Although every effort has been made to ensure the information contained on this program sheet is accurate, the SVC Catalog is the official reference for graduation requirements.

Telecommunication Networks Technology (TNT)

Voice, Video, & Computer Data Networks

See Electronics Technology (ET) or Electronics Engineering Technology (EET) or Computer-Based Instrumentation and Control Technology (CICT) for information on related programs. Each program utilizes a similar first-year course sequence.

Program Description

Graduates of the Telecommunication Networks Technology (TC) program may find employment in a broad range of areas from high-speed computer network cabling installation, testing, and design to microwave radio, cellular radio, video or fiber optics. A telecommunications technician may do some or all of these jobs. All businesses, utilities, cities, states, and federal government use some combination of computer networks, wide area networks, telephone systems, cellular telephone, data links, wireless data, satellite links, or fiber optic transmission systems. Jobs in this field are available throughout the United States.

First-year courses stress fundamental concepts in electronics and build a strong base for the study of telecommunication concepts during the second year. Classes combine lecture and hands-on laboratory activities including troubleshooting on equipment located in the telecommunications classroom.

All students are required to provide a basic set of hand tools for use in their first-year courses. When advancing to second-year application courses, the tool compliment will be augmented to meet the requirements of the major area. A complete list of tools and equipment is provided with each course syllabus.

Wireless Technology

Wireless is the new core technology leading the advancement of public safety, security, and the safeguarding of human life. Advanced satellite and maritime wireless communication systems now provide worldwide instant weather alerts, search and rescue support, navigation aids, and radio/telephone service for the marine industry. Federal communications policy and international treaty agreements require FCC licensed wireless technicians to install, operate and maintain all certified marine communications equipment on board commercial passenger and cargo vessels. Satellites now assist in search for downed aircraft and the rescue of survivors. Emergency location and position search for downed aircraft and the rescue of survivors. Emergency location and position enhancements for cellular networks to assist E911 emergency call centers in locating a mobile caller are now mandated by the Federal Communications Commission. The U.S. Department of Defense Global Position System (GPS) now supports a multitude of civilian oriented services. Vehicle navigation, anti-theft security, emergency road services, and m-commerce are only a few of the wireless services now available for motorists and world travelers.

The future demand for technically skilled technicians in the emerging wireless generation is potentially as explosive as the industry itself. The cellular base station equipment installer, wireless network administrator, mobile computer network technician, microwave radio equipment installer and repairman, satellite ground station installer, maritime equipment technician, wireless sales technical support, and fixed wireless installation technician are only a few of the many possible positions to emerge in the future job market for wireless technicians.

Entry into the Program

Please apply to the Admissions Office. Students entering the program should have one year of high school algebra before starting the course sequence. Students who lack this preparation should take additional review classes offered at the college. Students usually enter the program at the beginning of Fall Quarter. However, persons with prior experience or training in electronics may apply for advanced standing and start the program in Winter or Spring Quarter. Advanced standing is awarded to students who pass departmental qualifying exams.

For more information, contact the Department Chair or the Admissions Office.
Tech Prep
Skagit Valley College will grant credits toward a Professional/Technical degree based on competencies gained in high school. The competencies must be agreed upon by the appropriate teachers from the high school and the college. Credit will be transcripted after verification of successful completion of the agreed upon competencies. If you are interested in taking steps to begin work in the professional/technical workplace of the future, please contact your high school counselor.

Work-Based Learning
Students will integrate classroom learning with work-based learning experience in Cooperative Education (TC 199) at a supervised work site. Department Chair approval is required. Credits and grades are based on job-hours worked, work performance and completion of the learning objectives specified in the learning contract. Concurrent enrollment in a Cooperative Education Seminar or equivalent is required.

Associate in Technical Arts Degree
An Associate in Technical Arts degree (ATA) is awarded upon completion of a minimum of 90 credits of specified technical and related education coursework above 100 level with both an overall 2.0 grade point average and a 2.0 grade point average in the technical major.

Sample Schedule
ATA Telecommunication Networks Technology

First Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Cr</th>
<th>Winter</th>
<th>Cr</th>
<th>Spring</th>
<th>Cr</th>
</tr>
</thead>
<tbody>
<tr>
<td>TNT 135</td>
<td>5</td>
<td>TNT 136</td>
<td>5</td>
<td>TNT 137</td>
<td>5</td>
</tr>
<tr>
<td>ET 111</td>
<td>5</td>
<td>ET 112</td>
<td>5</td>
<td>ET 113</td>
<td>5</td>
</tr>
<tr>
<td>ET 141</td>
<td>5</td>
<td>ET 142</td>
<td>5</td>
<td>ET 145</td>
<td>5</td>
</tr>
<tr>
<td>SOSC 113</td>
<td>1</td>
<td>ENGL 170</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SOSC 125</td>
<td>2</td>
<td>PE 200</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
<td>Total</td>
<td>18</td>
<td>Total</td>
<td>20</td>
</tr>
</tbody>
</table>

Second Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Cr</th>
<th>Winter</th>
<th>Cr</th>
<th>Spring</th>
<th>Cr</th>
</tr>
</thead>
<tbody>
<tr>
<td>TNT 267</td>
<td>5</td>
<td>TNT 268</td>
<td>5</td>
<td>TNT 273</td>
<td>5</td>
</tr>
<tr>
<td>TNT 271</td>
<td>5</td>
<td>TNT 272</td>
<td>5</td>
<td>TNT 276</td>
<td>5</td>
</tr>
<tr>
<td>TNT 274</td>
<td>5</td>
<td>TNT 275</td>
<td>5</td>
<td>TNT 295</td>
<td>5</td>
</tr>
<tr>
<td>TNT 281</td>
<td>5</td>
<td>TNT 283</td>
<td>5</td>
<td>SPCH 125</td>
<td>3</td>
</tr>
<tr>
<td>LC/GE</td>
<td>5-10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
<td>Total</td>
<td>21+</td>
<td>Total</td>
<td>18</td>
</tr>
</tbody>
</table>

* Learning Community (5-10 credits) or 5 credits of General Education (culture, natural world or arts). Must be outside of technical area, approved by Department Chair. Please see INDEX regarding Learning Communities.

† Students who do not receive an appropriate test score will require additional coursework to develop necessary skills for entry into class.

‡ TC 199 may be taken at any time during the two-year program.

Program Certificates
Telecommunication Networks Technology Certificate
A Certificate in Telecommunications is awarded to those who complete the first four quarters of the Sample Schedule sequence plus 3-15 credits in TC 199, Cooperative Education, and Department Chair approval.

Individual Technical Certificate
An individual technical certificate may be tailored and customized in unique and specialized areas in conjunction with other programs to meet the goals and objectives of the prospective graduate with Department Chair approval.

Course Descriptions
TNT 135 Introduction to Semiconductor Devices (5)
Basic semiconductor theory and operation, including diodes, LEDs, bipolar transistors, FETs and operational amplifiers.

TNT 136 Advanced Semiconductor Devices (5)
Advanced solid state. Includes theory and operation of FETs, UJT, SCR, DIAC, TRIAC, and other similar devices. Prerequisite: ET/TNT 135.

TNT 137 Advanced Semiconductor Devices II (5)
Laboratory experience with integrated circuits. Prerequisite: ET 112 and TNT 136.

TNT 199 Cooperative Work Experience (1-15)
Supervised work experience in the field. Includes a weekly seminar. Instructor permission required.

TNT 267 Analysis of Op-Amp Circuits (5)
Fundamentals of operational amplifiers and linear ICs.

TNT 268 Linear Circuits for Microprocessor Systems (5)
Laboratory experiences in design, analysis and construction of integrators, comparators, oscillators, and regulated power supplies. Prerequisite: TNT 267.

TNT 271 High Speed Network Cabling (5)
Computer network and telephone network cabling using category 3 to category 6 cable. Includes installation of horizontal cable, connectors, and patch cords, cable termination on jacks and patch panels, and transmission testing for compliance with EIA/TIA Standards. Installation of network interface equipment and termination of telephone wiring from inside wire up to 200 pair cables. Perform wiring tasks to stated standards.
TNT 272  Telephone & Data Network Fundamentals (5)
Basic voice frequency and data transmission signal characteristics and the effects of circuit noise. Covers telephone fundamentals, types of service and equipment, transmission lines, and types of central office equipment. Includes installation, programming and maintenance of single line telephones and equipment, multi-line telephone systems and voice mail.

TNT 273  Data Communication Networks (5)
Multiplexing studied: Space division, frequency division and time division. Emphasis is on digital systems like T1, covering channel banks, the digital pulse train and B8ZS coding. ATM, frame relay, ISDN, ADSL and dial-up modems are covered and modem error control, throughput and data compression. Internet and emerging technologies, error detection, correction and control and cellular telephony.

TNT 274  Radio Frequency Communication (5)
Introduction to electronic communication systems. Review of electronic fundamentals, amplitude modulation (AM), frequency modulation (FM), radio transmitters, and communication receivers. Lab intensive course applying theory to practical circuits and developing trouble-shooting skills. Prerequisite: ET 113 and ET 145.

TNT 275  Electronic Communication Media (5)
Digital communication techniques, multiplexing, data, local area networks, transmission lines, antennas and radio wave propagation. Lab intensive applying theory and developing trouble-shooting skills. Prerequisite: TNT 274.

TNT 276  Electronic Communication Systems (5)
Microwave systems, satellite systems, telecommunication systems, television, communications tests and measurements. Prerequisite: TNT 275.

TNT 281  Digital Circuits for Microprocessors (5)
Theory and laboratory experiences involving the use of digital integrated circuits. Prerequisite: ET 113.

TNT 283  Microprocessor Support Circuits (5)
Theory and operation of microprocessors.

TNT 295  Fiber Optics (5)
Covers fiber optic design, installation, light sources and detectors, connectorization and splicing. Lab emphasizes safety in using lasers and in handling fiber. Fiber optic cable is installed between patch panels and SC, ST and MT-RJ connectors are installed and tested with optical test equipment.