dates. Submit this form when each task is done.

Sub	Init	Code	Type of Task	Task Description		
e	( )	B6e	**Lab Experiment**	Toothed Bar		
			Source:	LEGO dacta Technic I - 1031 Activity Cards		
			Unit: 13	**Page:**	**Min. Score:**	100%
f	( )	B6f	**Performance Test**	Piston Engine		
			Source:	LEGO dacta Technic I - 1031 Activity Cards		
			Unit: 13	**Page:** Back Page	**Min. Score:**	100%
g	( )	B6g	**Lab Experiment**	Merry-Go-Round		
			Source:	LEGO dacta Technic I - 1031 Activity Cards		
			Unit: 14	**Page:**	**Min. Score:**	100%
h	( )	B6h	**Performance Test**	Speed Governor		
			Source:	LEGO dacta Technic I - 1031 Activity Cards		
			Unit: 14	**Page:** Back Page	**Min. Score:**	100%

Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
7	**Chain Transmissions**	(/ /)	(/ /)

The student will demonstrate the operation of the sprocket and chain drive tranmission. They will construct a simple bicycle chain transmission, experiment with sprocket size, and calculate gear ratios. Further more, the student will construct a variety of simple vehicles using a chain transmission. They will compare the vehicles as hill climbers. To demonstrate their knowledge of chain transmissions, the student will construct a model chain saw using LEGOs.

Sub	Init	Code	Type of Task	Task Description		
a	( )	B7a	**Lab Experiment**	Bicycle Chain Transmission		
			Source:	LEGO dacta Technic II - 1033 Activity Cards		
			Unit: 7	**Page:**	**Min. Score:**	100%
b	( )	B7b	**Performance Test**	Motorbike/Compound Chain Transmission		
			Source:	LEGO dacta Technic II - 1033 Activity Cards		
			Unit: 7	**Page:** Back Page	**Min. Score:**	100%
c	( )	B7c	**Lab Experiment**	Simple Vehicles Using Chain Transmission		
			Source:	LEGO dacta Technic II - 1033 Activity Cards		
			Unit: 8	**Page:**	**Min. Score:**	100%
d	( )	B7d	**Performance Test**	Chain Saw		
			Source:	LEGO dacta Technic II - 1033 Activity Cards		
			Unit: 8	**Page:** Back Page	**Min. Score:**	100%

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Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
8	**Triphammers and Cams**	(/ /)	(/ /)

The student will demonstrate how rotarty movement can be changed to up and down motion. They will construct models of hammermills and a model of a machine that uses a cam to control a valve. Finally, they will invent a machine that records the patern of a cam's movement on paper.

Sub	Init	Code	Type of Task	Task Description
a	( )	**B8a**	**Lab Experiment**	Hammermills
			Source:	LEGO dacta Technic II - 1033 Activity Cards
			Unit: 14	**Page:** **Min. Score:** 100%
b	( )	**B8b**	**Lab Experiment**	Cam Operated Valve
			Source:	LEGO dacta Technic II - 1033 Activity Cards
			Unit: 14	**Page:** Back Page **Min. Score:** 100%
c	( )	**B8c**	**Performance Test**	Test Rig for Cams

Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
9	**Differential Gear**	(/ /)	(/ /)

The student will demonstrate how a differential works by constructing models that use one. They will construct several versions of a tractor that incorporates a differential in its design.
They will demonstrate their knowledge of the differential by constructing a complex tractor and then modifying the tractor so it goes slower.

Sub	Init	Code	Type of Task	Task Description
a	( )	**B9a**	**Lab Experiment**	Tractors Using a Differential Gear
			Source:	LEGO dacta Technic II - 1033 Activity Cards
			Unit: 16	**Page:** **Min. Score:** 100%
b	( )	**B9b**	**Performance Test**	Tractor Working Tools (Modified)
			Source:	LEGO dacta Technic II - 1033 Activity Cards
			Unit: 16	**Page:** Back Page **Min. Score:** 100%

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ASSIGNMENT CHECK-LIST
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Course #	Course Title
VEE406	**Robotics/Industrial Technology**

Area	Competency	Category
C	**COMPUTERS IN CONTROL - LEGO ROBOLAB/MINDSTORMS**	**VOCATIONAL**

Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
0	**Computers in Control - LEGO Robolab Theory**	(/ /)	(/ /)

The student will view the video series, "Computers In Control" and complete a worksheet testing their knowledge the presented concepts. The student must also successfully complete an examination covering the theory of Computers in Control using LEGO dacta components and control software.

Sub	Init	Code	Type of Task	Task Description
a	( )	**C0a**	**Reading Assignment**	Robot Madness - DISCOVER, May 1990
b	( )	**C0b**	**Reading Assignment**	RoboHockey - DISCOVER, May 1990
c	( )	**C0c**	**Video Tape Inst.**	Introducing the Robot
d	( )	**C0d**	**Video Tape Inst.**	Making Sense of the Real World
e	( )	**C0e**	**Video Tape Inst.**	Making Things Move
f	( )	**C0f**	**Video Tape Inst.**	Getting it Together
g	( )	**C0g**	**Video Tape Inst.**	Recognizing the Obvious
h	( )	**C0h**	**Homework Assignment**	Video Review Questions
i	( )	**C0i**	**Computer Test**	Computers in Control - Lego Robolab
j	( )	**C0j**	**Notebook**	Notebook Review
k	( )	**C0k**	**Exercise**	LEGO Robolab 9790 Kit Inventory

Source: LEGO dacta 9700 Activity cards
Unit: 1 **Page:** **Min. Score:** 100%

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Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
1	**Introduction to Robotic Systems**	(/ /)	(/ /)

The student will demonstrate how to setup and initialize the Lego Robolab RCX and IR transmitter. They will also construct a motorized vehicle and develop a basic program to control it. The student will demonstrate there skill by completing activities and then create a program to perform other operations.

Sub	Init	Code	Type of Task	Task Description
a	( )	**C1a**	**Exercise**	Introduction to the RCX
b	( )	**C1b**	**Exercise**	Using the Built-in Program 1
c	( )	**C1c**	**Exercise**	Using the Built-in Program 2
d	( )	**C1d**	**Exercise**	Using the IR Transmitter
e	( )	**C1e**	**Exercise**	Downloading Firmware
f	( )	**C1f**	**Exercise**	Troubleshooting

Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
2	**Robotic Programming Systems**	(/ /)	(/ /)

Sub	Init	Code	Type of Task	Task Description
a	( )	**C2a**	**Tutorial**	Programming the RCX

Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
3	**Robotic Systems**	(/ /)	(/ /)

Sub	Init	Code	Type of Task	Task Description
a	( )	**C3a**	**Exercise**	Robioptic
b	( )	**C3b**	**Exercise**	Robobumper
c	( )	**C3c**	**Exercise**	Moborobo
d	( )	**C3d**	**Exercise**	Robobeeper

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Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
4	**Guided Robotic Systems**	(/ /)	(/ /)

Sub	Init	Code	Type of Task	Task Description
a	( )	**C4a**	**Exercise**	Track Talker
b	( )	**C4b**	**Exercise**	Light Tracker
c	( )	**C4c**	**Exercise**	Outback Tracker
d	( )	**C4d**	**Exercise**	Trail Tracker

Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
5	**Mobile Robotic Systems**	(/ /)	(/ /)

The student will construct and program additional machines to perform a variety of tasks. The student will demonstrate their skill by altering the operation of the machines to perform differently to solve a design challenge.

Sub	Init	Code	Type of Task	Task Description
a	( )	**C5a**	**Exercise**	Triacrobot
b	( )	**C5b**	**Exercise**	Acrobumper
c	( )	**C5c**	**Exercise**	Acroflip
d	( )	**C5d**	**Exercise**	Acroscanner

Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
6	**Design Challenge: Lights Out**	(/ /)	(/ /)

The student will build and program an autonomous robot that will locate a pin-point light source and cover it up for one second. The playing field is a circle two meters in diameter with the light source 6 centimeters above the center of the playing field. The robot must locate and cover the light source for one second within 3 minutes of the start of play.

Sub	Init	Code	Type of Task	Task Description
a	( )	**C6a**	**Performance Test**	Lights Out

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Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
7	**Design Challenge: Mars Rover**	(/ /)	(/ /)

The student will build and program an autonomous robot that moves randomly placed "rock" samples from the playing field into a collection bin. The robot has 3 minutes to collect three rock samples. The playing field is rectangular measuring 1 meter by 2 meters. The collect bin can be placed anywhere in the playing field.

Sub	Init	Code	Type of Task	Task Description
a	( )	**C7a**	**Performance Test**	Mars Rover

Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
8	**Design Challenge: RoboHoops**	(/ /)	(/ /)

The student will build and program an autonomous robot that collects ping-pong balls from a reception point and moves them to a goal area and drops them in the basket. The robot must score three time within 3 minutes to qualify. The size of the field is 122cm square and the robot must be programmed not to step out of bounds.

Sub	Init	Code	Type of Task	Task Description
a	( )	**C8a**	**Performance Test**	RoboHoops

Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
9	**Design Challenge: Legged Robot Race**	(/ /)	(/ /)

The student will build and program a robot gets around on legs instead of wheels. The robot will be required to navigate rough terrain with obstacles randomly placed between the start and finish lines. The robot must complete a two meter course within three minutes.

Sub	Init	Code	Type of Task	Task Description
a	( )	**C9a**	**Performance Test**	Legged Robot Race

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Lastname, First Student Number Period

Subtasks are to be initialled by the instructor as they are completed. Indicate the task start and completion dates. Submit this form when each task is done.

H.H. Arnold High School
Electronics and Technology Education
Frank C. Pendzich

ASSIGNMENT CHECK-LIST
Generated: 08/25/02

Course #	Course Title
VEE406	**Robotics/Industrial Technology**

Area	Competency	Category
D	**COMPUTERS IN CONTROL - FISCHERTECHNIK PROFI**	**VOCATIONAL**

Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
0	**Computers in Control - Fischertechnik Profi**	(/ /)	(/ /)

Sub	Init	Code	Type of Task	Task Description
a	( )	**D0a**	**Reading Assignment**	Robot Madness - DISCOVER, May 1990
b	( )	**D0b**	**Reading Assignment**	RoboHockey - DISCOVER, May 1990
c	( )	**D0c**	**Video Tape Inst.**	Introducing the Robot
d	( )	**D0d**	**Video Tape Inst.**	Making Sense of the Real World
e	( )	**D0e**	**Video Tape Inst.**	Making Things Move
f	( )	**D0f**	**Video Tape Inst.**	Getting it Together
g	( )	**D0g**	**Video Tape Inst.**	Recognizing the Obvious
h	( )	**D0h**	**Computer Test**	Computers in Control
i	( )	**D0i**	**Notebook**	Notebook Review
j	( )	**D0j**	**Exercise**	Fishertechnik Profi Computing Inventory

Source: LEGO dacta 9700 Activity cards
Unit: 1 **Page:** **Min. Score:** 100%

Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
1	**Input/Output Systems**	(/ /)	(/ /)

Sub	Init	Code	Type of Task	Task Description
a	( )	**D1a**	**Exercise**	Reaction Tester
b	( )	**D1b**	**Performance Test**	Reaction Tester - Program Modification

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Lastname, First Student Number Period

Subtasks are to be initialled by the instructor as they are completed. Indicate the task start and completion dates. Submit this form when each task is done.

Sub	Init	Code	Type of Task	Task Description
c	( )	D1c	Exercise	Melody Game
d	( )	D1d	Exercise	Melody Game - Program Modification

Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
2	**Motors and Positioning Systems**	(/ /)	(/ /)

Sub	Init	Code	Type of Task	Task Description
a	( )	D2a	Exercise	Turtle
b	( )	D2b	Performance Test	Turtle - Program Modification

Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
3	**Logic Systems**	(/ /)	(/ /)

Sub	Init	Code	Type of Task	Task Description
c	( )	D3c	Exercise	Safe
d	( )	D3d	Performance Test	Safe - Program Modification

Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
4	**Coding and Encoding Systems**	(/ /)	(/ /)

Sub	Init	Code	Type of Task	Task Description
a	( )	D4a	Exercise	Code Card Reader
b	( )	D4b	Performance Test	Code Card Reader - Program Modification

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Lastname, First Student Number Period

Subtasks are to be initialled by the instructor as they are completed. Indicate the task start and completion dates. Submit this form when each task is done.

Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
5	**Actuators and Feedback Systems**	(/ /)	(/ /)

Sub	Init	Code	Type of Task	Task Description
a	( )	**D5a**	**Exercise**	Change Maker
b	( )	**D5b**	**Performance Test**	Change Maker - Program Modification

Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
6	**Data Storage Systems**	(/ /)	(/ /)

Sub	Init	Code	Type of Task	Task Description
a	( )	**D6a**	**Exercise**	CD-Player
b	( )	**D6b**	**Performance Test**	CD-Player - Program Modification

Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
7	**Decision Systems**	(/ /)	(/ /)

Sub	Init	Code	Type of Task	Task Description
a	( )	**D7a**	**Exercise**	Sortieranlage
b	( )	**D7b**	**Performance Test**	Sortieranlage - Program Modification
c	( )	**D7c**	**Exercise**	Paket-Wendeanlage
d	( )	**D7d**	**Performance Test**	Paket-Wendeanlage - Program Modification

Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
8	**Data Output Systems**	(/ /)	(/ /)

Sub	Init	Code	Type of Task	Task Description
a	( )	**D8a**	**Exercise**	Kurvenschreiber

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Lastname, First Student Number Period

Subtasks are to be initialled by the instructor as they are completed. Indicate the task start and completion dates. Submit this form when each task is done.

Sub	Init	Code	Type of Task	Task Description
b	( )	**D8b**	**Performance Test**	Kurvenschreiber - Program Modification
c	( )	**D8c**	**Exercise**	Plotter
d	( )	**D8d**	**Performance Test**	Plotter - Program Modification

Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
9	**Robotic Systems**	(/ /)	(/ /)

Sub	Init	Code	Type of Task	Task Description
a	( )	**D9a**	**Exercise**	Robot
b	( )	**D9b**	**Performance Test**	Robot - Program Modification

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Lastname, First Student Number Period

Subtasks are to be initialled by the instructor as they are completed. Indicate the task start and completion dates. Submit this form when each task is done.

H.H. Arnold High School
Electronics and Technology Education
Frank C. Pendzich

ASSIGNMENT CHECK-LIST
Generated: 08/25/02

Course #	Course Title
VEE406	**Robotics/Industrial Technology**

Area	Competency	Category
E	**COMPUTERS IN CONTROL - FISCHERTECHNIK EXPERIMENTAL**	**VOCATIONAL**

Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
1	**Computers In Control - Experimental (Theory)**	(/ /)	(/ /)

The student will design, construct, and program a robotic system using the Fischertechnik Computing Experimental Kit and control software. The robotic system they design will solve a particular design problem. It will require the use of sensors, triggers, and drive mechanisms to accomplish the task. The test of their design will be in the form of a head-to-head competition against other students. The student must also successfully complete an examination covering the theory of Computers in Control using the Fischertechnik Computing Experimental Kit and control software.

Sub	Init	Code	Type of Task	Task Description
a	( )	**E1a**	**Reading Assignment**	Robot Madness - DISCOVER, May 1990
b	( )	**E1b**	**Reading Assignment**	RoboHockey - DISCOVER, May 1990
c	( )	**E1c**	**Reading Assignment**	Preface **Source:** Computing Experimental - Fischertechnik Computing **Unit:** 1 **Page:** 3 TO 5 **Min. Score:** 85%
d	( )	**E1d**	**Reading Assignment**	What the Kit Contains **Source:** Computing Experimental - Fischertechnik Computing **Unit:** 2 **Page:** 6 TO 9 **Min. Score:** 85%
e	( )	**E1e**	**Reading Assignment**	How to Start **Source:** Computing Experimental - Fischertechnik Computing **Unit:** 3 **Page:** 10 TO 13 **Min. Score:** 85%
f	( )	**E1f**	**Video Tape Inst.**	Introducing the Computer
g	( )	**E1g**	**Video Tape Inst.**	Making Sense of the Real World
h	( )	**E1h**	**Video Tape Inst.**	Making Things Move
i	( )	**E1i**	**Video Tape Inst.**	Getting it Together
j	( )	**E1j**	**Video Tape Inst.**	Recognizing the Obvious
k	( )	**E1k**	**Video Tape Inst.**	MIT - Not In My Back Yard

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Lastname, First Student Number Period

Subtasks are to be initialled by the instructor as they are completed. Indicate the task start and completion dates. Submit this form when each task is done.

Sub	Init	Code	Type of Task	Task Description
l	( )	E1l	Video Tape Inst.	MIT - King of the Hill
m	( )	E1m	Video Tape Inst.	MIT - Pyramid of Balls
n	( )	E1n	Video Tape Inst.	MIT - MIT in Japan
o	( )	E1o	Video Tape Inst.	MIT - International Design Competition
p	( )	E1p	Homework Assignment	Video Review Questions
q	( )	E1q	Exercise	Fischertechnik 28 Pole Socket Connector
			Source:	Computing Experimental - Fischertechnik Computing
			Unit: 2	Page: 6 TO 8 Min. Score: 85%
r	( )	E1r	Video Tape Inst.	Automation and Control - Fischertechnik
s	( )	E1s	Exercise	How to Start - Loading the Driver
			Source:	Computing Experimental - Fischertechnik Computing
			Unit: 3	Page: 10 TO 13 Min. Score: 85%
t	( )	E1t	Computer Test	Computers in Control - Experimental
u	( )	E1u	Notebook	Notebook Review
v	( )	E1v	Exercise	Fischertechnik Experimental Inventory
			Source:	Computing Experimental Assembly Manual
			Unit: PARTS LIST	Page: 2 TO 5 Min. Score: 85%

Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
2	**Experiments With Pushbuttons And Motors**	(/ /)	(/ /)

The student will demonstrate how to control a motor as an output device using a computer. They will also show how switch contacts and pushbuttons can be used as input devices. After building a model of a winch, the student will program pushbutton inputs to control the model. Finally, the student will write a program demonstrating the commands necessary to change motor positions using a step-by-step method. To demonstrate their skill the student will develop a Logicator model that performs the same operations.

Sub	Init	Code	Type of Task	Task Description
a	( )	E2a	Exercise	Winch 1
			Source:	Computing Experimental Assembly Manual
b	( )	E2b	Exercise	Motor Control Using a Computer: Output
			Source:	Computing Experimental - Fischertechnik Computing
			Unit: 4.1	Page: 15 TO 18 Min. Score: 85%
c	( )	E2c	Exercise	Switch Contacts and Pushbuttons: Input
			Source:	Computing Experimental - Fischertechnik Computing
			Unit: 4.2	Page: 19 TO 21 Min. Score: 85%

Lastname, First _____ Student Number _____ Period _____

Subtasks are to be initialled by the instructor as they are completed. Indicate the task start and completion dates. Submit this form when each task is done.

Sub	Init	Code	Type of Task	Task Description
d	( )	E2d	**Exercise**	Winch 2
			Source:	Computing Experimental Assembly Manual
e	( )	E2e	**Exercise**	Motor Control Using Pushbuttons: Winch
			Source:	Computing Experimental - Fischertechnik Computing
			Unit: 4.3	**Page:** 22 TO 24 **Min. Score:** 85%
f	( )	E2f	**Exercise**	Winch 3
			Source:	Computing Experimental Assembly Manual
g	( )	E2g	**Exercise**	Commands and Positions: Step by Step
			Source:	Computing Experimental - Fischertechnik Computing
			Unit: 4.4	**Page:** 25 TO 30 **Min. Score:** 85%
h	( )	E2h	**Performance Test**	Pushbuttons and Motors - Logicator
i	( )	E2i	**Technical Report**	Pushbuttons and Motors

Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
3	**Switching With Light**	(/ /)	(/ /)

The student will modify and program the winch model to demonstrate fork light and reflecting light barrier switching techniques. They will use this knowledge to show how non-contact switching can be used to control a mechanism. Finally, the student will alter the operation of the mechanism by modifying the program which controls it. To demonstrate their skill the student will develop a Logicator model that performs the same operations.

Sub	Init	Code	Type of Task	Task Description
a	( )	E3a	**Exercise**	Fork Light Barrier
			Source:	Computing Experimental Assembly Manual
b	( )	E3b	**Exercise**	Non-Contact Switch: Fork Light Barrier
			Source:	Computing Experimental - Fischertechnik Computing
			Unit: 5.1	**Page:** 32 TO 34 **Min. Score:** 85%
c	( )	E3c	**Exercise**	Reflecting Light Barrier
			Source:	Computing Experimental Assembly Manual
d	( )	E3d	**Exercise**	Remote Switch: Reflecting Light Barrier
			Source:	Computing Experimental - Fischertechnik Computing
			Unit: 5.2	**Page:** 35 **Min. Score:** 85%
e	( )	E3e	**Performance Test**	Switching With Light - Logicator
f	( )	E3f	**Technical Report**	Switching With Light

Lastname, First _____ Student Number _____ Period _____

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Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
4	**Measurement And Evaluation**	(/ /)	(/ /)

The student will construct models of an Exposure Meter, Computer Eye, and Radar device. They will then program these models to measure and evaluate analog stimuli. Finally, the student will modify the computer program to convert the stimuli to other forms of useful information. To demonstrate their skill the student will develop a Logicator model that performs the same operations.

Sub	Init	Code	Type of Task	Task Description
a	( )	**E4a**	**Exercise**	Exposure Meter
			Source:	Computing Experimental Assembly Manual
b	( )	**E4b**	**Exercise**	Recording Analog Values: Lightmeter
			Source:	Computing Experimental - Fischertechnik Computing
			Unit: 6.1	**Page:** 36 TO 38 **Min. Score:** 85%
c	( )	**E4c**	**Exercise**	Computer Eye
			Source:	Computing Experimental Assembly Manual
d	( )	**E4d**	**Exercise**	Auto Light Measurement: Computer Eye
			Source:	Computing Experimental - Fischertechnik Computing
			Unit: 6.2	**Page:** 39 TO 41 **Min. Score:** 85%
e	( )	**E4e**	**Exercise**	Display of Reading: Screen Graphics
			Source:	Computing Experimental - Fischertechnik Computing
			Unit: 6.3	**Page:** 42 TO 46 **Min. Score:** 85%
f	( )	**E4f**	**Exercise**	Radar
			Source:	Computing Experimental Assembly Manual
g	( )	**E4g**	**Exercise**	Measure Reflected Light: Radar
			Source:	Computing Experimental - Fischertechnik Computing
			Unit: 6.4	**Page:** 47 TO 49 **Min. Score:** 85%
h	( )	**E4h**	**Performance Test**	Measurement and Evaluation - Logicator
i	( )	**E4i**	**Technical Report**	Measurement and Evaluation

Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
5	**Measurement and Control**	(/ /)	(/ /)

The student will construct models of a Thermometer, Furnace, Fan, and Throttle Valve. The student will then program each device to first measure and then control the device. Finally, the student will alter the operation of the mechanism by modifying the program which controls it. To demonstrate their skill the student will develop a Logicator model the performs the same operations.

Sub	Init	Code	Type of Task	Task Description

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Lastname, First Student Number Period

Subtasks are to be initialled by the instructor as they are completed. Indicate the task start and completion dates. Submit this form when each task is done.

a	( )	**E5a**	**Exercise**		Thermometer			
			Source:	Computing Experimental Assembly Manual				
b	( )	**E5b**	**Exercise**		Measuring Temperatures: Thermometer			
			Source:	Computing Experimental - Fischertechnik Computing				
			Unit:	7.1	**Page:**	50 TO 54	**Min. Score:**	85%
c	( )	**E5c**	**Exercise**		Furnace			
			Source:	Computing Experimental Assembly Manual				
d	( )	**E5d**	**Exercise**		Controlling the Heat Supply: Furnace			
			Source:	Computing Experimental - Fischertechnik Computing				
			Unit:	7.2	**Page:**	55 TO 57	**Min. Score:**	85%
e	( )	**E5e**	**Exercise**		Fan			
			Source:	Computing Experimental Assembly Manual				
f	( )	**E5f**	**Exercise**		Controlling a Cooling System: Fan			
			Source:	Computing Experimental - Fischertechnik Computing				
			Unit:	7.3	**Page:**	58 TO 60	**Min. Score:**	85%
g	( )	**E5g**	**Exercise**		Throttle Valve			
			Source:	Computing Experimental Assembly Manual				
h	( )	**E5h**	**Exercise**		Controlling Heat Flow: Throttle Valve			
			Source:	Computing Experimental - Fischertechnik Computing				
			Unit:	7.4	**Page:**	61 AND 62	**Min. Score:**	85%
i	( )	**E5i**	**Performance Test**		Measurement and Control - Logicator			
j	( )	**E5j**	**Technical Report**		Measurement and Control			

Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
6	**Robotics**	(/ /)	(/ /)

The student will demonstrate the operating areas of a typical robotic system and develop both linear and table type programs. The student will also demonstrate how sensors can be used to guide robot positioning. Finally, the student will alter the operation of their robot by modifying the program which controls it. To demonstrate their skill the student will develop a Logicator model that performs the same operations.

Sub	Init	Code	Type of Task		Task Description			
a	( )	**E6a**	**Exercise**		Welding Robot			
			Source:	Computing Experimental Assembly Manual				
b	( )	**E6b**	**Exercise**		Robot Geometry: Operating Area			
			Source:	Computing Experimental - Fischertechnik Computing				
			Unit:	8.1	**Page:**	64 TO 65	**Min. Score:**	85%
c	( )	**E6c**	**Exercise**		Linear Programming			
			Source:	Computing Experimental - Fischertechnik Computing				
			Unit:	8.2	**Page:**	66 TO 67	**Min. Score:**	85%

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Lastname, First Student Number Period

Subtasks are to be initialled by the instructor as they are completed. Indicate the task start and completion dates. Submit this form when each task is done.

Sub	Init	Code	Type of Task	Task Description
d	( )	E6d	Exercise	Table Programming: Custom Movements
			Source:	Computing Experimental - Fischertechnik Computing
			Unit: 8.3	Page: 68 TO 70 Min. Score: 85%
e	( )	E6e	Exercise	Welding Robot with Thermistor
			Source:	Computing Experimental Assembly Manual
f	( )	E6f	Exercise	Guiding the Robot by Sensors
			Source:	Computing Experimental - Fischertechnik Computing
			Unit: 8.4	Page: 71 AND 72 Min. Score: 85%
g	( )	E6g	Performance Test	Robotics - Logicator
h	( )	E6h	Technical Report	Robotics

Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
7	**The Turtle**	(/ /)	(/ /)

The student will construct and program a model mobile robot called a "Turtle". They will demonstrate how to control the robot, code a travel route, plan a route, teach a process, and plan the route on the computer screen. The student will demonstrate their skill by altering the operation of the Turtle by modifying the program which controls it. To demonstrate their skill the student will develop a Logicator model that performs the same operations.

Sub	Init	Code	Type of Task	Task Description
a	( )	E7a	Exercise	Turtle
			Source:	Computing Experimental Assembly Manual
b	( )	E7b	Exercise	Moving the Turtle
			Source:	Computing Experimental - Fischertechnik Computing
			Unit: 9.1	Page: 74 Min. Score: 85%
c	( )	E7c	Exercise	Coding the Travel Route
			Source:	Computing Experimental - Fischertechnik Computing
			Unit: 9.2	Page: 75 TO 77 Min. Score: 85%
d	( )	E7d	Exercise	Route Planning with the Turtle
			Source:	Computing Experimental - Fischertechnik Computing
			Unit: 9.3	Page: 78 TO 79 Min. Score: 85%
e	( )	E7e	Exercise	Teach-in Process
			Source:	Computing Experimental - Fischertechnik Computing
			Unit: 9.4	Page: 80 TO 83 Min. Score: 85%
f	( )	E7f	Exercise	Route Planning on the Screen
			Source:	Computing Experimental - Fischertechnik Computing
			Unit: 9.5	Page: 84 TO 85 Min. Score: 85%
g	( )	E7g	Performance Test	The Turtle - Logicator
h	( )	E7h	Technical Report	The Turtle

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Lastname, First Student Number Period

Subtasks are to be initialled by the instructor as they are completed. Indicate the task start and completion dates. Submit this form when each task is done.

Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
8	**The Turtle Grows Feelers**	(/ /)	(/ /)

The student will program the Turtle to detect obstacles with the bumper and then drive around them. The student will then add code to the program that will allow the Turtle to negotiate a maze. Adding a light sensor to the Turtle, the student will program the Turtle to sense light and dark and then search for light. Finally, the student will program the Turtle to trace a line. The student will the demonstrate their skill by developing a Logicator model that performs the same operations.

Sub	Init	Code	Type of Task	Task Description
a	( )	**E8a**	**Exercise**	Sensor for Detecting Obstacles: Bumper
			Source:	Computing Experimental - Fischertechnik Computing
			Unit: 10.1	**Page:** 86 TO 88 **Min. Score:** 85%
b	( )	**E8b**	**Exercise**	Driving Around Obstacles
			Source:	Computing Experimental - Fischertechnik Computing
			Unit: 10.2	**Page:** 89 AND 90 **Min. Score:** 85%
c	( )	**E8c**	**Exercise**	Feeling the Way
			Source:	Computing Experimental - Fischertechnik Computing
			Unit: 10.3	**Page:** 91 TO 96 **Min. Score:** 85%
d	( )	**E8d**	**Exercise**	Turtle with Recording Head
			Source:	Computing Experimental Assembly Manual
e	( )	**E8e**	**Exercise**	Sensor for Light
			Source:	Computing Experimental - Fischertechnik Computing
			Unit: 10.4	**Page:** 97 TO 98 **Min. Score:** 85%
f	( )	**E8f**	**Exercise**	Searching for Light
			Source:	Computing Experimental - Fischertechnik Computing
			Unit: 10.5	**Page:** 99 TO 101 **Min. Score:** 85%
g	( )	**E8g**	**Exercise**	Automatic Steering
			Source:	Computing Experimental - Fischertechnik Computing
			Unit: 10.6	**Page:** 102 TO 106 **Min. Score:** 85%
h	( )	**E8h**	**Exercise**	Traffic Management Systems
			Source:	Computing Experimental - Fischertechnik Computing
			Unit: 10.7	**Page:** 107 TO 112 **Min. Score:** 85%
i	( )	**E8i**	**Performance Test**	The Turtle Grows Feelers - Logicator
j	( )	**E8j**	**Technical Report**	The Turtle Grows Feelers

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Lastname, First Student Number Period

Subtasks are to be initialled by the instructor as they are completed. Indicate the task start and completion dates. Submit this form when each task is done.

Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
9	**Conveyor Belt System**	(/ /)	(/ /)

The student will program a conveyor belt system. The program will control three conveyors with timing cycle switches. It will be controlled by a photocell input. The student will demonstrate their skill by developing both BASIC and Logicator models of the control program.

Sub	Init	Code	Type of Task	Task Description
a	( )	**E9a**	**Performance Test**	Conveyor Belt Model Program - BASIC
b	( )	**E9b**	**Performance Test**	Conveyor Belt Sorter Program - Logicator
c	( )	**E9c**	**Technical Report**	Conveyor Belt System

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Lastname, First Student Number Period

Subtasks are to be initialled by the instructor as they are completed. Indicate the task start and completion dates. Submit this form when each task is done.

H.H. Arnold High School
Electronics and Technology Education
Frank C. Pendzich

ASSIGNMENT CHECK-LIST
Generated: 08/25/02

Course #	Course Title
VEE406	**Robotics/Industrial Technology**

Area	Competency	Category
F	**COMPUTERS IN CONTROL - FISCHERTECHNIK COMPUTING**	**VOCATIONAL**

Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
1	**Computers in Control - Computing (Theory)**	(/ /)	(/ /)

The student will design, construct, and program a robotic system using the Fischertechnik Computing Kit and control software. The robotic system they design will solve a particular design problem. It will require the use of sensors, triggers, and drive mechanisms to accomplish the task. The test of their design will be in the form of a head-to-head competition against other students. The student must also successfully complete an examination covering the theory of Computers in Control using the Fischertechnik Computing Kit and control software.

Sub	Init	Code	Type of Task	Task Description
a	( )	**F1a**	**Reading Assignment**	Robot Madness - Discover, May 1990
b	( )	**F1b**	**Reading Assignment**	RoboHockey - DISCOVER, May 1990
c	( )	**F1c**	**Video Tape Inst.**	Introducing the Robot
d	( )	**F1d**	**Video Tape Inst.**	Making Sense of the Real World
e	( )	**F1e**	**Video Tape Inst.**	Making Things Move
f	( )	**F1f**	**Video Tape Inst.**	Getting it Together
g	( )	**F1g**	**Video Tape Inst.**	Recognizing the Obvious
h	( )	**F1h**	**Video Tape Inst.**	MIT - Not In My Back Yard
i	( )	**F1i**	**Video Tape Inst.**	MIT - King of the Hill
j	( )	**F1j**	**Video Tape Inst.**	MIT - Pyramid of Balls
k	( )	**F1k**	**Video Tape Inst.**	MIT - MIT in Japan
l	( )	**F1l**	**Video Tape Inst.**	MIT - International Design Competition
m	( )	**F1m**	**Video Tape Inst.**	Automation and Control - Fischertechnik
n	( )	**F1n**	**Homework Assignment**	Video Review Questions

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Lastname, First Student Number Period

Subtasks are to be initialled by the instructor as they are completed. Indicate the task start and completion dates. Submit this form when each task is done.

Sub	Init	Code	Type of Task	Task Description
o	( )	F1o	**Exercise**	Fischertechnik 28 Pole Socket Connector **Source:** Electronic Applications for the COMPUTING KIT **Unit:** APPENDIX B **Page:** **Min. Score:** 85%
p	( )	F1p	**Computer Test**	Computers in Control - Computing
q	( )	F1q	**Notebook**	Notebook Review
r	( )	F1r	**Exercise**	Fischertechnik Computing Kit Inventory **Source:** Electronic Applications for the COMPUTING KIT **Unit:** A-D **Page:** **Min. Score:** 85%

Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
2	**Introduction to the Fischertechnik COMPUTING KIT**	(/ /)	(/ /)

The student will demonstrate how to use the computer interface through direct control of an output and input device using the Fischertechnik Diagnostics Program and Logicator modeler. The student will build and operate a model of a traffic light system. They will then modify a BASIC program to operate the traffic lights in both U.S. and European formats. Demonstrating their skill, the student will then develop a Logicator model of both types of traffic light systems.

Sub	Init	Code	Type of Task	Task Description
a	( )	F2a	**Exercise**	Fischertechnik Diagnostics Program
b	( )	F2b	**Exercise**	Logicator Modeler
c	( )	F2c	**Exercise** **Source:**	Traffic Light - BASIC Fischertechnik Computing Instructions
d	( )	F2d	**Performance Test**	Traffic Light - Logicator Model
e	( )	F2e	**Technical Report**	Intro to Fischertechnik COMPUTING KIT

Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
3	**Digital Input**	(/ /)	(/ /)

The student will demonstrate how switches can be used as sensing devices. They will construct and program a working model of an elevator (lift) system. To demonstrate their skill, they will develop a Logicator model that operates the lift system.

Sub	Init	Code	Type of Task	Task Description
a	( )	F3a	**Exercise**	Lift - BASIC **Source:** Fischertechnik Computing Instructions
b	( )	F3b	**Performance Test**	Lift - Logicator Model **Source:** Electronic Applications for the COMPUTING KIT **Unit:** II **Page:** **Min. Score:** 85%

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Lastname, First Student Number Period

Subtasks are to be initialled by the instructor as they are completed. Indicate the task start and completion dates. Submit this form when each task is done.

Sub	Init	Code	Type of Task	Task Description
c	( )	F3c	**Technical Report**	Digital Input

Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
4	**Analog Input**	(/ /)	(/ /)

The student will demonstrate models and programs that use variable resistance as a sensing device to control and output device. The student will construct and then program a model of an Aerial Rotor and Graphic Panel. They will then demonstrate their skills by developing a Logicator model of a directable antenna.

Sub	Init	Code	Type of Task	Task Description
a	( )	F4a	**Computer Aided Inst.**	How a Resistor Works
			Source:	Electronics Discovery CAI Software - EKI
			Unit: LPA01	**Page:** **Min. Score:** 85%
b	( )	F4b	**Computer Aided Inst.**	How a Potentiometer Works
			Source:	Electronics Discovery CAI Software - EKI
			Unit: LPA02	**Page:** **Min. Score:** 85%
c	( )	F4c	**Exercise**	Directional Antenna - BASIC
			Source:	Fischertechnik Computing Instructions
d	( )	F4d	**Performance Test**	Directional Antenna - Logicator Model
e	( )	F4e	**Exercise**	Graphic Panel
			Source:	Fischertechnik Computing Instructions
f	( )	F4f	**Technical Report**	Analog Input

Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
5	**Logic Functions**	(/ /)	(/ /)

The student will demonstrate the operation of basic logic functions as they apply to robotic systems. They will then develop programs that use these circuits for the Machine Tool. To demonstrate their skill the student will develop a Logicator model that operates the Machine Tool experiment.

Sub	Init	Code	Type of Task	Task Description
a	( )	F5a	**Computer Aided Inst.**	Intro To Digital Electronics
			Source:	Digital Magic Software - EKI Prep Course
			Unit: DML1	**Page:** **Min. Score:** 85%
b	( )	F5b	**Computer Aided Inst.**	Logic Circuits
			Source:	Digital Magic Software - EKI Prep Course
			Unit: DML2	**Page:** **Min. Score:** 85%
c	( )	F5c	**Exercise**	Machine Tool - BASIC
			Source:	Fischertechnik Computing Instructions

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Subtasks are to be initialled by the instructor as they are completed. Indicate the task start and completion dates. Submit this form when each task is done.

Sub	Init	Code	Type of Task	Task Description
d	( )	F5d	Performance Test	Machine Tool - Logicator Model
e	( )	F5e	Technical Report	Logic Functions

Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
6	**Analog Feedback Loops**	(/ /)	(/ /)

The student will demonstrate a practical application of potentiometers as sensing devices for position feedback. They will construct and program a working model of a solar cell tracking station and a pick-and-place robot arm.

Sub	Init	Code	Type of Task	Task Description
a	( )	F6a	Exercise Source: Fischertechnik Computing Instructions	Solar Cell Tracking - BASIC
b	( )	F6b	Exercise Source: Fischertechnik Computing Instructions	The Towers of Hanoi - BASIC
c	( )	F6c	Technical Report	Analog Feedback Loops

Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
7	**Robotic Systems - Sorting System**	(/ /)	(/ /)

The student will construct and program a model of a robotic sorting system. To demonstrate their skill the student will delelop a Logicator model that performs the same operations.

Sub	Init	Code	Type of Task	Task Description
a	( )	F7a	Exercise	Sorting System - BASIC
b	( )	F7b	Exercise	Sorting System - Logicator
c	( )	F7c	Technical Report	Sorting System

Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
8	**Robotic Systems - Teachable Robot**	(/ /)	(/ /)

The student will construct and program a model of a teachable robot arm. To demonstrate their skill, the student will develop a logicator model of this device.

Sub	Init	Code	Type of Task	Task Description
a	( )	F8a	Exercise Source: Fischertechnik Computing Instructions	Teachable Robot - BASIC
b	( )	F8b	Performance Test	Teachable Robot - Logicator Model

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Sub	Init	Code	Type of Task	Task Description
c	( )	**F8c**	**Technical Report**	Teachable Robot

Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
9	**Robotic Systems - Polar Coordinate Plotter**	(/ /)	(/ /)

The student will construct and program a model of a pen plotter. They will demonstrate their skill by altering the operation of the machine by modifying the BASIC program which controls it.

Sub	Init	Code	Type of Task	Task Description
a	( )	**F9a**	**Exercise** **Source:** Fischertechnik Computing Instructions	Polar Coordinate Plotter - BASIC
b	( )	**F9b**	**Technical Report**	Polar Coordinate Plotter

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Subtasks are to be initialled by the instructor as they are completed. Indicate the task start and completion dates. Submit this form when each task is done.

H.H. Arnold High School
Electronics and Technology Education
Frank C. Pendzich

ASSIGNMENT CHECK-LIST
Generated: 08/25/02

Course #	Course Title
VEE406	**Robotics/Industrial Technology**

Area	Competency	Category
G	**ROBOTIC FUNDAMENTALS**	**VOCATIONAL**

Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
1	**Robotic Fundamentals (Theory)**	(/ /)	(/ /)

The student will state the difference between hard automation devices and robots as well as the difference between servo-controlled and non-servo-controlled robots. They will define the terms axes, actuators, manipulators, controllers, and power supply as they apply to robots. The student will also identify the most common method of controlling high-technology robots and the device that made special purpose robots practical. They will state why pneumatics is the preferred method for actuating low-technology robots and which technology would be suited for a variety of industrial tasks.

Sub	Init	Code	Type of Task	Task Description
a	( )	**G1a**	**Reading Assignment**	Robotic Fundamentals **Source:** Robotics and Industrial Electronics - Book 1 **Unit:** 1 **Page:** 1-1 to 1-48 **Min. Score:** %
b	( )	**G1b**	**Homework Assignment**	Programmed Review Questions 1 to 39, Odd **Source:** Robotics and Industrial Electronics - Book 1 **Unit:** 1 **Page:** 8, 15, 32 & 47 **Min. Score:** 85%
c	( )	**G1c**	**Computer Test**	Robotic Fundamentals **Unit:** VEE406-F **Page:** **Min. Score:** 85%
d	( )	**G1d**	**Notebook**	Notebook Review

Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
2	**Model Hydraulic Robot Arm**	(/ /)	(/ /)

The student will design and construct a 3 axes hydraulic robot arm using a syringes, tubing and some common household materials. The robot must be able to pick up a pencil and move it to another location six inches away. The syringes will contain colored water... a different color for each axes.

Sub	Init	Code	Type of Task	Task Description
a	( )	**G2a**	**Project**	Model Hydraulic Robot Arm
b	( )	**G2b**	**Performance Test**	Model Hydraulic Robot Arm

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Subtasks are to be initialled by the instructor as they are completed. Indicate the task start and completion dates. Submit this form when each task is done.

Sub	Init	Code	Type of Task	Task Description
c	( )	G2c	**Technical Report**	Model Hydraulic Robot Arm

Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
3	**Robot Familiarization**	(/ /)	(/ /)

The student will demonstrate how to prepare various robotic training systems for use. They will also employ several programming commands to train the robot to perform specific operations. The student will identify the component parts of the robotic trainer as well as the robot's axes, actuators, manipulators, and controllers.

Sub	Init	Code	Type of Task	Task Description
a	( )	G3a	**Exercise**	Robotics Training System Familiarization
			Source:	Robotics Training Systems - Lab Volt
			Unit: 1	**Page:** 1-1 to 1-40 **Min. Score:** %
b	( )	G3b	**Technical Report**	The Lab-Volt Robotic Arm Trainer
c	( )	G3c	**Exercise**	Heathkit Robot Arm - Intro to the Robot
			Source:	Industrial Robotics and Automation - Student Workbook
			Unit: Exp. 1	**Page:** 13 to 31 **Min. Score:** %
d	( )	G3d	**Technical Report**	Introduction to the Robot
e	( )	G3e	**Exercise**	Heathkit Robot Arm - Work Envelope
			Source:	Industrial Robotics and Automation - Student Workbook
			Unit: Exp. 2	**Page:** 33 to 40 **Min. Score:** %
f	( )	G3f	**Technical Report**	The Work Envelope
g	( )	G3g	**Exercise**	HERO - Platform Mobility
			Source:	Robotics and Industrial Electronics - Student Workbook
			Unit: Exp. 1	**Page:** 11 to 18 **Min. Score:** %
h	( )	G3h	**Exercise**	HERO - Manipulator Axes of Motion
			Source:	Robotics and Industrial Electronics - Student Workbook
			Unit: Exp. 2	**Page:** 19 to 23 **Min. Score:** %
i	( )	G3i	**Technical Report**	HERO - Robot Familiarization
j	( )	G3j	**Exercise**	HERO 2000 - Axes of Motion/Work Envelope
			Source:	Programming and Interfacing HERO 2000
			Unit: 7	**Page:** 7-6 to 7-15 **Min. Score:** %
k	( )	G3k	**Exercise**	HERO 2000 - Using the BASIC Editor
			Source:	Programming and Interfacing HERO 2000
			Unit: 7	**Page:** 7-16 to 7-23 **Min. Score:** %
l	( )	G3l	**Technical Report**	HERO 2000 Robot Familiarization
m	( )	G3m	**Reading Assignment**	Intro. to the B810 Computer Interface
			Source:	B810 Computer Interface User's Manual
			Unit: 1	**Page:** **Min. Score:** %

Lastname, First _____ Student Number _____ Period _____

Subtasks are to be initialled by the instructor as they are completed. Indicate the task start and completion dates. Submit this form when each task is done.

Sub	Init	Code	Type of Task	Task Description
n	( )	**G3n**	**Exercise**	B810 CIM - Hardware Installation
			Source:	B810 Computer Interface User's Manual
			Unit: 2	**Page:** **Min. Score:** %
o	( )	**G3o**	**Exercise**	B810 CIM - Installing the Software
			Source:	B810 Computer Interface User's Manual
			Unit: 3	**Page:** **Min. Score:** %
p	( )	**G3p**	**Exercise**	B810 CIM - Configuring the Serial Port
			Source:	B810 Computer Interface User's Manual
			Unit: 4	**Page:** **Min. Score:** %
q	( )	**G3q**	**Exercise**	B810 CIM - Configuring A Robot Arm
			Source:	B810 Computer Interface User's Manual
			Unit: 5	**Page:** **Min. Score:** %
r	( )	**G3r**	**Exercise**	B810 CIM - Operating in Direct Mode
			Source:	B810 Computer Interface User's Manual
			Unit: 6	**Page:** **Min. Score:** %
s	( )	**G3s**	**Technical Report**	The B810 Robot Arm Computer Interface
t	( )	**G3t**	**Exercise**	EKI Robot Trainer - Using the Keypad
			Source:	EKI Robotics Workbook
			Unit: Asgn #2	**Page:** **Min. Score:** 85%
u	( )	**G3u**	**Exercise**	EKI Robot Trainer - Robot Program R-1
			Source:	EKI Robotics Workbook
			Unit: Asgn #3	**Page:** **Min. Score:** %
v	( )	**G3v**	**Technical Report**	EKI Robot Trainer Familiarization

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Subtasks are to be initialled by the instructor as they are completed. Indicate the task start and completion dates. Submit this form when each task is done.

H.H. Arnold High School
Electronics and Technology Education
Frank C. Pendzich

ASSIGNMENT CHECK-LIST
Generated: 08/25/02

Course #	Course Title
VEE406	**Robotics/Industrial Technology**

Area	Competency	Category
H	**AC AND FLUIDIC POWER**	**VOCATIONAL**

Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
1	**AC and Fluidic Power (Theory)**	(/ /)	(/ /)

The student will state the factors that affect the rating of an AC generator and the major differences between a wye-connected and delta-connected three-phase generator. They will exlain how a load is connected to a three-phase and wye-configured AC generator as well as how a revolving field is developed in a three-phase AC motor and single-phase capacitor motor. The student will also describe how to reverse the direction of a three-phase induction motor and state the difference between a cage rotor and form-wound rotor.
The student will explain the function of the basic components of hydraulic and pneumatic systems. Finally the student will describe the operation of a three-phase AC generator, three-phase induction motor, split-phase motor, and capacitor-start AC motor.

Sub	Init	Code	Type of Task	Task Description
a	( )	**H1a**	**Reading Assignment**	AC and Fluidic Power
			Source:	Robotics and Industrial Electronics - Book 1
			Unit: 2	**Page:** 2-1 to 2-66 **Min. Score:** %
b	( )	**H1b**	**Homework Assignment**	Programmed Review Questions 2 to 40 Even
			Source:	Robotics and Industrial Electronics - Book 1
			Unit: 2	**Page:** 20,21,41,61,66 **Min. Score:** 85%
c	( )	**H1c**	**Computer Test**	AC and Fluidic Power
			Unit: VEE406-G	**Page:** **Min. Score:** 85%
d	( )	**H1d**	**Notebook**	Notebook Review

Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
2	**AC Generators and Motors**	(/ /)	(/ /)

The student will construct and operate a three-phase AC alternator and an AC motor. They will collect information regarding exciter voltage, output voltage, and rotation speed. The student will demonstrate their skill by modifying the AC motor to change the motor's direction of rotation.

Sub	Init	Code	Type of Task	Task Description

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Lastname, First Student Number Period

Subtasks are to be initialled by the instructor as they are completed. Indicate the task start and completion dates. Submit this form when each task is done.

a	( )	**H2a**	**Exercise**	Alternator, 3 Phase, Rotating Field			
			Source:	AC and DC Rotating Electric Machine Manual			
			Unit:	81A	**Page:**	**Min. Score:**	%
b	( )	**H2b**	**Exercise**	Alternator, 3 Phase, Y & Delta Windings			
c	( )	**H2c**	**Technical Report**	AC Generators			
d	( )	**H2d**	**Exercise**	AC Motor, Single Phase Induction			
			Source:	AC and DC Rotating Electric Machine Manual			
			Unit:	48	**Page:**	**Min. Score:**	%
e	( )	**H2e**	**Exercise**	AC Split Phase Motor, Capacitor Start			
			Source:	AC and DC Rotating Electric Machine Manual			
			Unit:	32A & 33A	**Page:**	**Min. Score:**	%
f	( )	**H2f**	**Technical Report**	AC Motors			

Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
3	**Principles of Hydraulics**	(/ /)	(/ /)

The student will identify the components of a basic hydraulic system. They will demonstrate the uses of various hydraulic components and connect them together to perform specific operations.

Sub	Init	Code	Type of Task	Task Description			
a	( )	**H3a**	**Exercise**	Trainer Familiarization			
			Source:	Fundamentals of Technology - Principles of Hydraulics			
			Unit:	1	**Page:**	**Min. Score:**	%
b	( )	**H3b**	**Exercise**	Introduction to Hydraulic Systems			
			Source:	Fundamentals of Technology - Principles of Hydraulics			
			Unit:	2	**Page:**	**Min. Score:**	%
c	( )	**H3c**	**Exercise**	Hydraulic Fluids			
			Source:	Fundamentals of Technology - Principles of Hydraulics			
			Unit:	3	**Page:**	**Min. Score:**	%
d	( )	**H3d**	**Exercise**	Filtration Systems			
			Source:	Fundamentals of Technology - Principles of Hydraulics			
			Unit:	4	**Page:**	**Min. Score:**	%
e	( )	**H3e**	**Exercise**	Hydraulic Pumps			
			Source:	Fundamentals of Technology - Principles of Hydraulics			
			Unit:	5	**Page:**	**Min. Score:**	%
f	( )	**H3f**	**Exercise**	Pressure Control Devices			
			Source:	Fundamentals of Technology - Principles of Hydraulics			
			Unit:	6	**Page:**	**Min. Score:**	%
g	( )	**H3g**	**Exercise**	Manual Directional Control Valves			
			Source:	Fundamentals of Technology - Principles of Hydraulics			
			Unit:	7	**Page:**	**Min. Score:**	%

Lastname, First	Student Number	Period

Subtasks are to be initialled by the instructor as they are completed. Indicate the task start and completion dates. Submit this form when each task is done.

Sub	Init	Code	Type of Task	Task Description
h	( )	H3h	Exercise	Check Valves
			Source:	Fundamentals of Technology - Principles of Hydraulics
			Unit: 8	Page: Min. Score: %
i	( )	H3i	Exercise	Needle Valves
			Source:	Fundamentals of Technology - Principles of Hydraulics
			Unit: 9	Page: Min. Score: %
j	( )	H3j	Exercise	Hydraulic Cylinders
			Source:	Fundamentals of Technology - Principles of Hydraulics
			Unit: 10	Page: Min. Score: %
k	( )	H3k	Exercise	Hydraulic Flow Control Valves
			Source:	Fundamentals of Technology - Principles of Hydraulics
			Unit: 11	Page: Min. Score: %
l	( )	H3l	Technical Report	Introduction to Hydraulic Components
m	( )	H3m	Exercise	Paired Cylinders in a Circuit
			Source:	Fundamentals of Technology - Principles of Hydraulics
			Unit: 12	Page: Min. Score: %
n	( )	H3n	Exercise	Hydraulic Press Application
			Source:	Fundamentals of Technology - Principles of Hydraulics
			Unit: 13	Page: Min. Score: %
o	( )	H3o	Exercise	Hydraulic Jack Application
			Source:	Fundamentals of Technology - Principles of Hydraulics
			Unit: 14	Page: Min. Score: %
p	( )	H3p	Exercise	Hydraulic Logic - Positioner Application
			Source:	Fundamentals of Technology - Principles of Hydraulics
			Unit: 15	Page: Min. Score: %
q	( )	H3q	Exercise	Hydraulic Symbols and Schematics
			Source:	Fundamentals of Technology - Principles of Hydraulics
			Unit: 16	Page: Min. Score: %
r	( )	H3r	Technical Report	Hydraulic Applications Laboratories

Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
4	**Principles of Pneumatics**	(/ /)	(/ /)

The student will identify the basic components of a pneumatic system. They will demonstrate the uses of basic pneumatic components and connect them together to perform specific operations.

Sub	Init	Code	Type of Task	Task Description
a	( )	H4a	Exercise	Trainer Familiarization
			Source:	Fundamentals of Technology - Principles of Pneumatics
			Unit: 1	Page: Min. Score: %

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Lastname, First Student Number Period

Subtasks are to be initialled by the instructor as they are completed. Indicate the task start and completion dates. Submit this form when each task is done.

Sub	Init	Code	Type of Task	Task Description
b	( )	**H4b**	**Exercise**	Introduction to Pneumatic Systems
			Source:	Fundamentals of Technology - Principles of Pneumatics
			Unit: 2	**Page:** **Min. Score:** %
c	( )	**H4c**	**Exercise**	Flow Meters
			Source:	Fundamentals of Technology - Principles of Pneumatics
			Unit: 3	**Page:** **Min. Score:** %
d	( )	**H4d**	**Exercise**	Manual Direction Control Valves
			Source:	Fundamentals of Technology - Principles of Pneumatics
			Unit: 4	**Page:** **Min. Score:** %
e	( )	**H4e**	**Exercise**	Solenoid Directional Control Valves
			Source:	Fundamentals of Technology - Principles of Pneumatics
			Unit: 5	**Page:** **Min. Score:** %
f	( )	**H4f**	**Exercise**	Air Piloted Control Valves
			Source:	Fundamentals of Technology - Principles of Pneumatics
			Unit: 6	**Page:** **Min. Score:** %
g	( )	**H4g**	**Exercise**	Flow Control Valves
			Source:	Fundamentals of Technology - Principles of Pneumatics
			Unit: 7	**Page:** **Min. Score:** %
h	( )	**H4h**	**Exercise**	Single and Double Acting Cylinders
			Source:	Fundamentals of Technology - Principles of Pneumatics
			Unit: 8	**Page:** **Min. Score:** %
i	( )	**H4i**	**Exercise**	Lubrication Systems
			Source:	Fundamentals of Technology - Principles of Pneumatics
			Unit: 9	**Page:** **Min. Score:** %
j	( )	**H4j**	**Exercise**	Air Filtration Systems
			Source:	Fundamentals of Technology - Principles of Pneumatics
			Unit: 10	**Page:** **Min. Score:** %
k	( )	**H4k**	**Exercise**	Vacuum Generators
			Source:	Fundamentals of Technology - Principles of Pneumatics
			Unit: 11	**Page:** **Min. Score:** %
l	( )	**H4l**	**Technical Report**	Introduction to Pneumatic Components
m	( )	**H4m**	**Exercise**	Paired Cylinders in a Circuit
			Source:	Fundamentals of Technology - Principles of Pneumatics
			Unit: 12	**Page:** **Min. Score:** %
n	( )	**H4n**	**Exercise**	Feedback in Pneumatic Systems
			Source:	Fundamentals of Technology - Principles of Pneumatics
			Unit: 13	**Page:** **Min. Score:** %
o	( )	**H4o**	**Exercise**	Parts Feeder Application
			Source:	Fundamentals of Technology - Principles of Pneumatics
			Unit: 14	**Page:** **Min. Score:** %

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Lastname, First Student Number Period

Subtasks are to be initialled by the instructor as they are completed. Indicate the task start and completion dates. Submit this form when each task is done.

Sub	Init	Code	Type of Task	Task Description
p	( )	H4p	**Exercise**	Machining Application
			Source:	Fundamentals of Technology - Principles of Pneumatics
			Unit: 15	**Page:** **Min. Score:** %
q	( )	H4q	**Exercise**	Introduction to Air Logic
			Source:	Fundamentals of Technology - Principles of Pneumatics
			Unit: 16	**Page:** **Min. Score:** %
r	( )	H4r	**Exercise**	Pneumatic Symbols and Schematics
			Source:	Fundamentals of Technology - Principles of Pneumatics
			Unit: 17	**Page:** **Min. Score:** %
s	( )	H4s	**Technical Report**	Pneumatic Applications Laboratories

Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
5	**Pneumatic Robot Arm**	(/ /)	(/ /)

The student will assemble and operate a pneumatic robot arm. They will demonstrate their skill by programming the robot arm to perform a variety of tasks.

Sub	Init	Code	Type of Task	Task Description
a	( )	H5a	**Exercise**	Robot Arm Familiarization
			Source:	MB 501 Robot Arm User's Manual
			Unit: 1	**Page:** **Min. Score:** %
b	( )	H5b	**Exercise**	Robot Arm Motions
			Source:	MB 501 Robot Arm User's Manual
			Unit: 2	**Page:** **Min. Score:** %
c	( )	H5c	**Exercise**	Base Rotation and Elevation
			Source:	MB 501 Robot Arm User's Manual
			Unit: 3	**Page:** **Min. Score:** %
d	( )	H5d	**Exercise**	Reach and Grip
			Source:	MB 501 Robot Arm User's Manual
			Unit: 4	**Page:** **Min. Score:** %
e	( )	H5e	**Exercise**	Wrist Rotation
			Source:	MB 501 Robot Arm User's Manual
			Unit: 5	**Page:** **Min. Score:** %
f	( )	H5f	**Exercise**	Elevation and Grip
			Source:	MB 501 Robot Arm User's Manual
			Unit: 6	**Page:** **Min. Score:** %
g	( )	H5g	**Exercise**	Elevation and Base Rotation
			Source:	MB 501 Robot Arm User's Manual
			Unit: 7	**Page:** **Min. Score:** %
h	( )	H5h	**Exercise**	Base Rotation, Elevation, and Grip
			Source:	MB 501 Robot Arm User's Manual
			Unit: 8	**Page:** **Min. Score:** %

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Lastname, First Student Number Period

Subtasks are to be initialled by the instructor as they are completed. Indicate the task start and completion dates. Submit this form when each task is done.

Sub	Init	Code	Type of Task	Task Description
i	( )	**H5i**	**Exercise**	Speed Control and Rotary Actuator
			Source:	MB 501 Robot Arm User's Manual
			Unit: 9	**Page:** **Min. Score:** %
j	( )	**H5j**	**Technical Report**	Pneumatic Robot Arm

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Lastname, First Student Number Period

Subtasks are to be initialled by the instructor as they are completed. Indicate the task start and completion dates. Submit this form when each task is done.

H.H. Arnold High School
Electronics and Technology Education
Frank C. Pendzich

ASSIGNMENT CHECK-LIST

Generated: 08/25/02

Course #	Course Title
VEE406	**Robotics/Industrial Technology**

Area	Competency	Category
I	**DC MOTORS AND POSITIONING**	**VOCATIONAL**

Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
1	**DC Motors and Positioning (Theory)**	(/ /)	(/ /)

The student will state the advantages and disadvantages of series-wound, compound-wound, and shunt-wound DC motors. They will explain how motor load affects speed regulation. The student will also explain Hall-effect and how it is used to control a DC brushless motor. In addition, the student will describe the operation of bipolar and unipolar permanent magnet stepping motors, as well as describe the operation of a variable reluctance stepping motor. Finally, the student will explain how bipolar and unipolar control circuits operate. The student will successfully complete exercises and an exam to demonstrate their knowledge of this topic.

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Lastname, First Student Number Period

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Course #	Course Title
VEE406	**Robotics/Industrial Technology**

Area	Competency	Category
J	**ROBOT APPLICATIONS**	**VOCATIONAL**

Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
1	**Management Considerations**	(/ /)	(/ /)
2	**Environmental Feedback**	(/ /)	(/ /)
3	**Vision Systems**	(/ /)	(/ /)
4	**Tactile Sensing**	(/ /)	(/ /)
5	**Computer-Aided-Manufacturing (CAM)**	(/ /)	(/ /)

_____ _____ _____
Lastname, First Student Number Period

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Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
6	**Robot Applications**	(/ /)	(/ /)

Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
7	**Robotic Applications (Design Problem)**	(/ /)	(/ /)

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Lastname, First Student Number Period

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ASSIGNMENT CHECK-LIST

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Course #	Course Title
VEE406	**Robotics/Industrial Technology**

Area	Competency	Category
K	**INDUSTRIAL ROBOTICS AND AUTOMATION**	**VOCATIONAL**

Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
1	**Introduction to Industrial Robots**	(/ /)	(/ /)
2	**Hydraulic Systems**	(/ /)	(/ /)
3	**Pneumatic Systems**	(/ /)	(/ /)
4	**Electric Motors and Mechanical Drives**	(/ /)	(/ /)
5	**Servo Systems**	(/ /)	(/ /)

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Lastname, First Student Number Period

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Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
6	**Robot Control Devices**	(/ /)	(/ /)

Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
7	**Robot Interfacing**	(/ /)	(/ /)

Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
8	**Automated Manufacturing**	(/ /)	(/ /)

Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
9	**Industrial Robotics & Automation (Design Problem)**	(/ /)	(/ /)

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Lastname, First Student Number Period

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ASSIGNMENT CHECK-LIST

Generated: 08/25/02

Course #	Course Title
VEE406	**Robotics/Industrial Technology**

Area	Competency	Category
L	**INTELLIGENT MACHINES**	**VOCATIONAL**

Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
1	**The Intelligent Machine System**	(/ /)	(/ /)
2	**Data Input**	(/ /)	(/ /)
3	**Sensory Input Devices**	(/ /)	(/ /)
4	**Intelligent Machine Output**	(/ /)	(/ /)
5	**Robots**	(/ /)	(/ /)

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Lastname, First Student Number Period

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Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
6	**Intelligent Machines (Design Problem)**	(/ /)	(/ /)

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Lastname, First Student Number Period

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ASSIGNMENT CHECK-LIST

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Course #	Course Title
VEE406	**Robotics/Industrial Technology**

Area	Competency	Category
M	**DESIGN AND ENGINEERING**	**VOCATIONAL**

Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
1	**Problem Definition**	(/ /)	(/ /)
2	**Solution and Operational Concepts**	(/ /)	(/ /)
3	**Machine Design**	(/ /)	(/ /)
4	**Machine Construction**	(/ /)	(/ /)
5	**Machine Troubleshooting and Repair**	(/ /)	(/ /)

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Task	Task/Skill	Started mm/dd/yy	Completed mm/dd/yy
6	**Machine Performance**	(/ /)	(/ /)

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