

NCVEC Technician (2018-2022) license exam syllabus

- 1 T1A|Amateur Radio Service: purpose and permissible use of the Amateur Radio Service; operator/primary station license grant; **Meanings of basic terms used in FCC rules; Interference; RACES rules; Phonetics; Frequency Coordinator**
- 2 ~
- 3 T1B|Authorized frequencies: frequency allocations; ITU; emission modes; restricted sub-bands; spectrum sharing; transmissions near band edges; **contacting the International Space Station; power output**
- 4 ~
- 5 T1C|Operator licensing: operator classes; sequential and vanity call sign systems; international communications; reciprocal operation; places where the **Amateur Radio Service** is regulated by the FCC; name and address on FCC license database; license term; renewal; grace period
- 6 ~
- 7 T1D|Authorized and prohibited transmission: communications with other countries; music; exchange of information with other services; indecent language; compensation for use of station; retransmission of other amateur signals; codes and ciphers; sale of equipment; **unidentified transmissions; one-way transmission**
- 8 ~
- 9 T1E|Control operator and control types: control operator required; eligibility; designation of control operator; privileges and duties; control point; local, automatic and remote control; location of control operator
- 10 ~
- 11 T1F|Station identification; repeaters; **third-party communications**; club stations; FCC inspection
- 12 ~
- 13 T2A|Station operation: choosing an operating frequency; calling another station; test transmissions; procedural signs; use of minimum power; choosing an operating frequency; band plans; calling frequencies; repeater offsets
- 14 ~
- 15 T2B|VHF/UHF operating practices: SSB phone; FM repeater; simplex; splits and shifts; CTCSS; DTMF; tone squelch; carrier squelch; phonetics; operational problem resolution; Q signals
- 16 ~
- 17 T2C|Public service: emergency and non-emergency operations; applicability of FCC rules; RACES and ARES; net and traffic procedures **operating restrictions during emergencies**
- 18 ~
- 19 T3A|Radio wave characteristics: how a radio signal travels; fading; **multipath; polarization; wavelength vs absorption**; antenna orientation
- 20 ~
- 21 T3B|Radio and electromagnetic wave properties: the electromagnetic spectrum; wavelength vs frequency; **nature and velocity of electromagnetic waves; definition of UHF, VHF, HF bands**; calculating wavelength
- 22 ~
- 23 T3C|Propagation modes: line of sight; sporadic E; meteor and auroral scatter and reflections; tropospheric ducting; F layer skip; radio horizon
- 24 ~
- 25 T4A|Station setup: connecting microphones; reducing unwanted emissions power source; connecting a computer; RF grounding; connecting digital equipment; connecting an SWR meter
- 26 ~
- 27 T4B|Operating controls: tuning; use of filters; squelch function; AGC; repeater offset; memory channels
- 28 ~

NCVEC Technician (2014-2018) license exam syllabus

- 1 T1A|Amateur Radio Service: purpose and permissible use of the Amateur Radio Service; operator/primary station license grant; **where FCC rules are codified; basis and purpose of FCC rules; meanings of basic terms used in FCC rules; interference; spectrum management**
- 2 ~
- 3 T1B|Authorized frequencies: frequency allocations; ITU **regions**; emission modes; restricted sub-bands; spectrum sharing; transmissions near band edges
- 4 ~
- 5 T1C|Operator licensing: operator classes; sequential, **special event**, and vanity call sign systems; international communications; reciprocal operation; **station license and licensee**; places where the **amateur service** is regulated by the FCC; name and address on FCC license database; license term; renewal; grace period
- 6 ~
- 7 T1D|Authorized and prohibited transmission: communications with other countries; music; exchange of information with other services; indecent language; compensation for use of station; retransmission of other amateur signals; codes and ciphers; sale of equipment; **unidentified transmissions; broadcasting**
- 8 ~
- 9 T1E|Control operator and control types: control operator required; eligibility; designation of control operator; privileges and duties; control point; local, automatic and remote control; location of control operator
- 10 ~
- 11 T1F|Station identification; repeaters; **third party communications**; club stations; FCC inspection
- 12 ~
- 13 T2A|Station operation: choosing an operating frequency; calling another station; test transmissions; procedural signs; use of minimum power; choosing an operating frequency; band plans; calling frequencies; repeater offsets
- 14 ~
- 15 T2B|VHF/UHF operating practices: SSB phone; FM repeater; simplex; splits and shifts; CTCSS; DTMF; tone squelch; carrier squelch; phonetics; operational problem resolution; Q signals
- 16 ~
- 17 T2C|Public service: emergency and non-emergency operations; applicability of FCC rules; RACES and ARES; net and traffic procedures **emergency restrictions**
- 18 ~
- 19 T3A|Radio wave characteristics: how a radio signal travels; fading; **multipath; wavelength vs. penetration**; antenna orientation
- 20 ~
- 21 T3B|Radio and electromagnetic wave properties: the electromagnetic spectrum; wavelength vs. frequency; velocity of electromagnetic waves; calculating wavelength
- 22 ~
- 23 T3C|Propagation modes: line of sight; sporadic E; meteor and auroral scatter and reflections; tropospheric ducting; F layer skip; radio horizon
- 24 ~
- 25 T4A|Station setup: connecting microphones; reducing unwanted emissions power source; connecting a computer; RF grounding; connecting digital equipment; connecting an SWR meter
- 26 ~
- 27 T4B|Operating controls: tuning; use of filters; squelch function; AGC; repeater offset; memory channels
- 28 ~

22 diffs: 39 lines, 63 inline diffs in 39 changed lines

Added(0,18)

Deleted(0,27)

Changed(39)

Changed in changed(18)

Ignored

NCVEC Technician (2018-2022) license exam syllabus

29 T5A|Electrical principles, units, and terms: current and voltage; conductors and insulators; alternating and direct current; series and parallel circuits

30 ~

31 T5B|Math for electronics: conversion of electrical units; decibels; the metric system

32 ~

33 T5C|Electronic principles: capacitance; inductance; current flow in circuits; alternating current; definition of RF; definition of polarity; DC power calculations; impedance

34 ~

35 T5D|Ohm's Law: formulas and usage; components in series and parallel

36 ~

37 T6A|Electrical components: fixed and variable resistors; capacitors and inductors; fuses; switches; batteries

38 ~

39 T6B|Semiconductors: basic principles and applications of solid state devices; diodes and transistors

40 ~

41 T6C|Circuit diagrams; schematic symbols

42 ~

43 T6D|Component functions: rectification; switches; indicators; power supply components; resonant circuit; shielding; power transformers; integrated circuits

44 ~

45 T7A|Station equipment: receivers; transmitters; transceivers; modulation; transverters; transmit and receive amplifiers

46 ~

47 T7B|Common transmitter and receiver problems: symptoms of overload and overdrive; distortion; causes of interference; interference and consumer electronics; part 15 devices; over-modulation; RF feedback; off frequency signals

48 ~

49 T7C|Antenna measurements and troubleshooting: measuring SWR; dummy loads; coaxial cables; causes of feed line failures

50 ~

51 T7D|Basic repair and testing: soldering; using basic test instruments; connecting a voltmeter, ammeter, or ohmmeter

52 ~

53 T8A|Modulation modes: bandwidth of various signals; choice of emission type

54 ~

55 T8B|Amateur satellite operation; Doppler shift; basic orbits; operating protocols; transmitter power considerations; telemetry and telecommand; satellite tracking

56 ~

57 T8C|Operating activities: radio direction finding; radio control; contests; linking over the internet; grid locators

58 ~

59 T8D|Non-voice and digital communications: image signals; digital modes CW; packet radio; PSK31; APRS; error detection and correction; NTSC; amateur radio networking; Digital Mobile/Migration Radio

60 ~

61 T9A|Antennas: vertical and horizontal polarization; concept of gain; common portable and mobile antennas; relationships between resonant length and frequency; concept of dipole antennas

62 ~

63 T9B|Feed lines: types, attenuation vs frequency, selecting; SWR concepts; Antenna tuners (couplers); RF connectors: selecting, weather protection

64 ~

65 T0A|Power circuits and hazards: hazardous voltages; fuses and circuit

NCVEC Technician (2014-2018) license exam syllabus

29 T5A|Electrical principles, units, and terms: current and voltage; conductors and insulators; alternating and direct current

30 ~

31 T5B|Math for electronics: conversion of electrical units; decibels; the metric system

32 ~

33 T5C|Electronic principles: capacitance; inductance; current flow in circuits; alternating current; definition of RF; DC power calculations; impedance

34 ~

35 T5D|Ohm's Law: formulas and usage

36 ~

37 T6A|Electrical components: fixed and variable resistors; capacitors and inductors; fuses; switches; batteries

38 ~

39 T6B|Semiconductors: basic principles and applications of solid state devices; diodes and transistors

40 ~

41 T6C|Circuit diagrams; schematic symbols

42 ~

43 T6D|Component functions: rectification; switches; indicators; power supply components; resonant circuit; shielding; power transformers; integrated circuits

44 ~

45 T7A|Station equipment: receivers; transmitters; transceivers; modulation; transverters; low power and weak signal operation; transmit and receive amplifiers

46 ~

47 T7B|Common transmitter and receiver problems: symptoms of overload and overdrive; distortion; causes of interference; interference and consumer electronics; part 15 devices; over and under modulation; RF feedback; off frequency signals; fading and noise; problems with digital communications interfaces

48 ~

49 T7C|Antenna measurements and troubleshooting: measuring SWR; dummy loads; coaxial cables; feed line failure modes

50 ~

51 T7D|Basic repair and testing: soldering; using basic test instruments; connecting a voltmeter, ammeter, or ohmmeter

52 ~

53 T8A|Modulation modes: bandwidth of various signals; choice of emission type

54 ~

55 T8B|Amateur satellite operation; Doppler shift, basic orbits, operating protocols; control operator, transmitter power considerations; satellite tracking; digital modes

56 ~

57 T8C|Operating activities: radio direction finding; radio control; contests; linking over the Internet; grid locators

58 ~

59 T8D|Non-voice communications: image signals; digital modes; CW; packet; PSK31; APRS; error detection and correction; NTSC

60 ~

61 T9A|Antennas: vertical and horizontal polarization; concept of gain; common portable and mobile antennas; relationships between antenna length and frequency

62 ~

63 T9B|Feed lines: types of feed lines; attenuation vs. frequency; SWR concepts; matching; weather protection; choosing RF connectors and feed lines

64 ~

65 T0A|Power circuits and hazards: hazardous voltages; fuses and circuit

22 diffs: 39 lines, 63 inline diffs in 39 changed lines

Added(0,18)

Deleted(0,27)

Changed(39)

Changed in changed(18)

Ignored

NCVEC Technician (2018-2022) license exam syllabus

66 breakers; grounding; lightning protection; battery safety; electrical
code compliance

66
~~

67 T0B|Antenna safety: tower safety and grounding; erecting an antenna
support; safely installing an antenna

68
~~

69 T0C|RF hazards: radiation exposure; proximity to antennas; recognized
safe power levels; exposure to others; radiation types; duty cycle

70

NCVEC Technician (2014-2018) license exam syllabus

66 breakers; grounding; lightning protection; battery safety; electrical
code compliance

66
~~

67 T0B|Antenna safety: tower safety; erecting an antenna
support; overhead power lines; installing an antenna

68
~~

69 T0C|RF hazards: radiation exposure; proximity to antennas; recognized
safe power levels; exposure to others; radiation types; duty cycle

70

22 diffs: 39 lines, 63 inline diffs in 39 changed lines

Added(0,18)

Deleted(0,27)

Changed(39)

Changed in changed(18)

Ignored