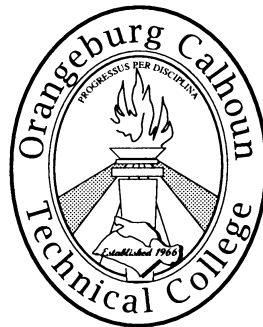


ELECTRONICS ENGINEERING TECHNOLOGY COMPETENCY PROFILE



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10-27-05

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An Instrumentation Technician installs, calibrates, repairs, & maintains process control systems

A. DEMONSTRATE A WORKING KNOWLEDGE OF PROGRAMMABLE CONTROLLERS	A-1 PROGRAM SINGLE & MULTI-LOOP CONTROLLERS	A-2 INTERFACE EQUIPMENT	A-3 SAVE UPGRADES & STORE PROGRAMS	A-4 LOAD PROGRAMS	A-5 USE PERIPHERAL DEVICES <i>(e.g., Printers, Program Loaders, *Laptops, etc.)</i>		
B. DEMONSTRATE A WORKING KNOWLEDGE OF DISTRIBUTIVE CONTROL SYSTEMS & PLCS	B-1 DEMONSTRATE A BASIC UNDERSTANDING OF PROGRAMMING		B-2 USE & KNOW MEANING OF TECHNICAL TERMINOLOGY <i>(Buzz Words)</i>		B-3 CALL UP NEEDED DATA <i>(e.g., Control Loop Config.)</i>	B-4 INTERPRET DATA DISPLAYS	
	B-5 INTERPRET LADDER DIAGRAM	B-6 TROUBLESHOOT LADDER LOGIC	B-7 CONFIGURE CONTROL LOOPS	B-8 DEVELOP CONCEPTS OF EQUIPMENT CONFIGUREMENT <i>(Including Graphics, C Language, Geneses, Siemens)</i>			
C. REPAIR & CALIBRATE ELECTRONIC/ PNEUMATIC INSTRUMENTATION	C-1 READ SCHEMATIC DIAGRAMS	C-2 ASSIMILATE INFORMATION FROM TECHNICAL MANUALS		C-3 ISOLATE THE PROBLEM	C-4 * USE TEST EQUIPMENT	C-5 USE SEMICONDUCTOR CROSS-REFERENCES	
	C-6 REQUISITION PARTS/CARDS		C-7 REPLACE DEFECTIVE PART(S)/CARDS(S)		C-8 SOLDER COMPONENT	C-9 VERIFY PROPER OPERATION AFTER REPAIR AND CALIBRATE	
	C-10 * MAINTAIN REPAIR TRACEABILITY RECORDS	C-11 READ PIPING & INSTRUMENTATION DIAGRAMS/SYMBOLS		C-12 * DEVELOP A WORKING KNOWLEDGE OF SMART TRANSMITTERS		C-13 * MAINTAIN CALIBRATION TRACEABILITY RECORDS, "AS FOUND, AS LEFT"	
D. USE CALIBRATION INSTRUMENTS	D-1 DETERMINE PROPER SCALING FOR INSTRUMENTATION	D-2 SIMULATE PROCESS <i>(Heat, Pressure, etc.)</i>	D-3 USE CURVES <i>(Thermo, Couples, RTD(s), etc.)</i>	D-4 SELECT PROPER TEST EQUIPMENT	D-5 ASSIMILATE INFORMATION FROM TECHNICAL MANUALS	D-6 PERFORM TESTS USING PROPER TEST EQUIPMENT <i>(e.g., D-7 to D-17)</i>	D-7 MULTIMETER
	D-8 OSCILLOSCOPE	D-9 CURRENT GENERATOR	D-10 PRESSURE & VACUUM GAUGES	D-11 MANOMETERS	D-12 DECADE BOXES <i>(Resistance & Capacitance)</i>		D-13 FREQUENCY GENERATORS
	D-14 FREQUENCY COUNTER	D-15 MILLIVOLT GENERATORS	D-16 DEAD WEIGHT TESTER	D-17 "SMART" CALIBRATORS	D-18 PRACTICE "BEST PRACTICE"	D-19 OPERATE PC BASED SIMULATORS	D-20 * RUN CALIBRATIONS ON LAPTOPS

E. TROUBLE SHOOT SYSTEMS	E-1 COLLECT INFORMATION	E-2 ISOLATE THE PROBLEM	E-3 READ SYSTEMS OPERATIONS PROCEDURES	E-4 READ PIPING & INSTRUMENTATION DIAGRAMS	E-5 READ & ANALYZE ELECTRICAL/ PNEUMATIC SCHEMATICS	E-6 TAKE APPROPRIATE ACTION <i>(Repair or Report as needed)</i>	E-7 * MAINTAIN RECORDS <i>(e.g., Prints, Programs)</i>
F. DEMONSTRATE A BASIC WORKING KNOWLEDGE OF VALVES	F-1 READ AND INTERPRET SPEC SHEETS/NAME PLATE DATA		F-2 KNOWLEDGE OF VARIOUS VALVES & ACTUATORS	F-3 REPAIR & CALIBRATE VALVES	F-4 BENCH SET ACTUATORS	F-5 REPAIR & CALIBRATE VALVE POSITIONERS	
	F-6 USE SMART POSITIONERS	F-7 PERFORM PERIODIC MAINTENANCE ON CONTROL VALVES		F-8 MOTOR OPERATED VALVES		F-9 HYDRAULIC ACTUATORS	F-10 * MAINTAIN RECORDS
G. TUNE CONTROL LOOP(S)	G-1 IDENTIFY THE PROCESS & HARDWARE	G-2 INTERPRET CONTROL SCHEMES	G-3 IDENTIFY TYPES OF CONTROL LOOPS	G-4 DETERMINE REQUIRED ADJUSTMENT	G-5 MAKE PROPORTIONAL/ GAIN ADJUSTMENTS	G-6 MAKE DERIVATIVE/ RATE ADJUSTMENTS	G-7 MAKE INTEGRAL/RESET ADJUSTMENTS
	G-8 AUTOTUNE BUTTONS/SOFTWARE	G-9 * DOCUMENT ADJUSTMENTS AND MAINTAIN RECORDS					
H. INSTALL ELECTRONIC & PNEUMATIC INSTRUMENTATION	H-1 READ PIPING & INSTRUMENTATION DIAGRAMS	H-2 READ WIRING DIAGRAMS	H-3 USE PROPER HAND TOOLS	H-4 RUN TUBING AND CONDUIT	H-5 * WIRE CURRENT LOOPS & KNOW SHIELDING REQUIREMENTS	H-6 FOLLOW MFGS. RECOMMENDED PROCEDURES	H-7 INSTALL EQUIPMENT ACCORDING TO STANDARD PROCEDURES
	H-8 VERIFY PROPER INSTALLATION	H-9 ENSURE PROPER OPERATION	H-10 SUPPLY "AS BUILT" DRAWINGS	H-11 REPORT DOCUMENTATION DISCREPANCIES	H-12 UNDERSTAND AREA CLASSIFICATIONS OF INTRINSIC BARRIERS		H-13 DEVELOP BASIC UNDERSTANDING OF ISO REQUIREMENTS, <i>(e.g., Traceability)</i>
I. DEMONSTRATE BASIC WORKING KNOWLEDGE OF SPEED CONTROLS (Inverter, AC/DC Drives, Servo)	I-1 KNOWLEDGE OF MOTOR AND MOTOR CONTROLS	I-2 CHECK/REPLACE FUSES	I-3 USE TEST EQUIPMENT	I-4 ASSIMILATE INFORMATION FROM TECHNICAL MANUALS	I-5 MAKE TUNING ADJUSTMENTS	I-6 WIRE CURRENT LOOPS & KNOW SHIELDING REQUIREMENTS	I-7 MAKE REPAIRS AS NEEDED

J. PRACTICE SAFETY	J-1 FOLLOW PLANT SAFETY PROCEDURES	J-2 USE PERSONAL SAFETY EQUIPMENT <i>(i.e. Gloves, Safety Glasses, Ear Plugs)</i>		J-3 RECOGNIZE DANGEROUS SITUATIONS <i>(Safety Conscious)</i>		J-4 FOLLOW MSDS <i>(Material Safety Data Sheets)</i>	J-5 FOLLOW CONFINED SPACE ENTRY POLICIES
	J-6 FOLLOW LOCKOUT/TAGOUT PROCEDURES	J-7 FOLLOW SAFETY FOR VOLTAGE	J-8 PERFORM GOOD HOUSEKEEPING	J-9 REPORT SAFETY HAZARDS TO SUPERVISOR			
K. EXHIBIT PROFESSIONALISM	K-1 DEMONSTRATE INITIATIVE	K-2 FOLLOW GOOD WORK HABITS <i>(e.g., Punctuality, Good Attendance)</i>		K-3 PRODUCE QUALITY WORK	K-4 RECOGNIZE & CORRECT PROBLEMS IN THE WORK AREA	K-5 DEVELOP GOOD WORKING RELATIONSHIPS <i>(Teamwork)</i>	K-6 DEVELOP WORKPLACE ETHICS
	K-7 INCREASE SKILL LEVELS <i>(Continue Education)</i>	K-8 EXHIBIT GOOD PERSONAL HYGIENE					
L. COMMUNICATE	L-1 SHARE INFORMATION WITH OTHERS	L-2 FOLLOW WORK ORDERS	L-3 * MAKE REPORT OF WORK COMPLETED <i>(Verbal & Written)</i>	L-4 REPORT PROBLEMS IN WORK AREA	L-5 MAKE WRITTEN REPORTS	L-6 PRACTICE ORAL COMMUNICATIONS	L-7 DEMONSTRATE INTERPERSONAL SKILLS
	L-8 EXHIBIT GOOD LISTENING SKILLS	L-9 DEVELOP/USE QUESTIONING TECHNIQUES <i>(Root Cause)</i>	L-10 DEVELOP INTERVIEWING TECHNIQUES				
M. MAINTAIN ANALYTICAL EQUIPMENT	M-1 ASSIMILATE INFORMATION FROM TECHNICAL MANUALS	M-2 DETERMINE PROPER SCALING	M-3 CALIBRATE/ REPAIR EQUIPMENT	M-4 DEVELOP CONCEPTS AND APPLICATIONS OF CONDUCTIVITY, GAS, RADIATION, PH, AND ORP MEASUREMENTS		M-5 MAINTAIN RECORDS FOR EPA, DHEC, OSHA & OTHERS	
N. COMPUTER SKILLS	N-1 PERFORM BASIC COMPUTER OPERATION	N-2 USE COMPUTER OPERATING SYSTEMS PROTOCOL	N-3 DEVELOP FAMILIARITY OF COMMUNICATION PROTOCOL; <i>e.g. Ethernet, RS485, RS232, RS422, etc.</i>		N-4 USE WINDOWS NT OPERATING SYSTEM	N-5 DEVELOP INTERNET SKILLS <i>(Web Sites for Manuals, Upgrades, Trouble shooting, etc.)</i>	
	N-6 OPERATE PC BASED PLC'S	N-7 INTRODUCTION TO SIMULATION PACKAGES; <i>e.g. HMI</i>		N-8 USE VISUAL BASIC	N-9 BUILD & USE SPREADSHEETS FOR TRACEABILITY RECORDS		N-10 COMPLETE REPORTS IN WORD PROCESSING

O-1 TEAM PLAYER	O-1 UNDERSTAND TEAM MECHANICS	O-2 CHOOSE/BECOME A TEAM LEADER	O-3 BECOME SELF DIRECTED	O-4 IDENTIFY GOALS	O-5 TAKE RESPONSIBILITY FOR MISTAKES	O-6 GIVE & RECEIVE CONSTRUCTIVE CRITICISM
	O-7 EXHIBIT HONESTY					
* <i>IDENTIFIES CRITICAL SKILLS AND ATTRIBUTES.</i>						

GENERAL KNOWLEDGE	BASIC SHOP MATH/ BASIC ALGEBRA	APPLIED CHEMISTRY	FIBER OPTICS USES & CAPABILITIES
	VISUAL BASIC PROGRAMS	BUILD WEB SITES	KNOWLEDGE OF VOLTAGE <i>(480, 6.9 etc).</i>
	MOTOR CONTROLS	FEED BACK TRANSMITTERS	

THIS DACUM WAS CONDUCTED ON OCTOBER 27, 2005, AT ORANGEBURG-CALHOUN TECHNICAL COLLEGE, 3250 ST. MATTHEWS RD., ORANGEBURG, SC 29118

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