

# RF Engineering

*Specialized Certificate*

## About the Antenna Engineering Program

### Become an RF Engineering Expert: Build the Future of Connectivity

In today's rapidly evolving world, wireless communication is transforming industries and daily life. From Bluetooth devices and video game controllers to GPS navigation and satellite TV, radio frequency (RF) technology powers it all. As RF Engineering reshape global connectivity, there has never been a more exciting time to master this field.

The RF Engineering Specialized Certificate provides engineers with the essential skills to excel in both the commercial and military sectors. Learn how to design cutting-edge RF circuits that are energy-efficient, high-performance, and cost-effective, enabling the next generation of wireless technology. This program equips you with hands-on knowledge to create RF subsystems, design integrated circuits, and master the fundamentals of RF systems.

### Learning Outcomes

By the end of this program, you will:

- Understand the unique design requirements at RF frequencies.
- Differentiate between RF circuit, integrated circuit (IC), and system design needs.
- Master the design of RF blocks and systems, including calculating system characteristics.
- Be ready to tackle RF challenges in industries ranging from telecom to aerospace.

### Program Benefits

- **Comprehensive Curriculum:** Covers everything from RF parameters and device theory to system impairments and performance.
- **Specialized Electives:** You have the opportunity to explore specialized topics such as mixed signal design, advanced antenna modeling, and microwave transmission engineering that gives you the flexibility to focus on the most relevant aspects of RF engineering to suit your professional goals.
- **Industry-Relevant Skills:** Stay ahead in a fast-paced industry with advanced topics in RF system architectures and sub-systems requirements.
- **Flexible Learning:** Gain introductory theory as well as advanced knowledge in specific RF topics.
- **Practical Training:** Combine theory with practical exercises to reinforce learning.
- **Career Opportunities:** RF engineers are in high demand in fields such as telecommunications, defense, consumer electronics, and automotive industries.
- **Experienced Instructors:** Courses taught by experienced instructors and industry professionals with extensive expertise in the RF engineering field, ensuring that you gain insights from real-world applications and the latest industry practices.
- **Career Resources Hub:** You will have access to dedicated Career Resources Hub with career information, job postings, events and tutorials.

## Program Details

### Prerequisites

Students should have general knowledge about principles of electronics and electronic engineering, general knowledge about transistor operation, and circuits analysis; and/or have a background in electrical engineering, or computer engineering. If you do not have this foundation, please take the Electronics and Telecommunications Review: Math, Circuits and Signals, RF Principles and Applications. If you have this background, you may take the required courses, no waiver is needed.

### Requirements

There are three required courses, and two elective courses required to complete the RF Engineering program. You may take the required courses in any order, provided you have met any prerequisite requirements. The chart below shows when and in what format courses are offered.

### Electives

Completion of two electives is required. You can begin taking electives at any time including prior to, concurrent to, and/or after taking required courses. However, before enrolling in an elective, please see the course page for prerequisite skills or classes needed for each class.

## Prerequisite Courses

If you have prerequisite knowledge you may enroll in required courses, no waiver is needed.

TITLE & COURSE NUMBER	UNITS	FALL	WINTER	SPRING	SUMMER
<u><a href="#">Electronics and Telecommunications Review: Math, Circuits and Signals</a></u> CSE-40289	3.0		Online		Online
<u><a href="#">RF Principles and Applications</a></u> EE-40137	3.0	Online		Online	

## Required Courses

All three are required and can be taken in any order

TITLE & COURSE NUMBER	UNITS	FALL	WINTER	SPRING	SUMMER
<u><a href="#">RFIC Design</a></u> CSE-40171	3.0	Online			
<u><a href="#">RF System Design For Wireless Communications</a></u> CSE-40098	3.0		Online		Online
<u><a href="#">RF Circuit Design</a></u> EE-40003	3.0			Online	

## Electives

choose two

TITLE & COURSE NUMBER	UNITS	FALL	WINTER	SPRING	SUMMER
<u><a href="#">Antenna Theory and Design</a></u> EE-40129	3.0	Online		Online	
<u><a href="#">Microwave Test &amp; Measurement</a></u> EE-40149	3.0		In-Class		
<u><a href="#">Microwave Transmission Engineering</a></u> EE-40153	3.0				Online
<u><a href="#">RF RLL Synthesizers</a></u> ECE-40294	3.0	Online	Online		
<u><a href="#">Mixed Signal Design</a></u> ECE-40244	3.0	Online		Online	
<u><a href="#">Advanced Antennas Design, Modeling, and Simulation</a></u> EE-40183	3.0		Online		Online
<u><a href="#">Design of High Performance RF Transceivers</a></u> EE-41006	3.0		Online		Online

## Other Courses of Interest

Not required to earn this certificate

TITLE & COURSE NUMBER	UNITS	FALL	WINTER	SPRING	SUMMER
<u><a href="#">Basic PCB Design</a></u> EE-41004	3.0	Online		Online	

## Length

Students on average take about a year and a half to complete this certificate. This certificate may be completed online from anywhere in the world. Students may take more than one class per quarter by taking one required class and one elective class in the same quarter. However, each course includes an average of 6-8 hours of homework per week. Taking more than one class per quarter should be well-thought-out, and other work/school/life commitments should be considered prior to enrolling in more than one class per quarter. Students cannot take more than one required course per quarter, since they need to be taken consecutively. You have up to five years to complete all requirements for the certificate.

## Cost

Related fees are estimated at: \$125 registration fee, \$825 per course and two electives. The total estimated cost of the certificate is \$4,120, including related fees mentioned previously. This estimate may vary on a variety of factors including elective courses chosen, course format, vendor used for textbooks. The cost of attendance does not include books, parking, transportation, or personal expenses. All estimated costs are subject to change; current fees and textbooks are listed on our website.

Program fees are paid on a per-course basis, when you enroll in a course.

## Frequently Asked Questions

### About the Certificate

#### How do I apply to the certificate Program?

STEP 1: If you have a My Extension account, skip to Step 2. If you do not have a My Extension account, go to [myextension.ucsd.edu](http://myextension.ucsd.edu), click "Create an account" on the right side of the page, and follow the instructions to create an account. Once you have a My Extension account, continue to Step 2.

STEP 2: Click on the "Apply Now" button on the certificate page. Complete the required fields on the application. Then click Save Your Work button. Once you have saved the application, the "Submit" button will appear. Click the "Submit" button to submit your application for review and consideration. Once submitted, your application cannot be changed. You can track the progress of your application at [My Extension](#).

#### Is there an application fee for the certificate program?

Current application or certificate fees, if any, are listed under the "Apply Now" button on the [certificate page](#) on our website.

#### Can I register for the certificate program at any time?

Yes, you may enroll in the program at any time. However, it is recommended that you enroll as soon as possible. The program curriculum may be updated at any time; if certificate requirements change, you must adhere to the curriculum at the time of your enrollment into the certificate. Enrolling in the certificate also gives you access to quarterly, personalized enrollment reminders from the program manager.

#### Can this certificate program be completed entirely online?

Yes! This program is designed for you to take it online at the convenience of your own home or office. Some courses may also have in-class options, but all program requirements can be completed online. For online courses, all assignments, tests, and quizzes can be completed online and submitted through our online learning platform. All class sessions are taught online. There are no face-to-face class sessions. You will have access to your online course on the published start date OR 1 business day after your enrollment is confirmed if you enroll on or after the published start date.

#### How long do I have to complete the certificate?

You officially have five years from when you begin taking courses in the program to complete all requirements for the certificate.

## If I already have the skills taught in one of the courses, can I skip that course?

If you have taken a course from an accredited university covering the learning objectives of a program course, you may be able to transfer your previous coursework to Division of Extended Studies. If you have not taken a course elsewhere, but already have the skills covered in a course, you may be able to substitute an alternate Division of Extended Studies course in its place. Please contact the program representative at [unexengr@ucsd.edu](mailto:unexengr@ucsd.edu) or 858-534-9351 for more information.

## Is this certificate program open to non-California residents?

Yes, the program is open to non-California residents, including non-US residents. The tuition is the same for all students. If you have questions about how enrolling in courses may or may not affect your visa status, please contact our International Department at [ipinfo@ucsd.edu](mailto:ipinfo@ucsd.edu) or (858) 534-6784.

## If I work full-time, will I still be able to complete this program?

Yes. Our programs are designed to be working-student friendly and most of our students are working professionals. The courses are typically three units, which amount to approximately 27-30 hours of class time.

## Is the program accredited?

UC San Diego is accredited by the Western Association of Schools and Colleges (WASC). UC San Diego Division of Extended Studies — like all other UC San Diego schools, colleges, and departments — is accredited by WASC through the University. All courses and certificate programs offered by UC San Diego Division of Extended Studies have been developed and are administered in accordance with Division of Extended Studies policy and the regulations of the Academic Senate of the University of California.

## Will this program prepare me for a certification exam?

This program is not aligned with any one certification exam. Our programs are designed to provide students with knowledge that will make them valuable in the workforce.

## How do I get my certificate once I have completed the requirements?

When you have paid your certificate fee and successfully completed all program requirements, you will need to request an audit by Student Services. To request an audit:

- In your My Extension account, click on "My Courses."
- On the right side of the page under "My Certificates," click on the name of the certificate.
- On the right side of the page under "Tools," click on "Request Certificate Audit."
- Complete and submit the form that appears.

Once you have formally submitted your audit request, your certificate will be mailed to the address we have on file for you within ten business days.

## Do you provide a job or internship placement?

No, we do not currently offer job placement assistance, internships, or career services assistance.

## Is financial aid available?

- UC San Diego Division of Extended Studies offers continuing education loans through UC Approved Lenders. Each institution offers low competitive interest rates and flexible payment options. You are also encouraged to contact your personal financial institution about possible lending solutions. Direct links to UC Approved Lenders can be found on our website's [Financial Resources](#) page. The Employment Development Department (EDD) provides a comprehensive range of employment and training services in partnership with state and local agencies/organizations. More information is available on their website at [edd.ca.gov](http://edd.ca.gov).
- Career Centers Located throughout San Diego County offer their communities comprehensive employment and training services benefiting both business and job seekers. More information is available on their website at [workforce.org](http://workforce.org).

- Please click [here](#) for information about Veteran's Benefits.
- Free Application for Federal Student Aid (FAFSA) funds are limited to degree programs only and cannot be used for courses or certificate fees at UC San Diego Division of Extended Studies.

## About the Courses

### When does course enrollment open for each quarter?

Our classes post to our website and become open for enrollment approximately two months prior to the start of the new quarter. If you would like to receive an email reminder, you can sign up for our newsletter(s) in [My Extension](#), under the "Preferences" tab.

### When should I enroll in a course?

We recommend enrolling as soon as possible, as occasionally classes will reach capacity.

### Once I have enrolled in a course, when will I get online access to it?

If you have enrolled at least three days before the course begins, you will have access starting on the first day of class. You should receive an email from Student Services with instructions for how to login to the course. If you have enrolled on or after the start date of the course, you will have access to the course within one business day.

### How are online courses formatted?

Online courses are asynchronous with prerecorded lectures, corresponding PowerPoints, and subsequent materials as provided by the instructor. They have a start and end date, but all the lessons are uploaded to our Learning Management System, so that you can learn at your own pace. However, please be aware that you may have weekly assignments, quizzes and/or tests that are due on specific dates.

### How do I access my online course?

To access your online course, first login to your [My Extension](#) account, next select "My Courses" from the menu. From your list of courses, select the course you would like to access, and click the link that appears in the "Location" section. You will then be redirected to the Learning Management System (LMS) where your course is located.

We are currently using Canvas as our (LMS) for all our online courses. While students do not get access to their respective courses until the first day of the course, we encourage students who are new to Canvas to click on the following link to Canvas and: [Take the free tour of Canvas](#).

### Once I have enrolled in a course, when will I get online access to it?

If you have enrolled at least three days before the course begins, you will have access starting on the first day of class. You should receive an email from Student Services with instructions for how to login to the course. If you have enrolled on or after the start date of the course, you will have access to the course within one business day.

### What if I am having trouble with my Learning Management System or My Extension?

Please contact Student Services at (858) 534-3400 or [unex-reg@ucsd.edu](mailto:unex-reg@ucsd.edu) if you experience any issues logging in to any of our systems.

### When does enrollment for a course close?

Enrollment on a course may be closed for one or more of the following reasons:

- The course is at capacity. If the course is at capacity, you will only be able to join the waitlist. If space becomes available on the course, students on the waitlist are contacted in order they joined the waitlist.
- The course has progressed to a point where students will no longer be able to make up the missed work and be successful in the course.
- The course is cancelled due to low enrollments.
- For all three of these reasons, we recommend students enroll early on their courses of interest.

## When is the refund deadline for courses?

The refund deadline for courses in this program is typically one week after the start of the course. This allows you to enroll in a course and participate in the course for approximately one week to determine if the course is a good fit. Then, if needed, you may either transfer your enrollment to a different course or submit a drop request. The exact refund deadline for each section is listed in the section notes.

## What are the grading options for courses?

You can take courses for one of three options: Letter Grade, Pass/No Pass, or Not for Credit. If you are taking a course towards a certificate, you must complete your courses for credit (i.e., Pass/No Pass or Letter Grade) and receive a C-/Pass or higher grade. Grades below a C-, No Pass, and Not for Credit will not count towards certificate requirements.

## How will I receive my final grade?

Once the course is completed, the instructor has 10 working days to submit your grades. After the grades have been posted, you can view and print them via [My Extension](#), your online education management portal. Please contact Student Services at 858-534-3400 or [unex-reg@ucsd.edu](mailto:unex-reg@ucsd.edu) if you experience any issues with logging in.

## What kind of credit do I earn?

The courses in this program are post-baccalaureate, professional-level, credit bearing courses. Credit earned in these courses may lead to the award of a formal certificate by UC San Diego Division of Extended Studies or may be applied toward an academic degree or professional credential, *subject to the approval of the receiving institution*.

If you wish to transfer credit, it is your responsibility to confer with the receiving institution before enrolling, as each individual academic institution decides whether to accept Division of Extended Studies credits.

## Are courses transferable?

UC San Diego Division of Extended Studies is not a degree granting institution; however, many UC San Diego Division of Extended Studies courses can be transferred to other colleges or universities. The transferability of credit is determined solely by the receiving institution. You should discuss how your individual courses will transfer with the Office of the Registrar at the receiving institution *prior to enrolling*.

## Can I take a course without registering for the certificate?

Yes, you may take any course in this program without registering for the certificate, provided you have fulfilled any and all prerequisites for the course.

## How long is each course?

Three-unit courses run for approximately 8-10 weeks. For exact course dates of upcoming sections, visit the webpage of the course you are interested in taking on [our website](#).

## When is each course offered?

Please visit the course page on [our website](#) to see when courses are typically offered. You can also see a full program schedule by clicking on the "View Schedule" button under the "Courses" section on the [certificate page](#).

## How can I get more information on the specific courses?

Please email [unexengr@ucsd.edu](mailto:unexengr@ucsd.edu) to request specific course syllabi.

## How many hours can I expect to spend studying outside of class time?

Each student has their own learning style so this can vary greatly. As a rule of thumb, expect to spend an average of two hours studying for every hour you spend in-class.

## What are the instructors' credentials?

The program courses are taught by seasoned professionals and overseen by an advisory board of leaders in the field. You can view the advisor list under the "Advisors" section on the [certificate page](#). You can find information about a course instructor, including a biography and credentials, on the course page.

## What are the required textbooks for a course?

Instructors will post the current textbooks requirements and recommendations on the course page on our website. Please note the textbooks requirements are subject to change every quarter and different instructor may require different books, even if they are teaching the same course in the same quarter, so be sure to check the textbook requirements for the section in which you are enrolling.

## Will I be able to order the required textbooks before the class begins?

Yes, you can order the book(s) any time after enrolling in the course. You may order books through the campus bookstore or online retailers, such as Amazon.com.

## For More Information

For program specific questions, please visit the [certificate page](#) on our website or contact a program representative at [unexengr@ucsd.edu](mailto:unexengr@ucsd.edu) or (858) 534-9152. For administrative questions, please contact our Student Services Department at [unex-reg@ucsd.edu](mailto:unex-reg@ucsd.edu) or (858) 534-34