Code # NHP35 (2014) REV

**New/Special Course Proposal-Bulletin Change Transmittal Form**

**Undergraduate Curriculum Council** - Print 1 copy for signatures and save 1 electronic copy.

**Graduate Council** - Print 1 copy for signatures and send 1 electronic copy to [mmcginnis@astate.edu](mailto:mmcginnis@astate.edu)

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| --- |
| **New Course or**  **Special Course (Check one box)**  *Please complete the following and attach a copy of the catalogue page(s) showing what changes are necessary.* |

|  |  |
| --- | --- |
| \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date… **Department Curriculum Committee Chair** | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…  **COPE Chair (if applicable)** |
| \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date… **Department Chair:** | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…  **General Education Committee Chair (If applicable)** |
| \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date… **College Curriculum Committee Chair** | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…  **Undergraduate Curriculum Council Chair** |
| \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date… **College Dean** | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…  **Graduate Curriculum Committee Chair** |
|  | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…  **Vice Chancellor for Academic Affairs** |

1. Proposed Course Prefix and Number (For variable credit courses, indicate variable range.)

RS 4623

2. Course Title – if title is more than 30 characters (including spaces), provide short title to be used on transcripts. Title cannot have any symbols (e.g. slash, colon, semi-colon, apostrophe, dash, and parenthesis). Please indicate if this course will have variable titles (e.g. independent study, thesis, special topics).

Computed Tomography Instrumentation

Short Title: CT Instrumentation

3. Will this course be lecture only, lab only, lecture and lab, activity, dissertation, experiential learning, independent study, internship, performance, practicum, recitation, seminar, special problems, special topics, studio problems, student exchange, occupational learning credit, or course for fee purpose only (e.g. an exam)? Please choose one.

Lecture only

4. What is the grade type (i.e. standard letter, credit/no credit, pass/fail, no grade, developmental)?

Standard letter

5. Is this course dual listed (undergraduate/graduate)?

No

6. Is this course cross listed? (If it is, all course entries must be identical including course descriptions. It is important to check the course description of an existing course when adding a new cross listed course.)

No

7. Brief course description (40 words or fewer) as it should appear in the bulletin.

Advanced concepts and applications of the instrumentation and operation of equipment used in the Computed Tomography suite. Understanding of the computer components, imaging theory and equipment operation will be stressed.

8. Indicate all prerequisites and if this course is restricted to a specific major, which major. (If a student does not have the prerequisites or does not have the appropriate major, the student will not be allowed to register).

a. Are there any prerequisites?

Formal admittance into the Radiologic Science Program

b. Why?

The Medical Imaging and Radiations Sciences programs are lock step programs. Students complete the program in cohorts.

9. Course frequency(e.g. Fall, Spring, Summer). Not applicable to Graduate courses.

Summer (10 weeks)

10. Contact Person (Name, Email Address, Phone Number)

Ray Winters

[rwinters@astate.edu](mailto:rwinters@astate.edu)

ext. 3329

11. Proposed Starting Term/Year

Summer 2016

12. Is this course in support of a new program? No

If yes, what program?

Enter text...

13. Does this course replace a course being deleted? Yes

If yes, what course?

RS 4622 Computed Tomography Instrumentation

Has this course number been used in the past? No

*Submit Course Deletion Proposal-Bulletin Change Transmittal Form.*

14. Does this course affect another program? No

If yes, provide contact information from the Dean, Department Head, and/or Program Director whose area this affects.

Enter text...

15. Justification should include:

a. Academic rationale and goals for the course (skills or level of knowledge students can be expected to attain)

The medical imaging professional must be able to understand the specifics of imaging equipment as well as recording equipment, including the components, purpose, safe operation and application.

Course Goals:

1. List the components and function of the components of a CT unit.
2. Explain the image intensification process.
3. Discuss the types of analog and digital imaging and recording components.
4. Detail the components, operation, application, and limitations of automatic exposure control (AEC) devices.
5. Evaluate AEC-acquired images for causes of errors
6. Identify corrective actions for image errors due to the misuse of AEC devices.
7. Discuss digital image display and quality management systems.
8. Detail digital image management systems including components, operation and purpose.
9. Discuss Federal regulations of CT equipment and personnel.

b. How does the course fit with the mission established by the department for the curriculum? If course is mandated by an accrediting or certifying agency, include the directive.

The mission of the programs in medical imaging and radiation sciences is to produce competent entry level practitioners.

c. Student population served.

Students formally admitted to the Bachelor of Science in Radiologic Sciences program

d. Rationale for the level of the course (lower, upper, or graduate).

This is an upper division class required upon entry to the professional curriculum.

16. Outline (The course outline should be topical by weeks and should be sufficient in detail to allow for judgment of the content of the course.)

Week 1: Overview of Computed Tomography

Week 2: Intro to computers and Digital Image processing

Weeks 3-4: Physical Principles of Computed Tomography

Week 5: Image reconstruction

Weeks 6-7:Basic Instrumentation, image post processing and visualization tools

Weeks 8-9: Image quality factors

Week 10: Radiation Dose in Computed Tomography

Weeks 11-12: Single and multi-slice Spiral/Helical Computed Tomography: physical principles

Weeks 13-14: Digital image management systems – RIS, HIS, and PACS

Week 15: FDA and State regulations

17. Course requirements (e.g. research papers, projects, interviews, tests, etc.)

Pre-lecture preparation assignments, three formative exams, one comprehensive exam.

18. Special features (e.g. labs, exhibits, site visitations, etc.)

This course content will be enhanced and supplemented with internet resources. There will be supplemental reading and required pre-lecture preparation assignments.

19. Department staffing and classroom/lab resources (Will this require additional faculty, supplies, etc.?)

No additional resources will be required.

20. What is the primary intended learning goal for students enrolled in this course?

Students will have the opportunity to obtain functional knowledge and clinical thinking skills of CT equipment which will be applied in actual clinical experiences.

21. Reading and writing requirements:

a. Name of book, author, edition, company and year

Computed Tomography by Seeram, 3rd edition, Saunder, 2013.

b. Number of pages of reading required per week: 30

c. Number of pages of writing required over the course of the semester: 2

22. High-Impact Activities (Check all that apply)

Collaborative assignments

Research with a faculty member

Diversity/Global learning experience

Service learning or community learning

Study abroad

Internship

Capstone or senior culminating experience

Other Explain: Enter text...

23. Considering the indicated primary goal (in Box #20), provide up to three outcomes that you expect of students after completion of this course.

**Outcome #1:** (For example, what will students who meet this goal know or be able to do as a result of this course?)

The student will be able to discuss the components, proper application and operation of computed tomography systems, recording, and image management equipment, as well as analyze causes and outcomes of misuse.

Learning Activity:(For example, what instructional processes do you plan to use to help students reach this outcome?)

The learning activities that will be used to help students develop their knowledge base and critical thinking skills in this course will be lectures, interactive discussions, videos, course readings and internet research.

Assessment Tool: (For example, what will students demonstrate, represent, or produce to provide evidence of their learning?)

Students will demonstrate their learning through internet activities and research, group discussion and problem-based assignments, and written examinations.

*(Repeat if needed for additional outcomes 2 and 3)*

**Outcome #2:**

Students will be able to identify and analyze causes and outcomes of the misuse of imaging, recording and image management equipment.

Learning Activity:

The learning activities that will be used to help students develop their knowledge base and critical thinking skills in this course will be lectures, interactive discussions, videos, course readings and internet research

Assessment Tool:

Students will demonstrate their learning through internet activities and research, group discussion and problem-based assignments, and written examinations.

**Outcome #3**:

Students will be able to discuss FDA and State regulation as they relate to CT systems.

Learning Activity:

The learning activities that will be used to help students develop their knowledge base and critical thinking skills in this course will be lectures, interactive discussions, videos, course readings and internet research

Assessment Tool:

Students will demonstrate their learning through internet activities and research, group discussion and problem-based assignments, and written examinations.

24. Please indicate the extent to which this course addresses university-level student learning outcomes:

* 1. Global Awareness

Minimally  
Indirectly  
Directly

* 1. Thinking Critically

Minimally  
Indirectly  
Directly

* 1. Using Technology

Minimally  
Indirectly  
Directly

**From the most current electronic version of the bulletin, copy all bulletin pages that this proposal affects and paste it to the end of this proposal.**

**To copy from the bulletin:**

1. Minimize this form.
2. Go to <http://registrar.astate.edu/bulletin.htm> and choose either undergraduate or graduate.
3. This will take you to a list of the bulletins by year, please open the most current bulletin.
4. Find the page(s) you wish to copy, click on the “select” button and highlight the pages you want to copy.
5. Right-click on the highlighted area.
6. Click on “copy”.
7. Minimize the bulletin and maximize this page.
8. Right-click immediately below this area and choose “paste”.
9. For additions to the bulletin, please change font color and make the font size larger than the surrounding text. Make it noticeable.
10. For deletions, strike through the text, change the font color, and enlarge the font size. Make it noticeable.

This is a complete program overhaul. Please refer to the accompanying Program package. This information will replace information on pages 311-332 and 504-512 in the bulletin