Course Specification

Institution :- **King Khalid University**
College/Department **College of Applied Medical Sciences** **Department of Radiological Sciences**

A- Course Identification and General Information

1- Course title and code: Clinical Practice 444 (Rad 444)
2. Credit hours: 3(1+2)
3. Program(s) in which the course is offered. **(If general elective available in many programs indicate this rather than list programs):** **Bs.c in radiological science**
4-Name of faculty member responsible for the course **Loi Elthagafi**
5. Level/year at which this course is offered: level 7
6. Pre-requisites for this course (if any) : **Clinical Practice 1 Rad 341** **Clinical Practice 2, Rad 342**
7. Co-requisites for this course (if any) : NO
8. Location if not on main campus : greger centre

B - Objectives

By the end of the course, the student will be able to :-

1- Identify the various components of an MRI equipment and explain the functions of each component.

2- Explain the various basic parameters and terminologies used during MRI scanning.

3- Prepare a room and a patient for MRI scanning.

4- Select sequence parameters and factors for choice of slice level.

5- Differentiate different types of MRI images.

6- Identify basic anatomy and pathology on images.

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)

- Computer lab with at least 30 computers with internet access.
- Library with enough references to all students.
- Two hours per week as library time for students.

C. Course Description:

Week No.	Item / Unit	Contact hours
1	Introduction. (Definition of MRI)	4
2	Essential components of MRI apparatus and suite magnets and coils.	8
1	Magnetic Resonance: Intrinsic and extrinsic factors modulating magnetic resonance movements field,larmor resonance MRI signal.	4
1	Longitudinal and transverse magnetization free induction decay. Use of impulses relaxation times and tissue characteristics.	4
1	Spin echo signal TR and TE repetition times	4
1	Formation of image. RF signal gradient field and acquisition. Signal intensity factors governing.	4
1	Saturation recovery sequence and inversion recovery sequence.	4
	Mid - semester exam	----------
	vacation	………..
2	Technique of scanning selection of sequence parameters slice level and width.	8
1	Gradient écho sequences.	4
1	Signal/ Noise.	4
1	Artifacts.	4
1	Contrast agents: uses and indications	4
1	Overview: CT and MRI comparison.	4
	Practical examination	--------
	Final examinations	--------

2 Course components (total contact hours per semester):

Lecture:	Tutorial:	Laboratory	Practical/Field work/Internship	Other:
15			45	

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)

3 hours weekly for the home work

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

- To introduce the students into the basic concepts principles and techniques of MRI, as well as its comparison with other imaging modalities.
- Equipment component and functions of each.
- The formation of an MRI image, magnetization and signal relaxation time.
- Preparation of room and patients.
- The technique of scanning, selection of sequence parameters.

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

- Theoretical Lectures.
- Tutorials.
- Assignment.
- Quizzes.
- Hospital practice.

(iii) Methods of assessment of knowledge acquired

- Quizzes.
- Tutorials.

b. Cognitive Skills

(i) Description of cognitive skills to be developed

1- Identify the various components of an MRI equipment and explain the functions of each component.

2- Explain the various basic parameters and terminologies used during MRI scanning.

3- Prepare a room and a patient for MRI scanning.

4- Select sequence parameters and factors for choice of slice level.

5- Differentiate different types of MRI images.

6- Identify basic anatomy and pathology on images.

(ii) Teaching strategies to be used to develop these cognitive skills.

a. Theoretical Lectures.
b. Tutorials.
c. Assignment.

(iii) Methods of assessment of students cognitive skills :

1- in class short MCQs quizzes

2- Practical exam.

c. Interpersonal Skills and Responsibility

(i) Description of the interpersonal skills and capacity to carry responsibility to be developed

- Care of equipment.
- Care of patient.
- General treatment with his colleques.

(ii) Teaching strategies to be used to develop these skills and abilities

- Practical sessions.

(iii) Methods of assessment of students interpersonal skills and capacity to carry responsibility

- Practical exams.

d. Communication, Information Technology and Numerical Skills

(i) Description of the skills to be developed in this domain.

1- Ability to deal with MRI machines.

2- Ability to deal with computer.

(ii) Teaching strategies to be used to develop these skills

- Computer applications.
- Practical applications.

(iii) Methods of assessment of students numerical and communication skills

e. Psychomotor Skills (if applicable)

(i) Description of the psychomotor skills to be developed and the level of performance required

- Ability to have good observation during the practical sessions.

(ii) Teaching strategies to be used to develop these skills

Practical sessions

(iii) Methods of assessment of students psychomotor skills

Practical exam.

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	- One theoretical examinations.	6	20%
2	- One theoretical examinations.	11	20%
3	- Assignment.	13	10%
4	- Final examination.	17	50%

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)

- 4 hours/ week in the office for academic advices.

E Learning Resources

1. Required Text(s)
- MR made easy.
- Radiologic Science for Technologists.
- Step by Step MRI
- Computed Body Tomography with MRI Correlation.
- Cross-sectional Imaging Made Easy.
- *Physical Principles of Medical Imaging, 2nd. Edition*

2. Essential References
- Radiologic Science for Technologists.
- Step by Step MRI.
- Basic physics of MRI.

3- Recommended Books and Reference Material (Journals, Reports, etc) (Attach List)

4-.Electronic Materials, Web Sites

- http://www.radiologyinfo.org/.

- http://www.Body MRI.

- http://www.The basic of MRI.

- http://www.basic physic of MRI

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.)

- Lecture room with 30 seats.
- Audiovisual aids.
- MRI department.

2. Computing resources

- Desktop computers.

3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list)

None

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching

- Questionnaire will be given to the students at the end of the course.
- Other teachers opinion in the field.
- Continuous evaluation.

2 Other Strategies for Evaluation of Teaching by the Instructor or by the Department

- Departmental council discussion of student's results.
- Workshop.

3 Processes for Improvement of Teaching

- Review of teaching strategies.
- Monitoring of teaching activities by senior faculty member.
- Teaching Staff training.

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)

Conducting standard exams such as American college of radiology or others

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- The course material and learning outcomes are periodically reviewed and the change are approved by the department
- Workshop.
- Opinion of other teachers in other Universities.
- Comparison of other courses in other Universities..