College of Engineering Curriculum Committee (2006-07)
Final Report (4/15/2007)

Members	Term Expiring
Prof. Er-Wei Bai, Chair	May 2007
Prof. Michael Mackey	May 2008
Prof. David Rethwisch	May 2007
Prof. Athanasios Papanicolaou	May 2009
Prof. Ralph Stephens	May 2009
Dean Alec Scranton, *ex officio* nonvoting	
Nicole Heacock, student representative, nonvoting	May 2007

The Curriculum Committee met a total of 6 times and conducted a number of discussions electronically. The Charges provided by the EFC were divided among CC members to investigate and develop responses:

Assessing the effectiveness of global awareness seminars (Profs: Papanicolaou and Bai),
Reviewing of CARs (Prof Stephens and Ms. Heacock),
Monitoring the assessment of the math sequence (Profs Mackey and Scranton),
Investigating the CLEP policy differences (Profs Rethwisch and Scranton).

The description that follows summarizes the Charges, actions taken, and, where appropriate, recommendations to the EFC.

General Charge
The Curriculum Committee shall be responsible for reviewing and evaluating all existing and any proposed curricula within the college, for reviewing and evaluating all existing and any proposed courses taught within the college or required in any of its curricula, and for making appropriate recommendations to the dean and the faculty.

In addition to specific changes, at the requests of EFC, the Curriculum Committee appointed

Prof Charles Stanier as the new course coordinator for 59:009, Thermodynamics.
Prof Geb Thomas as the new course coordinator for 59:006, EPS II.

Specific Charges

1. *Consider the memorandum by Dean Butler dated Sept. 5, 2006, regarding change in credit for First-Year Engineering Seminar from 0 s.h. to 1 s.h. (Appendix A). Explore its impact on tuition, transfer students, etc. If appropriate, suggest a motion for adoption by the CoE faculty to the EFC by November 17, 2006.*

The following motion was passed unanimously on 11/07/2006 by the Committee and the EFC was informed on the same day.

Motion:
The College Curriculum Committee recommends the following motion for modification of the College of Engineering Curriculum:

"The Engineering Faculty Council makes a motion that the following revisions be made to the College of Engineering graduation requirements outlined in the document "The New Undergraduate Curriculum", adopted by the College of Engineering Faculty on June 15, 2001,

7^{th} line
"First-Year Engineering Seminar, 59:090 (0. s.h.)" be amended as follows "First-Year Engineering Seminar, 59:090 (~~0.~~ **1** s.h.)"

3^{rd} line from bottom
"They must take the balance of the 128 sh as specified by their specific programs." be amended as follows: "They must take the balance of the 128 sh as specified by their specific programs. **These 128 sh shall not include required seminar courses.**"

The document "The New Undergraduate Curriculum" is attached in Appendix A.

2. *Assess the effectiveness of the newly introduced global awareness lectures. If needed, recommend appropriate changes.*

Observations:

Totally eight lectures were scheduled for the 2006-2007 academic year. Five were offered in Fall 2006 semester, three have been offered in Spring 2007 and the last one will be on April 26, 2007. The speakers were invited from diversified fields with different background. Some were Iowa graduates and others were not. The lectures were structured and a detailed instruction was sent to every speaker on what should be covered emphasizing on preparing engineering students for global awareness.

For the seven seminars that have already been offered either in Macbride Hall or 1505SC, the room was about 1/3 full for two seminars, about ½ full for one seminar, 3/4 full for two seminars and completely full for the remaining two. There was a significant disparity in terms of attendance. The number of students attended in Sp 2007 was much smaller than that in Fall 2006. One possible reason was that some departments only require students to register just for one semester. Lack of communication to departments could also hurt.

Limited samples from 2 DEO's, a half dozen faculty members and a number of students all indicated that the lectures were well received in general and did provide a possible opportunity for the students to be exposed to the word and its culture, and the impact of engineering practice in the global community. Some speakers had however too much PR on the company.

There was no college-wide requirement for attendance.

Conclusion:

The purpose of the Global Awareness Lectures was to offer an opportunity for departments so each department can decide if some of lectures are appropriate for its students to attend in terms of enhancing the global awareness. For this purpose, the global awareness lecture was successful and should be continued.

Recommendations:

- The Committee felt that the global awareness lecture along with its assessment could be used for ABET purpose. However, there are some logistical steps involved. It is not logical and feasible to make every lecture required for every department. The issue needs more studies.
- Seminar schedule should be made available as early as possible, especially to the DEOs and departmental seminar organizers well in advance so some of the Global Awareness Lectures could be incorporated into departmental seminars if they choose to. Departments should provide their plans to the Associate Dean if they choose to attend some of lectures.
- Eight lectures in an academic do not seem sustainable. Four seems to be a right number.
- More lectures could be targeted for fall semesters and less for spring semesters because of possible attendance difference.
- When inviting speakers, advise them to limit times on PR.
- One possible assessment is to ask the students to write one page summary.
- The lectures could be open to non-engineering majors.

3. *Participate in the Professionalism, Ethics and Leadership in Engineering Education Initiative (PELEEI). Contribute as requested to the deliberations of the PELEEI task force.*

The Committee did not receive any request from the PELEEI task force.

4. *Review Course Activity Reports (CAR) for the College of Engineering core curriculum courses (59:xxx & non-college courses). Submit an evaluation to the Engineering Faculty Council (EFC) of how well the assessment process for the core is working. If the Curriculum Committee identifies specific problems that need addressing, either with the overall process or with individual courses, report these to the EFC.*

Observations:

Three of five 059 core course CAR forms were available for the 2006-07 academic year. CARs were available for 059:007 Statics, 059:008 Electrical Circuits, and 059:009 Thermodynamics. CARs were not available for 059:005 EPSI and 059:006 EPSII. The Dean's office was not able to get these missing CARs Also, some CARs were not available for both semesters where applicable.

Assessments of CARs by the course coordinator/instructor were very similar to those of previous years, i.e., did not address changes suggested from a previous CAR. However, all three completed CAR's indicated course goals were achieved and were consistent with results of previous years. The three courses that had CARs used different assessment procedures:

- Statics addressed mean exam/homework/reports
- Electrical Circuits did not have any quantitative assessment of exams.
- Thermodynamics examined a sample of eight test scores.

In Statics it was indicated that the average technical reports score was 93, the average homework score was 82 and the three exam score averages were 63, 68, and 56. Despite these significant differences, it was stated that these average scores clearly indicate course goals were achieved. Do they?

In Electric Circuits, it was suggested that ECE students take a different section than non ECE students due to ECE students' greater interest and course achievements.

CARs also noted the reduction of focus on computer software. The Electrical Circuits CAR noted that to adjust the pace of the course, less emphasis would be placed on teaching *PSpice* circuits analysis software. Other CARs referenced the EASY surveys with specific notes of lower EASY rankings for questions addressing student understanding of course-related computer software, such as *PSpice* and *Interactive Thermodynamics.*

Room 1505 SC had both positive (Thermo) and negative (Statics and Electrical Circuits) instructor comments. The negative comments involved computer/screens/blackboard problems and lack of a Tablet PC.

All three course CARs indicated sufficient TA support was provided.

No commentary was made on solution manuals available to students.

Conclusions:

Some faculty members are not doing a sufficient job in getting core course CARs to the dean's office. CARs that were submitted often did not address previous CAR recommendations. This could have a negative affect on ABET program accreditation. Room 1505 SC needs projection equipment improvement. Sufficient TA support was provided.

Recommendations:

- Improve the CAR response and have more focus on improvement of meeting course educational objectives.
- Maintain the current TA support.
- Improve the projection in 1505 SC. Contact teachers that recently used 1505 SC.
- Do not form a special section in Electrical Circuits for ECE students.
- Address the solution manual usage where applicable.
- Address lack of student training in use of software in each class. Perhaps discussion sections could be used for better software learning.

5. *In the spring semester, monitor the results of the ongoing assessment of the math sequence being performed by the College of Engineering Office of the Dean.*

The assessment of the math sequence was performed in accordance with the procedure established previously by the Curriculum Committee and the EFC. In this procedure, College of Engineering Faculty is surveyed regarding the students' demonstration of mathematical abilities in engineering courses. Faculty teaching selected engineering courses which require mathematical skills are polled regarding the "relevance to their course" and the "students' preparedness" in each math topic taught in the core mathematics sequence. The list of topics is provided in Appendix C, and the list of faculty who were polled is provided in Appendix D. A summary of the survey results is provided in Appendix E.

Observations:

The data indicate that the students are well prepared by the mathematics sequence with "preparedness" ratings from engineering professors typically averaging around four on a five point scale.

The preparedness ratings are uniformly high for the first three courses in the mathematic sequence (22m-031, 22m-032, 22m-033).

The lowest ratings for preparedness occur for 22m-034: Differential Equations (7 of the 16 topics have preparedness ratings of ~3.3 on a 5 point scale). These same topics had the lowest relevance ratings (below 2 on a 5 point scale). This result does not seem to indicate a problem, but the results for this course will continue to be monitored in the future.

Variations in relevance clearly exist, but arise from the specialized nature of the courses surveyed. A low relevance for a specific course does not mean that the topic is unimportant for engineers. We do not recommend that any of the mathematics topics be dropped from the curriculum.

Recommendations:

We recommend that the survey be performed each semester, and recommend no changes in the methodology.

6. *Investigate differences in CLEP policies between CoE and CLAS. If needed, recommend a course of action to the EFC.*

The following motion was passed unanimously by the Committee on 3/23/2007.

Motion:

The Engineering Faculty Council moves that the College of Engineering College Level Examination Program (CLEP) Credit policies be modified (as indicated by bold in the attachment in Appendix B) to include a total of eight exams for credit toward an engineering degree. The six exams not previously accepted for credit (shown in bold) have been added to the list because they have been designated by the College of Liberal Arts and Sciences as duplicative of courses that are accepted toward an engineering degree.

7. *Recommend specific charges for the 2007-08 Curriculum Committee.*

- Continuation of assessing the math sequence.
- Continuation of monitoring the CARs for core curriculum.
- Continuation of monitoring the global awareness lectures and development of a plan that will improve attendance.

Appendix A.

Motion to Faculty
(Adopted by the Curriculum Committee on 11/07/2006)

The College Curriculum Committee recommends the following motion for modification of the College of Engineering Curriculum:

"The Engineering Faculty Council makes a motion that the following revisions be made to the College of Engineering graduation requirements outlined in the document "The New Undergraduate Curriculum", adopted by the College of Engineering Faculty on June 15, 2001,

7th line
"First-Year Engineering Seminar, 59:090 (0. s.h.)" be amended as follows "First-Year Engineering Seminar, 59:090 (~~0.~~ **1** s.h.)"

3rd line from bottom
"They must take the balance of the 128 sh as specified by their specific programs." be amended as follows: "They must take the balance of the 128 sh as specified by their specific programs. **These 128 sh shall not include required seminar courses.**"

THE UNIVERSITY OF IOWA

MEMORANDUM

TO: Voting Faculty, College of Engineering

FROM: Anthony English, Secretary of the Faculty
Jasbir Arora, EFC Chair

DATE: June 15, 2001

RE: Results of Undergraduate Curriculum Ballot

The third ballot for the following motion was distributed to the voting faculty pursuant to the May 1, 2001 faculty meeting.

The College of Engineering Faculty adopts the undergraduate curriculum defined in the document, "The New Undergraduate Curriculum."

A total of 54 ballots were submitted. The result is as follows:

48 Yes 6 No

The motion has been adopted.

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College of Engineering

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The New Undergraduate Curriculum

To obtain the degree B.S. Engineering all students entering the B.S. Engineering program, on or after Fall 2002, must complete the following requirements.

- They must take the following courses from the College of Engineering common core:

  Engineering Problem Solving I-59:005 (3 s.h.)
  Engineering Problem Solving II-59:006 (3 sh)
  Rhetoric requirement that is the same as the current requirement (4sh)
  First-Year Engineering Seminar, 59:090 (0 s.h.)
  Engineering I: Statics, 59:007 (2 s.h.)
  Fundamentals of Engineering II: Electrical Circuits 59:008 (3 s. h.)
  Fundamentals of Engineering III: Thermodynamics 59:009(3 s. h),
  Engineering Mathematics I—Calculus of Single Variable 22M:031 (4 s.h)
  Engineering Mathematics II—Calculus of Multiple Variables, 22M:032 (4 s.h),)
  Engineering Mathematics III—Matrix Algebra 22M:033 (2 s.h)
  Engineering Mathematics IV— Differential Equations 22M:034 (3 s.h)
  Fundamentals of Chemistry I-- 4:01x (4 s.h.),
  Engineering Physics I—Classical Mechanics 29:081 (4 s.h.),
  Engineering Physics II—Electricity and Magnetism 29:082 (3 s.h.), or Fundamentals of Chemistry II-- 4:01y (3 s.h.), (as specified by the program)

- They must meet the GEC requirement specified in the document entitled "Policy on Elective Focus Areas and General Education Component Courses". Students already in the program as of fall 2001, will be given the option of selecting the GEC courses according the selection procedure set out in the document entitled "Policy on Elective Focus Areas and General Education Component Courses", with the proviso that they must select 16 sh of courses.
- They must meet the EFA requirement specified in the document entitled "Policy on Elective Focus Areas and General Education Component Courses".
- They must take the balance of 128 sh as specified by their specific programs.
- All programs in the college shall employ the common core as outlined in Table I for the first three semesters of their departmental curriculum.

Appendix B

College of Engineering CLEP Credit Policies

- CLEP credit becomes part of your permanent record at the end of your first session of enrollment at this University.
- If you want to earn CLEP credit and are currently enrolled in a course in that area, the exam must be taken on or before the last day to register or add courses.
- Credit for CLEP tests cannot be earned if you have already received credit for an equivalent course or if you have been enrolled for more than three weeks in an equivalent college-level course, except for the CLEP Subject Test: Social Sciences & History. Students in a social sciences course may earn credit for the "History" portion of the exam and vice versa.
- CLEP credit will count toward hours earned for graduation but letter grades are not assigned and the credit is not included when your grade-point average is computed.
- CLEP credit brought to The University of Iowa on transcripts from other institutions is evaluated by the Office of Admissions under the same rules used for other transfer credits. Once 12 (or more) semester hours of graded classroom credit are accepted by transfer, any accompanying CLEP credit is accepted without reevaluation by the University.
- CLEP tests may be taken only once.
- Total of 10 hours either of AP/CLEP credit may be applied toward the GEC

College of Engineering

CLEP Exam	Score	Credit Awarded and Other Information
Calculus	70 or above	4 semester hours (s.h.) – Duplicates *22M:031 Engineering Mathematics I.* Duplicates *AP Test: Calculus AB* and *AP Test: Calculus BC*
Social Sciences & History	50-54	3 s.h. – May be used to complete the General Education Program: lower-level social science component
	55-80	6 s.h. – 3 s.h. may be used to complete the General Education Program: lower-level social science component; and 3 s.h. may be used to complete the General Education Program; lower-level humanities component
Analyzing & Interpreting Literature	**57 or above**	**3 semester hours (s.h.) Literature—Duplicates *08G:001 Interpretation of Literature.* Duplicates *AP Test: English Literature & Composition.*: Credit is awarded only if the essay portion is submitted and receives a passing grade.**
American Government	**65 or above**	**3 s.h.—Duplicates *030:001 Introduction to American Politics.* Duplicates *AP Test: Government & Politics (US).* May be applied to General Education Program: social sciences hours; or used to satisfy one (1) high school course deficiency in social studies; or applied to requirements for the Political Science major or minor; or used as elective hours.**
Macroeconomics	**63 or above**	**3 s.h.—Duplicates *06E:002 Principles of Macroeconomics.* Duplicates *AP Test: Macroeconomics.* May be applied to General Education Program: social sciences hours; or used to satisfy one (1) high school course deficiency in social studies; or used as elective hours**
Microeconomics	**62 or above**	**3 s.h.—Duplicates *06E:001 Principles of Microeconomics.* Duplicates *AP Test: Microeconomics.* May be applied to General Education Program: social sciences hours; or used to satisfy one (1) high school course deficiency in social studies; or used as elective hours.**
Psychology	**59 or above**	**3 s.h.—Duplicates *031:001 Elementary Psychology.* Duplicates the *AP Test: Psychology.* May be applied to General Education Program: social sciences hours; or used to satisfy one (1) high school course deficiency in social studies; or applied to requirements for the Psychology major or minor; or used as elective hours.**
Sociology	**59 or above**	**3 s.h.—Duplicates *034:001 Introduction to Sociology Principles.* May be applied to General Education Program: social sciences hours; or used to satisfy one (1) high school course deficiency in social studies; or used as elective hours.**

Appendix C.

Core Math Course: 22M:031 Single Variable Calculus

	Topics covered during class
1)	Pre-calculus: absolute value, intervals, lines, functions and their graphs including trig and inverse trig functions, exponential and log, base e and natural log.
2)	Limits: Definition (intuitive, geometric and epsilon-delta). Limit theorems and their use. One sided limits and limits at infinity.
3)	Continuity and introduction to the derivative; define point-wise continuity and continuity on an interval; state and explain intermediate value theorem and extreme value theorem; define derivative of a function at a point and connect to slopes of tangent lines and instantaneous rates of change.
4)	Differentiation techniques, products, quotients, chain-rule
5)	Derivatives of trig functions, inverse trig functions, exponential and log functions
6)	Applications of derivative, implicit differentiation, related rates, differentials and tangent line approximation.
7)	Max-Min and the Mean-Value Theorems, absolute max-min of continuous function on a closed bounded interval, critical points, endpoints, increasing and decreasing functions, the mean value theorem, relative max/min, first derivative test and some applied max-min problems
8)	Taylor polynomials and the remainder; extend the Mean-Value Theorem to approximate and estimate error.
9)	Graphing concavity, second derivative test, curve-sketching
10)	Exponential growth and decay; L'Hospital's rule; graphs involving log and exponential functions.

11)	Definite Integral and Fundamental Theorem of Calculus; definition of definite integral via Riemann sums, properties, relate to anti-derivative via the Fundamental Theorem.
12)	Techniques of integration; standard rules for anti-differentiation and use of substitution
13)	More techniques of integration include integration by parts and partial fractions
14)	Improper integrals and numerical integration
15)	Area and volumes of revolution

Core Math Course: 22M:032 Multivariable Calculus	Topics covered during class
1)	Explicit, implicit, parametric equations for curves, including lines, circles, ellipses, and parabolas.
2)	Vector geometry addition, scalar multiple, dot product, projections and angles, cross product. (postpone determinants and oriented areas and volumes until later in the course)
3)	Functions of several variables (include polar/cylindrical coordinates)
4)	Partial derivatives, directional derivatives, differential
5)	Tangents lines and planes, relation to gradient vector
6)	Maxima and minima
7)	Applications of MAX-MIN
8)	Multiple integrals in 2-dimensions
9)	Multiple integrals in 3-dimensions (somewhere in 2- and 3- dim integrals, do polar/cylindrical coordinates; this means confronting “change of variable” “stretching factor” in some form)
10)	Parametric curves, velocity, curvature
11)	Vector fields and flows

12)	Integration on curves (work integrals)

Core Math Course: 22M:033 Matrix Algebra	Topics covered during class
1)	Matrix arithmetic: addition, multiplication, properties
2)	Vectors: addition, scalar multiplication - algebraic and geometric
3)	Linear combinations, linear independence, basis subspace - examples from R2 and R3
4)	Reduced row echelon form of a matrix; calculation by hand and with computer
5)	Solving linear systems and finding bases for row space and column space of matrix
6)	Inverse of an nxn matrix: existence; calculate by hand and with computer
7)	Use of inverse in solving systems of equations. Rank and dimension
8)	Null Space; solution of Ax=0; General solution of Ax=b
9)	Determinants; definition and properties; calculate by hand (row reduction) and computer; Expansion by minors (Laplace expansion of determinant)
10)	Applications of determinants: Cramer's rule; cross- product.
11)	Eigenvalues and eigenvectors: linear transformation; eigen-value, -vector, - space and examples
12)	Diagonalization: P-1AP=D, where columns of P are basis for Rn consisting of eigenvectors of A, and D is a diagonal matrix of eigenvalues of A. Examples of diagonalization
13)	Orthogonal bases: calculation by hand and by computer; Orthogonal diagonalization of symmetric matrix: principal axis theorem; calculation by hand and by computer.

14)	Fitting a line or curve to data: Vandermonde matrices; least squares fittings.
15)	Projection in R2 and R3: projecting a vector on a line and into a plane
16)	Orthogonal matrices in R2 and R3: Applications of principal axis theorem
17)	Rotations and reflections in R2 and R3
18)	Exams, review/practice

Core Math Course: 22M:034 Differential Equations	Topics covered during class
1)	Classification of differential equations; direction fields
2)	Exponential growth and decay; related physical phenomena
3)	Linear equations and integrating factors
4)	Separable equations
5)	Reduction of order, application of nonlinear equations: Bernoulli and logistic equations, gravitation
6)	Sample computer lab assignment: direction fields; integration and differentiation; solution of first-order differential equations and initial value problems. Mechanical and electrical oscillation: modeling by initial value problems
7)	Linear, constant-coefficient second order equations: homogeneous case; the characteristic polynomial
8)	The method of undetermined coefficients
9)	Oscillation and resonance (plus amplitude modulation and other phenomena)
10)	The Laplace transform L; definition and foundations; some table entries; 1st differentiation rule

11)	Solving initial value problems using Laplace and inverse Laplace
12)	Sample computer assignment: Laplace transform (beyond constant coefficient equations and beyond the familiar table entries); undetermined coefficients; amplitude modulation.
13)	More on the Laplace transform: 1st and 2nd shift rules, 2nd differentiation rule, discontinuous inputs, periodic functions, impulse functions, convolution, impulse response, transfer function
14)	Linearity; the Wronskian
15)	Use of a known homogeneous solution to find another; variation of parameters
16)	Topics chosen from: (I) Systems: generalities, reduction of higher-order equations to first-order systems. (II) Linear systems: homogeneous with constant coefficients; eigenvalues; the cases of complex and repeated eigenvalues; non-homogeneous systems; simultaneous differential equations. (III) Brief introduction to nonlinear second-order equations and first-order systems; phase plane and energy methods; the pendulum; predator-prey and competing species; nonlinear oscillators; autonomous systems and stability

Appendix D: Course

BME

51:040 Biological Systems Analysis I
51:050 Biomechanics ______
51:060 Fundamentals of Biomedical Imaging ______

CBE

52:161 Mass Transfer and Separation
52:171 Thermodynamics/Transport lab
52:185 Process Dynamics/Control Design

CEE

53:033 Principles of structural Engineering
53:050 Natural Environmental Systems ______
53:063 Principles of Transport Engineering

ECE

55:032 Intro to Digital Design
55:040 Linear Systems
55:070 Electromagnetic Theory

MIE (Industrial)

56:032 Design for Manufacturing
56:134 Process Engineering ______

56:144 Human Factors
56:162 Quality Control

MIE (Mechanical)

58:048 Energy Systems Design
58:080 Experimental Engineering

Appendix E.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	Relavance to Course (1 = not relavant, 5 = very relavant)														
Mean	4.0	3.0	3.6	3.6	3.3	2.6	2.0	2.1	1.9	2.6	3.0	2.8	2.9	2.6	2.3
Median	4.5	3.0	3.0	4.0	3.5	2.0	2.0	1.5	2.0	2.0	3.5	3.0	3.0	2.5	2.0
St. Dev	1.4	1.4	1.4	1.5	1.5	1.2	1.1	1.5	1.0	1.8	1.8	1.4	1.2	1.7	1.3
	Student preparedness (1 = not prepared, 5 = well prepared)														
Mean	4.1	4.1	4.0	3.9	3.7	4.2	4.2	3.8	3.8	4.0	3.7	3.8	4.3	4.4	3.6
Median	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.5	4.0	4.0	3.5	4.0	4.5	4.0	4.0
St. Dev.	1.0	0.8	1.1	0.9	1.1	0.8	0.8	1.0	0.8	0.9	1.2	1.2	0.8	0.5	1.1

22m-032 Multivariable Calculus

	1	2	3	4	5	6	7	8	9	10	11	12
	Relavance to Course (1 = not relavant, 5 = very relavant)											
Mean	2.9	2.6	2.3	3.4	2.0	2.9	2.5	1.6	1.4	2.0	2.5	2.3
Median	3.0	2.0	1.5	3.5	1.0	3.0	2.5	1.0	1.0	1.5	2.0	2.0
St. Dev	1.8	1.8	1.8	1.6	1.5	1.2	1.5	0.9	0.5	1.4	1.7	1.5
	Student preparedness (1 = not prepared, 5 = well prepared)											
Mean	4.2	4.4	3.8	4.1	3.8	4.0	4.0	3.7	3.3	3.8	4.0	3.8
Median	4.0	5.0	3.5	4.0	3.5	4.0	4.0	4.0	3.0	3.5	4.0	3.5
St. Dev.	0.8	0.9	1.0	0.9	1.0	0.9	0.9	0.6	0.6	1.0	1.0	1.0

22m-033 Matrix Algebra

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Relavance to Course (1 = not relavant, 5 = very relavant)																	
Mean	3.1	3.0	2.5	1.8	2.6	1.6	2.3	2.0	1.7	1.5	2.1	1.4	1.5	3.0	1.4	1.6	1.4	2.1
Median	3.0	3.0	1.5	1.0	2.5	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	3.0	1.0	1.0	1.0	1.0
St. Dev	1.7	1.9	1.9	1.2	1.6	1.4	1.9	1.9	1.5	1.1	1.8	1.1	1.4	1.5	0.7	1.4	1.1	2.0
	Student preparedness (1 = not prepared, 5 = well prepared)																	
Mean	4	4	4.4	4	4	4	4	4	3.7	3.3	3.8	3.7	3.7	3.8	3.3	3.7	3.3	3
Median	4	4	4	4	4	4	4	4	4	3	3.5	4	4	3.5	3	4	3	3.5
St. Dev.	0.9	0.9	0.5	0.8	0.7	1	0.8	0.8	0.6	0.6	1	0.6	0.6	1	0.6	0.6	0.6	1.4

22m-034 Differential Equation

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	Relavance to Course (1 = not relavant, 5 = very relavant)															
Mean	2.9	3.5	3.1	2.5	2	2.4	3.4	1.5	1.8	2.3	2	1.5	1.5	1.5	1.5	2.4
Median	2.5	4	3.5	1.5	2	1.5	4	1	1	1	1	1	1	1	1	2
St. Dev	1.9	1.8	1.9	1.9	1.1	1.7	1.8	1.1	1.5	1.8	1.9	1.4	1.4	1.4	1.1	1.8
	Student preparedness (1 = not prepared, 5 = well prepared)															
Mean	4.2	4.2	4.2	4	3.3	4.2	4	3.3	3.5	3.5	3.3	3.3	3.3	3.3	3.3	2.8
Median	4	4	4	4	3	4	4	3	3.5	3.5	3	3	3	3	3	3
St. Dev.	0.8	0.8	0.8	1	0.5	0.8	0.9	0.6	0.6	0.6	0.5	0.6	0.6	0.6	0.6	1.1