

# Ham Radio Extra License Course Outline

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Tri-Lakes Monument Radio Association WØTLM

Oct 2025 Rev 1

## Course Directors:

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Additional members of the WØTLM organization will serve as student *Elmers*, providing personal assistance with learning topics, answering questions, and checking student progress. Students will be assigned to an Elmer before the first session, and these tutors/mentors will be introduced to students at the first session on October 4, 2025.

## Course Objective:

This course has two objectives:

1. The student will be able to pass the FCC Extra License Exam (Element 4), qualifying for the top-level FCC Amateur Radio License.
2. The student will have sufficient knowledge to operate an amateur radio station on the Extra Class frequency allocations above 1.8 MHz, with particular focus on HF single sideband operations.

## Philosophy:

This is a compressed-pace course that depends on the focus and motivation of the student. Lesson coverage should be individually accomplished in accordance with the class pacing schedule. The pacing schedule is designed to keep all students progressing together for the purposes of timely completion, class review sessions, and Elmer assistance. The use of lesson quizzes and course practice exams is very important for evaluating topic areas that need attention.

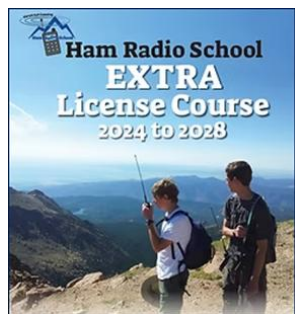
## Registration Cost:

At the time of registration, we require a **nonrefundable** payment of \$65. Payment is made via Paypal, which also accepts major debit/credit cards. *Note that this payment will not be refunded and may not be credited to future class offerings, so make sure of your plans before registering. All paid registrants will retain the online course subscription.*

## Lesson Material & Support:

**Required:** *Ham Radio School Extra License Course 2024-2028 Online Course*

by Stu Turner, WØSTU and Bob Witte, KØNR.



Students will be provided a non-expiring subscription to the online course following registration and payment of the class fee. The online course content includes a complete set of digital book readings, video lessons, optional depth learning media, quizzes and practice exams. The multimedia content supports all learning styles. Students may cover lessons at times convenient to their schedules, but within the pace defined by the class pacing schedule so that all students are progressing together. See more, including a free course preview option, at [HamRadioSchool.com](https://HamRadioSchool.com).

Students will also be assigned a volunteer Elmer from the WØTLM organization who will conduct weekly check-ins for Q&A and who will be available to the student on demand for assistance with challenging topics.

## Session 1: Saturday October 4, 2025, In-person Meeting – 1 to 3:30 pm

Woodmoor Community Center Barn, 1691 Woodmoor Dr, Monument, CO 80132 [<map>](#)

**Preparation:** Ensure you have an active online course account. Complete the *Introduction* lesson, including viewing the video titled *How This Course Works* and reading the introductory book sections and references. Continuing with the *Lesson Ø: Before We Begin...* content is also recommended, including reading, video, and examination of depth options of interest. Covering lessons in advance of the indicated pacing schedule below is encouraged, as feasible.

**Activities:** At the in-person Session 1 we will provide an overview of the course, pacing schedule, and student expectations. We will introduce you to your assigned Elmer who will be available to help you with challenging topics in your studies and provide practical advice on amateur radio topics. We will address your questions and concerns, and we will provide recommendations for effective learning in the class.

### Pacing Schedule: Student Lesson Completion

The following table details the schedule of expected student progress through the online course lessons. Scheduled class review sessions via remote meeting are also listed, held Saturdays at 9:00 am (approximately 1 hour in length).

	Chapter	Lesson	Video Duration (min:sec)	Reading Pages (count)	Complete NLT Date
Week 1	<b>Course Introduction</b>	Course Introduction	4:22	i-vii (7)	4 Oct
	<b>Ø: Before We Begin...</b>	Ø: Before We Begin...	19:20	1-11 (11)	9 Oct
	<b>1: Operating Your Station</b>	1.1 Common Operating Practices	17:10	12-21 (10)	9 Oct
		1.2 Amateur Satellite Operations	13:52	22-31 (10)	9 Oct
	<b>2: Rules &amp; Regs</b>	2.1 Operational Regulations	10:30	32-38 (7)	9 Oct
		2.2 Station Control & Restrictions	9:38	39-45 (7)	9 Oct
		2.3 Volunteer Examiner Regulations	5:14	46-49 (4)	9 Oct
	<b>3: Propagation</b>	3.1 HF Propagation Factors	14:34	51-60 (10)	9 Oct
		3.2 VHF+ Propagation Factors	13:49	61-67 (7)	9 Oct
	<b>4: Digital Modes</b>	4.1 Digital Encoding Concepts	11:49	69-73 (5)	11 Oct
		4.2 Frequency Shift Keying Modes	9:25	74-80 (7)	11 Oct
		4.3 Digital Packet Modes	11:12	81-88 (8)	11 Oct
		4.4 Additional Digital Modes	13:21	89-96 (8)	11 Oct
		4.5 Amateur TV	9:36	97-104 (8)	11 Oct
Week 2	<b>Class Review Session</b>	Zoom meeting - 9:00 am			<b>11 Oct</b>
	<b>5: Electrical Circuit Principles</b>	5.1 Complex Impedance	33:54	105-125 (21)	16 Oct
		5.2 Resonant Circuits & Q	11:52	126-134 (9)	16 Oct
Continued...					

	Chapter	Lesson	Video Duration (min:sec)	Reading Pages (count)	Complete NLT Date
Week 2, cont.	<b>6: Hamtronics I</b>	6.1 Inductors and Cores	11:42	135-141 (7)	16 Oct
		6.2 Semiconductor Components	17:00	142-157 (16)	16 Oct
		6.3 VHF+ Component Packaging	7:14	158-163 (6)	18 Oct
		6.4 Photovoltaics & Optoelectronics	5:51	164-170 (7)	18 Oct
		6.5 Digital Logic Devices	15:53	171-178 (8)	18 Oct
Week 3	<b>Class Review Session</b>	Zoom meeting - 9:00 am			<b>18 Oct</b>
	<b>Break Week</b>	Catch up and/or get ahead			25 Oct
Week 4	<b>7: Hamtronics II</b>	7.1 Amplifiers	20:12	179-193 (15)	30 Oct
		7.2 Filters & Matching Networks	9:34	194-200 (7)	30 Oct
		7.3 Power Regulators & Supplies	11:24	201-205 (5)	30 Oct
		7.4 Oscillators & Signal Generators	8:24	206-212 (7)	30 Oct
	<b>8: Processing Signals</b>	8.1 Modulation & Demodulation	26:18	213-230 (18)	1 Nov
		8.2 FM Signal Processing	10:07	231-238 (8)	1 Nov
		8.3 Digital Signal Processing	19:11	239-250 (12)	1 Nov
	<b>Class Review Session</b>	Zoom meeting - 9:00 am			<b>1 Nov</b>
Week 5	<b>9: Station Performance &amp; Measurement</b>	9.1 Noise & Spurious Emissions	14:34	251-259 (9)	6 Nov
		9.2 Measuring Performance	12:04	260-270 (11)	6 Nov
	<b>10: Antennas</b>	10.1 Types of Antennas	15:49	271-279 (9)	6 Nov
		10.2 Performance Factors	16:25	280-291 (12)	6 Nov
		10.3 Impedance Matching & Phasing	8:32	292-300 (9)	6 Nov
		10.4 Transmission Lines	12:09	301-309 (9)	8 Nov
		10.5 Smith Chart	9:43	310-317 (8)	8 Nov
		10.6 Special Antennnas	7:44	318-325 (8)	8 Nov
Week 6	<b>11: Safety</b>	11.0 Safety	14:51	326-336 (11)	8 Nov
	<b>Class Review Session</b>	Zoom meeting - 9:00 am			<b>8 Nov</b>
	<b>Final Review Session</b>	Zoom meeting - 7:00 pm			<b>13 Nov</b>
	<b>Exam Session</b>	Monument Library - 10:30 am			15 Nov

## Exam Session: Saturday November 15, 2025, In Person Meeting

Monument Library, 1706 Lake Woodmoor Drive, Monument, CO 80132 <[map link](#)> 10:30 am start time

**Preparation:** Take multiple 50-question practice exams. Taking all 15 of the [Ham Radio School practice exams](#) reviews all 602 question pool items. Repeat practice exams as necessary to ensure consistent performance of 85% or better (43 out of 50 correct answers or better). We also recommend the use of the [HamStudy.org mobile app](#) for quizzing and practice exams. The app has an organizational preference you can select so that it presents questions in the Ham Radio School Extra License Course organization, lesson by lesson.

**NOTE:** Students must [register in advance with WØTLM for this exam session](#). (<https://w0t1m.com/exam-team>)

Students may attend any VE session to take the examination. Sessions are offered regularly in the Colorado Springs area (1-2 per month), and additional sessions are held in Franktown, Woodland Park, and Denver.

Additionally, exams are offered online by remote meeting app with minor setup and monitoring requirements. See a listing of online exam options sponsored by *HamStudy.org* at: <https://hamstudy.org/sessions>

A conventional calculator with the memory erased is allowed (no cell phone use permitted).  
You may not bring any written notes or calculations into the exam session.  
A pencil or two is recommended.

**Direct any questions to the course directors listed at the beginning of this course outline.**