Course Specifications

Kingdom of Saudi Arabia
The National Commission for Academic Accreditation & Assessment

Course Specifications
(CS)

ENG 201 Engineering Drawing

March 2013
Course Specification

<table>
<thead>
<tr>
<th>Institution</th>
<th>University of Tabuk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faculty</td>
<td>Faculty of Engineering</td>
</tr>
<tr>
<td>Program</td>
<td>Mechanical Engineering</td>
</tr>
<tr>
<td>Department</td>
<td>Department of Mechanical Engineering</td>
</tr>
</tbody>
</table>

**A. Course Identification and General Information**

1. **Course title:** Engineering Drawing  
   **Course Code:** ENG 201

2. **Credit hours:** 3  
   **Lecture:** 2  
   **Lab:** 3  
   **Tutorial:** 0  
   **Total:** 5

3. Program(s) in which the course is offered: Mechanical Engineering

4. Name of faculty member responsible for the course: **Dr. Muwaffag Suleiman Tarawneh**

5. Level/year at which this course is offered: **Fifth Level**

6. Pre-requisites for this course (if any): **Non**

7. Co-requisites for this course (if any): **Non**

8. Location: main campus
B Objectives

1. Summary of the main learning outcomes for students enrolled in the course.
2. Understand and appreciate the importance of basic concepts and principles of Engineering Drawing (components, sections, views, and graphical representation)
3. Develop and improve the spatial visualization skills, Apply the four key principles which are accuracy, speed, neatness, and time management
4. Realize and appreciate the importance of engineering drawings as a medium of communication to convey ideas in engineering fields.
5. Enable the students with various concepts like dimensioning, conventions and standards related to working drawings in order to become professionally efficient
6. Making the student able to draw lettering technically and by freehand.
7. Equip students with basic skills required in engineering drawings,
8. Develop the ability to communicate with others through the language of technical drawing and sketching. And the ability to read and interpret engineering drawings created by others.
9. Students will be able to draw orthographic projections and sections.
10. Develop an understanding for size specification procedures and use of SI and traditional units of linear measure

11. Briefly describe any plans for developing and improving the course that are being implemented.
   - The course content must be reviewed, evaluated and modified on regular time interval.
   - Mini projects should be included (applications related to the subject
   - An extensive use of latest soft wares should be applied.
   - One lecture per month should be planned to discuss latest contributions in the field of research.

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

<table>
<thead>
<tr>
<th>List of Topics</th>
<th>No of Weeks</th>
<th>Contact hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Introduction to Engineering Graphics</strong>: The design process, the role of the designer, design documentation, types of drawings, the engineering profession, design communication, examples</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td><strong>Basic Drafting and Lettering</strong>: Manual drafting tools, drawing board, T-square, compass, divider, triangles, protractor, drawing templates, French and flex curves, erasing shield, metric and engineering scales, pencil grade, pen sizes and line weights, line types, lettering and sketching, horizontal, vertical and inclined lines, parallel and perpendicular lines, circles and arcs, text in engineering drawings, lettering guidelines</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td><strong>Sketching and Line Techniques</strong>: Sketching lines, types of sketches, sketching materials and graph papers, sketching rules, sketching straight lines, sketching circles, sketching ellipses, proportions in sketching, isometric sketching, orthographic sketching</td>
<td>3</td>
<td>15</td>
</tr>
<tr>
<td><strong>Geometric Construction</strong>: Basic geometric elements, triangles, quadrilaterals, polygons, circles and arcs, polyhedral, prisms, cylinders, cones, spheres, bisecting a line or a circular arc, bisecting an angle, transferring an angle, parallel and perpendicular lines, dividing lines, drawing triangles, tangent lines and tangent arcs, conic sections, ellipse, parabola, hyperbola</td>
<td>4</td>
<td>20</td>
</tr>
<tr>
<td><strong>Multi-view Drawings and orthographic projection</strong>: Views of an object, revolving an object, the six regular views, necessary views, two-view drawings, one-view drawings, hidden lines, center lines, alignment of views, meanings of lines, precedence of lines, projection methods, the glass box, folding lines, alternate positioning of views, partial views, revolution conventions, removed views, visualization, surfaces, edges and corners, adjacent areas, similar shapes of surfaces, dimensions and lettering</td>
<td>3</td>
<td>15</td>
</tr>
<tr>
<td><strong>Auxiliary Views</strong>: The auxiliary plane, auxiliary view classifications, uses of auxiliary views, hidden lines in auxiliary views, drawing simplification by auxiliary views, partial and half auxiliary views</td>
<td>1</td>
<td>5</td>
</tr>
</tbody>
</table>
2 Course components (total contact hours per semester): **80 Hrs** (16 weeks, **5 Hrs** per week)

<table>
<thead>
<tr>
<th>Lecture: 80</th>
<th>Tutorial: non</th>
<th>Laboratory non</th>
<th>Practical/Field work/Internship</th>
<th>Other: non</th>
</tr>
</thead>
</table>

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

Students are required to use the given notes and to prepare the next course prior to start the lecture consuming at least two hrs per week

4. Development of Learning Outcomes in Domains of Learning

For each of the domains of learning shown below indicate:

- Learn to take data and transform it into graphic drawings.
- Learn basic engineering drawing formats
- Prepare the student for future Engineering positions
- Increase ability to communicate with people through the language of technical drawing and sketching.
- Develop the ability to communicate with others
- Develop the ability to read and interpret engineering drawings created by others.
- Develop an understanding for size specification procedures and use of SI and traditional units of linear measure
- Emphasize freehand sketching to aid in the visualization process and to efficiently communicate ideas graphically
- Increase ability to understand the concepts of projection in engineering drawings,
- Read and interpret mechanical and structural engineering drawings

a. **Knowledge:**
### (i) Description of the knowledge to be acquired

- Ability to acquire and apply fundamental principles of science and engineering.
- Capability to communicate effectively.
- Acquisition of technical competence in specialized areas of engineering discipline.
- Ability to work effectively

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

Learning activities may include CAD programs and lectures, research projects, Individual assignments. Applying different software application and drawing animation.

### (iii) Methods of assessment of knowledge acquired

Evaluation is based on the class, homework and a written exam.

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### b. Cognitive Skills

#### (i) Description of cognitive skills to be developed

- The ability to Interpreting.
- The ability to Analyzing.
- The ability to Classifying
- The ability to Comparing and contrasting.
- The ability to Storing, manipulating, and retrieving information.
- The ability to Evaluating the reading materials.

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

1. Making connections between different concepts across the domains.
2. Assigning research questions that can be answered through collecting and analyzing data.
3. Class discussions.
4. Using the Internet to create learning activities.

#### (ii) Methods of assessment of students cognitive skills

Quizzes and Exams. As well as evaluating their class and homework assignments
c. Interpersonal Skills and Responsibility

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

1. Developing oral presentations
2. Communicating personal ideas and thoughts.
3. Responding to class discussions.

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

Workshops and training

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

Instructor’s observations

d. Communication, Information Technology and Numerical Skills

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

- The essential components of communication skills are based on developing critical skills, observation, and feedback.
- Encourage students to use online resources.

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

Groups discussion combined with team work

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

Implement oral presentations, technical report writing.

e. Psychomotor Skills (if applicable)
(i) Description of the psychomotor skills to be developed and the level of performance required

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

(iii) Methods of assessment of students psychomotor skills

5. Schedule of Assessment Tasks for Students During the Semester

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Assessment task (eg. essay, test, group project, examination etc.)</th>
<th>Week due</th>
<th>Proportion of Final Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Class activates (in class quizzes, and homework)</td>
<td>daily</td>
<td>10%</td>
</tr>
<tr>
<td>2</td>
<td>Class Discussions</td>
<td>daily</td>
<td>10%</td>
</tr>
<tr>
<td>3</td>
<td>Exams1, and 2</td>
<td>Week 8, and 12</td>
<td>40%</td>
</tr>
<tr>
<td>4</td>
<td>Final exam</td>
<td>Last week</td>
<td>40%</td>
</tr>
</tbody>
</table>

D. Student Support

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

   The faculty member has 8 hours per week for consultations and academic advice.

E Learning Resources

1. Required Text(s): technical drawing with engineering graphics 4th Ed.
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.)
   - Air-conditioned Drawing Labs (10 computers)

2. Computing resources
   - Internet connection and a website for each faculty member

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
   - A student-feedback form is distributed at the end of the course.

2 Other Strategies for Evaluation of Teaching by the Instructor or by the Department
<table>
<thead>
<tr>
<th>3 Processes for Improvement of Teaching</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developing the lectures periodically.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4. 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)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meetings are conducting for checking the grading of the exams</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Lecturers survey</td>
</tr>
<tr>
<td>2. Students survey</td>
</tr>
</tbody>
</table>
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 *Handbook 2 Internal Quality assurance Arrangements*.

These notes are intended to provide additional advice on particular items in the templates.

<table>
<thead>
<tr>
<th>Institution, College/Department</th>
<th>Show the name of the institution and the college or department principally responsible for the course.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. Course Identification and General Information</strong></td>
<td></td>
</tr>
<tr>
<td>1. Course title and code</td>
<td>Show the title and the institutional code number for the course.</td>
</tr>
<tr>
<td>2. Credit hours</td>
<td>Write the number of credit hours for the course.</td>
</tr>
<tr>
<td>3. Program(s) in which the course is offered</td>
<td>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.</td>
</tr>
<tr>
<td>4. Name of faculty member responsible for the course</td>
<td>If a single faculty member has been given responsibility for teaching and reporting on the delivery of a course that persons name should be given. If a team of faculty 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.</td>
</tr>
<tr>
<td>5. Level/year at which the course is offered</td>
<td>Show the year level when the course is intended to be taken.</td>
</tr>
<tr>
<td>6. Pre-requisites for this course</td>
<td>List any courses or other requirements that are prerequisites for enrolling in the course.</td>
</tr>
<tr>
<td>7. Co-requisites for this course</td>
<td>List any courses or other experiences that must be taken concurrently with this course.</td>
</tr>
<tr>
<td>8. Location if not on main campus</td>
<td>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.</td>
</tr>
</tbody>
</table>

| **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 expected 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 faculty 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 faculty 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 (e.g. 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. E.g. 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. E.g. 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. E.g. Workshops on teaching methods, review of recommended teaching strategies.

4. Processes for Verifying Standards of Student

Describe methods used to compare standards of achievement with standards achieved elsewhere. E.g. check marking of a sample of examination papers or
<table>
<thead>
<tr>
<th>Achievement</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>assignment tasks,</td>
<td></td>
</tr>
<tr>
<td>5. Action Planning for Improvement</td>
<td>Describe process for reviewing feedback on the quality of the course and planning for improvement</td>
</tr>
</tbody>
</table>