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ABSTRACT

A study was undertaken at Glendale Community College, in California, to determine the effectiveness of a 2-week summer macroeconomics course. To gather data, the instructor maintained a diary of topics covered and problems encountered, surveyed all 20 students upon completion of the class regarding their experiences and satisfaction, and compared outcomes on standard unit exams for three 15-week classes offered in spring 1995. Study results included the following: (1) the 2-week course was perceived as more stressful than 15-week courses by nearly 60% of the students and imposed severe time burdens on all students; (2) student satisfaction declined upon taking the course, with 45% indicating that they would not take the course again; (3) 45% of the students thought that they would have achieved better mastery of course material in a 15-week course; and (4) while summer students performed better than spring students on unit tests from the first half of the course involving simple recall of information, they performed worse on unit tests from the second half involving comprehension, application, and analysis. As a result of the findings, it was recommended that the 2-week format be abandoned for economics classes. Appendixes include the course syllabus, the instructor's diary, the student survey questionnaire with tabled responses, and tables of the statistical analysis of unit exams. (TGI)

THE TWO WEEK SUMMER MACROECONOMICS COURSE: SUCCESS OR FAILURE?

Glendale Community College

July 1996

GLENDALE
COMMUNITY
COLLEGE
6000 West Olive Avenue
Glendale, AZ 85302-9983

Date: July 8, 1996

To: Paul DePippo

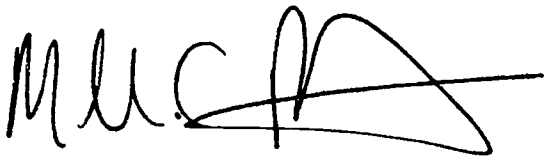
From: Michael C. Petrowsky

Re: The Two Week Summer Class Experience

As requested, I developed extensive documentation on my experience in teaching the two week macroeconomics principle (ECN111) course. I kept a diary, developed and then administered a student survey, and then compared the summer unit exam scores with exam scores from my three Spring '96 classes in macroeconomics using classical hypothesis testing between means.

While the results are obviously tentative, this preliminary analysis adds credence to the widespread belief that the two week course lowers student satisfaction, raises stress levels, and diminishes academic performance in the critical area of economic theory and policy that stresses abstract thinking over mere recall. Because of this, it is recommended that the two week course format be suspended for use in economics pending additional study.

I am indebted to Carol Williams for her kindly help and assistance in preparing this document. Needless to say, any errors and omissions in the document are mine and are probably the result of this mind boggling summer heat.



Michael Petrowsky

EXECUTIVE SUMMARY

The two week summer class in macroeconomics (ECN111) was compared and contrasted with three Spring 15 week classes in order to ascertain what effect, if any, the shortened course length had on student satisfaction and academic performance. Tentative evidence indicates that the two week course raises stress levels, lowers student satisfaction and diminishes academic performance in those areas of economics that stress comprehension and analysis over mere recall.

Given this, it is recommended that economics, along with other abstract courses such as mathematics and the sciences, not be taught using a course length model of two weeks. Courses that are largely characterized by affective or rote memory type of learning might be amenable to a reduced course length format. Extreme course length reduction, however, may only work for students who are highly motivated and experienced. If extreme course length reduction scheduling is to be used in the Fall and Spring semester, appropriate student screening mechanisms may have to be employed.

CONTENTS

THE TWO WEEK SUMMER MACROECONOMICS COURSE: SUCCESS OR FAILURE?

I. CONCEPTUAL FOUNDATIONS

A. RATIONALE FOR STUDY

What impact does the length of a course have on successful student achievement? On a somewhat different level, what is the course length* that maximizes student achievement, student satisfaction, and the overall learning process? While these questions may appear rather academic, they assume practical significance in view of recent trends towards course length flexibility.

Glendale Community College (GCC) is no exception to this trend. GCC has experimented with its course schedule by offering courses with varying course lengths. These course lengths have varied from eight week courses during the Fall and Spring semester to the (now) controversial two week class that will be discussed in this study. This latter class is offered between Spring graduation day and the beginning of the traditional first five week summer semester. Because of time compression, it is normally scheduled for ten consecutive weekdays at 4 1/2 hours per day.

The growth of these two week courses has generated comment and discussion which can be usefully contrasted as evidence for two competing - and different - educational philosophies. The first group, which can be called "FTSE Maximizers," advocate course length flexibility. They typically follow a "student as customer" model and want to tailor courses so as to increase FTSE. Their rationale is that

*The term "course length" is defined here to mean the duration of time (in weeks) over which the class is held. Because total class hours are regulated and thus constant, varying the course length can then either increase or decrease the hours spent in class per week and per day.

the current course schedule system is clumsy and inimical to student enrollment. In this approach, educational concerns such as quality, academic standards, and the impact of course length flexibility on the learning process itself are quietly ignored or eschewed.

These latter concerns are taken up by a competing group which can be labeled "Academic Purists." This group, while not condemning FTSE Maximization per se, do find serious flaws in the student as customer model. Course length brevity** , as evidenced by a two week course, is seen as being inimical to the learning process. As a corollary, course length brevity is also seen as being a vehicle by which academic standards are diluted or diminished. For these reasons, the "Academic Purists" reject the course length brevity trend. In their model, society is the customer, not the student. And the best way to serve society is by maintaining academic standards that more or less rely on traditional course lengths. While evidence for their approach is scanty, they do point to two well known colleges in the valley that promote course length flexibility and that do have, as a result, (and in their own eyes), diminished academic standards.

In a slightly different vein, it can be argued that the two schools of thought are arguing along two different dimensions. The FTSE Maximizers, for example, are really saying that student (customer) satisfaction would be increased by course length flexibility, with little or no damage to academic standards. Their rationale, then, while not clearly stated, is that course length flexibility would increase student satisfaction, which in turn would

**The course length flexibility argument, as practiced by the FTSE Maximizers, seems to run in one direction. Proponents typically advocate course length compression, not expansion.

increase FTSE. The implication here is that increased student satisfaction would derive from (1), greater access (convenience) to courses and (2), a more positive experience with these flexible length courses, with this latter factor clearly predominating over the long run.

The "Academic Purists," on the other hand, say little or nothing about student (customer) satisfaction. Their position against course length flexibility is that (1), academic standards will be lowered, and that (2), student academic performance, if objectively measured, would suffer due to course brevity. How this would happen is not explicitly stated, but clearly time is seen as a critical variable in the learning process. From a slightly different angle, time is viewed as a key element in the ability to learn, a variable that must be given its due. And for most disciplines, 15 weeks (the normal course length) is just about the right amount of time needed to maximize student academic performance.

The two sides, then, view course length flexibility very differently. While one side emphasizes student satisfaction, the other side stresses academic performance. Both sides also see time as a critical variable that impacts the discussion but in opposing directions. For the FTSE Maximizer, time diminution is a plus, for course brevity presumably increases student satisfaction and hence FTSE. For the Academic Purist, time diminution is negative, for course brevity hurts academic standards and performance.

The issue, then, becomes largely empirical and focuses on the impact that course brevity (constraining time) has on both academic

performance and student satisfaction. Given this line of reasoning, this study had the following objectives:

1. How is student academic performance in the macroeconomics course affected by time? Specifically, what is the different outcome, if any, between a 15 week course and a two week course?
2. What difference is there in student satisfaction between the 15 and two week courses?
3. What recommendations, if any, should follow from these results?

These objectives determined the focus of the study.

B. SCOPE OF SURVEY

Documentation for this study was based on data gathered from three macroeconomic principles (ECN111) classes I taught during the Spring '96 semester as well as on data gathered from the two week macroeconomic principles course that was offered during the May 17-31, 1996 period. For control purposes, the common elements that these four courses had consisted of the following:

1. All four courses were offered in the morning. Differences between day and evening students can thus be discounted.
2. The same course material/syllabus that I used for my three Spring '96 macroeconomic classes was also used in the two week class. The syllabus used is shown as Appendix A. As a result, exams, lectures, and material coverage can be treated as identical for purposes of this study.

One element that was unique to the two week course was the perfect attendance requirement. Because the class was only of two weeks duration, I had students sign a "contract" that required perfect attendance. What effect this had on subsequent student performance is unknown, but it should be pointed out that perfect attendance was mandatory given the ten day duration of the course. Partly as a result of this, comparative retention figures between the summer class and the spring classes were not analyzed for purposes of this study.

Another element that was unique to the Spring classes was the use of a standardized pre-test and post-test that is part of a different

assessment study.* Inasmuch as the post-test was included in final grade computations, the grading system between the Spring classes and the Summer class is somewhat different. It also means that final grade comparison (whether it be by letter grade or point) cannot be made, for the standards are somewhat different. (Time constraints precluded the use of a pre and post-test for the summer class).

So there are some differences. Yet the common syllabus, the common unit exams, and the same material (including the textbook), provided a framework by which the Spring classes and the two week class could be compared and contrasted. Given this, the assessment of the two week course was accomplished by using the diagnostic instruments listed below.

1. Diary. A diary, shown in Appendix B, was kept during the two week period. Thematic impressions from the diary are discussed in the next section.
2. Survey Questionnaire. A 30 question student survey questionnaire was developed and administered to students at the end of the two week course. The questionnaire, along with Tables that were generated from the responses, is in Appendix C.
3. Statistical Analysis. Exam scores for the Spring and summer classes were compared and contrasted using hypothesis testing between means. Results are shown in Appendix D.

The three data instruments form the nucleus of this study. Needless to say, a note of caution is in order. There are obvious

* The standardized exam was prepared by the Joint Council on Economic Education (JCEE). The JCEE has tested thousands of students across the country using this instrument, so norms have been developed.

limitations associated with sample size and nonrandomness that impact on validity and wider generalizations. But these reflect scarcities of time, money and data that are the natural restraint of any survey. Quick research is expedient and timely, but it does have a downside.

C. A THEORY OF COURSE LENGTH EFFECTIVENESS

Assume that you could select an infinite number of course lengths within the constraint of having to meet for 45 classroom hours. At one extreme there would be a class that met for 45 straight hours; at the other end of the continuum, the class could meet one hour a year for 45 years. Given this wide assortment of choices, what course length would maximize student satisfaction and academic performance?

Before you answered this question, you would probably want to know at least two things. First, what type of course is it? What are the learning objectives in the course that receive the most emphasis? Are the objectives in the cognitive domain (for mental skills)? Or are they in the affective domain (feeling, emotions)? Finally, are any learning objectives in the psychomotor domain that covers manual and physical skills? Clearly, some assessment of the course would be needed before any reasonable answer could be formulated.

Second, you probably would want to think about the positive and negative effects that course length changes would have on student satisfaction and academic performance. In analyzing a two week course, these positive and negative factors might include the following:

I. Positive Factors: Course length reduction increases student satisfaction and academic performance.

A. From Student's Standpoint:
   1. Students are more focused. A two week goal is easy to see.
   2. Group cohesiveness. Students spend 4 1/2 hours together.
   3. Shortened time frame means that students will test better on material that is affective as opposed to cognitive. In the latter domain, students will test better on material that is easy to memorize. This means that knowledge behaviors (recall of data) improve.

B. From Instructor's Standpoint:
   1. Instructor is more focused.
   2. Fewer classes means that less time is lost to non teaching activities such as attendance, waiting for students to sit down, etc.

II. Negative Factors: Course length reduction decreases student satisfaction and academic performance.

A. From Student's Standpoint:
   1. The severe time constraints increases stress levels.
   2. Hard to sustain energy needed after first week.
   3. Students will test worse on tasks that require time to understand Because of this, comprehension, application, and analysis behaviors will show declines.

B. From Instructor's Standpoint:
   1. Fewer classes means less repetition of material. Topic coverage flows uninterrupted without time for students to digest material. (Normally, I would spend the first few minutes of class

reviewing what we did in the previous class.)

2. Time constraints may distort sequencing of topics because of need to test and review.
3. Instructor fatigue may diminish after class teacher-student interaction.

Which effect dominates is largely an empirical proposition that will depend on course length and course type. For the principles of macroeconomics course, however, we can venture several hypotheses that are based on the nature of economics as a discipline. First, economics is a highly cognitive discipline that is largely bereft of behaviors found in the affective and psychomotor domains of learning. Second, the macroeconomics principles course is marked by the distinctive characteristic that the second half of the course (theory proper) is far more abstract than the first half with its emphasis on terms, concepts, and fundamental principles. This means that knowledge behaviors (recall of data) are more emphasized in the first half of the course, while comprehension, application, analysis and synthesis behaviors are more emphasized in the second half. Because of this, it is not unusual to see student exam scores decline in the latter half of the course.

With this background about the macroeconomics principles course, and with some understanding of the positive and negative factors that are generated by course length changes, we can postulate the following hypotheses concerning the two week course:

1. For the first half of the course, exam scores for the two week course will be above those for the three Spring '96

classes. (Time constraints generate positive factors that make recall of information easier.)

2. For the second half of the course, exam scores for the two week course will be below those for the three Spring '96 classes. (Time constraints are negative, making comprehension, application, and analysis more difficult.)
3. Student satisfaction, as measured by stress levels, forced course choice questions, and other data will be lower relative to the same course given over a 15 week semester.

In the next major section, diagnostic instruments such as a diary, a survey questionnaire, and a statistical analysis of exam scores, are used to address these hypotheses.

II. SURVEY RESULTS

A. THE DIARY

My diary for the two week macroeconomics course covers the course length which was from May 17th through May 31st. It is included as Appendix B. The diary was recorded daily and immediately after teaching the class. My intent was to provide a blow by blow description of topics covered, problems encountered, as well as general feelings and impressions. The goal here, quite simply, was to generate a qualitative description/assessment that would supplement more quantitative methods. Needless to say, the diary is very subjective and makes no pretense at being either objective or consistent. Still, this type of data is helpful in forming gestalt impressions. Those impressions that I gleaned from keeping the diary had the following themes:

- Distorted Topic Sequences. The time compression reduced flexibility in terms of material presentation. The need to give homework assignments and exams within this restricted time frame meant that I had to cover some topics out of my normal sequence. I do not know what effect this had.
- Less Review, Less Problems. The time compression meant less review for an exam, a phenomenon which is perhaps related to the two themes noted previously. I also noticed a marked decline in my ability to find time to do some of the problems that are in the back of each chapter in the text.
- Type of Students. These students appeared older, better prepared, and certainly more motivated than my Spring semester students. There was also a group cohesiveness

that I found rather striking. I attribute this to being together for 4 1/2 hours per day. One positive side effect of this is a noticeable increase in students helping each other.

- Stress Level. Very evident. The group's strong goal orientation, coupled with the work that had to be done, contributed to this.
- Effects on Me. The physical toll on me was noticeable. After 4 1/2 hours, I found my voice cracking and my legs aching. By noon, I was tired of "speaking economics." Whether this was noticeable to students is anyone's guess. I suspect it was. (But to be fair to myself here, it should be noted that economics is a "standup" subject that requires lots of explanation and lots of chalkboard work.)

B. THE STUDENT SURVEY QUESTIONNAIRE

At the end of the course (May 31), students were asked to complete a survey questionnaire concerning their experience in the two week course. The survey questionnaire is shown in Appendix C, along with related tables that summarize the responses for the 20 students that were in the class. As with any survey, there were problems in implementation as well as in interpretation of specific questions. Yet the survey did provide a "snapshot" of what these students encountered. For purposes of exposition, I have organized their responses along the following lines:

- Student Characteristics
- Objective Time Constraints
- Time Constraint Effects on Students
  - Stress
  - Competency
  - Satisfaction
- Support for Course Length Effectiveness Theory

1. Characteristics of the Two Week Summer School Student

Table 1 compares selected characteristics of the two week summer class students with those of the three Spring classes. The characteristics chosen are age, cumulative college credit hours completed, and cumulative grade point average (GPA). As the table indicates, students in the two week class were older, had double the academic experience in terms of college credits completed, and had a GPA that was significantly above the Spring students.

The two week summer school students, then, were qualitatively different, and in an important sense "better," than the Spring students in terms of their ability to handle an accelerated two week course. This has two implications for purposes of this study. First, if student exam scores are lower in the two week class when compared to the Spring classes, this will only reinforce the course length effectiveness hypotheses cited in a previous section. And second, it may mean that courses this brief are only designed for the "upper tier" of students, thus weakening a key element of the FTSE maximization philosophy.

Despite this caveat, however, there is some support for the "student as customer" model when attention is drawn to Tables 2 through 4. The five responses that listed "fit into my schedule" as a reason for taking this course are clearly in alignment with the course length flexibility/FTSE maximization approach. The same responses, though, also appear to indicate that at least some students expected to see academic standards lowered, a finding which partially confirms the "Academic Purist" position.

2. Objective Time Constraints

The reality of constrained time is the most salient characteristic of the two week course. In a two week period of time, students must cover an entire semester of course material in addition to other activities such as employment and class attendance. The three objective variables of time spent attending class, studying the material, and working, become real, concrete constraints that every student must contend with in taking a two week course.

Tables 5 through 10 provide a window into these objective student constraints. Tables 5 and 6 reveal that 80 percent of the two week summer school students were employed, and that they worked an average of almost 25 hours per week. (This figure, moreover, should be interpreted in a minimal way, for several students indicated that they cut back on employment once they realized what was involved.)

In addition to employment, students had to obviously find time to study for the course. Tables 7 and 8 highlight the time spent studying during the weekday as well as the weekend. Students reported that they studied an average of 3.15 hours per weekday and 4 hours over the weekend, for a total of nearly 20 hours per week. Almost one day out of seven, then, was spent studying course material.

The other major constraint was time spent in class. This amounted to 4 1/2 hours per day, or 22.5 hours per week. When this is factored in, we get some indication of the time burdens that faced 80 percent of the class who worked. Tables 9 and 10 show the weekday and weekly time commitments that were faced by students who worked, attended class, and studied. For these students, the daily, weekday time commitment was a crushing 12.52 hours per workday, a figure which obviously does not include commuting, eating, sleeping, etc. Seen on a weekly basis, this triad of activities consumed over 66 hours per week.

3. Time Constraint Effects on Students

From these numbers, it can be seen that time scarcity is an objective reality that is very much a part of the two week course. While the effects of time scarcity are probably varied, it is useful to think of the effects as impacting on stress, mastery of material (competency), and course satisfaction. The three effects are obviously liked together, so no attempt is made to imply causation.

Stress. Tables 11 and 12 attempt to gauge the stress that was involved in the two week course. Eighty-five percent of the students reported the course as being at least somewhat stressful. Almost 60 percent, moreover, stated that the course was more stressful than a normal 15 week semester course. As to be expected, only 16 percent reported that the two week course was less stressful, a finding that is perhaps congruent with the objective time burdens noted in the previous section.

Competency. Stress is probably linked with competency, or mastery of the material. Table 13 asked students to compare their learning over the two week period with what they would have achieved over a 15 week semester. Not surprisingly, 45 percent of the students stated that they would have learned more if they had taken the course over a 15 week period. This is further supported by Table 14, which shows that 80 percent of the students felt that they could have mastered the material better if they had more time.

Time definitely posed a problem vis-a-vis mastery of the material. As Table 15 illustrates, 50 percent of the students indicated problems with course material that were directly related to lack of time (Table 16). That students were aware of this is also

shown by Table 17, for over two thirds of the students felt that time spent working in paid employment interfered with needed study time for the course. This also probably affected such studentship skills as reading and outline making (Tables 18 and 19), for almost two thirds of the students reported that they read each chapter only one time. This is despite the instructor's advice that chapters should be read 2 or 3 times.

Student Satisfaction. We would expect that high stress levels, when coupled with less perceived mastery of material, would of necessity lead to diminished student satisfaction. And this seems to be at least partially supported by Tables 20 through 23. Data from Table 20 reveal that 45 percent of these students would not take another two week course (in economics) if they had to do it over again. Their reasons (Table 21) varied from too much work, not enough time, to "too difficult" for such a short period of time. Partly as a result of this, 55 percent of these students (Table 22) felt that it was better to take the course over a 15 week period. and another 35 percent (Table 23) would not recommend the two week economics course to a friend.

Conclusion. From all this data, it is reasonable to assume that the two week course places serious burdens of time on students, burdens that are reflected in nigh stress levels, diminished course mastery (as perceived by the student), and lower student satisfaction. Seen from this perspective, the two week course probably does not promote the FTSF maximization philosophy, and may in fact hurt it. Academic standards may also indirectly be hurt, for the two week course places serious time burdens on students,

burdens that could generate pressure on instructors to lower standards.

From the standpoint of course length effectiveness, it appears that course length reduction, when carried to the level of a two week course, leads to the predominance of those negative factors cited in a previous section. In other words, course length reduction seems to decrease student satisfaction and perceived student performance, with the word "perceived" being underlined to emphasize the fact that performance (defined in terms of test scores) needs to be compared for the Summer and Spring classes.

4. Support for Course Length Effectiveness Theory

In a previous section it was stated that the second half of the macroeconomics course was harder and more abstract for the students than the first half. This statement generated a set of hypotheses that will be tested in the next section. But is the second half harder? Fortunately, Tables 24 and 25 seem to confirm this statement. When students were questioned about course difficulty (Table 24), 85 percent indicated that the second half of the course was harder. As a corollary to this, students were also asked (Table 25) to rate the textbook chapters by level of difficulty. As the table illustrates, chapters in the second half of the course were rated at a higher level of difficulty (3.16) than the first half (4.43), giving additional support to the idea that the second half of the macroeconomics course is harder for students.

C. SPRING AND SUMMER CLASS COMPARISONS: A STATISTICAL ANALYSIS

Four identical unit exams were given in the summer and three Spring classes. Each exam consisted of 25 multiple choice questions and covered between three to five chapters of textbook material. Students were also given the same time (50 minutes) to complete an exam. The mean scores for these exams are shown below in Figure 1. Each score is "raw," for it shows the mean number correct out of 25 questions.

Figure 1:
Mean Scores, Summer and Spring Classes

EXAM	SPRING CLASSES	SUMMER CLASSES
1st	21.83	22.95
2nd	16.56	19.45
3rd	19.04	17.25
4th	17.17	16.10

Two patterns are evident from a visual scan of this data. First, there is the decline in mean scores as we move from the 1st to the 4th exams for both Summer and Spring classes. This simply illustrates the increasing difficulty of the macroeconomics course during the second half of the semester. Second, during the first half of the course the Summer class had higher mean scores (exams 1 and 2) than the three Spring classes. This pattern, however, reverses itself during the second half of the course, for the Spring classes had higher mean scores than the Summer class for the third and fourth exams.

The data appear to confirm our hypothesis concerning course length effectiveness in economics. Yet statistical analysis that tested the difference between two means at the .05 level gave mixed results. The difference between means for the first and second exams was statistically significant; for the third and fourth exams, however, it was not, a reflection, perhaps, of the small sample size (n=20) for the Summer class.

To get around this, an effort was made to build up the sample size by developing combined mean scores for the first two and last two exams. The results are shown in Figure 2.

Figure 2:

Combined Mean Score	Spring Classes	Summer Classes
First Two Exams	19.32	21.24
Third & Fourth Exams	18.14	16.67

Classical hypothesis testing that tested the difference between two means at the .05 level was then employed. The results are shown in Appendix D. The differences between the means are statistically significant at the .05 level, which enables us to make the following statements:

1. The difference in mean scores between the first half and the second half of the course is statistically significant. The last half of the macroeconomics course is simply more conceptual and more abstract for students. This phenomenon applies to both Spring and Summer classes.
2. The difference in mean scores for the Spring and Summer classes for the first two exams is statistically significant.

The Summer class performed better than the Spring classes during the first half of the course.

3. The difference in mean scores for the Spring and Summer classes for the third and fourth exams is statistically significant. The Spring classes performed better than the Summer class during the latter half of the course.

The above analysis suggests tentative support concerning the impact of the two week course on subsequent academic performance. At least in economics, the two week course has had a negative impact when students are required to comprehend, apply and analyze. These same students, however, do much better (and even better than the Spring classes) when learning simply involves recall of information. The lack of time, then, is clearly an obstacle to tasks that require abstract, analytic thinking. Unfortunately, this time barrier even applies to the "qualitatively better" summer school student. We would thus expect to see these results reinforced if Spring students had taken the two week course.

III. ANALYSIS OF FINDINGS AND RECOMMENDATIONS

A. FINDINGS

1. Students perceive the two week course as being very stressful with a significant number indicating that it is more stressful than a 15 week course.
2. The two week course imposes severe time burdens on students when consideration is given to the demands of employment, class time, and study time.
3. There is some evidence that student satisfaction declines upon taking the course.
4. Time burdens in the two week course have a negative impact on subsequent student academic performance when learning objectives focus on comprehension, analysis, application, and synthesis. The negative impact is lessened when tasks focus on knowledge (recall of data).
5. For the study of economics, the negative factors associated with course length reduction appear to outweigh any positive factors. While the optimum course length is not known, a length of two weeks appears detrimental to academic performance and student satisfaction.
6. Extreme course length reduction (two weeks) appears to attract exceptional students.

B. RECOMMENDATIONS

1. Economics should not be taught using a course length model of two weeks.
2. Courses that require abstract, analytic thinking are not suitable for the two week format, for it appears that learning objectives that focus on comprehension, analysis, application and synthesis require long time periods for learning to occur. Examples of such courses obviously include mathematics, the sciences, accounting, statistics, and other cognate fields that are abstract and technical. Course length reduction in these areas should be avoided.
3. Courses that are largely affective might be amenable to a reduced course length format. Courses that emphasize knowledge (recall of data) might also prove functional to a reduced course length if tasks involving higher order comprehension and analysis are kept to a minimum.
4. Extreme course length reduction may only work for students who are highly motivated and experienced. Because of this, screening of students may be necessary if extreme flexible course reduction is to be used in the Fall and Spring semesters.

APPENDIX A: COURSE SYLLABUS

MACROECONOMIC PRINCIPLES - ECONOMICS 111
SUMMER 1996 - ACCELERATED TWO WEEK COURSE

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GLENDALE COMMUNITY COLLEGE - COURSE INFORMATION

ECONOMICS 111 MACROECONOMIC PRINCIPLES SUMMER 1996

COURSE DESCRIPTION . A descriptive analysis of the structure and functioning of the American economy. Emphasis on basic economic institutions and factors that determine national income and employment levels. Consideration given to the macroeconomic topics of national income, unemployment, inflation, and monetary and fiscal policies. Prerequisites: None, but some elementary algebra is helpful.

COURSE GOALS. To understand and apply general macroeconomic principles as they relate to output, employment, income and prices in a capitalistic economy.

COURSE OBJECTIVES. By the end of this course, students should be able to:

1. Understand and manipulate economic models that show fluctuations in output, employment, income and prices.
2. Understand and list the roles that government plays in a modern economy.
3. Understand the political and philosophical dimensions of economic theory and policy.

REQUIRED TEXTBOOKS AND MATERIALS

1. ECONOMICS, by Michael Parkin. Second Edition.
2. Eight scantron sheets (882 - E) . A No.2 Pencil.

RECOMMENDED MATERIALS:

1. Two or three colored pencils.
2. Graph paper.
3. Study Guide that accompanies the Parkin text.

EXAMS AND ASSIGNMENTS. There are three major components to this course. These include:

1. There are four homework problems. Each problem consists of 20 multiple choice questions. Problems must be turned in by the scheduled due dates. Problems turned in late will receive a two point (equivalent to a letter grade) reduction.
2. Four multiple choice exams will be given that cover the 14 chapters in the Parkin text. Each exam will have 25 multiple choice questions and students will have 50 minutes to complete each exam.
3. Attendance. Because this course is so accelerated, attendance is required. Students that miss one class will have their final grade reduced by one letter grade. Two missed classes will result in the final grade being reduced by two letter grades. Lateness will also not be tolerated. A Student that is consistently late will be withdrawn from the class.

DISABLED STUDENT RESOURCES. Every reasonable effort will be made to accomodate disabled students. Students that require special assistance and/or accomodations should see me before/after class. The Disabled Student Resources Center (435-3080), located in the SPS building, can also be of assistance.

GRADING SCALE AND SYSTEM

TASK	POINTS
1. Homework Problems: 4 Problems, 20 points each equals ...	80 pts
2. Four Multiple Choice Exams, 25 Points each equals	100 pts
TOTAL POSSIBLE POINTS	180 pts

POINTS EARNED	GRADE
160 to 180	A
140 to 159	B
120 to 139	C
100 to 119	D
Below 100	F

MAKE UP EXAMS. Given at the privilege of the instructor. Students must write a letter explaining the reason. A 10 percent grade reduction will apply.

LIBRARY. The Library can be of immense help in this course! The library contains a large number of introductory textbooks that can help you. See the attached list.

TUTORING. Tutoring is available in the Learning Assistance Center .

WITHDRAWALS. If you decide to drop the class, remember that it is your responsibility to complete all necessary forms with the Registrar.

SYLLABUS REVISION. Every attempt will be made to follow the course outline and requirements. Should time be a problem, some material and requirements may be omitted.

CLASSWORK.
1. The assignments for the entire two weeks are indicated in the "Course Outline." It is understood that you will complete the study of the assigned material before coming to class. Students are expected to participate fully in class discussions by both asking and answering questions.
2. It is suggested that you read each chapter three times. ASSIGNMENTS ASSUME A MINIMUM OF 4 -6 HOURS OF PREPARATION PER NIGHT
3. Many of your class sessions will be devoted to lectures on the assigned material, so it is strongly advised that you keep well organized notes. You should review your notes immediately before AND after class. Taping, recording of lectures is not permissible, so plan on taking notes!

COURSE OUTLINE

EXAM	CHAPTERS	Assignment	Topic
		Chapter 1	Definition of Economics
		Chapter 2	Graphs
		Chapter 3	Production & Exchange
1	1, 2, 3	Chapter 4	Supply & Demand
2	4, 22, 23	Chapter 22	Inflation & Unemployment
3	24, 25, 26	Chapter 23	GDP
4	27, 28, 29 33, 34	Chapter 24	AD & AS
		Chapter 25	Keynesian Analysis
		Chapter 26	Keynesian Analysis
		Chapter 27	Money & Banking
		Chapter 28	Federal Reserve
		Chapter 29	Fiscal & Monetary Policy
		Chapter 33	Economic Stabilization
		Chapter 34	Debt & Deficits

ECONOMICS 111 - MACROECONOMICS
TWO WEEK SUMMER SESSION
MAY 17 - MAY 31

STUDENT CONTRACT

I have received the syllabus for the two week course in Macroeconomic Principles. Course requirements were explained. The instructor also explained the attendance requirement, make up exams, and homework assignments. I understand that my successful completion of this course (that is, an A or B grade) will require perfect classroom attendance as well as a minimum of 4 hours of preparation each day.

_____ _____

Student Name Date

STUDENT RECORD
ECN 111 MACROECONOMICS
ACCELERATED SUMMER SESSION

EXAMS	POINTS	HMWRK ASSIGNMENT	POINTS
1	_____	1	_____
2	_____	2	_____
3	_____	3	_____
4	_____	4	_____
TOTAL POINTS	_____	TOTAL POINTS	_____

TOTAL POINTS = EXAMS + HMRK = _____

GRADING SCALE:

160 to 180 = A
140 to 159 = B
120 to 139 = C
100 to 119 = D
Below 100 = F

NOTE: Students that miss one class will have their final grade reduced by one letter grade. Two missed classes will result in the final grade being reduced by two letter grades.

APPENDIX B:
DIARY OF MICHAEL C. PETROWSKY
FOR ECN 111 - SECTION 1410
May 17 - 31, 1996

MAY 17th. Syllabus handed out. Course requirements explained. Collected signed student contracts. Told class that two 15 minute breaks would be given. 28 students signed up, but there were six "no shows" which I reported to Leslie Prehoda. So I'm down to 21 students. Topics covered today included: Definition of economics, opportunity cost, three fundamental economic questions, economic fallacies, scientific method, and production possibilities.

Note: I had to push explication of PP curve up because I wanted to give them a homework assignment over the weekend. Time compression may be distorting topic sequences.

May 20th. Collected first homework assignment on P-P curve. Topics covered today included law of comparative advantage (using opportunity cost concept), factors of production, circular flow, graphing and slope concepts. Also discusssed differences between capitalism and socialism. Described key characteristics of capitalism. Used circular flow and P-P concepts to highlight differences between macro and micro. Began discussion of supply and demand. Ended by introducing concept of demand. Emphasized price - value - choice -behavior nexus. Announced that first exam would be tommorrow and would cover Chapters 1-3.

May 21st. Discussed supply and demand. Gave back first homework assignment. Students did well. First exam was also given today. Was able to quickly grade. Scores are very high. Gave out second homework assignment that covers supply and demand.

Note: These are extremely **good** students. Intake system for this class is very different from fall and summer semesters. Students are highly motivated - and a cut above from even the

normal 5 week summer school student. Because of this, I think comparisons between this class and others will be difficult if not impossible. Another note: time compression makes it impossible to do any problems that are at the back of the chapters. Too bad! Some of those Parkin problems are both interesting and challenging. Given this, class is starting to have a "bare bones" air about it. "Macro lite", if you will. Also, spent some time to go over exams and homework assignments. Time constraint is real.

May 22nd. Business cycles, unemployment, employment, and inflation were covered. Brief discussion of price indexes. Some class discussion concerning the lack of time. One interesting observation: this class has acquired a cohesiveness, a group consciousness, that is very evident. Whew, this is tiring! After 4.5 hours my brain is fogged.....

May 23rd. Covered national income accounting. Went over second homework assignment. Told them my personal anecdote about my seminar with Simon Kuznets. Gave them GDP handout.

May 24th. Second exam was given. This covered supply & demand, GDP, inflation, unemployment, and business cycles. I also covered the AD/AS model in chapter 24. Towards the last 45 minutes of the class I moved into chapter 25 (Keynesian theory). Provided a brief, compare/contrast of classical and keynesian theory. Note: while the mood of the class is jovial, the stress is also high.

May 28th. Keynesian theory covered. This corresponds to chapters 25 and 26 in the Parkin text. Students are freaked out over the abundance of multipliers in chapter 26 of the second edition Parkin text. I allayed their fears by telling them that Parkin was engaging in overkill. Class began with the temperature in the room hot. Boards in class were also not cleaned. This is the second time this has happened.
Went over components of the aggregate expenditure (AE) function. Thoroughly discussed the consumption function (apc, aps, mpc, mps) with numbers and graphs. Same for savings function. Discussed

operating and capital budgets and then developed investment demand function. Then discussed shifts in the MEI curve. Not much to say about G. Endogeneous versus exogeneous variables! Completed this section by discusssing exports and imports. Graphed a net export function to illustrate.

Used columns of number and graphs (AE & savings function) to illustrate Keynesian equilibrium at less than full employment. Developed concepts of expenditure multiplier, GDP gap, recessionary gap. Complicated the simple expenditure multiplier a tad by introducing imports, MPI. Showed how multiplier is impacted by business cycle, price levels, and international trade.

Fiscal policy defined and components discussed. Led into standard discussion of balanced budget multiplier theorem . God! By now class is over. Enough already! Note: a student (Robin Buck) dropped today. She is working full time and cannot keep up. I had to delay giving their second exam back because of this. Third exam is tommorrow. Third homework is also due. Again, time compression is distorting the teaching/learning sequence, for normally I would give back the homework **before** I gave the third exam. This is educationaly sad, for now we are getting into the heart - and hard part - of the course. My voice is cracking .....

May 29th. Gave back second exam. Scores were high, but only about a percentage point higher than my Spring classes. Probably not statistically significant. Collected third homework problem which covered Keynesian & AD/AS models. Note: compressed time frame has built group cohesiveness. One unintended consequence of this, when coupled with the concrete tables directly outside classroom LB-14, is that class members may be sharing answers to the homework assignments. This will probably raise scores relative to my Spring classes.

Topics covered today included: limitations of fiscal policy, graphical compare/contrast of Keynesian model to AD/AS model. Also covered money & credit, brief history of banking system. Used T accounts to show deposit creation by banking system. Developed simple

money multiplier and gave examples. Concepts defined included legal reserves, required reserves, excess reserves, discount rate, federal funds rate. Third exam was taken today and covered chapters 24 thru 26. Heard the usual grumblings about chapter 26. Further note: my strict attendance requirement is working. With the exception of one student (Robin Buck, who dropped), I have had **perfect** attendance since the course began. This is unprecedented, for I have not seen this in my 20 plus years of teaching. I also told the class that the last homework assignment (covering banking and monetary policy) would be due Friday. Last exam will also be given on this date. Again, time compression is distorting my normal sequence of giving them a homework assignment - and grading it - as preparation for the subsequent exam. To save time, I have not gone over the exams after I have given them back. (I did this for the first exam, but it ate up too much time.) The same goes for the homework problems. I realize I'm cutting corners, but I'm committed to getting through the same amount of material that I covered for the Spring semester.

May 30th. Provided background info on Fed. Went over tools of the Fed, i.e., monetary policy. Discussed strengths and weaknesses of monetary policy. Spent some time on the quantity theory of money and equation of exchange. Related this to AD/AS model. Then discussed the demand for money. This brought me into chapter 29 of the Parkin text using shifts in the demand for money. I gave back the third homework assignment and the third exam. Grades are down, class stress is high. Told class that if they gave me a stamped, self-addressed envelope on Friday, I would mail them their grades. Exam tomorrow will be given at last hour - 11 A.M. I will probably lecture for at least 3 hours tomorrow. Very weird! I suspect I'll give them a half hour break or so before the exam so they can relax. Gave them a handout from DOL's Occupational Handbook. It describes what economists do. I also gave them the econ course descriptions from ASU's catalog. Briefly discussed econ as a major. My voice is hoarse and my legs ache.....

May 31st. I covered chapters 33 and 34. This included problems in formulating policy (lags), feedback versus fixed rules, debt and deficits, crowding out, ricardian equivalence. I also returned the fourth homework assignment. Following the break, I gave out "certificates of participation" to all class members. For two students with the highest class average, I also gave out books. Sodas and cookies were brought in, and I asked them to complete a questionnaire I worked up. After they completed the survey, we had a discussion about their two week experience. I drew no conclusions from this, but I felt that it was important for them to ventilate. I told the class that this was the first time econ was ever taught in two weeks, that this was an experiment.

APPENDIX C:

SURVEY QUESTIONNAIRE
ECONOMICS 111 - MACROECONOMICS
ACCELERATED TWO WEEK COURSE
5-17-96 TO 5-31-96

INSTRUCTIONS: Please answer the questions below as completely as possible. Information gathered from the questionnaire will help to improve the course offerings and course schedules at GCC.

I. Student Information

•Age_____ Major_____
•Grade Point Average_____
•College Credits Completed_____
•GCC Student?
_____Yes
_____No
_____Other. Explain._____

_____

_____

1) Are you Currently employed?
_____Yes
_____No

2) If yes, how many hours per week do you work?
_____0-10 hours
_____11-20 hours
_____21-30 hours
_____31-40 hours
_____over 40 hours

3) If you do work, what is your occupation?_____

_____

II. Course Information

1) When you enrolled in this course, were you aware that an entire semester of work would be covered in two weeks?
_____Yes
_____No

2) If you answered "no," did you think that the course material would be reduced?
_____Yes
_____No

3) Why did you enroll in this course?
_____To fulfill a course requirement.
_____To get a quick 3 credits.
_____Because it fit into my schedule.
_____Other. Explain._____

_____

_____

4) When the syllabus and course requirements were explained to you on the first day of class, what was your reaction?

_____

_____

_____

_____

_____

5) How many hours per day during the week (Monday through Friday) did you study for this course?
_____less than 2 hours
_____between 2 and 4 hours
_____over 4 hours but less than 6 hours
_____over 6 hours

6) How many hours did you study over the weekend (Saturday and Sunday) for this course?
_____less than 2 hours
_____between 2 and 4 hours
_____over 4 hours but less than 6 hours
_____over 6 hours

7) if you had to take this course over again, would you enroll in another two week economics course?
_____Yes
_____No

8) If you answered "no" to the question above, list/describe your reasons below.
_____Too much work in two weeks.
_____Not enough time.
_____Too difficult for a two week course.
_____Other. Explain._____

_____

_____

_____

9) If you answered "yes" to question 7, give your reasons below.

_____

_____

_____

_____

10) Has this course been stressful for you?
_____yes, very much
_____yes, somewhat
_____No

11) Compared to a normal 15 week semester long course, has this course been
_____more stressful?
_____less stressful?
_____about the same.

12) You have just finished taking the course, "Economics 111 - Macroeconomics" over a two week period. If you had taken this course over a 15 week semester, would you have
_____learned more than the two week course?
_____learned less than from taking the two week course?
_____learned about the same?

13) If you think you would have learned more from a 15 week course, indicate your reason(s) below.

_____

_____

_____

_____

14) Is it better to take this course over a 15 week period or over a two week period?
_____It is better to take this course over 15 weeks.
_____It is better to take this course over two weeks.

15) Would you recommend to a friend to take the two week course in Economics 111?
_____Yes
_____No

16) If you answered "no" to question 15, give your reason(s) below.
_____Not enough time
_____Too stressful
_____Too much material
_____Other. Explain._____

_____

_____

17) Have you had any problems with the course material over the last two weeks?
_____Yes
_____No

18) If you answered "yes" to question 17, indicate below the problems that you have experienced. Rank the problems with "1" being the most serious and "5" being the least serious.
_____Not enough time to read the book.
_____Not enough time to review.
_____No time to ask questions.
_____No time to understand.
_____Other. Explain._____

_____

_____

19) Compare the first half of the course (Chapters 1, 2, 3, 4, 22, 23) to the second half of the course (Chapters 24, 25, 26, 27, 28, 29, 33, 34). Which half was harder?

_____The first half was harder.
_____The second half was harder.
_____They were about the same.

20) Which topics did you find the hardest/easiest to master? In your response, use the following code:

1 = very difficult
2 = difficult
3 = somewhat difficult
4 = somewhat easy
5 = easy
6 = very easy

_____Definition of Economics (Chapter 1)
_____Production Possibilities (Chapter 3)
_____Supply and Demand (Chapter 4)
_____GDP (Chapter 22-23)
_____Unemployment/Inflation (Chapter 22-23)
_____Aggregate Demand/Aggregate Supply (Chapter 24)
_____Keynesian Economics (Chapter 25)
_____Fiscal Policy (Chapter 26)
_____Money and Banking (Chapter 27)
_____Monetary Policy (Chapters 28, 29)
_____Economic Stabilization (Chapter 33)
_____Debt/Deficit (Chapter 34)
_____Graphing/Slope (Chapter 2)

21) How many times did you read each chapter?

_____Once
_____Twice
_____3 times
_____More than 3 times

22) Did you make an outline of each chapter?

_____Yes
_____No

23) Would you have mastered the material better if you had had more time?

_____Yes
_____No

24) What could the instructor have done, in this two week course, to make the material easier to understand?

25) Go back to question 10. If you felt that this course was stressful, indicate below the nature of the stress.

26) If you are currently employed, did you find that the hours that you worked interfered with the time that you needed to study for this course?

_____Yes
_____No
_____I do not work

27) What could you have done, in this two week course, to make the material easier to understand?

28) During the past two weeks, what would you have done differently if you could do it over?

29) In your opinion, what type of student is best able to take and successfully complete this two week course?

30) Additional Comments?

TABLE 1
Selected Student Characteristics:
Two week summer class versus
three Spring '96 Classes

CHARACTERISTIC	SPRING' 96 CLASSES	SUMMER CLASS
Age (Years)	23.80	26.40
Cum. College Credits Compl.	33.90	71.05*
G.P.A.	2.54	3.34

* NOTE: Nine out of the 20 students reported that they were not GCC students. Stated college affiliations included Grand Canyon, ASU, ASU West, Brigham Young, Yavapai.

TABLE 2
Why did you enroll in this course?*

REASON (S) STATED	NUMBER
To fulfill course requirement.	13
To get quick 3 credits.	3
Fit into schedule.	5
Other.	3

* More than one reason could be given.

TABLE 3

When you enrolled in this course, were you aware that an entire semester of work would be covered in two weeks?

RESPONSE	NUMBER	% OF TOTAL
Yes	15	75%
No	5	25%
Total	20	100%

TABLE 4

If you answered "no," did you think that the course material would be reduced?

RESPONSE	NUMBER
Yes	2
No	3

Table 5
Are you currently employed?

RESPONSE	NUMBER	% OF TOTAL
Yes	16	80%
No	4	20%
TOTAL	20	100%

Table 6
How many hours per week do you work?

HOURS	RESPONSE	% OF TOTAL
0-10	1	6%
11-20	5	31%
21-30	5	31%
31-40	4	25%
over 40	1	6%
TOTAL	16	100%

Table 7
How many hours per day during the week (Monday through Friday) did you study for this course?

TIME SPENT STUDYING PER DAY	NUMBER	% OF TOTAL
less than 2 hours	7	35%
between 2 and 4 hours	8	40%
over 4 hours but less than 6 hours	2	10%
over 6 hours	3	15 %
TOTAL	20	100%

MEAN STUDY TIME TIME PER WEEK DAY = 3.15 HOURS

Table 8
How many hours did you study over the weekend (Saturday and Sunday) for this course?

TIME SPENT STUDYING OVER THE WEEKEND	N	% OF TOTAL
less than two hours	7	35%
between 2 and 4 hours	4	20%
over 4 hours but less than 6 hours	1	5%
over 6 hours	8	40%
TOTAL	20	100%

MEAN WEEKEND STUDY TIME = 4.0 Hours

Table 9
Mean weekday time commitment
(hours) for two week summer class

ACTIVITY	TIME
Employment	4.87 Hours
Class time	4.50 Hours
Study time	3.15 Hours
TOTAL =	12.52 Hours

Table 10
Weekly Time Commitment (Hours)
For Two Week Summer Class

ACTIVITY	TIME
Employment	24.37
Class time	22.50
Study time	19.75
TOTAL =	66.62 Hours

Table 11
Has this course been stressful for you?

Response	Number	% OF TOTAL
Yes, very much	3	15%
Yes, somewhat	14	70%
No	3	15%
Total	20	100%

Table 12
Compared to a normal 15 week semester long course, has this course been

STRESS COMPARISON	NUMBER	% OF TOTAL
more stressful ?	11	58%
less stressful ?	3	16%
about the same	5	26%
TOTAL	19	100%

Table 13
You have just finished taking the course, "Economics 111 - Macroeconomics" over a two week period. If you had taken this course over a 15 week semester, woud you have

COURSE COMPARISON RESPONSE	NUMBER	% OF TOTAL
learned more than the two week course?	9	45%
learned less than from taking the two week course?	4	20%
learned about the same?	7	35%
TOTAL	20	100%

Table 14
Would you have mastered the material better if you had more time?

RESPONSE	NUMBER	% OF TOTAL
Yes	16	80%
No	4	20%
TOTAL	20	100%

Table 15
Have you had any problems with the course material over the last two weeks?

RESPONSE	NUMBER	% OF TOTAL
Yes	10	50%
No	10	50%
Total	20	100%

Table 16
If you answered "yes" to question 17, indicate below the problems that you have experienced . Rank the problems with "1" being the most serious and "5" being the least serious.

CATEGORY	RESPONSES	RANK
Not enough time to read book	1	3
Not enough time to review	2	1.6
No time to ask questions	1	3
No time to understand	2	2.8

Table 17

If you are currently employed, did you find that the hours that you worked interfered with the time that you needed to study for this course?

RESPONSE	NUMBER	% OF TOTAL
Yes	11	73.4%
No	4	26.6%
Total	15	100%

Table 18

How many times did you read each chapter?

RESPONSE	NUMBER	% OF TOTAL
Once	13	65%
Twice	6	30%
Three Times	0	0
More than 3 times	1	5%
Total	20	100%

Table 19
Did you make an outline of each chapter?

RESPONSE	NUMBER	% OF TOTAL
Yes	5	25%
No	15	75%
Total	20	100%

Table 20
If you had to take this course over again, would you enroll in another two week economics course?

RESPONSE	NUMBER	% OF TOTAL
Yes	11	55%
No	9	45%
Total	20	100%

Table 21

If you answered "no" to the question above (Table 20), list/describe your reason(s) below.

REASONS	NUMBER	% OF TOTAL
Too much work in two weeks	2	10%
Not enough time	2	10%
Too difficult for two weeks	3	15%
Other (lack of study skills, etc.)	2	10%
Total	9	45%

Table 22

Is it better to take this course over a 15 week period or over a two week period?

RESPONSE	NUMBER	%OF TOTAL
It is better to take this course over 15 weeks.	11	55%
It is better to take this course over two weeks.	7	35%
No response.	2	10%
Total	20	100%

Table 23
Would you recommend to a friend to take the two week course in Economics 111?

RESPONSE	NUMBER	% OF TOTAL
Yes	11	55%
No	7	35%
Not sure	1	5%
No response	1	5%
Total	20	100%

Table 24
Compare the first half of the course (chapters 1,2, 3, 4, 22, 23) to the second half of the course (chapters 24, 25, 26, 27 28, 29, 33, 34). Which half was harder?

RESPONSE	NUMBER	% OF TOTAL
The first half was harder	2	10%
The second half was harder	17	85%
They were about the same.	1	5%
Total	20	100%

Table 25

Which topics did you find hardest/ easiest to master? In your response, use the following code:

1 = very difficult
2 = difficult
3 = somewhat difficult
4 = somewhat easy
5 = easy
6 = very easy

TOPIC	RATING
First half of course	
Definition of Economics (chapter 1)	5.22
Graphing/slope (chapter 2)	4.11
Production-Possibilities (chapter 3)	4.94
Supply & Demand (chapter 4)	4.50
GDP (chapters 22-23)	4.0
Unemployment/Inflation (chapters 22-23)	3.83
First half of course mean	**4.43**
Second half of course	
Aggregate Demand/Aggregate Supply (chpt. 24)	3.33
Keynesian Economics (chapter 25)	2.94
Fiscal Policy (Chapter 26)	2.83
Money & Banking (chapter 27)	3.33
Monetary Policy (chapters 28, 29)	3.05
Economic Stabilization (chapter 33)	3.22
Deficit/Debt (chapter 34)	3.44
Second half of course mean	**3.16**

APPENDIX D: STATISTICAL ANALYSIS

CONTENTS OF 1STEXAM

Observation	Column 1 (spring)	Column 2 (summer)
1	23.00	24.00
2	24.00	22.00
3	21.00	20.00
4	22.00	20.00
5	23.00	20.00
6	18.00	24.00
7	24.00	25.00
8	24.00	25.00
9	24.00	18.00
10	20.00	22.00
11	25.00	24.00
12	21.00	22.00
13	21.00	23.00
14	20.00	25.00
15	25.00	21.00
16	20.00	24.00
17	24.00	23.00
18	11.00	25.00
19	23.00	25.00
20	24.00	25.00
21	21.00	25.00
22	24.00	
23	24.00	
24	24.00	
25	17.00	
26	22.00	
27	24.00	
28	22.00	
29	23.00	
30	24.00	
31	17.00	
32	25.00	
33	24.00	
34	19.00	
35	22.00	
36	24.00	
37	21.00	
38	25.00	
39	23.00	
40	22.00	
41	24.00	
42	22.00	
43	24.00	
44	23.00	
45	25.00	
46	23.00	
47	22.00	
48	17.00	
49	17.00	
50	17.00	

CONTENTS OF 1STEXAM

Observation	Column 1 (spring)	Column 2 (summer)
51	19.00	
52	19.00	
53	25.00	
54	19.00	
55	25.00	
56	17.00	
57	22.00	
58	24.00	
59	21.00	
60	23.00	
61	22.00	
62	23.00	
63	20.00	
64	24.00	
65	24.00	
66	19.00	
67	24.00	
68	23.00	
69	24.00	
70	21.00	
71	25.00	
72	19.00	
73	25.00	
74	21.00	
75	19.00	
76	17.00	
77	25.00	
78	24.00	
79	14.00	
80	20.00	
81	23.00	
82	24.00	
83	20.00	

DESCRIPTIVE MEASURES OF LOCATION AND DISPERSION

DATA SET NAME: 1STEXAM

VARIABLE: spring OBSERVATIONS: 83

Mean	Variance	Standard Deviation	Coefficent of Variation
21.83	8.02	2.83	12.97

Minimum Value	25th Percentile	Median	75th Percentile	Maximum Value
11.00	20.00	23.00	24.00	25.00

DESCRIPTIVE MEASURES OF LOCATION AND DISPERSION

DATA SET NAME: 1STEXAM

VARIABLE: summer OBSERVATIONS: 21

Mean	Variance	Standard Deviation	Coefficent of Variation
22.95	4.55	2.13	9.29

Minimum Value	25th Percentile	Median	75th Percentile	Maximum Value
18.00	22.00	24.00	25.00	25.00

CONTENTS OF 2NDEXAM

Observation	Column 1 (spring)	Column 2 (summer)
1	19.00	18.00
2	18.00	10.00
3	10.00	19.00
4	12.00	14.00
5	18.00	20.00
6	15.00	24.00
7	11.00	24.00
8	14.00	10.00
9	22.00	21.00
10	14.00	19.00
11	14.00	13.00
12	16.00	23.00
13	21.00	21.00
14	11.00	20.00
15	23.00	25.00
16	8.00	20.00
17	14.00	23.00
18	20.00	21.00
19	16.00	20.00
20	14.00	24.00
21	19.00	
22	19.00	
23	10.00	
24	18.00	
25	22.00	
26	16.00	
27	10.00	
28	19.00	
29	19.00	
30	21.00	
31	18.00	
32	14.00	
33	16.00	
34	10.00	
35	20.00	
36	14.00	
37	21.00	
38	22.00	
39	20.00	
40	24.00	
41	17.00	
42	15.00	
43	18.00	
44	12.00	
45	16.00	
46	8.00	
47	16.00	
48	20.00	
49	17.00	
50	23.00	

CONTENTS OF 2NDEXAM

Observation	Column 1 (spring)	Column 2 (summer)
51	17.00	
52	20.00	
53	16.00	
54	13.00	
55	18.00	
56	18.00	
57	17.00	
58	20.00	
59	14.00	
60	19.00	
61	14.00	
62	17.00	
63	22.00	
64	18.00	
65	12.00	
66	19.00	
67	12.00	
68	17.00	
69	16.00	
70	22.00	
71	20.00	
72	15.00	
73	16.00	
74	14.00	
75	12.00	

DESCRIPTIVE MEASURES OF LOCATION AND DISPERSION

DATA SET NAME: 2NDEXAM

VARIABLE: spring OBSERVATIONS: 75

Mean	Variance	Standard Deviation	Coefficent of Variation
16.56	14.33	3.79	22.86

Minimum Value	25th Percentile	Median	75th Percentile	Maximum Value
8.00	14.00	17.00	19.00	24.00

DESCRIPTIVE MEASURES OF LOCATION AND DISPERSION

DATA SET NAME: 2NDEXAM

VARIABLE: summer OBSERVATIONS: 20

Mean	Variance	Standard Deviation	Coefficent of Variation
19.45	19.94	4.47	22.96

Minimum Value	25th Percentile	Median	75th Percentile	Maximum Value
10.00	18.50	20.00	23.00	25.00

CONTENTS OF 3RDEXAM

Observation	Column 1 (spring)	Column 2 (summer)
1	14.00	13.00
2	19.00	13.00
3	19.00	20.00
4	21.00	14.00
5	19.00	18.00
6	18.00	24.00
7	19.00	10.00
8	14.00	14.00
9	22.00	16.00
10	15.00	18.00
11	18.00	16.00
12	23.00	19.00
13	22.00	10.00
14	18.00	20.00
15	15.00	24.00
16	13.00	18.00
17	24.00	19.00
18	21.00	21.00
19	18.00	15.00
20	20.00	23.00
21	24.00	
22	21.00	
23	20.00	
24	25.00	
25	19.00	
26	23.00	
27	18.00	
28	20.00	
29	16.00	
30	19.00	
31	20.00	
32	14.00	
33	19.00	
34	23.00	
35	19.00	
36	18.00	
37	26.00	
38	23.00	
39	21.00	
40	23.00	
41	17.00	
42	18.00	
43	14.00	
44	15.00	
45	22.00	
46	14.00	
47	21.00	
48	19.00	
49	20.00	
50	23.00	

CONTENTS OF 3RDEXAM

Observation	Column 1 (spring)	Column 2 (summer)
51	15.00	
52	19.00	
53	16.00	
54	16.00	
55	17.00	
56	25.00	
57	14.00	
58	17.00	
59	19.00	
60	17.00	
61	21.00	
62	20.00	
63	17.00	
64	11.00	
65	21.00	
66	23.00	
67	21.00	
68	16.00	
69	22.00	
70	20.00	

DESCRIPTIVE MEASURES OF LOCATION AND DISPERSION

DATA SET NAME: 3RDEXAM

VARIABLE: spring OBSERVATIONS: 70

Mean	Variance	Standard Deviation	Coefficent of Variation
19.04	10.65	3.26	17.14

Minimum Value	25th Percentile	Median	75th Percentile	Maximum Value
11.00	17.00	19.00	21.00	26.00

DESCRIPTIVE MEASURES OF LOCATION AND DISPERSION

DATA SET NAME: 3RDEXAM

VARIABLE: summer OBSERVATIONS: 20

Mean	Variance	Standard Deviation	Coefficent of Variation
17.25	17.46	4.18	24.22

Minimum Value	25th Percentile	Median	75th Percentile	Maximum Value
10.00	14.00	18.00	20.00	24.00

CONTENTS OF 4THEXAM

Observation	Column 1 (spring)	Column 2 (summer)
1	20.00	16.00
2	18.00	7.00
3	21.00	12.00
4	14.00	13.00
5	14.00	18.00
6	24.00	19.00
7	15.00	15.00
8	24.00	13.00
9	14.00	22.00
10	17.00	20.00
11	18.00	13.00
12	20.00	17.00
13	17.00	21.00
14	15.00	12.00
15	15.00	19.00
16	21.00	12.00
17	14.00	21.00
18	17.00	16.00
19	22.00	16.00
20	16.00	20.00
21	17.00	
22	16.00	
23	21.00	
24	12.00	
25	11.00	
26	19.00	
27	14.00	
28	19.00	
29	15.00	
30	15.00	
31	14.00	
32	15.00	
33	18.00	
34	20.00	
35	14.00	
36	20.00	
37	17.00	
38	18.00	
39	14.00	
40	15.00	
41	17.00	
42	18.00	
43	18.00	
44	14.00	
45	16.00	
46	18.00	
47	18.00	
48	17.00	
49	16.00	
50	16.00	

CONTENTS OF 4THEXAM

Observation	Column 1 (spring)	Column 2 (summer)
51	21.00	
52	22.00	
53	16.00	
54	17.00	
55	18.00	
56	16.00	
57	19.00	
58	21.00	
59	13.00	
60	20.00	
61	23.00	
62	17.00	
63	18.00	
64	11.00	
65	16.00	

DESCRIPTIVE MEASURES OF LOCATION AND DISPERSION

DATA SET NAME: 4THEXAM

VARIABLE: spring OBSERVATIONS: 65

Mean	Variance	Standard Deviation	Coefficent of Variation
17.17	8.74	2.96	17.22

Minimum Value	25th Percentile	Median	75th Percentile	Maximum Value
11.00	15.00	17.00	19.00	24.00

DESCRIPTIVE MEASURES OF LOCATION AND DISPERSION

DATA SET NAME: 4THEXAM

VARIABLE: summer OBSERVATIONS: 20

Mean	Variance	Standard Deviation	Coefficent of Variation
16.10	15.67	3.96	24.59

Minimum Value	25th Percentile	Median	75th Percentile	Maximum Value
7.00	13.00	16.00	19.50	22.00

COMPARISON OF SUMMER FIRST HALF COMBINED MEAN EXAM SCORES WITH SUMMER SECOND HALF COMBINED MEAN EXAM SCORES

CBS-Hypothesis Testing 06-26-1996 - 13:39:12

Information Entered

Test Procedure:	Two Sided
Alpha Error:	0.0500
Critical Z (Test Statistic - alpha/2):	1.9600
Hypothesis Value:	0
Sample Size for Group 1:	41
Sample Size for Group 2:	40
Mean for Group 1:	21.2439
Mean for Group 2:	16.6750
Standard Deviation (S) for Group 1:	3.8586
Standard Deviation (S) for Group 2:	4.0597

	1half	2half		1half	2half		1half	2half
1 =	24	13	20 =	25	23	39 =	21	16
2 =	22	13	21 =	25	16	40 =	20	20
3 =	20	20	22 =	18	7	41 =	24	
4 =	20	14	23 =	10	12			
5 =	20	18	24 =	19	13			
6 =	24	24	25 =	14	18			
7 =	25	10	26 =	20	19			
8 =	25	14	27 =	24	15			
9 =	18	16	28 =	24	13			
10 =	22	18	29 =	10	22			
11 =	24	16	30 =	21	20			
12 =	22	19	31 =	19	13			
13 =	23	10	32 =	13	17			
14 =	25	20	33 =	23	21			
15 =	21	24	34 =	21	12			
16 =	24	18	35 =	20	19			
17 =	23	19	36 =	25	12			
18 =	25	21	37 =	20	21			
19 =	25	15	38 =	23	16			

Results

Standard Error of Mean (unequal variances):	0.8804
Lower Limit:	-1.7257
Upper Limit:	1.7257
Standard Error of Mean (equal variances):	0.8799
Lower Limit:	-1.7246
Upper Limit:	1.7246
Mean 1 - Mean 2:	4.5689
Degrees of Freedom:	79
Critical Z (Test Statistic - alpha/2):	1.9600
Computed Z (unequal variances):	5.1893
p value:	0.0002

Conclusion: Reject Hypothesis

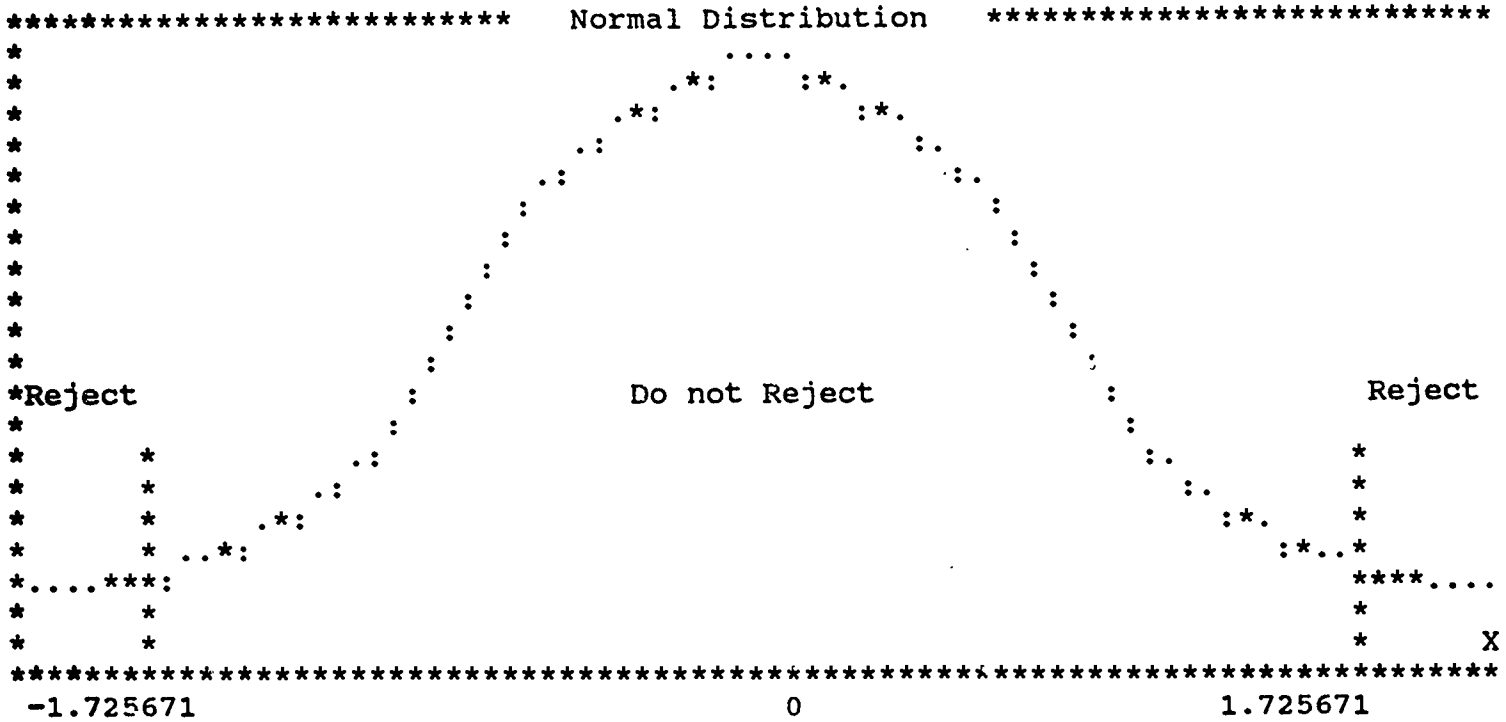
Power Curve

-- unequal variances --

	Actual	Beta	1-Beta
1	5.0445	0.9767	0.0233
2	3.3851	0.8390	0.1610
3	1.7257	0.5000	0.5000
4	0.0662	0.1610	0.8390
5	-1.5932	0.0233	0.9767

-- equal variances--

	Actual	Beta	1-Beta
1	5.0434	0.9767	0.0233
2	3.3840	0.8390	0.1610
3	1.7246	0.5000	0.5000
4	0.0651	0.1610	0.8390
5	-1.5943	0.0233	0.976[illegible]


Normal Distribution
Reject
Do not Reject
Reject
X
-1.725671
0
1.725671

COMPARISON OF SPRING FIRST HALF COMBINED MEAN EXAM SCORES WITH SPRING SECOND HALF COMBINED MEAN EXAM SCORES

E CBS-Hypothesis Testing 06-26-1996 - 14:09:0

Information Entered

Test Procedure:	Two Sided
Alpha Error:	0.0500
Critical Z (Test Statistic - alpha/2):	1.9600
Hypothesis Value:	0
Sample Size for Group 1:	158
Sample Size for Group 2:	135
Mean for Group 1:	19.3291
Mean for Group 2:	18.1407
Standard Deviation (S) for Group 1:	4.2328
Standard Deviation (S) for Group 2:	3.2465

	1half	2half		1half	2half		1half	2half		1half	2half
1 =	23	14	20 =	24	20	39 =	23	21	58 =	24	17
2 =	24	19	21 =	21	24	40 =	22	23	59 =	21	19
3 =	21	19	22 =	24	21	41 =	24	17	60 =	23	17
4 =	22	21	23 =	24	20	42 =	22	18	61 =	22	21
5 =	23	19	24 =	24	25	43 =	24	14	62 =	23	20
6 =	18	18	25 =	17	19	44 =	23	15	63 =	20	17
7 =	24	19	26 =	22	23	45 =	25	22	64 =	24	11
8 =	24	14	27 =	24	18	46 =	23	14	65 =	24	21
9 =	24	22	28 =	22	20	47 =	22	21	66 =	19	23
10 =	20	15	29 =	23	16	48 =	17	19	67 =	24	21
11 =	25	18	30 =	24	19	49 =	17	20	68 =	23	16
12 =	21	23	31 =	17	20	50 =	17	23	69 =	24	22
13 =	21	22	32 =	25	14	51 =	19	15	70 =	21	20
14 =	20	18	33 =	24	19	52 =	19	19	71 =	25	20
15 =	25	15	34 =	19	23	53 =	25	16	72 =	19	18
16 =	20	13	35 =	22	19	54 =	19	16	73 =	25	21
17 =	24	24	36 =	24	18	55 =	25	17	74 =	21	14
18 =	11	21	37 =	21	26	56 =	17	25	75 =	19	14
19 =	23	18	38 =	25	23	57 =	22	14	76 =	17	24

	1half	2half		1half	2half		1half	2half		1half	2half
77 =	25	15	96 =	21	19	115 =	14	16	134 =	17	11
78 =	24	24	97 =	11	14	116 =	16	18	135 =	20	16
79 =	14	14	98 =	23	19	117 =	10	18	136 =	16	
80 =	20	17	99 =	8	15	118 =	20	17	137 =	13	
81 =	23	18	100 =	14	15	119 =	14	16	138 =	18	
82 =	24	20	101 =	20	14	120 =	21	16	139 =	18	
83 =	20	17	102 =	16	15	121 =	22	21	140 =	17	
84 =	19	15	103 =	14	18	122 =	20	22	141 =	20	
85 =	18	15	104 =	19	20	123 =	24	16	142 =	14	
86 =	10	21	105 =	19	14	124 =	17	17	143 =	19	
87 =	12	14	106 =	10	20	125 =	15	18	144 =	14	
88 =	18	17	107 =	18	17	126 =	18	16	145 =	17	
89 =	15	22	108 =	22	18	127 =	12	19	146 =	22	
90 =	11	16	109 =	16	14	128 =	16	21	147 =	18	
91 =	14	17	110 =	10	15	129 =	8	13	148 =	12	
92 =	22	16	111 =	19	17	130 =	16	20	149 =	19	
93 =	14	21	112 =	19	18	131 =	20	23	150 =	12	
94 =	14	12	113 =	21	18	132 =	17	17	151 =	17	
95 =	16	11	114 =	18	14	133 =	23	18	152 =	16	

	1half	2half
153 =	22	
154 =	20	
155 =	15	
156 =	16	
157 =	14	
158 =	12	

Results

Standard Error of Mean (unequal variances):	0.4376
Lower Limit:	-0.8576
Upper Limit:	0.8576
Standard Error of Mean (equal variances):	0.4466
Lower Limit:	-0.8753
Upper Limit:	0.8753
Mean 1 - Mean 2:	1.1884
Degrees of Freedom:	291
Critical Z (Test Statistic - alpha/2):	1.9600
Computed Z (unequal variances):	2.7158
p value:	0.0070

Conclusion: Reject Hypothesis

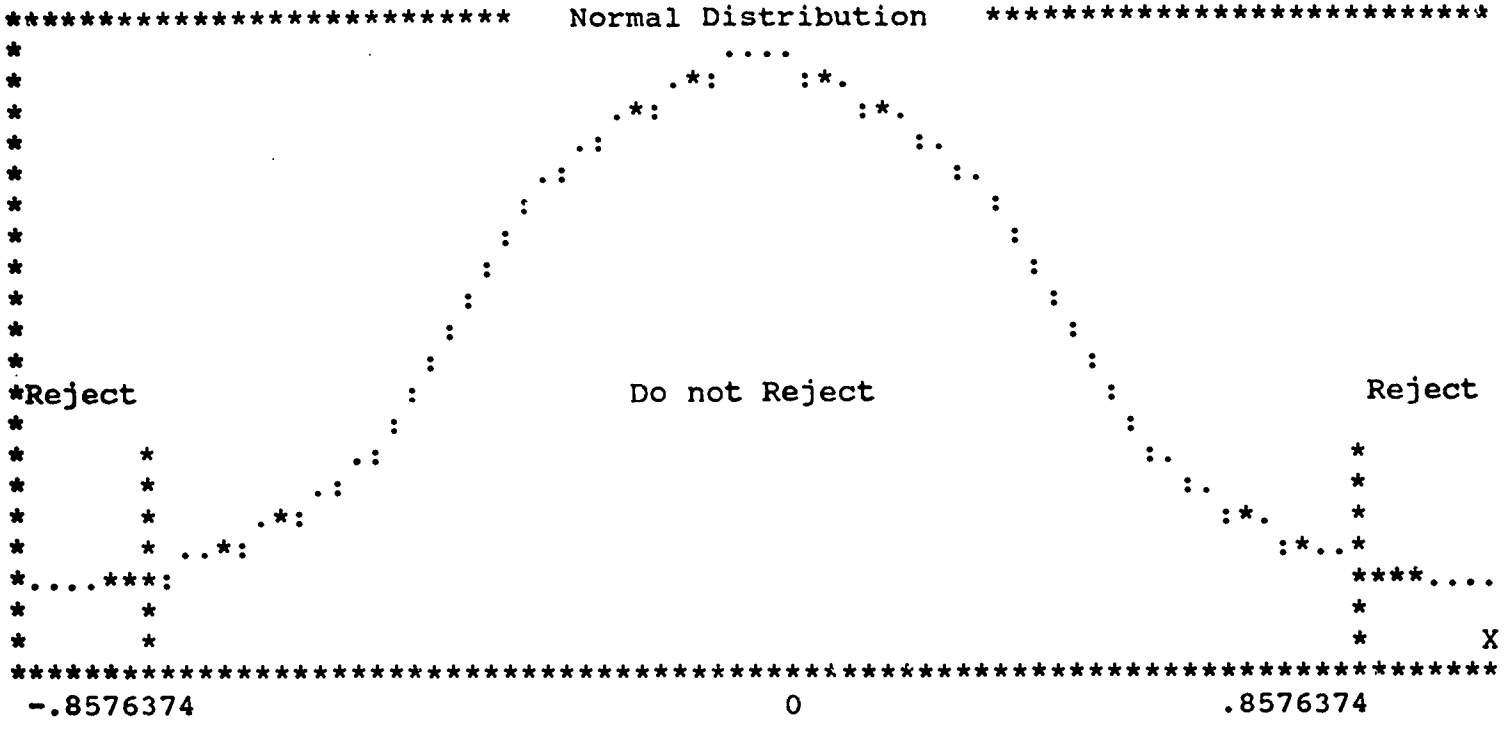
Power Curve

-- unequal variances --

	Actual	Beta	1-Beta
1	6.7969	0.9767	0.0233
2	3.8273	0.8390	0.1610
3	0.8576	0.5000	0.5000
4	-2.1120	0.1610	0.8390
5	-5.0816	0.0233	0.9767

-- equal variances--

	Actual	Beta	1-Beta
1	6.8146	0.9767	0.0233
2	3.8450	0.8390	0.1610
3	0.8753	0.5000	0.5000
4	-2.0943	0.1610	0.8390
5	-5.0639	0.0233	0.9767


Normal Distribution
Reject
Do not Reject
Reject
X
-.8576374
0
.8576374

COMPARISON OF SPRING FIRST HALF COMBINED MEAN EXAM SCORES WITH SUMMER FIRST HALF COMBINED MEAN SCORES

CBS-Hypothesis Testing 06-26-1996 - 14:46:34

Information Entered

Test Procedure:	Two Sided
Alpha Error:	0.0500
Critical Z (Test Statistic - alpha/2):	1.9600
Hypothesis Value:	0
Sample Size for Group 1:	158
Sample Size for Group 2:	41
Mean for Group 1:	19.3291
Mean for Group 2:	21.2439
Standard Deviation (S) for Group 1:	4.2328
Standard Deviation (S) for Group 2:	3.8586

	sprin	summr		sprin	summr		sprin	summr		sprin	summr
1 =	23	24	20 =	21	25	39 =	22	21	58 =	24	
2 =	24	22	21 =	24	25	40 =	24	20	59 =	21	
3 =	21	20	22 =	24	18	41 =	22	24	60 =	23	
4 =	22	20	23 =	24	10	42 =	24		61 =	22	
5 =	23	20	24 =	17	19	43 =	23		62 =	23	
6 =	24	24	25 =	22	14	44 =	25		63 =	20	
7 =	24	25	26 =	24	20	45 =	23		64 =	24	
8 =	24	25	27 =	22	24	46 =	22		65 =	24	
9 =	20	18	28 =	23	24	47 =	17		66 =	19	
10 =	25	22	29 =	24	10	48 =	17		67 =	24	
11 =	21	24	30 =	17	21	49 =	17		68 =	23	
12 =	21	22	31 =	25	19	50 =	18		69 =	24	
13 =	20	23	32 =	24	13	51 =	19		70 =	21	
14 =	25	25	33 =	19	23	52 =	19		71 =	25	
15 =	20	21	34 =	22	21	53 =	25		72 =	19	
16 =	24	24	35 =	24	20	54 =	19		73 =	25	
17 =	11	23	36 =	21	25	55 =	25		74 =	21	
18 =	23	25	37 =	25	20	56 =	17		75 =	19	
19 =	24	25	38 =	23	23	57 =	22		76 =	17	

	sprin	summr		sprin	summr		sprin	summr		sprin	summr
77 =	25		96 =	21		115 =	14		134 =	17	
78 =	24		97 =	11		116 =	16		135 =	20	
79 =	14		98 =	23		117 =	10		136 =	16	
80 =	20		99 =	8		118 =	20		137 =	13	
81 =	23		100 =	14		119 =	14		138 =	18	
82 =	24		101 =	20		120 =	21		139 =	18	
83 =	20		102 =	16		121 =	22		140 =	17	
84 =	19		103 =	14		122 =	20		141 =	20	
85 =	18		104 =	19		123 =	24		142 =	14	
86 =	10		105 =	19		124 =	17		143 =	19	
87 =	12		106 =	10		125 =	15		144 =	14	
88 =	18		107 =	18		126 =	18		145 =	17	
89 =	15		108 =	22		127 =	12		146 =	22	
90 =	11		109 =	16		128 =	16		147 =	18	
91 =	14		110 =	10		129 =	8		148 =	12	
92 =	22		111 =	19		130 =	16		149 =	19	
93 =	14		112 =	19		131 =	20		150 =	12	
94 =	14		113 =	21		132 =	17		151 =	17	
95 =	16		114 =	18		133 =	23		152 =	16	

	sprin	summr
153 =	22	
154 =	20	
155 =	15	
156 =	16	
157 =	14	
158 =	12	

Results

Standard Error of Mean (unequal variances):	0.6903
Lower Limit:	-1.3530
Upper Limit:	1.3530
Standard Error of Mean (equal variances):	0.7290
Lower Limit:	-1.4289
Upper Limit:	1.4289
Mean 1 - Mean 2:	-1.9148
Degrees of Freedom:	197
Critical Z (Test Statistic - alpha/2):	1.9600
Computed Z (unequal variances):	-2.7738
p value:	0.0061

Conclusion: Reject Hypothesis

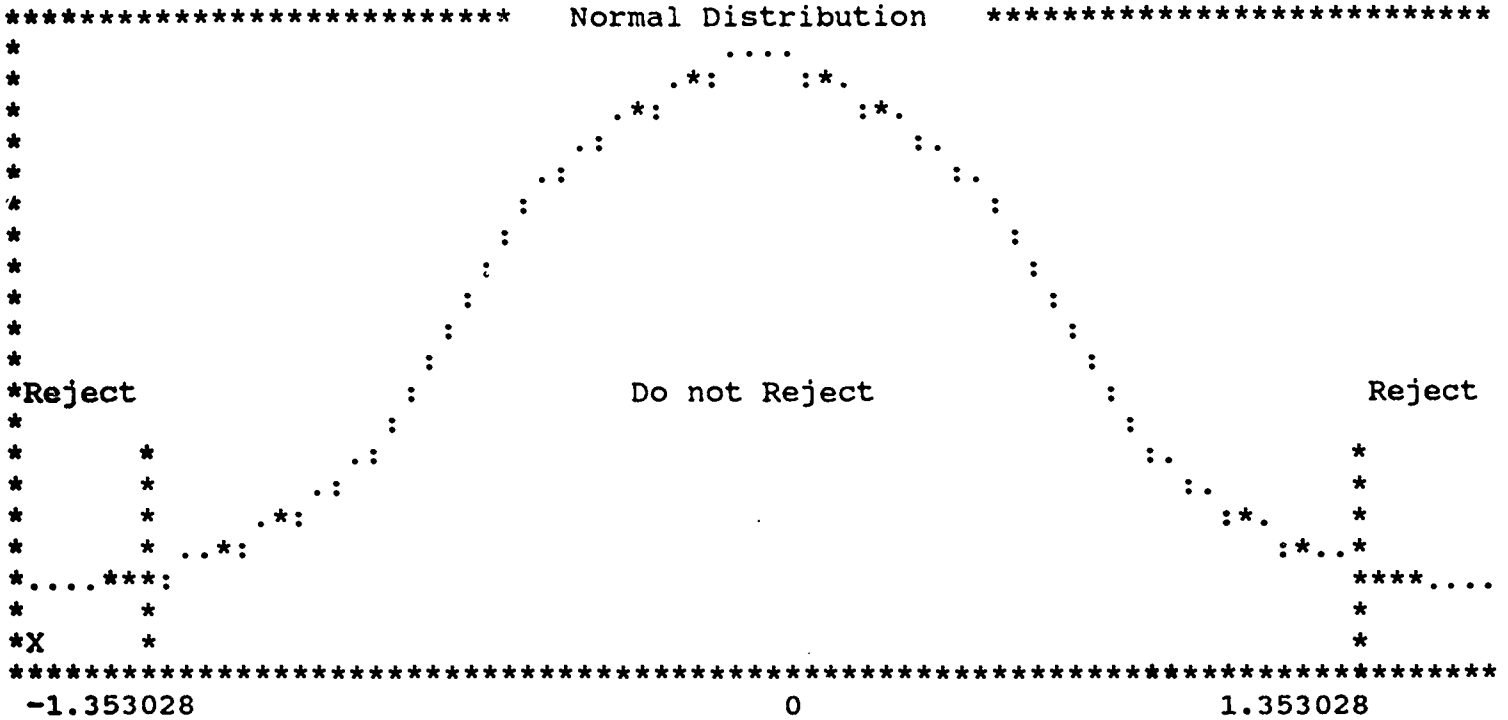
Power Curve

-- unequal variances --

	Actual	Beta	1-Beta
1	-7.2923	0.0233	0.9767
2	-4.3227	0.1610	0.8390
3	-1.3530	0.5000	0.5000
4	1.6166	0.8390	0.1610
5	4.5862	0.9767	0.0233

-- equal variances--

	Actual	Beta	1-Beta
1	-7.3682	0.0233	0.9767
2	-4.3985	0.1610	0.8390
3	-1.4289	0.5000	0.5000
4	1.5407	0.8390	0.1610
5	4.5103	0.9767	0.0233


Normal Distribution
Reject
Do not Reject
Reject
-1.353028
0
1.353028

COMPARISON OF SPRING SECOND HALF COMBINED MEAN SCORES WITH SUMMER SECOND HALF COMBINED MEAN SCORES

CBS-Hypothesis Testing 06-26-1996 - 14:^5:17

Information Entered

Test Procedure:	Two Sided
Alpha Error:	0.0500
Critical Z (Test Statistic - alpha/2):	1.9600
Hypothesis Value:	0
Sample Size for Group 1:	135
Sample Size for Group 2:	40
Mean for Group 1:	18.1407
Mean for Group 2:	16.6750
Standard Deviation (S) for Group 1:	3.2465
Standard Deviation (S) for Group 2:	4.0597

	sprin	summr		sprin	summr		sprin	summr		sprin	summr
1 =	14	13	20 =	20	23	39 =	21	16	58 =	17	
2 =	19	13	21 =	24	16	40 =	23	20	59 =	19	
3 =	19	20	22 =	21	7	41 =	17		60 =	17	
4 =	21	14	23 =	20	12	42 =	18		61 =	21	
5 =	19	18	24 =	25	13	43 =	14		62 =	20	
6 =	18	24	25 =	19	18	44 =	15		63 =	17	
7 =	19	10	26 =	23	19	45 =	22		64 =	11	
8 =	14	14	27 =	18	15	46 =	14		65 =	21	
9 =	22	16	28 =	20	13	47 =	21		66 =	23	
10 =	15	18	29 =	16	22	48 =	19		67 =	21	
11 =	18	16	30 =	19	20	49 =	20		68 =	16	
12 =	23	19	31 =	20	13	50 =	23		69 =	22	
13 =	22	10	32 =	14	17	51 =	15		70 =	20	
14 =	18	20	33 =	19	21	52 =	19		71 =	20	
15 =	15	24	34 =	23	12	53 =	16		72 =	18	
16 =	13	18	35 =	19	19	54 =	16		73 =	21	
17 =	24	19	36 =	18	12	55 =	17		74 =	14	
18 =	21	21	37 =	26	21	56 =	25		75 =	14	
19 =	18	15	38 =	23	16	57 =	14		76 =	24	

	sprin summr		sprin summr		sprin summr		sprin summr
77 =	15	96 =	19	115 =	16	134 =	11
78 =	24	97 =	14	116 =	18	135 =	16
79 =	14	98 =	19	117 =	18		
80 =	17	99 =	15	118 =	17		
81 =	18	100 =	15	119 =	16		
82 =	20	101 =	14	120 =	16		
83 =	17	102 =	15	121 =	21		
84 =	15	103 =	18	122 =	22		
85 =	15	104 =	20	123 =	16		
86 =	21	105 =	14	124 =	17		
87 =	14	106 =	20	125 =	18		
88 =	17	107 =	17	126 =	16		
89 =	22	108 =	18	127 =	19		
90 =	16	109 =	14	128 =	21		
91 =	17	110 =	15	129 =	13		
92 =	16	111 =	17	130 =	20		
93 =	21	112 =	18	131 =	23		
94 =	12	113 =	18	132 =	17		
95 =	11	114 =	14	133 =	18		

Results

Standard Error of Mean (unequal variances):	0.7001
Lower Limit:	-1.3722
Upper Limit:	1.3722
Standard Error of Mean (equal variances):	0.6205
Lower Limit:	-1.2161
Upper Limit:	1.2161
Mean 1 - Mean 2:	1.4657
Degrees of Freedom:	173
Critical Z (Test Statistic - alpha/2):	1.9600
Computed Z (unequal variances):	2.0937
p value:	0.0377

Conclusion: Reject Hypothesis

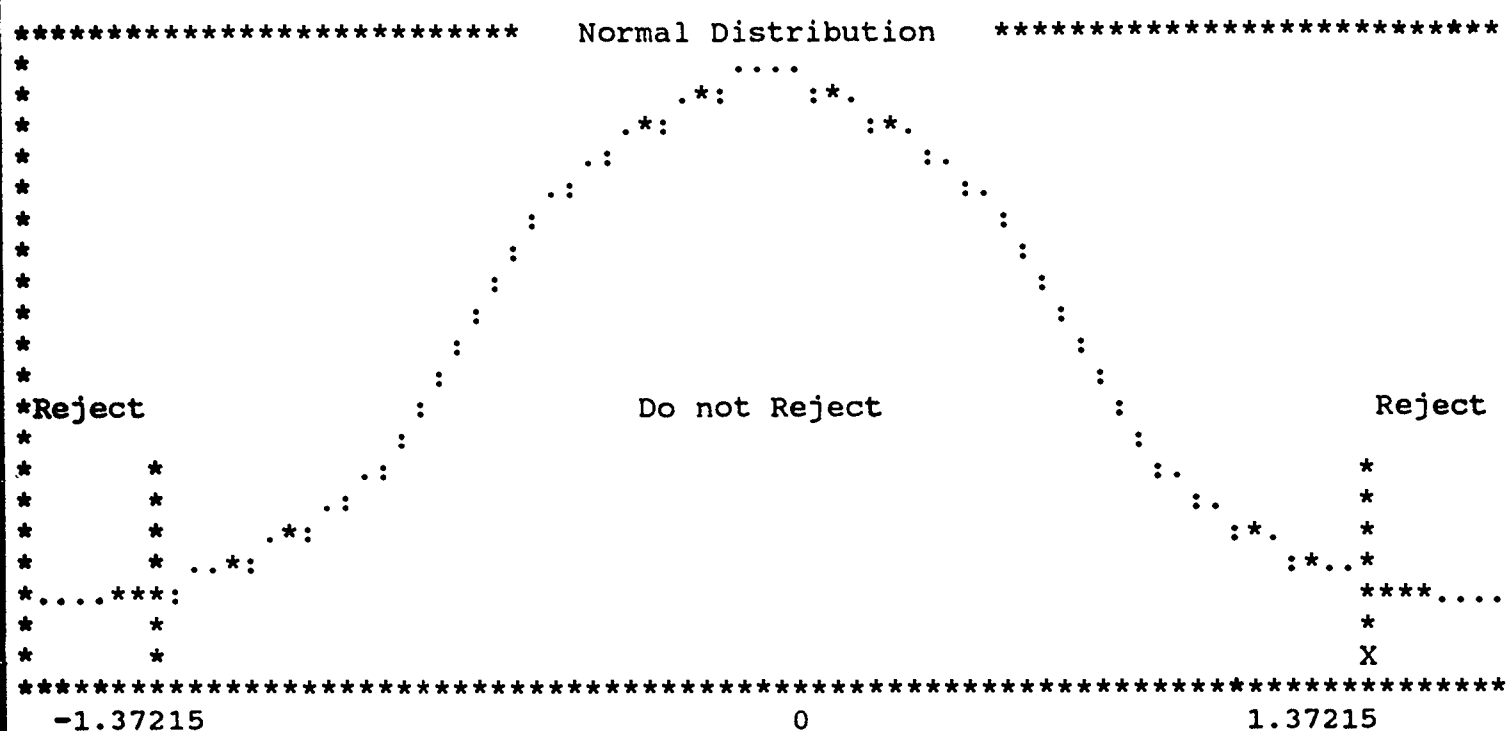
Power Curve

-- unequal variances --

	Actual	Beta	1-Beta
1	8.5300	0.9767	0.0233
2	4.9511	0.8390	0.1610
3	1.3722	0.5000	0.5000
4	-2.2068	0.1610	0.8390
5	-5.7857	0.0233	0.9767

-- equal variances--

	Actual	Beta	1-Beta
1	8.3739	0.9767	0.0233
2	4.7950	0.8390	0.1610
3	1.2161	0.5000	0.5000
4	-2.3628	0.1610	0.8390
5	-5.9417	0.0233	0.9767


Normal Distribution
Reject
Do not Reject
Reject
-1.37215
0
1.37215