KING SAUD UNIVERSITY
College of Science
Department of **Chemistry**

جامعة الملك سعود
كلية العلوم
قسم / **الكيمياء**

COURSE SPECIFICATION

Nuclear and Radiation Chemistry.

Chem. (334)

Revised April 2011

Course Specification

Institution King Saud University
College/Department College of Science Department of Chemistry

A Course Identification and General Information

1. Course title and code: **Nuclear and Radiation Chemistry 334 chem**
2. Credit hours 2
3. Program(s) in which the course is offered. (If general elective available in many programs indicate this rather than list programs)
4. Name of faculty member responsible for the course **Dr.Khalid.A.AL Homaidy**
5. Lev Second year el/year at which this course is offeredV Second year
6. Pre-requisites for this course (if any) 101 chem
7. Co-requisites for this course (if any) None
8. Location if not on main campus

B Objectives

1. Summary of the main learning outcomes for students enrolled in the course. This course aims to provide students with basic knowledge of nuclear radiation chemistry.
2. Briefly describe any plans for developing and improving the course that are being implemented. (eg increased use of IT or web based reference material, changes in content as a result of new research in the field

C. Course Description (Note: General description in the form to be used for the Bulletin or Handbook should be attached)

1 Topics to be Covered		
List of Topics	No of Weeks	Cont acth ours
1-nucleous components	1	2
2-nuclear stability	1	2
3-nuclear particles	2	4
4-radiation laws	1.5	3
5-instrumentaion	1.5	3

6-introduction to radiation chemistry	1	2
7-radiatin systems	1.5	3
8-effect of radiation on organic compounds 9-indusrial applications of radiation	2 1.5	4 3

2 Course components (total contact hours per semester):				
Lecture:26	Tutorial:	Laboratory	Practical/Field work/Internship	Other:

3. Additional private study/learning hours expected for students per week. (This should be an average :for the semester not a specific requirement in each week)

-students need to use nuclear reagents

4. Development of Learning Outcomes in Domains of Learning

For each of the domains of learning shown below indicate:

- A brief summary of the knowledge or skill the course is intended to develop;
- A description of the teaching strategies to be used in the course to develop that knowledge or skill;
- The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.

a. Knowledge

(i) Description of the knowledge to be acquired

Upon completion of this course, the student should be able to:

- Enumerate basic principles of nuclear radiation chemistry.

- Describe nuclear radiation applications in chemical analysis.

- Carry out some experiments on the quantitative and qualitative applications of molecular spectroscopy.

- Carrying out experiments on radiation.

- Apply technique on real samples as to prepare them to work in quality control laboratories.

(ii) Teaching strategies to be used to develop that knowledge

-in lectures where student learn most of the basic principles of these techniques

-in group discussion where students participate in evaluating different methods of interests

-in lecture where students learn most of the basic principles of these techniques

(iii) Methods of assessment of knowledge acquired

-in class-short exams-major and final exams

-in presentation of homework and assignments

b. Cognitive Skills

(i) Description of cognitive skills to be developed

-the ability to compare between different analytical techniques

-the usage of different techniques for identifying and determining various samples

(ii) Teaching strategies to be used to develop these cognitive skills -assignments and oral discussion -literature survey of some application of the method
(iii) Methods of assessment of students cognitive skills -assignments and quizzes -major and final exams
c. Interpersonal Skills and Responsibility
(i) Description of the interpersonal skills and capacity to carry responsibility to be developed -individual independence in class
(ii) Teaching strategies to be used to develop these skills and abilities -discussion of the findings in oral presentation -
(iii) Methods of assessment of students interpersonal skills and capacity to carry responsibility -self performance in class -written presentation of assignments

-direct contact during office hours
d. Communication, Information Technology and Numerical Skills
(i) Description of the skills to be developed in this domain. -the capability in performing reseach
(ii) Teaching strategies to be used to develop these skills -homework assignments
(iii) Methods of assessment of students numerical and communication skills -performance in problem solving and assignment
e. Psychomotor Skills (if applicable)
(i) Description of the psychomotor skills to be developed and the level of performance required Not applicable
(ii) Teaching strategies to be used to develop these skills Not applicable

(iii) Methods of assessment of students psychomotor skills

Not applicable

5. Schedule of Assessment Tasks for Students During the Semester

Assessment	Assessment task (eg. essay, test, group project, examination etc.)	Week due	Proportion of Final Assessment
1	Short exam	2weeks	3%
2	Major exam 1	4weeks	15%
3	Open exam	6weeks	3%
4	Major exam	8weeks	15%
5	Research assignment	9 weeks	4%
6	Final exam	15 weeks	60%
7			
8			

D. Student Support

1. Arrangements for availability of teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week) Office hours which are 6 per week for all students

E Learning Resources

1.
2. Essential References 2. nuclear chemistry by Choppin and Rydberg
3- Recommended Books and Reference Material (Journals, Reports, etc) (Attach List)
4-.Electronic Materials, Web Sites etc
5- Other learning material such as computer-based programs/CD, professional standards/regulations

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Lecture rooms, laboratories, etc.) class room with 25 seats
2. Computing resources
3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list)

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching -course evaluation by students -student-college meetings
2 Other Strategies for Evaluation of Teaching by the Instructor or by the Department -departmental board meetings -discussion with analytical chemistry group
3 Processes for Improvement of Teaching -workshops offered by experts on improving teaching methodologies

4. Processes for Verifying Standards of Student Achievement (eg. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution) -faculty members from other universities to review the grading policies
5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. -the chairman of the department and college council take the responsibilities -the course material should be reviewed by the department and the facultyboards

Attachment 2(f)

Guidelines on Using the Template for a Course Specification

Descriptions of what should be included in program and course specifications and in the annual and periodic reports are included in Section 2.4 of Part 2 of this *Handbook*

Institution, College/Department	Show the name of the institution and the college or department principally responsible for the course.
A. Course Identification and General Information	
1. Course title and code	Show the title and the institutional code number for the course.
2. Credit hours	Write the number of credit hours for the course.
3. Program(s) in which the course is offered	Write the name of the program in which the course is offered. A course may be offered in more than one program and a brief explanation may be needed to show how it relates to those programs. As a guide, if a course is an important component of several programs, list these programs. If it is used as a general skills course or a service course for a number of programs this should be noted and an indication given of the fields that are supported by it. (A first year course in mathematics might be an example of this.) If the course is a general elective which could be taken in many different programs this should be noted but those programs would not be listed.
4. Name of faculty member responsible for the course	If a single member of teaching staff has been given responsibility for teaching and reporting on the delivery of a course that persons name should be given. If a team of staff teach the course and one person has been given coordinating responsibility that persons name should be shown. If it is a new course for which an instructor has not yet been appointed that should be noted and the new appointees name included when it is known.
5. Level/year at which the course is offered	Show the year level when the course is intended to be taken.
6. Pre-requisites for this	List any courses or other requirements that are prerequisites for

course	enrolling in the course.
7. Co-requisites for this course	List any courses or other experiences that must be taken concurrently with this course.
8. Location if not on main campus	If the course is offered in a different location such as an industry setting or in another city or township indicate where this is done.

B. Objectives	
1. Summary of main learning outcomes.	This is intended as a brief statement of the main learning outcomes of the course. Detailed learning outcomes in domains of learning are shown in the next section.
2. Course development plans	Briefly describe any plans for developments or changes in the course such as changes in use of web based material, new techniques of instruction, changes in content or increased reliance on students self study or use of library resources. The description should include the reason(s) for the changes being made.
C. Course Description	
The general course description set out in the Handbook or Bulletin should be attached.	
1. Topics to be Covered	Complete the table to indicate the amount of time and the total number of contact hours intended to be given for each topic in the course. If part of a week is allocated for a particular topic use decimals to indicate time fraction. (For example a particular topic may be planned for 2.5 or 3.5 weeks).
2. Course Components	Indicate the total contact hours intended to be given in each organizational arrangement—Lecture, tutorial, laboratory etc.
3. Additional Private Study or Learning Hours	Indicate the amount of time expected of students in private study, assignment or other work associated with the course This should be shown as an average amount of time per week over the semester.
4. Development of Learning Outcomes in Domains of Learning	In this item summarize the learning outcomes expected from the course in each of the domains of learning, the teaching strategies to be used to develop that learning and the way student learning will be

	assessed. Note that every course is not expected to contribute to every domain. However wherever it is feasible to do so courses should be designed to contribute to the development of skills such as effective group participation, capacity for independent learning, communication skills, and problem solving abilities. The description of teaching strategies requires more than a specification of the organizational arrangement shown under C 2 and should indicate what will be done within those arrangements to develop the kind of learning sought.
a. Knowledge	
(i) Knowledge to be acquired	This should be a list of topics or areas of knowledge that students should know and understand when they complete the course.
(ii) Teaching strategies	Explain what strategies will be used to develop students' knowledge and understanding. *Example—Lectures, tutorials and independent study assignments. Introductory lecture gives an overview of the content and significance of the course and of its relationship to students' existing knowledge. Each subsequent lecture begins with a similar overview linking the particular content of the presentation to the general overview. Tutorials review the content of each lecture and clarify any matters not understood. Individual assignments require use of library reference material and web sites to identify information required to complete tasks.*
(iii) Methods of assessment	Explain how acquisition of knowledge will be assessed. *Example--15 minute multiple choice test on content on completion of each topic with results carrying 20% of final assessment. Multiple choice knowledge item on final exam.*
(b) Cognitive Skills	
(i) Cognitive skills to be developed	List the thinking and problem solving skills the course is intended to develop. As a guide it may be useful to begin with the phrase "The ability to…." The list should include both the use of analytic and predictive formulae and conceptual tools when asked to do so, and the ability to identify and use ones that are appropriate for new and unanticipated problems.
(ii) Teaching strategies	Explain techniques to be used to teach and encourage appropriate use of cognitive skills. *Example—Explanations and examples given in lectures and practiced*

	under supervision in tutorials and laboratory tasks. Transfer of learning encouraged by use of analytical tools in different applications and through discussion of potential application in other areas. Assignment tasks include some open ended tasks designed to apply predictive, analytical and problem solving skills (Eg. What would happen if……..?, How could……..?)
(iii) Methods of assessment	Explain method of assessment for cognitive skills. *Example—Problem solving questions carrying 50% of mark on tests given at the end of each topic and on end of semester examination. Group and individual assignments require application of analytical tools in problem solving tasks.*
(c) Interpersonal Skills and Responsibility	
(i) Skills to be developed	List the objectives of this course for improving students' interpersonal skills, capacity for self directed learning, and personal and social responsibility.
(ii) Teaching strategies	Explain what will be done in the course to develop students' interpersonal skills, personal and social responsibility, and capacity for independent learning. *Example—One group assignment in which 25% of assessment is based on individuals contribution to the group task. (Instructor meets with each group part way through project to discuss and advise on approach to the task) Two individual assignments requiring investigation using internet and library resources as a means of developing self study skills. Role play exercise on controversial issue relevant to the course based on a case study, with discussion in tutorial of appropriate responses and consequences to individuals involved.*
(iii) Methods of assessment	Explain how interpersonal skills and responsibility will be assessed. *Example—Assessment of group assignment includes component for individual contribution. Capacity for independent study assessed in individual assignments.*
(d) Communication Information Technology and Numerical Skills	
(i) Skills to be developed	Indicate the contribution of this course to students'communication, IT and numerical skills. Note that what is intended in this section is the development of generic skills for all students rather than specialized

	studies relevant to a field of study that would be included under items a. or b. For example a course in history or philosophy might include some use of basic mathematical or statistical information and the use of ICT in searching for information and presenting reports. A course in computer science might include the ability to present written reports that develop language ability.
(ii) Teaching strategies	Explain what will be done in the course to develop students' numerical and communication skills. *Example—Student assignments require good standards of use of ICT. Where standards are inadequate the student is referred for special remedial instruction. Student essay assignments require proper style and referencing format as specified in college style manual.*
(iii) Methods of assessment	Explain how numerical and communication skills will be assessed in this course. *Example—Test questions require interpretation of simple statistical information. Assessments of students assignment and project work include expectation of adequate use of numerical and communication skills. Five percent of marks allocated for standard of presentation using ICT.*
(e) Psychomotor Skills	
(i) Skills to be developed	Indicate any psychomotor skills the course is intended to develop and describe the standard to be achieved.
(ii) Teaching strategies	Explain processes to be used to develop required psychomotor skills as specified in course learning outcomes.
(iii) Methods of assessment	Explain how psychomotor skills will be assessed.

6. Schedule of Assessment Tasks	Complete the table to show the dates planned for each assessment task and the proportion of the final assessment allocated for that task.

D. Student Support	
1. Availability of teaching staff for consultations and advice.	Describe the arrangements to be made for individual student counseling and advice. This should include the time allocation and schedule for teaching staff to meet with students.

E Learning Resources	
1. Required Texts	List any required texts.
2. Essential References	List reference material regarded as essential for teaching the course.
3. Recommended Books and Reference Material	Attach list of material that should be available for reference by students undertaking the course.
4. Electronic Materials	List requirements for access to electronic materials, data bases etc.
5. Other Materials	List any other learning materials that are required for the course

F. Facilities Required	
1. Accommodation	Specify accommodation requirements for delivery of the course indicating the type of facility (eg lecture rooms, laboratories etc. the amount of time needed, any special requirements for scheduling, and the number of students to be accommodated.
2. Computing resources	Specify requirements for computer access.
3. Other Resources	Specify any other requirements for the course including specialized equipment. Attach list if necessary.

G. Course Evaluation and Improvement Processes	
1. Strategies for Obtaining Student Feedback on Quality of Teaching	Describe strategies. Eg. confidential completion of standard course evaluation questionnaire. Focus group discussion with small groups of students.
2. Other Strategies for Evaluation of Teaching	Describe any other strategies for evaluation of teaching. Eg. observations and assistance from colleagues, independent assessment of standards achieved by students, independent advice on assignment tasks, etc.
3. Processes for Improvement of Teaching	Describe processes for improvement of teaching. Eg. Workshops on teaching methods, review of recommended teaching strategies.
4. Processes for Verifying Standards of Student Achievement	Describe methods used to compare standards of achievement with standards achieved elsewhere. Eg. check marking of a sample of examination papers or assignment tasks,

5. Action Planning for Improvement	Describe process for reviewing feedback on the quality of the course and planning for improvement