



ASSOCIATE'S DEGREE in Applied Sciences: Telecommunications Technology

APT's Associate's Degree in Telecommunications Technology program is based on a set of objectives that are valuable to the industry, the employer, and the student. This program incorporates strategically designed curriculum to maximize the benefits of distance learning alongside instructor-led education. Simulators and lab coursework enhance the practical learning experience.

This AS degree program requires 60 college credits to complete. The curriculum consists of three (3) core courses, a minimum of twenty-seven (27) elective course credits, and six (6) general education courses. Students may be able to apply work experience, transfer credits, and CLEP (College Level Examination Program) exam results toward degree requirements. *APT's* Credit Evaluation Committee will evaluate all transfer and work experience credit.

APT has provided high quality telecommunications, renewable energy, and electric power systems training since 1993. *APT* is a degree-granting institution that is recognized by the U.S. Department of Education, accredited by the Distance Education and Training Council (DETC), approved by the International Association of Continuing Education Training (IACET), and approved by the North American Electric Reliability Corporation (NERC) as a CEH provider.

APT's Program Advantages

- Learning outcomes target industry needs!
- Foundation for advanced studies
- State-of-the-art curriculum that is always updated
- No program entrance exam
- Curriculum designed with the adult-learner in mind
- NERC Continuing Education Hours
- Previous *APT* course credits may apply
- Credit for industry work experience
- Highly experienced and educated instructors
- Potential to obtain industry certifications and licensure
- *APT* offers flexibility, specialization, & marketability

Learning Outcomes

Upon completion of this degree, students will be able to:

- Demonstrate competence in the understanding and the application of electronic circuits, including analog and digital systems
- Demonstrate proficiency in the application of telecommunications associated software and understanding of voice and data communications
- Identify the underlying principles upon which core telecommunications are based and how information is generated and disseminated
- Demonstrate proficiency in the technical aspects of a network that use different types of transmission media, including installation, maintenance, monitoring, and performance issues

Program Courses

CORE (9 credits minimum)

- TEL102 Basic Electronics (4)
- TEL104 Data Communications and Networks (4)
- TEL105 Fiber Optics Communications (4)

ELECTIVES (27 credits minimum)

- TEL107.1 Cisco-Internetworking Fundamentals (4)
- TEL115 Voice over Internet Protocol (4)
- TEL120 Internet Protocol Television (4)
- TEL125 Multi-Media Universal Technician (4)
- TEL135 Data Cabling Installation (4)
- TEL140 Wireless Communications Technology (4)
- TEL150 Wireless LAN Technologies (3)
- TEL205 Central Office Telecommunications (4)
- TEL230 Cisco Certified Network Administrator (5)
- TEL235 Analyzing Cisco Internetworks (4)
- TEL240 FCC General Radiotelephone License (3)
- TEL250 Solar Power for Telecommunications (4)
- PWR250 High Voltage Protection for Telecommunications (4)
- EXP280 Independent Study (1-3)
- EXP290 Internship Program (1-3)

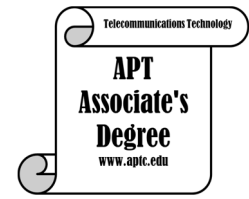
GENERAL EDUCATION (18 credits minimum)

Available through APT and APT partnership institutions

- English Composition (3)
- Analytical Thinking and Oral Communications (3)
- Natural Sciences (Life or Physical) (3)
- Humanities (Art, Literature, History, Philosophy, World Language) (3)
- Social, Behavioral, and Political Sciences (3)
- Mathematics and Quantitative Reasoning (3)

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COURSE DESCRIPTIONS (See website for more information)

TEL102: Basic Electronics Series (Course includes hands-on activities)

The curriculum includes a math review, basic electronics principles and concepts, utilization of number relations and numbering systems and digital logic as related to computers and digital communication systems. Topics include Ohm's Law, power equations, electronic components, integrated circuits, AC/DC.

TEL104: Data Communications and Networks (Course includes hands-on activities)

This course covers Communications Networks, Network Connectivity, Data Representation, Digital Communications Techniques, and Basic Data Transport Concepts. Data networking concepts; transport media and standards, LAN hardware functionality, TCP/IP and signal processing are discussed in detail.

TEL105: Fiber Optics Communication (Course includes optional in-class ETA, ACES and the FOA certifications!)

This comprehensive course includes theory, applications, standards with extensive hands-on splicing, epoxy connectors and testing lab experience. The curriculum covers how voice, data and video signals are composed, multiplexed and transmitted over fiber optic systems. Major topics include optical fiber construction, PONs and FTTx architectures, Total Internal Reflection, Optical light sources, optical modulation and multiplexing, and the SONET Standard.

TEL107.1: Cisco-Internetworking Fundamentals (Course includes hands-on activities)

This course provides the student with key internetworking knowledge, skills and abilities that posture the student for success in Cisco production environments. The course also provides foundational exposure to core objectives centered in the Cisco 640-822 ICND1 and Cisco 640-802 CCNA certification exam paths. The Cisco Internetworking Fundamentals course builds a foundation that the student can leverage to develop sound core knowledge and command line interface experience. The Cisco Internetworking Fundamentals curriculum utilizes Cisco approved tactics, techniques and procedures to develop core internetworking knowledge and introduce the student to basic analytical, troubleshooting and configuration skills in a simulated internetwork.

TEL115: Voice Over Internet Protocol (Course includes extensive hands-on activities and optional in-class ETA and or TIA CTP certification.)

Get an in-depth understanding of IP based networks. Primary topics include LAN architecture, TCP/IP Protocols, SIP messaging Protocol, Real Time Protocol (RTP) network integration, function and configuration of network elements (such as Proxy servers and VoIP Gateways) and end user devices (such as IP phones, Analog Telephone Adapters, and Soft Phones). Various technical and regulatory challenges between IP Networks and "Toll Quality" Circuit Switched networks are discussed. Plus discussions of competitive technologies such as traditional dedicated voice services, VoATM, and Wireless alternatives.

TEL120: Internet Protocol Television (IP-TV) (Course includes interactive demonstrations.)

Get an in-depth understanding of emerging IP Centric Services over Broadband Networks including IPTV, VoIP, IMS and Network Architecture. Individuals with some previous data communications knowledge such as TCP/IP, principals of digital communications, or fiber optics will gain additional insight about how those technologies play a vital role in IPTV and other future services.

TEL125: Multi-Media Universal Technician (Course includes extensive hands-on activities and optional in-class ETA's RESI certification.)

Course covers structured wiring in residential installations using TIA/EIA 570A standards. These concepts include fiber optics (FTTX, FTTP), Wireline (DSL, twisted pair), Coax Cable (CATV), and Satellite. Multimedia content types (HDTV, SDTV, Internet, Telephony, Security and others) are discussed. General OSHA safety procedures and Low Voltage National Electric Code (NEC) rules and regulations are covered.

TEL135: Data Cabling (Course includes extensive hands-on activities and optional in-class ETA and ACES certification.)

Course provides excellent experience in basic Telephone, Video, CableTV and Data Network installations. The student learns basic theory, installation requirements, industry standards and proper cabling documentation. The course covers configurations used in inside and outside plant facilities. The electrical and mechanical characteristics of twisted pair and coax cable are discussed.

TEL140: Wireless Communication Technology (Course includes extensive hands-on activities.)

This course provides a fundamental understanding of modern wireless communications technologies and equipment for both voice and data. This course covers fixed wireless applications, such as Wireless LANs, Local and Metropolitan Multipoint Distribution Systems, PCS, cellular phone technology, wireless PDA's one and two-way pagers, etc. It covers popular protocols such as, Frequency Hopping Spread Spectrum, Direct Sequence Spread Spectrum, Time Division, Bluetooth, IrDA, RFID, 802.11a/b/g/n, WiMAX, 3G, etc.

TEL150: Wireless LAN Technologies (Course includes extensive hands-on activities.)

This course provides students with an introduction to wireless local area network (WLAN) technology that is impacting every sector of our interconnected world today. This course will help students develop core knowledge entered in WLAN standards and a conceptual understanding of the design, communication and components that enable WLANs.

TEL205: Central Office Telecommunications (Course includes extensive hands-on activities.)

The student gets a comprehensive overview of how data and voice services work through the central office and outside plant infrastructure, with emphasis on the Central Office. Major equipment (i.e. class 4 & 5 switches, ATM & Frame Relay, DSLAMs, T1 Channel Bank, DSX, Office Repeaters, Network Interface Units, etc.) used in the CO to provide Data and Voice services, transmission media (i.e. fiber optics, coax, twisted pair, etc.), transport services and testing plus wiring practices/concepts are covered. Basic regulatory terminology and regulations are discussed.

TEL240: FCC General Radiotelephone Operator License Training (APT administers actual FCC licensing exams in the course!)

This course provides a valuable insight into wireless radiotelephone communications fundamentals including rules & regulations, basic radio circuits, antenna theory and wave propagation characteristics. The license is required by most aviation, communications and maritime companies and organizations to maintain and operate radio communications equipment.

TEL230: Cisco Certified Network Administrator Preparation (Course includes extensive hands-on activities.)

This course provides students with the knowledge required to become a Cisco Certified Network Associate as described by the new Cisco 640-802 CCNA exam. The CCNA Certification Preparation course covers the extensive body of CCNA knowledge in six blocks of instruction. See website for more details.

TEL235: Advanced Cisco Internetworks (Course includes extensive hands-on activities.)

This series of classes develops the student's analytical skills required of a Cisco Certified Network Associate as described by the new Cisco 640-802 CCNA exam using hands-on lab simulators. See website for more details.

TEL250: Solar Power for Telecommunications (Course includes extensive hands-on activities.)

This course provides students with a working knowledge of Solar Photo Voltaic (PV) systems used in the telecommunications industry. This course is for individuals wanting to gain an in depth knowledge of PV systems, design techniques, equipment module functionality as well as installation requirements and practical grid-tie and off grid battery interconnection methods.

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