

ECG - 616 - Space Sensors and Instruments

2 Graduate Course Create 2021-22

I. Course Information

The faculty member originating this proposal is to complete sections I,II, III, and IV.

TURN ON help text before starting this proposal by clicking  in the top right corner of the heading.

You will need to turn on help text again after any actions that refresh the page including after saving proposals, importing information, or running impact reports.

FILL IN ONLY fields required marked with an *. You will not be able to launch the proposal without completing the required fields.

Department*

Electrical and Computer Engineering

Prefix:*

ECG

Number:* 616

Is a new Prefix being suggested? Yes No

Suggested Prefix

Long Course Name:* Space Sensors and Instruments

Short Course Name* Space Sens & Instrument

Tip: 25 characters max. for short name (abbreviations are acceptable if needed)

Tips

avoid the use of the words *student*, *course*, and *covers*
incomplete sentences are ok
avoid repeating the course title
(50 words max)

Catalog Description*

Explores astrophysical and space science concepts and environments: Spacecraft orbits, sensors for electromagnetic waves, photons, and particle radiation; Radiometry, interferometry, telescope design, arrayed sensors, remote sensing, CubeSats, constellation flight. Case study of spacecraft, payload, and mission design. Crosslisted with EE416.

Is this course a culminating experience?*

Yes No

If Yes, to which programs?

Space science and engineering are interdisciplinary in nature. Space sensors and instruments are payload, i.e. the functional part for spacecraft. ECG616 will benefit students majoring in Electrical and Computer Engineering, Mechanical Engineering, Computer Science, Physics, Biology, Chemistry, Geology, etc ...

First Term Course Offered*

Summer 2021

Explanation for Course Create*

To promote knowledge and research among graduate students in the field of Optics.

Course covers:

- Frontiers of astrophysical and space science
- Optical sensors
- Radiation sensors
- Telescopes
- Interferometry
- Remote sensing
- Gravitation reference sensor
- Spacecraft and payload design
- Constellation flight
- Mission examples

Are you adding a Service-Learning designation to this course?*

Yes No

If the Service-Learning designation is being added to this course:

A syllabus in Word or PDF format must accompany this form.

Graduate syllabi must meet the minimum criteria as required by the Provost's office (See Semester Memo under Executive Vice President and Provost Policies and Forms www.unlv.edu/policies). Graduate courses that are linked to undergraduate courses (300/500 and 400/600 level joint courses) must clearly state in the syllabus how the class experience and expectations are different for graduate students, what additional requirements students enrolled in the graduate level course must fulfill, and how the grading scale will be applied to graduate students.

Please attach a current syllabus by navigating to the Proposal Toolbox and clicking  in the top right corner.

Information about Service-Learning is available [here](#). Faculty can visit the [faculty Service-Learning page](#) as well as the [UNLV Guide for Service Learning](#) for additional information.

If adding Service-Learning designation, syllabus is attached Attached

II. Catalog Information

Will this be an experimental (x) course? Yes No

Has this course number been used previously as an Experimental (X) course? Yes No

If yes, X-Course Prefix

X-Course Code

Program(s) impacted by this new course* ECG616 is a key course in the newly established "Photonics Specialization" leading to Ph.D degrees in Electrical and Computer Engineering.

Tip (note): A Program Change form will need to be submitted to add the new course into a program.

Detail the changes to the program catalog entry required due to the creation of this course.* We will add this course into both undergraduate and graduate handbooks in Electrical and Computer Engineering. The undergraduate course EE416 has been listed for offering in Summer III 2021. ECG616 needs to be added in for co-offering in Summer III 2021.

Fixed/Variable Credits* Fixed Variable

If fixed, enter number of credits. If variable, enter minimum and maximum credits (E.g., 1-3)

Number of Credits 3

Course is Repeatable* Yes No

If yes, the maximum number of credits that may be earned is

Grading System* Letter Grade S/U Thesis/Dissertation

Is this a Special Topics course? Yes No

Sub-topic(s)

Are topics repeatable? Yes No

If yes, number of credits

Prerequisites Instructor Consent

Corequisites

Does this course have any non-credit components? Yes No

- If yes, indicate component(s)
- Clinical
 - Discussion
 - Field Studies
 - Independent Study
 - Internship
 - Laboratory
 - Lecture
 - Practicum
 - Research
 - Seminar
 - Supervision
 - Thesis Research

CROSS-LISTING / Same As, will this course be:* Same As=Undergraduate: same content and same career (UG/UG). Graduate: Same/similar course content and same career (Grad/Grad)
 Cross-listing= Cross-listed courses contain the same or similar content and may be in different programs (eg., WMST 497 & SOC 497) or different careers (e.g., BIOL 467 & BIOL 667 or PSC 722 & PHIL 728)
 Not Cross-Listed or Same As

If yes, list the course EE 416

Indicate the instructional modes that should be available for scheduling*

- In Person Supplemental Web
- Field Study
- Hybrid
- Independent Study
- Television
- Web-based
- Web-based w/ on/off campus meeting

Differential fees required for this course? (if yes, please clarify on explanation field above)

- Yes No

III. Evaluation of Library Resources

A. This section is completed by the faculty member originating this proposal—indicate library resources that will be needed to support this course

Will this course creation require changes to library resources?*

- Yes No

Please indicate library resources that will be needed to support students taking this course*

- Core journals
- Core books (not required texts)
- Electronic resources (e.g., databases, videos, media, etc.)


Critically needed journals for this subject area:


ISSN: 0032-0633 Planetary and Space Science, Journal of Astronomical Telescopes, Instruments, and Systems

Core books needed:

Electronic Resources:

3. LAUNCH proposal by clicking  in the top left corner.

4. Finish the launch of your proposal by clicking the icon  located in the Proposal Toolbox on left side at top. Make your decision, comment is optional, and click on "Make decision".

You can check the status of the proposal by clicking  in Proposal Toolbox to verify that the proposal has gone to the next step.

B. This section is completed by the librarian.

Level of support the
Library can provide

Library Comments

IV. Syllabus

A syllabus in Word or PDF format must accompany this form.

Graduate syllabi must meet the minimum criteria as required by the Provost's office (See Semester Memo under Executive Vice President and Provost Policies and Forms <https://www.unlv.edu/policies/current-policies>). Graduate courses that are linked to undergraduate courses (300/500 and 400/600 level joint courses) must clearly state in the syllabus how the class experience and expectations are different for graduate students, what additional requirements students enrolled in the graduate level course must fulfill, and how the grading scale will be applied to graduate students.

Attachments List


Please attach any required files by navigating to the Proposal Toolbox and clicking  in the top right corner.

Attached syllabus* Attached

V. Department Vote Information

Note: This section is to be filled out by the Department Chair on behalf of the committee.

(The role has been assigned to the corresponding person on this step. If incorrect, please notify GradCurriculum@unlv.edu)

1. Review the proposal. Discuss and make appropriate revisions.
2. Fill in vote information.
3. Then go to the proposal toolbox at the top right side. Click on  and select the corresponding decision for the committee. This will enable the proposal to go to the next person on the workflow.

You can check the status of the proposal by clicking  in Proposal Toolbox to verify that the proposal has gone to the next step.

Date faculty voted
on proposal 11/15/2019


Result of vote Yes -- unanimous
(Number of
yes/no/abstention
votes)

Manner of vote in person
(online, in-person,
etc.)

VI. Unit Vote Information

Note: This section is to be filled out by the College Committee Chair on behalf of the committee.

(The role has been assigned to the corresponding person on this step. If incorrect, please notify GradCurriculum@unlv.edu)

1. Review the proposal. Discuss and make appropriate revisions.
2. Fill in vote information.
3. Then go to the proposal toolbox at the top right side. Click on  and select the corresponding decision for the committee. This will enable the proposal to go to the next person on the workflow.

You can check the status of the proposal by clicking  in Proposal Toolbox to verify that the proposal has gone to the next step.

Date faculty voted 3/31/2021
on proposal

Result of vote 4/0/0
(Number of
yes/no/abstention
votes)

Manner of vote Online
(online, in-person,
etc.)

VIII. Processing Notes (Graduate College/Registrar Use Only)

PS Processing Notes

PS Processing Date 4/23/2021

Initials

**Aalog Processing
Notes**

Aalog Processing 4/23/2021
Date

Initials

Comments for ECG - 616 - Space Sensors and Instruments

Curriculog	4/23/2021 9:47 am Reply
This proposal has been completed.	
REG Curriculum	4/23/2021 9:47 am Reply
New course ECG 616 effective 2021-22 catalog.	
Curriculog	4/23/2021 9:47 am Reply
REG Curriculum has approved this proposal on Implementation: Catalog and PeopleSoft.	
Curriculog	4/22/2021 10:35 am Reply
Emily Lin has approved this proposal on Graduate College Dean.	
Curriculog	4/21/2021 10:31 am Reply
James Navalta has approved this proposal on behalf of Graduate Course Review Committee. See Graduate Course Review Committee 4-14-2021 for more information.	
Curriculog	4/20/2021 9:21 am Reply
Graduate Curriculum has approved this proposal on Graduate Course Review Committee.	
Curriculog	3/31/2021 8:05 pm Reply
Mohamed Trabia has approved this proposal on School/College Associate Dean/ Dean.	
Melissa Morris	3/31/2021 3:57 pm Reply
The college Committee Approved	
Curriculog	3/31/2021 3:57 pm Reply
Melissa Morris has approved this proposal on School/College Committee.	
Curriculog	3/30/2021 4:46 pm Reply
ECE Chair has approved this proposal on Department Chair.	

Curriculog

3/30/2021 3:25 pm [Reply](#)

ECG Graduate Coordinator has approved this proposal on Graduate Coordinator.

Graduate Curriculum

3/30/2021 11:54 am [Reply](#)

Past deadline - moved forward.

Curriculog

3/30/2021 11:54 am [Reply](#)

Graduate Curriculum has force approved this proposal.

Curriculog

3/30/2021 0:16 am [Reply](#)

This proposal has passed its deadline and has been approved.

Curriculog

3/29/2021 5:01 pm [Reply](#)

System Administrator Graduate Curriculum has routed this proposal.

Curriculog

3/29/2021 5:01 pm [Reply](#)

System Administrator Graduate Curriculum has routed this proposal.

Library CDM

3/29/2021 8:41 am [Reply](#)

Subject librarian assigned, sue.wainscott@unlv.edu

Curriculog

3/29/2021 8:41 am [Reply](#)

Library CDM has requested to route.

Curriculog

3/25/2021 5:18 pm [Reply](#)

Graduate Curriculum has approved this proposal on Technical Review.

Curriculog

3/24/2021 11:35 am [Reply](#)

Ke-Xun Sun has approved this proposal on Originator.

Graduate Curriculum

12/11/2020 2:09 pm [1 Reply](#) | [Reply](#)

- Please review suggestive revised description. If satisfactory, no action needs to be taken, simply approve the proposal once again. Otherwise please re-edit and approve with comments.

- Please answer the following questions within the explanation field, regarding the rationale for crosslisting this course:

- 1) What aspect of graduate preparation is met via this course that goes beyond the undergraduate program?
- 2) What common aspects are offered in the crosslistings and what grad level pieces are not?
- 3) What would be beneficial in offering the crosslisted courses from a graduate education perspective?

- Please include crosslisted syllabus that highlights differences between grad and undergrad.

For assistance please contact gradcurriculum@unlv.edu

Ke-Xun Sun

3/24/2021 10:46 am

The new course "Space Sensors and Instruments" is actually more for graduate students than for undergraduate students, even in universities with an Aero/Astro Engineering department. The challenge is to make the course accessible to undergraduate students.

I have included a new syllabus (v4). The course has many graduate level topics in both science and engineering aspects. Examples are throughout the course:

Frontiers of astrophysical and space science (all topics)

Optical sensors

Radiation sensors

Remote sensing

Gravitational reference sensors

Spacecraft and payload design

Constellation flight

Mission examples

In addition to completing all undergraduate requirements, graduate students are expected to gain more depth in space physics and space missions, via advanced assignments:

- Additional textbook "Space Physics: An Introduction" by C. T. Russell, J. G. Luhmann, R. J. Strangeway
- More reading current research papers
- Complete additional problem in problem sets
- More thorough presentation in term project

Common aspects for EE416/ECG616

- Grad and Undergrad Students come to same lectures
- Students learn same basic experimental facts
- Students should have adequate quantum mechanics understanding, as reflected in EE310

Cross listing will benefit undergraduate students in learning space science and space sensors, and will additionally benefit graduate students in their research in space missions. My group has an active space research program.

I have included a new syllabus with for cross listing

Curriculog

12/11/2020 2:09 pm [1 Reply](#) | [Reply](#)

Graduate Curriculum has rejected this proposal on Technical Review.

Ke-Xun Sun

3/24/2021 10:48 am

I have replied the questions from Graduate Curriculum. Please review.

Curriculog

12/9/2020 2:41 pm [Reply](#)

Ke-Xun Sun has approved this proposal on Originator.

Curriculog

12/9/2020 2:40 pm [Reply](#)

Ke-Xun Sun has launched this proposal.

Curriculog

12/9/2020 2:08 pm [Reply](#)

Ke-Xun Sun imported from the map 2021-2022 Working Graduate Catalog into the following proposal fields: I. Course Information: Department, I. Course Information: Prefix:, I. Course Information: Number:, I. Course Information: Long Course Name:.