

**Covington Campus****INDUSTRIAL SYSTEMS TECHNOLOGY  
ASSOCIATE IN APPLIED SCIENCE DEGREE**

The Industrial Systems Technology degree program is designed for the student who wishes to prepare for a career in installation and maintenance of industrial production machinery and automated control systems. The program builds upon the diploma program in Industrial Systems Technology, providing background skills in several areas of industrial maintenance and control systems. The program provides learning opportunities that introduce, develop and reinforce academic and technical knowledge, skill, and attitudes required for job acquisition, retention, and advancement. Additionally, the program provides opportunities to retrain or upgrade present knowledge and skill. Graduates are qualified for employment as industrial electricians or industrial mechanics or millwrights with opportunities to move into management positions.

<u>Course Number</u>	<u>Course</u>	<u>Class Hours</u>	<u>Lab Hours</u>	<u>Total Hours</u>	<u>Credit Hours</u>	<u>Prerequisites/Corequisites</u>
<b>FIRST QUARTER</b>						
IFC 100	Industrial Safety Procedures	20	10	30	2	
IFC 101	Direct Current Circuits I	30	20	50	4	
IFC 102	Alternating Current I	30	20	50	4	IFC 101; MAT 103
MAT 191	College Algebra	50	0	50	5	*, See course description
SCT 100	Introduction to Microcomputers	<u>10</u>	<u>40</u>	<u>50</u>	<u>3</u>	
	<b>TOTAL</b>	140	90	230	18	
<b>SECOND QUARTER</b>						
ENG 191	Composition and Rhetoric I	50	0	50	5	See course description
IDS 103	Industrial Wiring	30	90	120	6	IFC 101, IFC 102
IDS 105	DC and AC Motors	20	30	50	3	IFC 101, IFC 102, MAT 103
IFC 103	Solid State Devices I	<u>30</u>	<u>20</u>	<u>50</u>	<u>4</u>	IFC 102
	<b>TOTAL</b>	130	140	270	18	
<b>THIRD QUARTER</b>						
IDS 110	Fundamentals of Motor Controls	20	30	50	3	IDS 105
IDS 113	Magnetic Starters and Braking	10	50	60	3	IDS 110
IDS 115	Two-Wire Control Circuits	0	50	50	2	IDS 110
IDS 121	Advanced Motor Controls	10	30	40	2	IDS 115
MAT 194	Pre-Calculus <b>OR</b>					MAT 191 with minimum of "C"
PHY 190	Introductory Physics	<u>50</u>	<u>0</u>	<u>50</u>	<u>5</u>	MAT 191 or MAT 196
	<b>TOTAL</b>	90	160	250	15	
<b>FOURTH QUARTER</b>						
IDS 131	Variable Speed Motor Control	20	30	50	3	IDS 121
IDS 215	Industrial Mechanics	40	60	100	6	*, **
IDS 221	Industrial Fluidpower	<u>60</u>	<u>40</u>	<u>100</u>	<u>7</u>	*, **
	<b>TOTAL</b>	120	130	250	16	
<b>FIFTH QUARTER</b>						
IDS 231	Pumps and Piping Systems	10	40	50	2	*, **
IDS 101	Industrial Computer Applications	30	50	80	5	IFC 101, SCT 100
IDS 141	Basic Industrial PLC's	<u>40</u>	<u>60</u>	<u>100</u>	<u>6</u>	IDS 105, IDS 121
	<b>TOTAL</b>	80	150	230	13	
<b>SIXTH QUARTER</b>						
IDS 142	Industrial PLC's II	40	60	100	6	IDS 141
IDS 209	Industrial Instrumentation	40	60	100	6	IDS 141, IDS 142
ECO 191	Principles of Economics <b>OR</b>					*
SOC 191	Introduction to Sociology <b>OR</b>					*
PSY 191	Introduction to Psychology	<u>50</u>	<u>—</u>	<u>50</u>	<u>5</u>	*
	<b>TOTAL</b>	130	120	250	17	
<b>SEVENTH QUARTER</b>						
HUM 191	Introduction to Humanities	50	0	50	5	*, ENG 191 with minimum of "C"
ENG 195	Technical Communications <b>OR</b>					*, ENG 191, SCT 100
SPC 191	Fundamentals of Speech	<u>50</u>	<u>0</u>	<u>50</u>	<u>5</u>	ENG 191
	<b>TOTAL</b>	100	0	100	10	

\*Approved admission level English, reading, and/or math competency required

\*\*Or Advisor Approval

CIP CODE: 47.030303

MAJOR CODE: ICS3

REQUIRED CREDIT HOURS: 107

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The curriculum is subject to change to meet changing conditions. As set forth in its catalog, DeKalb Technical College does not discriminate on the basis of race, color, creed, national or ethnic origin, gender, religion, disability, age, veteran status, or citizenship status (except in those special circumstances permitted or mandated by law).

**DEKALB TECHNICAL COLLEGE**  
*Covington Campus*

**INDUSTRIAL SYSTEMS TECHNOLOGY COURSE DESCRIPTIONS**

**ECO 191 – PRINCIPLES OF ECONOMICS (5)**

Prerequisites: Program admission (degree) English and Math  
Provides a description and analysis of economic operations in contemporary society. Emphasis is placed on developing an understanding of economic concepts and policies as they apply to everyday life. Topics include: basic economic principles; economic forces and indicators; capital and labor; price, competition, and monopoly; money and banking; government expenditures, federal and local; fluctuations in production, employment, and income; and United States economy in perspective.

**ENG 191 COMPOSITION AND RHETORIC I(5)**

Prerequisites: Degree program admission level English and reading competency or completion of ENG 098 or ENG151 and RDG 098 or RDG 150 with grades of "S", "C", or better and the appropriate score on the Writing and Reading ASSET or COMPASS Exit Exams.

This course explores the analysis of literature and articles about issues in the humanities and in society. Students practice various modes of writing, ranging from exposition to argumentation and persuasion. The course includes a review of standard grammatical and stylistic usage in proofreading and editing. An introduction to library resources lays the foundation for research. Topics include: writing analysis and practice, revision, and research.

**ENG 195 - TECHNICAL COMMUNICATIONS (5)**

Prerequisites: ENG 191 and SCT 100 (or EET 100) with a minimum grade of "C" or exemption exam  
Emphasizes practical knowledge of technical communications techniques, procedures, and reporting formats used in industry and business. Topics include: research, device and process description, formal technical report writing, business correspondence, and oral technical report presentation.

**HUM 191 – INTRODUCTION TO HUMANITIES (5)**

Prerequisite: ENG 191 with a minimum grade of "C"  
Explores the philosophic and artistic heritage of humanity expressed through a historical perspective on visual arts, music, and literature. The humanities are presented as a source of subjective insights for the understanding of people and society. Topics include: historical and cultural developments, and contributions of the humanities.

**IDS 101 – INDUSTRIAL COMPUTER APPLICATIONS(5)**

Prerequisites: IFC 103 and SCT 100  
Provides a foundation in Industrial computers and computer systems with a focus in linking computers to the plant floor process. Topics include: hardware, software, boot sequence, configuration, troubleshooting, and communication platforms.

**IDS 103 – INDUSTRIAL WIRING (6)**

Prerequisites: IFC 101, IFC 102  
Teaches the fundamental concepts of industrial wiring with an emphasis on installation procedures. Topics include: grounding; raceways; three phase systems; transformers (three phase and single phase); wire sizing; overcurrent protection; NEC requirements; industrial lighting systems; and switches, receptacles, and cord connectors.

**IDS 105 - DC AND AC MOTORS (3)**

Prerequisites/Corequisites: IFC 101, IFC 102, MAT 103 with a minimum grade of "C"  
Introduces the fundamental theories and applications of single-phase and three-phase motors. Topics include: motor theory and operating principles, motor terminology, motor identification, NEMA standards, AC motors, DC motors, scheduled preventive maintenance, and troubleshooting and failure analysis.

**IDS 110 - FUNDAMENTALS OF MOTOR CONTROLS(3)**

Prerequisite/Corequisite: IDS 105  
Introduces the fundamental concepts, principles, and devices involved in industrial motor control. Emphasis is placed on developing a theoretical foundation of industrial motor control devices. Topics include: principles of motor control, control devices, symbols and schematic diagrams, and Article 430 NEC.

**IDS 113 - MAGNETIC STARTERS AND BRAKING (3)**

Prerequisite/Corequisite: IDS 110  
Provides instruction in wiring motor control circuits. Emphasis is placed on designing and installing magnetic starters in across-the-line, reversing, jogging circuits, and motor braking. Topics include: control transformers, full voltage starters, reversing circuits, jogging circuits, and braking.

**IDS 115 - TWO-WIRE CONTROL CIRCUITS (2)**

Prerequisite/Corequisite: IDS 110  
Provides instruction in two-wire motor control circuits using relays, contactors, and motor starters with application sensing devices. Topics include: wiring limit switches, wiring pressure switches, wiring float switches, wiring temperature switches, wiring proximity switches, and wiring photo switches.

**IDS 121 - ADVANCED MOTOR CONTROLS (2)**

Prerequisite/Corequisite: IDS 115  
Continues the study and application of motor control circuits with emphasis on sequencing circuits, complex circuits, and motor control centers. Topics include: sequencing circuits, reduced voltage starting, motor control centers, and troubleshooting.

**IDS 131 - VARIABLE SPEED MOTOR CONTROL (3)**

Prerequisite/Corequisite: IDS 121  
Provides instruction in the fundamentals of variable speed drives, industrial motors, and other applications of variable speed drives. Topics include: fundamentals of variable speed control, AC frequency drives, DC variable speed drives, installation procedures, and ranges.

**IDS 141 - BASIC INDUSTRIAL PLC's (6)**

Prerequisites: IDS 105, IDS 121  
Introduces operational theory, systems terminology, PLC installations, and programming procedures for programmable logic controls. Emphasis is placed on PLC programming, connections, installations, and start-up procedures. Topics include: PLC hardware and software; PLC functions and terminology; introductory numbering systems, PLC installation and set-up; PLC programming basics; relay logic instructions; timers and counters; connecting field devices to I/O cards; and PLC safety procedures.

**DEKALB TECHNICAL COLLEGE**  
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**INDUSTRIAL SYSTEMS TECHNOLOGY COURSE DESCRIPTIONS**

**IDS 142 - INDUSTRIAL PLC's II****(6)**

Prerequisite: IDS 141

Provides for hands-on development of operational skills in the maintenance and troubleshooting of automated industrial machinery. Emphasis is placed on applying skills developed in previous courses in programmable logic control (PLC) in an industrial setting. Topics include: data manipulation; math instructions, instructions, program control instructions, introduction to HMI's; analog control; and troubleshooting discrete I/O devices.

**IDS 209 - INDUSTRIAL INSTRUMENTATION****(6)**

Prerequisites: IDS 141, IDS 142

Provides instruction in the principles and practices of instrumentation for industrial process control systems with an emphasis on industrial maintenance techniques for production equipment. Topics include: instrument tags; process documentation; sensing pressure, flow, temperature, and level; control theory; instrument calibration and looptuning.

**IDS 215 - INDUSTRIAL MECHANICS****(6)**

Prerequisite: Program admission level math competency, or Advisor Approval

Provides instruction in basic physics concepts applicable to mechanics of industrial production equipment, and teaches basic industrial application of mechanical principles with emphasis on power transmission and specific mechanical components. Topics include: mechanical tools, fasteners, basic mechanics, lubrication, bearings, gaskets & seals, belt, chain and gear drives.

**IDS 221 - INDUSTRIAL FLUIDPOWER****(7)**

Prerequisite: Program admission level math competency, or Advisor Approval

Provides instruction in fundamental concepts and theories for safely operating hydraulic components and systems. Topics include: hydraulic theory, suction side of pumps, actuators, valves, pumps/ motors, accumulators, symbols and circuitry, fluids, filters, pneumatic theory, compressors, pneumatic valves, air motors and cylinders, and safety.

**IDS 231 - PUMPS AND PIPING SYSTEMS****(2)**

Prerequisite: Program admission level math competency, or Advisor Approval

Studies the fundamental concepts of industrial pumps and piping systems. Topics include: pump identification; pump operation; pump installation, maintenance, and troubleshooting; piping systems; and installation of piping systems.

**IFC 100 - INDUSTRIAL SAFETY PROCEDURES****(2)**

Provides an in-depth study of the health and safety practices required for maintenance of industrial equipment. Topics include: introduction to OSHA regulations; tool safety, fire fighting equipment, personal protective equipment, chemical safety, fall protection, confined space entry, lock out procedures; first aid and CPR.

**IFC 101 - DIRECT CURRENT CIRCUITS I****(4)**

Prerequisite/Corequisite: MAT 101 - out-of-program standards; MAT 103 - in-program standards

Introduces direct current (DC) concepts and applications. Topics include: fundamental electrical principles and laws; direct current test equipment; and series, parallel, and simple combination circuits; and basic laboratory procedures and safety practices.

**IFC 102 - ALTERNATING CURRENT I****(4)**

Prerequisites/Corequisites: IFC 101, MAT 104

Introduces the theory and application of varying sine wave voltages and current. Topics include: AC wave generation, oscilloscope operation, inductance, and capacitance.

**IFC 103 - SOLID STATE DEVICES I****(4)**

Prerequisite/Corequisite: IFC 102

Introduces the physical characteristics and applications of solid-state devices. Topics include: PN diodes, power supplies, voltage regulation, and special applications.

**MAT 191 - COLLEGE ALGEBRA****(5)**

Prerequisites: Degree program admission level math competency **or** MAT 099 with a grade of "S" or minimum grade of "C" **and** an appropriate score on the Algebra ASSET or COMPASS Exit Exam. The appropriate "exit" exam score can be either of the following: (1) The student completes MAT 099 with an "S" or minimum grade of "C" **AND** scores "37" or higher on the MAT 099 Compass exit exam or "42" or higher on the MAT 099 Asset exit exam; (2) The student obtains transfer credit for MAT 099 **AND** scores "37" or higher on the MAT 099 Compass exit exam or "42" or higher on the MAT 099 Asset exit exam; (3) The student scores a "42" or higher on the ASSET Elementary Algebra test or scores a "37" or higher on the COMPASS.

This course emphasizes techniques of problem solving using algebraic concepts. The major topics include: fundamental concepts of algebra; techniques of solving equations and inequalities; the study of functions and their graphs; systems of equations; sequences, series, and probability; and analytic geometry.

**MAT 194 - PRE-CALCULUS****(5)**

Prerequisite: MAT 191 with a minimum grade of "C"

This course prepares students for Calculus. Topics include: an intensive study of polynomial, rational, exponential, logarithmic, and trigonometric functions and their graphs. Applications include simple maximum and minimum problems, exponential growth and decay. Computer and Internet technology are an integral part of this course.

**PHY 190 - INTRODUCTORY PHYSICS****(5)**Prerequisite: MAT 191 **or** MAT 198 with a minimum grade of "C"

Introduces the student to the basic laws of physics. Topics include: Newtonian mechanics, fluids, heat, light and optics, sound, electricity and magnetism, and modern physics.

**PSY 191 - INTRODUCTION TO PSYCHOLOGY****(5)**

Prerequisites: Program Admission

Emphasizes the basics of psychology. Topics include: science of psychology; social environments; life stages; physiology and behavior; personality; emotions and motives; conflicts, stress, and anxiety; abnormal behavior; and perception, learning, and intelligence.

**SCT 100 - INTRODUCTION TO MICROCOMPUTERS****(3)**

Introduces the fundamental concepts and operations necessary to use microcomputers. Emphasis is placed on basic functions and familiarity with computer use. Topics include: computer terminology, introduction to the Windows environment, introduction to networking, introduction to word processing, introduction to spreadsheets, introduction to databases, and introduction to presentation graphics.

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**SOC 191 – INTRODUCTION TO SOCIOLOGY (5)**

Prerequisites: ENG 098 and RDG 098 with a grade of "S" or ENG 151 and RDG 150 with a minimum grade of "C" in each course  
Explores the sociological analysis of society, its culture, and structure. Sociology is presented as a science with emphasis placed on its methodology and theoretical foundations. Topics include: basic sociological concepts, socialization, social interaction and culture, social groups and institutions, deviance and social control, social stratification, and social change.

**SPC 191 - FUNDAMENTALS OF SPEECH (5)**

Prerequisite: ENG 191 with a minimum grade of "C"  
Introduces the fundamentals of oral communication. Topics include: selection and organization of materials, preparation and delivery of individual and group presentations, and analysis of ideas presented by others.

**ESTIMATED PROGRAM COSTS**

**INDUSTRIAL SYSTEMS TECHNOLOGY  
ASSOCIATE IN APPLIED SCIENCE DEGREE**

**First Quarter**

Tuition/Fees.....	\$544.00
Books.....	235.00
Supplies.....	200.00
<b>Total.....</b>	<b>\$979.00</b>

**Second Quarter**

Tuition/Fees.....	\$544.00
Books.....	110.00
Supplies.....	200.00
<b>Total.....</b>	<b>\$854.00</b>

**Third Quarter**

Tuition/Fees.....	\$544.00
Books.....	65.00
Supplies.....	200.00
<b>Total.....</b>	<b>\$809.00</b>

**Fourth Quarter**

Tuition/Fees.....	\$544.00
Books.....	210.00
Supplies.....	200.00
<b>Total.....</b>	<b>\$954.00</b>

**Fifth Quarter**

Tuition/Fees.....	\$544.00
Books.....	110.00
Supplies.....	200.00
<b>Total.....</b>	<b>\$854.00</b>

**Sixth Quarter**

Tuition/Fees.....	\$544.00
Books.....	65.00
Supplies.....	200.00
<b>Total.....</b>	<b>\$809.00</b>

**Seventh Quarter**

Tuition/Fees.....	\$472.00
Books.....	110.00
Supplies.....	200.00
<b>Total.....</b>	<b>\$782.00</b>

**Total Cost.....\$6,041.00**

Tuition/fees and cost of books/supplies are estimates only and are subject to change without notice. Tuition is based on Georgia residency.

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