

المركز الوطني للتقويم والاعتماد الأكاديمي

**National Center for Academic Accreditation and Evaluation**

### ATTACHMENT 5.

**T6. COURSE SPECIFICATIONS**

**(CS)**

**Course Specifications**

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| Institution: **King Saud University** | Date: 11/12/2017 |
| College/Department : **College of Sciences/Chemistry Department** | |

**A. Course Identification and General Information**

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| 1. Course title and code: **Inorganic Reactions Mechanism (CHEM 423)** |
| 2. Credit hours: **3** (2 lectures + 0 lab+1 tutorial) |
| 3. Program(s) in which the course is offered.  (If general elective available in many programs indicate this rather than list programs)  **Chemistry** |
| 4. Name of faculty member responsible for the course  **Dr. Ali Alsalme** |
| 5. Level/year at which this course is offered:  **7th level/fourth year** |
| 6. Pre-requisites for this course (if any):  **CHEM. 101, CHEM. 107, CHEM. 321** |
| 7. Co-requisites for this course (if any): |
| 8. Location if not on main campus: |
| 9. Mode of Instruction (mark all that apply):  Yes  100 %  a. traditional classroom What percentage?  b. blended (traditional and online) What percentage?  c. e-learning What percentage?  d. correspondence What percentage?  f. other What percentage?  Comments: |

**B Objectives**

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| 1. What is the main purpose for this course?  **Introduction to inorganic reaction mechanism**, **Nucleophilic substitution reactions in square planar at four coordination sites, Bioinorganic chemistry includes: Non red-ox metallic enzymes, Oxygen carriers and the weight oxygen proteins, proteins of the hemoglobin. Nitrogen fixation and sulphur, iron proteins, heavy metal ion storage.** |

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| 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)  **Students must be supplied with the appropriate Lists of the necessary text books , periodicals, Internet sites computer based programs and CDs.** |

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

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| Course Description: |

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| 1. Topics to be Covered | | |
| List of Topics | No. of  Weeks | Contact hours |
| **Introduction to inorganic reaction mechanism** | **2** | **6** |
| **Soft and hard acids and base,** | **2** | **6** |
| **Nucleophilic substitution reactions in square at four coordination site** | **2** | **6** |
| **Mechanism of oxidation-Reduction reactions** | **3** | **9** |
| **Bio-inorganic chemistry includes: Non red-ox metallic enzymes** | **1** | **3** |
| **Oxygen carriers and the weight oxygen proteins, proteins of the hemoglobin. Nitrogen fixation and sulphur, iron proteins, heavy metal ion storage.** | **2** | **6** |
| **Metals and non-meals in medicine and biological system** | **2** | **6** |

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| 2. Course components (total contact hours and credits per semester): | | | | | | | |
|  | | Lecture | Tutorial | Laboratory/  Studio | Practical | Other: | Total |
| Contact  Hours | Planed | **28** | **14** | **--** | **--** | **--** | **42** |
| Actual | **2** | **1** | **--** | **--** | **--** | **3** |
| Credit | Planed | **28** | **14** | **--** | **--** | **--** | **42** |
| Actual | **2** | **1** | **--** | **--** | **--** | **3** |

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| 3. Additional private study/learning hours expected for students per week.  2 |

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| 4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy | | | |
| **On the table below are the five NQF Learning Domains, numbered in the left column.**  **First**, insert the suitable and measurable course learning outcomes required in the appropriate learning domains (see suggestions below the table). **Second**, insert supporting teaching strategies that fit and align with the assessment methods and intended learning outcomes. **Third**, insert appropriate assessment methods that accurately measure and evaluate the learning outcome. Each course learning outcomes, assessment method, and teaching strategy ought to reasonably fit and flow together as an integrated learning and teaching process. (Courses are not required to include learning outcomes from each domain.) | | | |
| **Code**  **#** | **NQF Learning Domains**  **And Course Learning Outcomes** | **Course Teaching**  **Strategies** | **Course Assessment**  **Methods** |
| **1.0** | **Knowledge** | | |
| 1.1 | Define the basic mathematical skills related to this course. | In class lecturing where current topics are interrelated the past and future topics. Basic principles, instrumental design and application of each technique are discussed with students. | In-class quizzes, majors and final exams  Homework assignments |
| 1.2 | Recall the ability to plot the different kinds of equations involved in this course |
| 1.3 | Recognize the suitable experimental methods for following a chemical reaction. |
| 1.4 | Recognize the mathematical derivation skills of the student. |
| **2.0** | **Cognitive Skills** | | |
| 2.1 | Reconstruct thinking during lectures by giving some pop questions. | In-class quizzes. | Homework assignments |
| 2.2 | Interpret the related slides obtained from the net | Performance in discussions during lectures | In-class quizzes |
| 2.3 | Evaluate homework assignments. | Homework assignments on problem solving |  |
| 2.4 | Prepare In-class short exams. | Enhance students thinking by In-class short exams and discussions | Major and final exams |
| **3.0** | **Interpersonal Skills & Responsibility** | | |
| 3.1 | Demonstrate how students can work effectively individually and in teams in classroom. | Working independently and in groups towards some case studies. Collect literature reports, summarize, analyse and interpret the main findings. | Individual performance within a group |
| 3.2 | Involving students in group discussions | Manage resources, time and other members of the group | In-class problems solving. |
| 3.3 | Group and individual assignments | Communicate results of work to others through written reports and oral presentations. | Individual performance during lectures. |
| **4.0** | **Communication, Information Technology, Numerical** | | |
| 4.1 | Read, evaluate, and interpret numerical, chemical and general scientific information. | Homework assignments | Performance in the problem solving assigned in the homework |
| 4.2 | Demonstrate oral communication skills, especially the ability to transmit complex technical information in a clear and concise manner. | Usage of computer and chemistry software packages in demonstrating chemistry applications | Performance in the problem solving assigned in the homework |
| 4.3 | The ability to use computers for chemical simulation and computation, and database usage. | In-class exams | Quizzes |
| 4.4 | The ability to search and use the chemical literature in both printed and electronic formats. | Usage of computer and chemical software packages for kinetic chemistry applications | Quizzes |
| **5.0** | **Psychomotor** | | |
| 5.1 | Not applicable | Not applicable | Not applicable |

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| 5. Schedule of Assessment Tasks for Students During the Semester | | | |
|  | Assessment task (i.e., essay, test, quizzes, group project, examination, speech, oral presentation, etc.) | Week Due | Proportion of Total Assessment |
| 1 | **Class activities (in-class quizzes and discussions)** | **Weekly** | **5 %** |
| 2 | **Homework** | **3-6** | **5 %** |
| 3 | **Major Exam I** | **Week 6** | **25 %** |
| 4 | **Major Exam II** | **Week 12** | **25 %** |
| 5 | **Final Exam** | **Week 16** | **40 %** |
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**D. Student Academic Counseling and Support**

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| 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)   * **Office hours (6 hours per week + appointments )** * **Help session (problem solving): On request (tutorials are added in the new course)** |

**E Learning Resources**

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| 1. List Required Textbooks  **Mechanism of Inorg. Reactions by R. Person and F. Basalo (Wiley)**  **Mechanism of Inorg. Reactions in solutions by D. Benson (Mc. Graw Hill)** |
| 2. List Essential References Materials (Journals, Reports, etc.)  **Any reference dedicated to Inorganic Chemistry.** |
| 3. List Electronic Materials, Web Sites, Facebook, Twitter, etc.  **Any web site dedicated to Inorganic Chemistry available on the internet** |
| 4. Other learning material such as computer-based programs/CD, professional standards or regulations and software.  **Power point presentations and other handouts posted on the WebCT for the students enrolled in the course.** |

**F. Facilities Required**

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| 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.)   * **A classroom with 20 seats** |
| 2. Technology resources (AV, data show, Smart Board, software, etc.)   * **Computer lab containing at least 20 computer sets.** |
| 3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) |

**G Course Evaluation and Improvement Processes**

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| 1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching   * **Course evaluation by students** * **Faculty – students general gathering** |
| 2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department   * **Peer consultation on teaching** * **Departmental council discussions** * **Discussions with the group of faculty teaching both the lab and lecture portions of the course.** |
| 3. Processes for Improvement of Teaching   * **Conducting workshops presented by experts on the teaching methodologies** * **Periodical departmental revisions on its methods of teaching** * **Monitoring of teaching activities by senior faculty members** |
| 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)   * **Providing samples of all kind of assessment in the departmental course portfolio of the course** * **Assigning group of faculty members teaching the same course to grade same questions for various students. Faculty from other institutions are invited to review the accuracy of the grading policy** |
| 5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.   * **The course material and learning outcome are periodically reviewed and the changes to be taken are in the departmental and higher councils.** |

Name of Course Instructor: \_\_\_**\_ Dr. Ali Alsalme** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date Specification Completed: \_\_\_11/12/2017\_\_\_\_\_\_\_\_\_

Program Coordinator: \_\_Dr. Fahad Alharthi\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date Received: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_