

T6. Course Specification (CS)

| | | | |
|--------------------|--|------|------------|
| Institution | Najran University | Date | 29-04-2018 |
| College/Department | College of Art and Science / Mathematical Department | | |

A. Course Identification and General Information :

| | | | |
|--|-------------------------------------|------------------|----|
| 1. Course title and code : | | | |
| The principles of logic and modern algebra (145 Math.-3) | | | |
| 2. Credit hours: 3 | | | |
| 3. Program(s) in which the course is offered. | | | |
| B.Sc. in Mathematics | | | |
| 4. Name of faculty member responsible for the course : | | | |
| Dr. Akram A. M. Naji | | | |
| 5. Level/year at which this course is offered : | | | |
| Level Four / 2 nd year | | | |
| 6. Pre-requisites for this course (if any) : | | | |
| none | | | |
| 7. Co-requisites for this course (if any): | | | |
| none | | | |
| 8. Location if not on main campus : | | | |
| Faculty of science and arts - Najran (Male and Female) | | | |
| Faculty of science and arts - Sharwrah (Male and Female) | | | |
| 9. Mode of Instruction (mark all that apply): | | | |
| a. Traditional classroom | <input checked="" type="checkbox"/> | What percentage? | 90 |
| b. Blended (traditional and online) | <input type="checkbox"/> | What percentage? | |
| c. e-learning | <input checked="" type="checkbox"/> | What percentage? | 10 |
| d. Correspondence | <input type="checkbox"/> | What percentage? | |
| f. Other طرق أخرى | <input type="checkbox"/> | What percentage? | |
| Comments : | | | |

B. Objectives الأهداف

| |
|--|
| 1. What is the main purpose for this course? Acquisition student background on the The principles of logic and modern algebra Students are expected to have strong and sound understanding of logical thinking and modern algebra in term of its concepts, techniques and theorems. Students will deal with abstract proofs based on these theorems and concepts. |
| 2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) <ul style="list-style-type: none"> - Review the syllabus, references and teaching strategies periodically. - Self-study (lecture videos) - Online Books and Lecture Notes - Sites of Exams for Logical courses - Blackboard (eLearning) |

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

| |
|---|
| Course Description : This course is designed to cover topics in Basic mathematical logic, Methods of proof, Basics of set theory, Relations, mappings (functions), binary operations, Algebraic systems, groups, rings, fields, and A basis for other mathematical courses. |
|---|

| 1. Topics to be Covered : | | |
|---|--------------|---------------|
| List of Topics | No. of Weeks | Contact Hours |
| <ul style="list-style-type: none"> - The Propositional Calculus (Propositional Connectives, Compound Propositions, Truth Tables, Tautologies and Contradictions) - Predicate Calculus | 3 | 9 |
| <ul style="list-style-type: none"> - Sets (Types of Numerical Sets and its Main Characteristics, and Algebra of sets) and their Operations | 2 | 6 |

| | | |
|---|---|---|
| - Proof Methods (Direct Proof, Proof by: Contrapositives, Contradiction, and Counterexample, and Mathematical Induction) | 3 | 9 |
| - Relations (Cartesian Product of Sets and its Properties, Definition of Relations, Operation on Relations) - Equivalence Relations and Partitions - Order Relations | 2 | 6 |
| - Mappings (Functions), Type of Mappings, and Composition of Mappings | 2 | 6 |
| - Binary Operations , and Algebraic systems | 1 | 3 |
| - Groups | 1 | 3 |
| - Rings and Fields | 1 | 3 |

1.Course components (total contact hours and credits per semester):

| | Lecture | Tutorial | Laboratory or studio | Practical | Other: | Total |
|---------------|---------|----------|----------------------|-----------|--------|-------|
| Contact Hours | 45 | | | | | 45 |
| Credit | 3 | | | | | 3 |

3-Additional private study/learning hours expected for students per week

12

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy.

| Code # | NQF Learning Domains And Course Learning Outcomes | Course Teaching Strategies | Course Assessment Methods |
|------------|---|--|-----------------------------|
| 1.0 | Knowledge (By the end of the semester, the students will be able to) | | |
| 1.1 | - Define the basic concepts of the principles of logic. | Lecture Cooperative learning Problem solving Brain storming Self-Learning eLearning | Midterm Exams Final Exam |
| 1.2 | - State different Proof Methods. | | |
| 1.3 | - Define the concepts of the Modern Algebra as (Relations, Mappings, Sets and their properties, binary operations, and algebraic Systems) | | |
| 2.0 | Cognitive Skills | | |
| 2.1 | - Determinate whether two statements are logically equivalent, and the converse, inverse and contrapositive of a conditional statement. | | |
| 2.2 | - Generate proofs of theorems and mathematics problem by using the adequate proof method. | | |
| 2.3 | - Show a given Relation, Mapping, or algebraic system that its kind or type with its mathematics properties. | | |
| 3.0 | Interpersonal Skills & Responsibility (By the end of the semester, the students will be able to) | | |
| 3.1 | Not applicable | | |
| 3.2 | | | |
| | | | |
| 4.0 | Communication, Information Technology, Numerical (By the end of the semester, the students will be able to) | | |
| 4.1 | Not applicable | | |
| 4.2 | | | |
| 5.0 | Psychomotor | | |
| 5.1 | Not applicable | | |

| 5. Schedule of Assessment Tasks for Students During the Semester | | | |
|--|--|------------------------|--------------------------------|
| | Assessment task (e.g. essay, test, Quizzes, group project, examination, speech, oral presentation, etc.) | Week Due | Proportion of Total Assessment |
| 1 | Midterm exams I | Fifth week | 25 |
| 2 | Midterm exams II | Eleventh week | 25 |
| 3 | Final exam | Eighteenth week | 50 |

D. Student Academic Counseling and Support :

| |
|---|
| <p>1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week):</p> <ul style="list-style-type: none"> - Action of faculty members for advice and guidance of a student's academic. - Office hours 10hr/ week. - Follow-up of the academic advisor. |
|---|

E. Learning Resources :

| |
|---|
| <p>1. List Required Textbooks :</p> <ul style="list-style-type: none"> - السلطان ، سلمان – المدخل الى البنى الجبرية – الرياض – منشورات جامعة الملك سعود – 1993. - معروف سمحان ، فدوى أبو مريفة – أسس الرياضيات – الرياض – منشورات جامعة الملك سعود – 2006. |
| <p>2. List Essential References Materials (Journals, Reports, etc.)</p> <ul style="list-style-type: none"> - John B.Fraleigh, A first Course in Abstract algebra , fourth edition . New York 1989 |
| <p>3 List Recommended Textbooks and Reference Material (Journals, Reports, etc)</p> <ul style="list-style-type: none"> - K. H. Rosen, Discrete Mathematics and its Applications, McGraw-Hill, 5th Edition (2004). - Richard Johnsonburg, Discrete Mathematics, Prentice Hall, 6th Edition (2004). - K. Devlin, Sets, Functions and Logic, Chapman and Hall, (1995). - S. S. Epp, Discrete Mathematics with Applications, PWS-Cant Pub. Co., 1990. - L. Lesniak, Discrete Structures, Logic, and Computability, Jones and Bartlett Publishers, (2002). - I. N. Herstein, Topics in Algebra, John Wiley and Sons, 1975 |

4. List Electronic Materials Web Sites, Facebook, Twitter, etc.

[http://en.wikipedia.org/wiki/Field_\(mathematics\)](http://en.wikipedia.org/wiki/Field_(mathematics))
<http://www.arab-math.com/forum/forumdisplay.php?f=7>
<http://en.wikipedia.org/wiki/Mathematics>

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F. Facilities Required:

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)

- Classrooms number of seats = 30 seat
- Rooms equipped with modern teaching techniques and different display devices.

2. Computing resources (AV, data show, Smart Board, software, etc.)

- Data Show
- Smartboard

3. Other resources (specify, e.g. 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

- Distribute questionnaires to students at the end of the semester to get a special assessment for the course.
- Interview a sample of students enrolled in the course to take their views.
- Follow-up over the performance of the students interact with the course through attendance and tests.

2. Other Strategies for Evaluation of Teaching by the Instructor or by the department.

| |
|---|
| <ul style="list-style-type: none"> • Presentation of the results of a sample of students on an external reviewer. • Qualitative analysis of the results of the students. |
| <p>3. Processes for Improvement of Teaching:</p> <ul style="list-style-type: none"> • Training programs and workshops for faculty members on the most important teaching methods based around the learner. • Self-assessment by Professor article. • Creating the right atmosphere for students through social programs, entertainment, and so on. • Upgrading of the relationship between professor and student to be a human relationship. • Follow the new teaching strategies. |
| <p>4. Processes for Verifying Standards of Student Achievement (e.g. 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)</p> <ul style="list-style-type: none"> • Check and correct sample of student work by faculty members are independent. • Exchange periodically to correct or sample tests with a faculty member of the same specialty in other faculties. • A special committee as determined by management college at the end of each semester. |
| <p>5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement :</p> <ul style="list-style-type: none"> • Periodic meetings with outstanding students to see the positive and negative aspects in the course. • Comparison with similar courses in the corresponding faculties of other universities. • Update the sources of learning of the course to make sure to keep abreast of developments in the field. • Statistical results to assess the students' course and to benefit from its results in the improvement and development of the course. |

Name of instructor: **Dr. Akram A. M. Naji** Signature : _____

Date Report Completed: **30-04-2018**

Name of field experience teaching staff: _____

Program coordinator: **Dr. Hamoud Alhadad**

Signature: _____ Date received: _____