**Course Specification**

*For Guidance on the completion of this template, please refer to of Handbook 2 Internal Quality Assurance Arrangements*

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| Institution **King Saud University** |
| College/Department **College of Architecture & Planning / Dept. of Architecture & Building Sciences** |

# A Course Identification and General Information

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| 1. Course title and code: **ARCH414 Statics and Strength of Materials** |
| 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)  **Undergraduate Program in Architecture** |
| 4. Name of faculty member responsible for the course  **Dr. Hussam Alghamdi** |
| 5. Level/year at which this course is offered **1st semester-4th year (Level 7)** |
| 6. Pre-requisites for this course (if any) **Phys105: Physics (1)** |
| 7. Co-requisites for this course (if any) |
| 8. Location if not on main campus |

**B Objectives**

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| 1. Summary of the main learning outcomes for students enrolled in the course.    * **To develop the thought process and discipline of the students to enable them to systematically solve problems regardless of difficulty.**    * **Students should be able to develop confidence and competence.** |
| *7*2*B* . 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)   * **Update the knowledge by focusing on current research and methods.** * **Modelling of structures by using computers to see their behaviors.** * **Encourage the students to visit e-library and e-learning related to books**. |

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

Principles of mechanics force systems, equilibrium structures, distributed forces, centroids and friction. Prereq: phis 105

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| 1 Topics to be Covered | | |
| Topic | No of Weeks | Contac thours |
| **Course introduction, Master the mechanics of vector Algebra.** | **2** |  |
| **Physical meaning of a force and moment equilibrium to ensure equilibrium for structures.** | **5** |  |
| **Concepts related to drawing a complete and correct Free Body diagram of forces and moment for the structure.** | **1** |  |
| **Method of Joints and method of Sections for the analysis of trusses.** | **2** |  |
| **Concept of Friction, Reaction forces and drawing Shear and Moment diagrams.** | 4 |  |

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| 2 Course components (total contact hours per semester): 45 | | | |
| Lecture: 30 | Tutorial: 12 | Practical/Fieldwork/Internship:  3 | Other:  ---- |

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| 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)  **6 Hours per week** |

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| 1. 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;      1. **Understand Concept related to structural modeling.**      2. **Ability to solve modeled structure by applying the principles of mechanics**   **.**A description of the teaching strategies to be used in the course to develop that knowledge or skill;  **-Be over-prepared rather than underprepared.**  **-Class room communication**  **-Use three R’s --- Repeat Respond Reinforce**   * The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.   **Project, Homework, Surprise Quizzes and Exams** |
| **a. Knowledge** |
| 1. Description of the knowledge to be acquired    * **Familiarizing the student with the behavior and response of the structures using principles of statics.**    * **Should be able to Model a Structure** |

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| * **Modeling of the structure** * **Enabling a student to take up a project of a structure** |
| 1. Teaching strategies to be used to develop that knowledge    * **Classroom communication, (communication is more than talking and Lecturing, eye contact, physical gesture, use of proper digital media etc.**    * **Group discussions**    * **Encouraging the student to solve the problems in class room sometimes at the writing board.** |
| 1. Methods of assessment of knowledge acquired    * **Student’s Attendance**    * **Student’s attention towards Lecture.**    * **Maintaining of lecture notes**    * **Surprise quizzes, Home works and exams** |
| **b. Cognitive Skills** |
| 1. Cognitive skills to be developed    * **Need to develop concentration and paying attention.**    * **Perception of the structural behaviors ( to get a clear picture of the structure ).**    * **Memory development to recall the past experience of structural behavior.**    * **Logical and analytical thinking.** |
| 1. Teaching strategies to be used to develop these cognitive skills    * **Need to develop ability to concentrate and attend to the task for a prolonged period of time by Lecturing and explanations of the material.**    * **Need to make them visualize the past experience to percept the material taught by discussions.**    * **Develop the ability to note the physical features of a given stimuli to be able to recognize at a later time.** |
| 1. Methods of assessment of students cognitive skills   **Assess one’s attention, perception and memory by**   * + **Conducting simple tests and questionnaire**   + **Class room discussion participation**   + **Home works and projects submission in time**   + **Mid-term exams, Quizzes and Final exam.** |
| **c. Interpersonal Skills and Responsibility** |

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| (i) Description of the interpersonal skills and capacity to carry responsibility to be developed  Interpersonal skill involves active listening and tone of voice, delegation of leadership. How well you can communicate with students and how well you behave or carry yourself. |
| 1. Teaching strategies to be used to develop these skills and abilities    * Expose respect to others.    * Develop the ability to interact with the students.    * Teach time management    * Teach to develop ethical behavior    * Team work |
| 1. Methods of assessment of students interpersonal skills and capacity to carry responsibility    * Assessment can be done by seeing one’s general control, the feelings that emerge in difficult situations and respond appropriately, instead of being overwhelmed by emotions.    * Overall Students academic performance. |
| **d. Communication, Information Technology and Numerical Skills** |
| 1. Description of the skills to be developed in this domain.    * Use of e-journal to probe into modern structures.    * Web based video Lectures.    * Use of power point, data show and smart boards etc to ease understand the subject. |
| 1. Teaching strategies to be used to develop these skills    * Demonstrations, explanations clearly made to understand the subject.    * Encourage the students to reach perfection.    * Encourage self study and self evaluation.    * Teacher is a model to students. |
| 1. Methods of assessment of students numerical and communication skills    * Incitement and provocation of students.    * Given chance to genius students to lead the team.    * Extra grades and verbal encouragement. |
| **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 |

# Student Support

1. Arrangements for availability of faculty for individual student consultations and academic advice. (include amount of time faculty are available each week)

**3 Hours / Week / Course**

***E Learning Resources***

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| 1. Required Text(s)  J. L. Meriam, L. G. Kraig “ Engineering Mechanics (Static) eighth edition. SI version |
| 2. Essential References |
| 1. Recommended Books and Reference Material (Journals, Reports, etc) (Attach List)    * **J.L. Meriam and L.G. Kraige, Engineering Mechanics: Statics, Sixth Edition**    * **RC Hibbeler (2010). Engineering Mechanics, Statics, Twelfth Edition**    * **Alexander and Gunaskera J.S, Strength of Materials , Ellis Horwood Limited**   **,1984.**   * + **Suter, Bowels / Russel . Mechanics of Engineering Materials ,1986.**   + **Meriam JL. (1998). Engineering Mechanics, (Vol 1.)**   + **Lioud, J.D . (1998). Architecture and the Environment, Laurence King** |
| 4-.Electronic Materials, Web Sites etc [http://www.Wiley.com/college/meriam.](http://www.Wiley.com/college/meriam) |
| 5- Other learning material such as computer-based programs/CD, professional standards/regulations  Web based video Lectures |

# F. Facilities Required

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| 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.)  Need better maintenance of laboratories and smart classroom accessories. ( smart boards, overhead projectors etc.) |
| 2. Computing resources  Need functioning LAN and WI-FI network system to smart class rooms. |
| 1. Other resources (specify --e.g. If specific laboratory equipment is required, list requirements or attach list)    * Furnished laboratories with skilled manpower ( Lab assistants etc.)    * Supply of testing materials and models. |

**G Course Evaluation and Improvement Processes**

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| 1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching   * Evaluation of course by students at the end of each semester * Periodical open discussion |
| 2 Other Strategies for Evaluation of Teaching by the Instructor or by the Department Open teacher-student and student-administration discussion sessions |
| 3 Processes for Improvement of Teaching   1. Arrangement of Training Courses 2. Arrangement of workshops 3. Discussion with Colleagues to improve the system of teaching |
| 1. Processes for Verifying Standards of Student Achievement (eg. check marking by an independent faculty member of a sample of student work, periodic exchange and remarking of a sample of assignments with a faculty member in another institution)    1. Proper correction of Home works and exams with distribution of correct solution.    2. Students are made to compare their solutions with better student’s solutions. |
| 5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.   1. Need to update always by comparing the improvements in other good ranking Institutions of the world. 2. Need to compare with the past results and outcomes and improve the drawbacks accordingly. |