IDAHO STATE UNIVERSITY COLLEGE OF TECHNOLOGY

PROGRAM TITLE: INSTRUMENTATION & AUTOMATION ENGINEERING TECHNOLOGY

Information included in this handout may change at anytime without notice and should not be considered as a binding contract between Idaho State University and students.

Program Options & Length:

Instrumentation & Automation Technology, Associate of Applied Science degree	4 ½ Semesters
Instrumentation & Automation Technology, Advanced Technical Certificate	4 ½ Semesters
Industrial Controls, Associate of Applied Science degree	5 Semesters
Industrial Controls, Advanced Technical Certificate	4 Semesters
Instrumentation and Automation Assistant, Post Secondary Technical Certificate	1 ½ Semesters

Entry dates for this program:
August and January

Approximate cost for books, tools, & supplies:
$2,452
(See below for registration fees.)

For more information, Contact:
Idaho State University
College of Technology
Student Services Office
Campus Box 8380
Pocatello, ID 83209-8380
(208)282-2622
e-mail: ctech@isu.edu
www.isu.edu/ctech/

Job Description: Instrumentation and Automation Technicians are employed in every type of industry. Sometimes referred to as control technicians, or maintenance technicians, they keep automated systems running. Examples of automation may include three-phase motor control, pneumatic control, computer, and programmable logic controllers (PLCs). They work with modes of measurement, interfacing, transmission, and control of industrial process variables such as temperature, pressure, level, flow, density, PH, humidity, analysis, conductivity, and others. They work with human machine interface (HMI) software, data logging software, and PLC software. To describe their work, some say instrumentation technicians are to industry what physicians are to humans; they monitor and maintain all systems in industry to the level of troubleshooting and replacement.

I**ndustrial Controls Technicians** are found in process, manufacturing, construction, food chemical, space, utilities, mining, semiconductor, nuclear, research, and other industries. They may work in positions such as control technicians, electricians, maintenance technicians, instrumentation technicians, field engineers, sales representatives, programmers, operators, and millwrights. Their work includes automated equipment such as conveyors, pumps, data logging, packaging, computer/PC controls, and devices that interface controllers with processes that involve temperature, pressure, flow, level, inventories, etc. They are involved in installations, troubleshooting, and maintenance of plants that provide food, cars, electricity, building materials, paper, pharmaceutical products, tools, chemicals, electronic devices, and other products.

Aptitudes and Interests: Have good manual dexterity; have good color vision; have agility and good health; have ability to use judgment in planning operations and in selecting tools and materials. Workers should enjoy solving problems and be able to follow through an assignment; be willing to assume responsibility for quality work.

Helpful High School Courses:
Algebra/ Trigonometry English Chemistry Drafting Electricity Geometry Physics

TUITION AND FEES

Fees apply to the current Idaho State University fee schedule located at **http://www.isu.edu/finserv/costinfo.shtml**.

Fees include **mandatory** student health insurance, any student with existing health insurance coverage may be exempt and waivers are available at **http://www.isu.edu/stuhlth/insurance/pp.html** .

ADMISSION STEPS

- Complete and return an Application for Admission along with a check or money order for $40 (non-refundable), payable to Idaho State University. You may also apply online via the Idaho State University home page: www.isu.edu . Click on Prospective Students.
- Submit official college transcripts, if applicable, from each accredited institution of higher education that you have attended.
- Submit an official copy of your high school transcript or GED scores (Not required if you have completed and submitted proof of 14 or more academic credits from an accredited institution of higher education.)
- Meet with a College of Technology counselor, if desired, to obtain more in-depth information. To make an appointment, call (208)282-2622.
- Either:
    1. Complete the COMPASS Placement test. This test enables us to place you in the appropriate classes to enhance your success in college.
    2. Submit ACT/SAT scores, valid for seven (7) years from the date of testing. ACT scores are not required for acceptance to the College of Technology, however they are required to qualify for some scholarships
- Apply for financial aid if needed. Questions, call (208) 282-2756.
- Former College of Technology students who have been out of school one semester or more must complete the necessary forms in the Student Services office before returning to the program. Re-entering student must meet the requirements as outlined in the catalog effective at the date of their re-enrollment.

Idaho State University subscribes to the principles and laws of the State of Idaho and the federal government, including applicable executive orders pertaining to civil rights. All rights, privileges, and activities of the University are made available without regard to race, creed, color, sex, age, disability, national origin or veteran status. The University is an Equal Opportunity and Affirmative Action employer. Evidence of practices that are not consistent with such a policy should be reported to: Leonard E. "Buddy" Frazier, Affirmative Action Director; Museum Building, Room 422 Box 8315.E-mail frazleon@isu.edu, (208) 282-3964.

Idaho State University is committed to equal opportunity in education for all students, including those with documented disabilities. If you have a diagnosed disability or if you believe that you have a disability that might require reasonable accommodations, please contact: Dennis J. Toney, ADA Disabilities and Resource Center Director; Gravely Hall, Room 123 Box 8121.E-mail tonedenn@isu.edu, (208)282-3599.

Licensure, certification, and/or employment applications related to some degree programs require students to disclose any history of criminal prosecution which may include the student's driving record. Students who have a criminal history are strongly encouraged to contact the licensing agency or meet with the coordinator of the program they are interested in, prior to beginning classes, to discuss potential impediments to licensure, certification, or employment.

IDAHO STATE UNIVERSITY COLLEGE OF TECHNOLOGY

PROGRAM TITLE: INSTRUMENTATION & AUTOMATION ENGINEERING TECHNOLOGY

COURSE SEQUENCE

1st Year - 1st Semester

ATC	AAS	Course #	Course Title	Credits
x	x	ELTR 141	Applied Mathematics I	4
x	x	ELTR 153	Electronic Theory	5
x	x	ELTR 155	Electronic Laboratory	5
x	x	COMM 101	Principles of Speech	3

1st Year - 2nd Semester

ATC	AAS	Course #	Course Title	Credits
x	x	ELTR 142	Applied Mathematics II	4
x	x	ELTR 154	Electron Control Devices Theory A	5
x	x	ELTR 156	Electron Control Devices Laboratory A	5
x	x	PHYS 101 & 101L	Elements of Physics (or ELTR 147 for ATC)	4
x	x	TGE 158	Employment Strategies	2

2nd Year - 3rd Semester

ATC	AAS	Course #	Course Title	Credits
x	x	INST 281	Electrical Automation Theory	8
x	x	INST 282	Electrical Automation Laboratory	5
x	x	ELTR 269	Electronic Drafting I	2
x	x	ENGL 101	English Composition	3

2nd Year - 4th Semester

ATC	AAS	Course #	Course Title	Credits
x	x	INST 296	Process Measurement and Control Theory	10
x	x	INST 297	Process Measurement and Control Laboratory	5

Students will also need to schedule the following classes if they are seeking the Associate of Applied Science degree: three (3) credits from Goal 3; and three (3) credits from Goals 6, 7, 9, 10A, 11 or 12.

IDAHO STATE UNIVERSITY COLLEGE OF TECHNOLOGY

*PROGRAM TITLE: Postsecondary Technical Certificate: Instrumentation/System Automation Assistan*t

COURSE SEQUENCE

1st Year -spring

Course #	Course Title	Credits
ELTR 130	Fundamental Electricity and Electronic Theory	5
ELTR 131	Fundamental Electricity and Electronic Lab	5
INST 140	Intro to Motors and Motor Control Theory	2
INST 220	Introduction to Programmable Logic Controllers	3

1st Year -summer

INST 240	Instrumentation Theory	2
INST 242	Instrumentation Theory	2
INST 250	Laboratory	1
INST 251	Laboratory	1
INST 253	Laboratory	1
INST 254	Laboratory	1

IDAHO STATE UNIVERSITY COLLEGE OF TECHNOLOGY

PROGRAM TITLE: INDUSTRIAL CONTROLS

COURSE SEQUENCE

1st Year - 1st Semester

ATC	AAS	Course #	Course Title	Credits
x	x	ELTY 131	Electrical Theory I	4
x	x	ELTY 133	Applied Mathematics I	4
x	x	ELTY 135	Electrical Laboratory I	4
x	x	ELTY 137	Electrical Code I	3

1st Year - 2nd Semester

ATC	AAS	Course #	Course Title	Credits
x	x	ELTY 132	Electrical Theory II	5
x	x	ELTY 134	Applied Mathematics II	5
x	x	ELTY 136	Electrical Laboratory II	5
x	x	ELTY 138	Electrical Code II	3
x	x	TGE 158	Employment Strategies	2

2nd Year - 3rd Semester

ATC	AAS	Course #	Course Title	Credits
x	x	ELTY 139	Print Reading	2
x	x	IC 291	Industrial Controls Theory	8
x	x	IC 292	Industrial Controls Laboratory	5
x	x	TGE 151	Technical Writing	2

2nd Year - 4th Semester

ATC	AAS	Course #	Course Title	Credits
x	x	ELTY 140	Motor Control Theory	2
x	x	INST 296	Process Measurement and Control Theory	10
x	x	INST 297	Process Measurement and Control Laboratory	5

Students will also need to schedule the following classes if they are seeking the Associate of Applied Science degree: ENGL 101, PHYS 101 & 101L or CHEM 100, three (3) credits from Goal 3; and one (1) of Goals 6, 7, 9, 10A, 11 or 12.

IDAHO STATE UNIVERSITY COLLEGE OF TECHNOLOGY

PROGRAM TITLE: INSTRUMENTATION & AUTOMATION ENGINEERING TECHNOLOGY

BOOK AND TOOL LIST

Textbooks may be purchased at the University Bookstore located at the Pond Student Union - Building #14. Textbooks may also be purchased or reserved on-line through www.efollett.com or the bookstore's website at www.isu.edu/bookstor. Payments may be made with cash, check, VISA, Mastercard, American Express, or Discover. A shipping charge will be added for mail orders. See the bookstore's website for more information on purchasing or reserving books or for refund policy information. **Save Your Receipts!**

Approximate total book and tool costs for this program's options are listed below.
Additional book costs will vary depending on the courses taken to fulfill general education requirements for the AAS degree.
For a breakdown of books by individual class requirements, you must check your course curriculum.

NOTE: PRICES ARE SUBJECT TO CHANGE AT ANYTIME WITHOUT PRIOR NOTIFICATION

SEE INSTRUCTOR BEFORE PURCHASING

FIRST SEMESTER – ELECTRONICS CORE

I. BOOKS & SUPPLIES:

DESCRIPTION		APPROXIMATE PRICE
ELECTRONICS & COMPUTER MATH	0131711372	149.00
GROB'S BASIC ELECTRONICS	0072974751	137.00
Engineering Computational paper		7.00
Single subject spiral notebook		3.00
Jump Drive		20.00
Lab Book		14.00
Lab Lock Deposit (refundable at the end of 2nd Semester)		(5.00)

TOTAL BOOKS & SUPPLIES – FIRST SEMESTER	**$330.00**

II. LAPTOP/NOTEBOOK COMPUTER:

MINIMUM CONFIGURATION GUIDELINES

Processor	Intel Core 2 Duo processor T5500 (1.66GHz)
Memory (RAM)	2GB
Hard Drive	80GB
Optical Drive	CD-RW/DVD
Wireless	802.11b/g
Ethernet	1Gb
Battery Life	3-4 hours
Warranty	3 years
Operating System	Windows Vista Home Premium
Software, Office Suite	MS Office Pro 2007

Laptop/Notebook Computer and Software (approximate minimum cost)	**$890.00**

ISU Bookstore offers the Windows Vista operating system upgrade for $90.00 and MS Office Professional 2007 for $200.00. (Check with Bookstore for updated prices.)

Computer Account (needed on all wireless computers). Purchase at Rendezvous Building (#38) Computer Lab or Business Administration Building (#5) Basement A18.	**$25.00**

NOTE: DO NOT PURCHASE TOOLS UNTIL AFTER STUDENT ORIENTATION

III. TOOLS

DESCRIPTION	APPROXIMATE PRICE
Wire stripper	4.50
Diagonal Pliers	12.00
Needle/long nose pliers 4 1/2”	10.00
Screwdriver, slotted 3/16 & 1/4’’ tips	6.25
Screwdriver, Phillips #0 & #1 tips	6.50
Screwdriver, Precision/Jewelers set	5.00
Alligator clip leads	4.20
Soldering Aide	3.25
Soldering Iron/pencil 25 Watt (or less) with holder	25.00
Solder, 1/4 lb 60-40 Rosin Core	4.25
Solder wick (braided flat copper wire)	3.75
Desoldering bulb or pump, 060820 Electronix Express or equivalent	6.00
Circuit board holder, Helping Hands	8.10
Safety glasses	8.00
Proto Board or Bread Board	25.00
Scientific Calculator	15.00
Tool Box with lock (large enough to store volt-ohm meter)	20.00
Digital Volt-Ohm-Millampmeter (see specifications below)	65.00

TOTAL TOOLS – FIRST SEMESTER	**$231.80**

DIGITAL VOLT-OHM-MILLAMPMETER SPECIFICATIONS:

DC Voltage ranges = 2V, 20V, 200V, 600V
Resistance ranges = >200Ω, 2KΩ, 200KΩ, 2MΩ, 20MΩ
AC Current ranges = >200mA, 20A
DC Current ranges = >20µA, 200µA, 200mA, 10A
Input Inpedance = 10 – 12 Mµ

APPROXIMATE TOTAL BOOKS, COMPUTER, AND TOOLS - FIRST SEMESTER	**$1,476.80**

SECOND SEMESTER - ELECTRONICS CORE

I. BOOKS & SUPPLIES

DESCRIPTION		APPROXIMATE PRICE
ELECTRONIC DEVICES:CONV CURRENT VERS (W/CD)	0132429733	140.00
DIGITAL ELECTRONICS (W/2 CDS)	0132435789	137.00
Engineering Computational paper		7.00
Single subject spiral notebook		3.00

TOTAL BOOKS & SUPPLIES – SECOND SEMESTER	**$287.00**

Computer Account (needed on all wireless computers). Purchase at Rendezvous Building (#38) Computer Lab or Business Administration Building (#5) Basement A18.	**$25.00**

II. TOOLS

DESCRIPTION	APPROXIMATE PRICE
Radio Kit (Available from the Program)	25.00
Heat Sink, GC 9077 or equivalent	1.25
Soldering aide tool, GC 9075 or equivalent	2.25
Solder wick (for de-soldering), GC 684/685 or equivalent	3.75
*Solder, 60/40 Rosin Core only, 1/4 lb reel (18GA)	4.25
*Solder Flux paste (non-acid)	3.25

TOTAL TOOLS – SECOND SEMESTER	**$39.75**

*These items were purchased for 1st Semester, but additional quantities may be needed.

APPROXIMATE TOTAL BOOKS AND TOOLS - SECOND SEMESTER	**$351.75**

APPROXIMATE TOTAL BOOKS, COMPUTER, AND TOOLS – CORE YEAR	**$1,828.55**

THIRD SEMESTER

I. BOOKS & SUPPLIES

DESCRIPTION		APPROXIMATE PRICE	
INST 281 ELECTRICAL AUTOMATION THEORY			
ELECTRICAL MOTOR CONTROLS (W/CD)		0826916759	80.00
1999 NEC CODEBOOK, NFPA			58.00
UNDERSTANDING THE NEC		0971030715	60.00
UGLY'S ELECTRICAL REFERENCE		0962322962	12.00
2 ea	Binders, Large, 3-ring		15.00
INST 282 ELECTRICAL AUTOMATION LABORATORY			
Class fee (INST 282)			15.00

ELTR 269 ELECTRONIC DRAFTING I	
Class fee (ELTR 269)	15.00
APPROXIMATE TOTAL BOOKS & SUPPLIES - THIRD SEMESTER	**$255.00**

TALK TO YOUR INSTRUCTOR BEFORE PURCHASING ANY OF THE FOLLOWING TOOLS.

II. SUPPLIES & DRAFTING TOOLS

DESCRIPTION	APPROXIMATE PRICE
Disk, floppy	2.00
Eraser, Pencil	2.00
Guide, Ames Lettering	2.00
Lead, Pencil 0.5 mm and 0.7 mm	2.00
Pencil, Mechanical 0.5 mm	5.00
Pencil, Mechanical 0.7 mm	5.00
Scale, Architect's	3.00
Tape, Drafting	1.00
Template, Circle	2.00
Template, Electronic Symbol R 375 or R 301	8.00
Triangle, 45	7.00
APPROXIMATE TOTAL SUPPLIES & DRAFTING TOOLS - THIRD SEMESTER	**$39.00**

APPROXIMATE TOTAL BOOKS & TOOLS - THIRD SEMESTER	$294.00

FOURTH SEMESTER

TALK WITH YOUR INSTRUCTOR BEFORE PURCHASING THE FOLLOWING ITEMS:

I. BOOKS & SUPPLIES

DESCRIPTION	APPROXIMATE PRICE	
INST 296 PROCESS MEASUREMENT AND CONTROL THEORY		
PROCESS INSTRUMENTATION Vol 1 Product #SCP114		87.00
PROCESS INSTRUMENTATION Vol 2 Product #SCP115		87.00
PURDY'S INSTRUMENT HANDBOOK	1880215265	16.00
UGLY'S ELECTRICAL REFERENCE (2008 ED)	0763771263	23.00

ELECTRICAL MOTOR CONTROLS ETC (W/CD)	0826912176	96.00
Graduation Application fee for first Certificate/Degree		20.00
Optional fee for any additional Certificate/Degree		(10.00)
APPROXIMATE TOTAL BOOKS & FEES - FOURTH SEMESTER		**$329.00**

APPROXIMATE TOTAL BOOKS & FEES - ENTIRE PROGRAM	**$2,451.55**

ANTICIPATE ADDITIONAL EXPENSES ASSOCIATED WITH THIS PROGRAM:
TEXTBOOKS ASSOCIATED WITH ACADEMIC COURSES,
TRANSPORTATION, PARKING, CHILD CARE, HOUSING.
YOU MUST CHECK YOUR CLASS SCHEDULE TO DETERMINE TEXTBOOKS REQUIRED BY INSTRUCTOR.