Quality Assurance and Accreditation Project (QAAP)  
Course Specifications: Numerical Analysis  
University: Fayoum  
Faculty: Engineering  
Department: Civil Engineering

Course Specifications
Programme(s) on which the course is given  
civil Engineering
Major or Minor element of programmes  
Major
Department offering the programme  
Mathematics and physics Engineering department
Department offering the course  
civil Engineering department
Academic year / Level  
second
Date of specification approval  
12/2007

A- Basic Information
Title:  
Numerical Analysis
Code: MTH201
Credit Hours:  
Lecture: 2
Tutorial:  
Practicals: 2  
Total: 4

B- Professional Information
1 – Overall Aims of Course
By the end of the course, the graduate should gain the following
1. Study matrices
2. Study eigenvalue problem, diagonalization and matrix function.
3. Solve of systems of linear and non linear equations
4. Interpolation of experiments.

2 – Intended Learning Outcomes of Course (ILOs)
By the end of the course, the student should be familiar with:

a- Knowledge and Understanding:
a1- Define different types of matrices

b- Intellectual Skills
B1- Find the eigenvalue and the eigenvector of the matrix.
B2- Find the inverse of the matrix.
B.3 Determine the rank of the matrix. Hence determine the type of solution of linear system of equations
B4- Solve a system of equation.

c- Professional and Practical Skills
The course enables the student, after graduation, to:
C1 - Solve non linear system of equations
C2 . Interpolate of experiments

d- General and Transferable Skills
D 1- Access data and information from the internet related to the course subjects.
D2- Able to promote new design and analysis techniques for linear and non linear systems.
D3- Cooperate with team.
3- Contents

<table>
<thead>
<tr>
<th>Topic</th>
<th>No. of hours</th>
<th>Lecture</th>
<th>Practical</th>
</tr>
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<tbody>
<tr>
<td>Matrices, Eigenvalue problem and Linear system of equations</td>
<td>20</td>
<td>10</td>
<td>10</td>
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<tr>
<td>Digitalization and matrix function</td>
<td>12</td>
<td>6</td>
<td>6</td>
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<tr>
<td>Curve fitting approximation</td>
<td>8</td>
<td>4</td>
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<tr>
<td>Solution of non linear system of equations</td>
<td>12</td>
<td>6</td>
<td>6</td>
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</table>

4- Teaching and Learning Methods

4.1- Lectures
4.2- Tutorial classes are given on the blackboard

5- Student Assessment Methods

5.1-Semester Work: to measure a1 & b1 to b4 & c1 to c2 and d1 to d3
5.2-Written exams: to measure a1 & b1 to b4 & c1 to c4.

Assessment Schedule

Assessment 1 Semester Work Week 3 to 13
Assessment 2 Final exam Week 14

Weighting of Assessments

<table>
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<tr>
<th>Assessment</th>
<th>%</th>
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<tbody>
<tr>
<td>Class exam</td>
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<tr>
<td>Mid-Term Examination</td>
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<tr>
<td>Final-term Examination</td>
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<td>Oral Examination</td>
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<td>Practical Examination</td>
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<tr>
<td>Semester Work (exam)</td>
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<td>Other types of assessment</td>
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<td>Total</td>
<td>100</td>
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</table>

Any formative only assessments

6- List of References

6.1- Course notes
N.A.
6.2- Required books (Text books)
N.A
6.3- Recommended books,
1- د مجدي الطويل "المصفوفات النظرية والتطبيق " دار الفتح للإعلان العربي. القاهرة
2- Numerical analysis dr abd El Latif Al Sedik
6.4- Periodicals, web sites, etc.
N.A.

7- Facilities Required for Teaching and Learning
   a) Computers
   b) black board
   c) Experimental facilities

Course Coordinator: Dr. Amany Mohammed Mohammed Attia

Head of Department: Prof. Dr. Magdy T. Hann

Date: 12/2007