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THESIS

A METHODOLOGY FOR DETERMINING THE MARGINAL COST PER STUDENT AT THE NAVAL POSTGRADUATE SCHOOL

by

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June, 1997

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The overall objective of this thesis was to develop a flexible model to determine the marginal cost of graduate education per student for each of the various curricula at the Naval Postgraduate School (NPS). In the past, "average cost per student" values were calculated. These calculations missed the nuances of the 44 different curricula (curriculum length, student loading, professor salaries, lab intensive curricula, etc.) at NPS and provided no information as to the marginal costs of graduate education. Two models resulted from the research. The Cost per Curriculum Model calculates the average cost per student for each curriculum, given selected cost inputs. The costs are allocated across the courses and then allocated to the students that took the courses. A second model, Marginal Cost per Student Model, was developed that calculates the marginal cost per student for a single curriculum, for a selected number of additional students. Both models provide the user with considerable flexibility in determining and ultimately better information regarding both the average and marginal costs of graduate education at NPS.

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A METHODOLOGY FOR DETERMINING THE MARGINAL COST PER STUDENT AT THE NAVAL POSTGRADUATE SCHOOL

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Submitted in partial fulfillment
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ABSTRACT

The overall objective of this thesis was to develop a flexible model to determine the marginal cost of graduate education per student for each of the various curricula at the Naval Postgraduate School (NPS). In the past, "average cost per student" values were calculated. These calculations missed the nuances of the 44 different curricula (curriculum length, student loading, professor salaries, lab intensive curricula, etc.) at NPS and provided no information as to the marginal costs of graduate education. Two models resulted from the research. The Cost per Curriculum Model calculates the average cost per student for each curriculum, given selected cost inputs. The costs are allocated across the courses and then allocated to the students that took the courses. A second model, Marginal Cost per Student Model, was developed that calculates the marginal cost per student for a single curriculum, for a selected number of additional students. Both models provide the user with considerable flexibility in determining and ultimately better information regarding both the average and marginal costs of graduate education at NPS.

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I. INTRODUCTION

A. BACKGROUND

As part of the Navy's Graduate Education Policy, the Chief of Naval Operations (CNO) stated, "I reaffirm the investment in Graduate Education of selected officers to be a strategic requirement for the Navy...Our investment in Graduate Education must be pursued as a priority even in the face of competing demands and declining resources." [Ref. 1] The challenge facing the Navy, and thus the Naval Postgraduate School (NPS), is to provide that graduate education in the most cost-effective way possible. Before efficiencies can be realized, the true costs of education must be determined.

In a recent response to the draft Center for Naval Analyses (CNA) study entitled, A Bottom-Up Assessment of Navy Flagship Schools [Ref. 2], NPS argued that as long as the reimbursable students[1] are covering their marginal costs, NPS would not save any money by reducing this student population. NPS went on to say that if these reimbursable students were eliminated, the fixed costs at NPS would not change. The question that arises is, "What are the students' marginal cost at NPS?"

Whether in support of a cost-benefit analysis, a cost-effectiveness study, a comparison of NPS with similar civilian institutions (CIVINS), or a justification for additional funding, the measure used invariably seems to be some form of "average cost per student or graduate." Although seemingly easy to calculate, average cost per student

[1] A reimbursable student is a student from an organization not under the cognizance of the Department of the Navy (DON), who is charged a tuition rate reimbursable to the DON to attend NPS.

or graduate does not provide decision makers with very accurate information for three important reasons. First, the methodology in arriving at such "average costs" never seems to be the same as that used in arriving at the comparison numbers, e.g. different costs are used in almost all the calculations. Second, with 44 curricula at NPS that differ in length of study, intensity, and cost, an average cost per student figure provides absolutely no information regarding these important differences. Finally, average costs treat all fixed costs as variable, which, in anything but the very long run, is not accurate. The cost that is relevant to such discussions is the marginal cost. The marginal cost, for this thesis, is meant to be the cost of increasing or decreasing the student enrollment by one student.

B. OBJECTIVE

The overall objective of this thesis is to develop a flexible model to determine the marginal cost of graduate education per student for each of the various curricula at NPS. [Initially, the objective was to determine the marginal cost per student for each of the various academic departments. For reasons that will be explained in detail in Chapter III, this proved to be comparing "apples with oranges."] What evolved was the development of two cost models. One determines the cost per student in each of the various curricula, given a particular collection of cost inputs. This model provides the decision makers with a more refined "average cost per student," resulting in a wealth of information about the uniqueness of each curriculum; but it still does not answer the marginal cost question. Therefore, the second model was developed to determine the marginal cost per student for

one particular curriculum, given various inputs, based on the current excess capacity at NPS.

C. RESEARCH QUESTIONS

Several questions arise when attempting to develop a model to determine the marginal cost per student in each of the various curricula. First, can a spreadsheet model be developed that will estimate the marginal cost per student in each of the various curricula at NPS?

Second, what are the various assumptions that must be made and the limitations in developing such a model that result in a usable estimate for the marginal cost per student at NPS?

Third, assuming that such a model can be developed, could the spreadsheet model be developed to be flexible enough to handle desired changes to the model input and accommodate future modifications? If so, how and what can it be used for?

Finally, as will be discussed in Chapter II, there are a number of "average cost per student" estimates that have been calculated over the years. Focusing primarily on the methodology behind the calculations, how does the marginal cost per student spreadsheet model output compare to the previous estimates?

D. SCOPE AND LIMITATIONS

Developing a method for estimating the marginal cost per student involves a myriad of variables, all of which could not be addressed in this thesis. Some of the

assumptions made were subjective and the models treat them as user inputs to make the models more flexible. The thesis does not attempt to provide any definitive cost figures, rather it provides a framework where many of the relevant cost factors can be incorporated in a more consistent and transparent manner to provide decision makers with more accurate information and the context in which the costs are generated.
The models were developed to be flexible enough so that other relevant cost factors could easily be included.

The specific numbers are not meant to be taken as the conclusion of this thesis. In fact, they mean little without thoroughly understanding the assumptions and inputs that went into the models. The methodology is what is important. It is envisioned that, because the models were developed to be flexible, it will give decision makers valuable tools if and when the pure numbers must be compared.

The Marginal Cost Model was developed only to analyze the Financial Management curriculum. Currently, the model will only calculate the marginal cost per student for a desired increase in the number of students. The cost of providing instruction if a new section is required for a particular course is based on average numbers, but with additional research the models could be modified to account for the obvious differences in how much that instruction might cost. Further study could easily apply this methodology to other curricula.

E. ORGANIZATION

This section is a brief discussion of the organization of the remainder of the thesis.

1. Chapter II. Background and Theory

This chapter provides some of the background to what has been done in the past with regards to this subject. Over the years, numerous attempts have been made to calculate an "average cost per graduate" for various purposes. The results of these studies will be researched, discussed and tabulated. Finally, the theory of the marginal cost concept will be discussed.

2. Chapter III. Methodology and Model Development

Chapter III will discuss the thought process behind the development of the models, the research methods and techniques used, and the assumptions and limitations of each model.

3. Chapter IV. Cost Data Collection

Chapter IV discusses the data collection and methodology. This chapter will discuss what data were included in the model and more importantly what were not. Finally, it will provide the rationale behind the cost calculations.

4. Chapter V. Analysis of Results and Comparison with Past Data

Chapter V describes and presents the results of a selected number of both model runs and presents these data alongside previous data discussed in Chapter II. Some comparisons will be made to demonstrate the validity and usefulness of the models.

5. Chapter VI. Recommendations and Conclusions

Chapter VI provides conclusions and recommendations for future study, based on the issues that were raised and could not be addressed due to time constraints and the nature of the models.

II. BACKGROUND AND THEORY

A. INTRODUCTION

The objective of this chapter is to provide a look at past attempts at estimating average cost per student or per graduate. By having an idea of how the cost per student was calculated in the past, i.e., the methodology, one can appreciate the need for a better way of doing it, and understand the author's rationale in the development of the cost models. Because the tendency is to look only at the numbers, this chapter will also discuss how the various estimates for average cost per student or per graduate were derived. Lastly, the chapter will end with a brief discussion of the theory of the marginal cost concept and why an estimate of the marginal cost provides the decision maker with better information than the average cost.

B. PAST COST PER STUDENT ESTIMATES

Over the years, there have been numerous attempts to calculate some "average cost per student or graduate." They were derived for various reasons and the numbers themselves should always be taken in the context of the purpose behind their derivation. This section will briefly describe each of the attempts, focusing on the methodology.

One issue that must be cleared up first is the denominator in the "cost per student." Sometimes it is calculated as the cost per graduate and other times as cost per student. There is a difference between these two, though sometimes negligible. Most of the calculations researched have used Average on Board (AOB), which is an average of

quarterly "snapshots" of students at NPS. This may slightly differ from the number of graduates per year at NPS. Curricula are of varying lengths and therefore some turn out graduates more frequently than others. This issue will be discussed again later, but it is brought up here because it is important to identify what is defined as the denominator in these calculations and what value is used.

1. Navy Graduate Education Program Select Study Committee (1975).

The discussion of cost per student is not a new one; in fact a very similar study took place in the mid-1970's. Even though 20 years old, the resultant report brought up several valid arguments with regards to the marginal (incremental) costs of graduate education that are still valid today. In September 1975, the Navy Graduate Education Program Select Study Committee submitted a report to the Secretary of the Navy with recommendations and discussion of the utilization and allocation of resources by the Navy for educational programs. [Ref. 3] They concluded that NPS conducted specialized education otherwise not available to the Navy and that the costs were driven by *class sections* in the various curricula. NPS efficiency was dependent heavily upon the assignment of students in economical units (*class sections*). They discussed at length the importance of thinking on the margin when making financial decisions with respect to NPS. However, their discussion of the marginal cost turned into one of the incremental cost, in that additional costs were only assumed to be incurred when an entire section (24 students) was added. They differentiated between unique and non-unique curricula, as far as comparing them to Civilian Instruction. For the unique curricula, a further distinction

was made between technical and non-technical. The conclusion was that the incremental cost of an additional section varied from $1,200 to $3,600 per 4-quarter student-year, depending on the curriculum. Refer to Figure 2-1 for study conclusions.

As previously stated, they assumed that NPS only incurred incremental costs if an entire section was required, a section being defined as having 24 students. They then simply asked the question, "What would an additional section cost?" Based on their experience in FY75, they concluded that NPS could accept up to 150 students to fill empty seats in existing sections and not incur any costs, assuming an optimum distribution of students to the various curricula.

Much of their discussion was geared towards using these "cost per student" numbers to help determine which curriculum should be taught at NPS and which should be taught at Civilian Institutions.

2. Unit Costing at the Naval Postgraduate School (1991).

In 1991, a Master's Thesis was written that also attempted to establish the methodology to identify costs at NPS and support the objectives of Unit Costing.[Ref. 4] The eventual goal was to come up with a more relevant cost per graduate. The methodology was in accordance with the DOD Unit Costing guidelines.[Ref. 5] Two primary output measures were identified as *graduates* and *research*, with a secondary output being support to the various tenant commands, defined as *other*. The costs of instruction were then classified into three categories; direct costs, indirect costs, and general and administrative (G&A). A cost matrix was constructed to calculate and

present the costs. The total instruction costs were divided by the average number of students on board NPS (FY90 AOB) to come up with a cost per graduate. It was correctly pointed out that it was not to be construed as a point estimate, but merely a rough approximation of the unit cost, and that further study would have to be performed. See Figure 2-1 for the cost per graduate calculated in this thesis.

3. Non-Technical Graduate Education Programs in the Navy: A Cost-Effectiveness Study of the Naval Postgraduate School (1992, Unpublished).

In October 1992, a study was prepared for OP-01/BUPERS-21 but never published. [Ref. 6] As part of a cost comparison of NPS with other civilian institutions, an annual cost per graduate was derived for the Administrative Sciences (now Systems Management) and the National Security Affairs Departments and compared to similar programs at civilian institutions. Direct Education Costs were presented for each department, with almost no explanation as to how they were derived. A footnote described these direct education costs as "mission costs" only, which excludes Base Operations and Support (BOS) and Maintenance of Real Property (MRP) costs. Basically these costs were presented as FY90 annual cost per graduate, so the assumption is that costs for the departments were compiled and totaled and then divided by the respective average number of students on board in those departments. The numbers are not as important as the methodology. Considering that the study was never published, the methodology is not fully explained, but this simply provides another view of a methodology of calculating cost per student at NPS. See Figure 2-1 for results.

4. FY94 Cost Analysis of Providing Fully-funded education programs at NPS and CIVINS (1993).

In March 1993, the office of the Deputy Chief of Naval Operations (DCNO) for Resources, Warfare Requirements and Assessments (N8) performed a cost analysis of the Navy's Graduate Education program.[Ref. 7] This came in response to several issues concerning the closure of NPS, which was being discussed in the N8 office. But the primary reason was that a common set of *cost numbers* was not available for the decision makers. They compiled costs in the categories shown in the Cost per Student Matrix (Figure 2-1). The conclusion was that it cost approximately $40,180 per student per year (operating costs with ALL students included). The average operating cost per student was also derived for only USN/R students and only DON (USN/R and USMC) students. They compared this to civilian institution tuition and also discussed the difference in credit hours given per year at NPS compared to civilian institutions. This was done to compare more accurately the cost per student. This study caused some concern because of the costs that were used to arrive at the numbers. They are not fully explained in the study and include some categories that are questionable as to whether they should be included or not. Again, the problem was due to taking the numbers at face value and not understanding where they came from.

The study's conclusions were largely based on subjective findings, which while not necessarily wrong, perhaps gave more credence to the accuracy of the numbers than was warranted. The differences between the cost per student at NPS and other civilian institutions attracted the most attention. See Figure 2-1 for results.

5. NPS Cost per Class Hour (1993/1995).

In November 1993, as part of a report by NPS to the Graduate Education Review Board (GERB), and later in 1995 as a point paper, NPS highlighted the difference in the number of class hours that are provided each year between NPS and other civilian institutions. [Ref. 8] The conclusion was that the cost per student class hour at NPS was cheaper than at civilian institutions. The relevance here is that they used the same cost per student data as the 1993 N8 study.

6. A Bottom-Up Assessment of Navy Flagship Schools (1997).

Sometime in 1997, the Center for Naval Analysis (CNA) is scheduled to publish a report that also includes a calculation of the average cost per student, one that NPS has helped them derive in accordance with the *Integrated Post-Secondary Data System* (IPEDS) database guidelines. [Ref. 2] The report is still in the process of being finalized, but the methodology and majority of the comments are final.

There is still some debate between NPS and CNA over what numbers to use in computing the Total Expenditures, but the basic methodology is the same for both. In accordance with guidance and definitions set forth by IPEDS, costs (expenditures) are being compiled for three different categories: instructional expenditures, academic support expenditures, and institutional support expenditures. These costs are divided by a Full Time Equivalent (FTE) number, as used in the IPEDS database, which CNA says closely approximates AOB for NPS. Several different cost per-student examples are presented in Figure 2-1.

Figure 2-1. Cost per Student Matrix

Study/Cost Estimate	Methodology	Relevant Costs used	Annual Cost/Graduate
Navy Graduate Education Program Select Study Committee **September 1975**	Incremental Cost Analysis (What it would cost to add one more section of 24 students)	Non-Laboratory Curriculum: Full time Associate Professor (For one full year) Direct Educational Support Costs	**$1,598** (FY76) (based on 24 student section)
		Laboratory Curriculum: Hiring Cost of two new Professors Salary cost for two new Professors One additional Lab Technician Lab supplies/equipment/repair Increase in support costs	**$3,562** (FY76) (based on a 24 student section)
Unit Costing at the Naval Postgraduate School **Master's Thesis** **June 1991**	Unit Cost Analysis (in accordance with DOD guidelines) (Attempted to establish methodology to support objectives of unit costing)	Direct Civilian Labor Costs Indirect Civilian Labor Costs Direct Military Labor Costs Indirect Military Labor Costs Direct Non-Labor Costs Indirect Non-Labor Costs G&A (allocated)	**$18,786** (FY90) (Total costs divided by FY90 AOB = 1856)
Non-Technical Graduate Education Programs in the Navy: A Cost Effectiveness Study of NPS (Unpublished) **October 1992**	Incremental Costs (Excluding military salary, BAQ/VHA)	Systems Management Mission costs only	**$16,148** (FY90)
		National Security Affairs Same Mission Costs only	**$14,240** (FY90)
Graduate Education Costs **N81 Memorandum** **March 1993**	Annual Cost per Student comparison of NPS and CIVINS (Excludes military salary, BAQ/VHA)	Academic O&MN BOS (NPS share) MRP (NPS share) FECA HAZMAT Family Service (NPS share) OPN (avg FY94-99) MILCON (avg FY94-99) FHN FMT Tuition (other students) STAFF MPN	**$40,184** (FY94) (ALL students) **$50,512** (FY94) (Only DON students, minus FMT and Other Tuition)

Study/Cost Estimate	Methodology	Relevant Costs used	Annual Cost/Graduate
NPS Costs Point Paper **June 1995**	Cost per student per class hour (More relevant comparison between NPS and CIVINS)	Used numbers from N81 Study March 1993 NPS Class Hours = 768 hrs	**$65.76/class hour** (DON students)
Bottom-Up Assessment of Navy Flagship Schools **Center for Naval Analyses** **May 1997**	Annual cost per student at top-tier technical schools (1993-1994) (In accordance with *IPEDS* definitions)	Expenditures/student/year O&MN, OPN, MPN, Tuition, excludes student salaries AOB = 1461 DON (w/out reimbursable tuition) AOB=1074	**$46,880** **$57,570**
		Program expenditures per student (same as above for average stay length of 22.8 months) AOB = 1461 DON (w/out reimbursable tuition) AOB = 1074	**$89,070** **$109,380**
		IPEDS Total (1993-1994)	**$55,000**
		IPEDS Educational Cost of Instruction, academic and institutional support, and student services, excludes cost of physical plant.	**$28,000** (1993-1994)

Figure 2-1. Cost per Student Matrix

The 1997 CNA study, and the input that has gone into the IPEDS database, is a much more comprehensive cost study then this thesis will present, but these cost categories can easily be built into the models that follow to provide the decision makers with actual cost per student data for the 44 different curricula.

The above represents the various attempts at calculating the "cost per student" that have been presented and made available to the decision makers over the years. The actual numbers have been tabulated in Figure 2-1, but more importantly the methodology behind the numbers has been revealed for each study/analysis. For the most part, the "cost per student" numbers have been derived for one of two reasons. First, they are calculated so that NPS can be somehow compared to some civilian institution, either in a cost-effectiveness study or simply a comparison. Secondly, the numbers are presented as the incremental cost per student, usually in the argument for or against planned or executed changes in funding for NPS.

This leads to two different thoughts on what has been presented in the past. First, the fact that NPS houses 44 curricula that vary considerably in duration and cost is lost in the average cost per student argument. The numbers are always some total of expenditures divided by some average number of students or graduates. There is only so much utility for "average cost per student" data. Simply dividing total instructional expenditures by total students is almost like comparing the proverbial "apples to oranges." Chapters III and IV discuss this in more detail and provide a different way to look at this question.

Second, until recently, it seems that the discussion of the marginal costs has been lost. The concept was thoroughly discussed in the 1975 Navy Graduate Education study and yet seems to have been forgotten in the years since. The marginal cost issue has relevance to several discussions that include the effect of decreased funding at NPS, changes in student enrollment, reimbursable tuition rates, and foreign tuition rates. This

last section of this chapter will provide a further understanding of the marginal cost concept.

C. THE THEORY BEHIND THE MARGINAL COST CONCEPT

This section will briefly discuss the marginal cost concept, compare it to the average cost concept, and discuss its relevance to the many hard fiscal decisions facing today's leaders in the Department of Defense.

The total cost of an operation can be broken down into fixed and variable costs. However, these cost elements are highly dependent on time. One can view the time factor as either the long run or the short run. In the long run, all inputs could be considered variable, but in the short run, there are certain inputs and their associated costs that could not be changed regardless of the output. So, in the short run, some of these input costs would be considered fixed. In the short run:

Total Costs (TC) = Fixed Costs (FC) + Variable Costs (VC)

The marginal cost is the change in total cost per unit change in output. Marginal costs take into account that the fixed costs cannot be changed in the short run. Mathematically, the marginal cost would be the derivative of the total cost equation.

TC(Q) = FC + VC(Q) where Q is the unit output (students or graduates)

Therefore, $d(TC(Q))/dQ = d(FC)/dQ + d(VC(Q))/dQ$

and from mathematics, it is known that $d(FC)/dQ = 0$, therefore

$$d(TC(Q))/dQ = d(VC(Q))/dQ,$$

That means that the marginal cost is equal to the change in the variable cost per unit change in output. In terms of the thesis discussion, the marginal cost would reflect the cost of graduating one more student or the realized savings of graduating one less. It would reflect the costs of providing graduate education to one additional student.

As will be discussed briefly in later chapters, much of the costs incurred at NPS are of the fixed nature and will not change for a moderate change in the number of students on board. It is the variable costs that are directly related to the instruction of students that are relevant and must be included in the marginal cost discussion.

D. THEORY VERSUS REALITY

The theory is clear, but reality clouds the issue. Due to excess capacity at NPS, it could be argued that the marginal cost of one additional student at NPS is close to zero. In fact, it could also be argued that the marginal cost of adding some 150 students, in the right curricula with the appropriate excess capacity, is essentially zero. As will be discussed in Chapter III, there are many variables and it is not as easy as saying that the marginal cost is the cost of teaching one more student.

The fact that average cost per student does not provide much insight into the many differences between the curricula at NPS and that the marginal costs are the relevant costs when discussing small changes in enrollment leads one to ask several of the critical questions outlined in the last chapter. There must be another way to calculate relevant costs, a way that provides more information than just an "average cost per student." The next chapter looks at the methodology and development of two cost models that will answer those questions.

III. METHODOLOGY AND MODEL DEVELOPMENT

A. INTRODUCTION

The original objective of this thesis was to determine the marginal cost per student in each of the academic departments at NPS. After additional research, that concept was found to be flawed, primarily because graduates or students are not the direct output of the academic departments. This chapter will further discuss this thought process and the development of the first model that provides a better "average cost per student" for each curriculum at NPS. As stated before, this model did not answer the marginal cost question, so data was extracted from the first model to develop a second model that does provide the decision maker with a marginal cost per student for a particular curriculum. The development and operation of this second model will be discussed, as will the assumptions and limitations of both models.

B. THE MONEY FLOW

In determining the marginal cost per student, it was found that a student could not be directly related to the academic department funding. There are two visible outputs of the academic departments, research and courses. Students are not the true output. Indirectly they are, because they take a collection of courses, as required by the individual curricula. Because students take courses from several different academic departments during their course of study at NPS, it is incorrect to associate the costs incurred by an academic department with a particular student. Figure 3-1 is a basic flowchart that shows

where the funding comes from and what it is used for as far as teaching is concerned. In reality, the money does not "change hands" as depicted in Figure 3-1, but the figure gives one a feel for basically how the money is used. While the figure has left out several cost centers and funding sources, the object is to graphically show that the true output of the academic departments is courses. There are no students in an academic department, only faculty and staff. Most students may take the majority of their courses from one particular academic department, but, as can be seen graphically in Figures 3-1 and 3-2, they are not an output of the department.

Unlike most other graduate education institutions, NPS provides the courses based on the educational requirements of the various curricula sponsors. The courses are provided when students require that particular course, according to their particular curriculum matrix. Figure 3-2 is a graphical illustration that courses are provided to students in one of the 44 curricula, as of FY96. So, instead of calculating a marginal cost per student in each of the academic departments, somehow a cost must be calculated for each curriculum.

In a discussion with Professor Gil Howard, Associate Provost for Academic Planning, the idea of building a cost per curriculum model came to life. The idea was based on a "matrix" that he had built to obtain a better feel for how much each curriculum cost at NPS. Figure 3-3 is the skeleton framework of the model, as it was originally envisioned. Basically, by knowing what courses were taught during FY96 and what students were enrolled in the courses by curricula, the costs of the particular course could be identified and allocated to each student in the course. By knowing what curriculum the

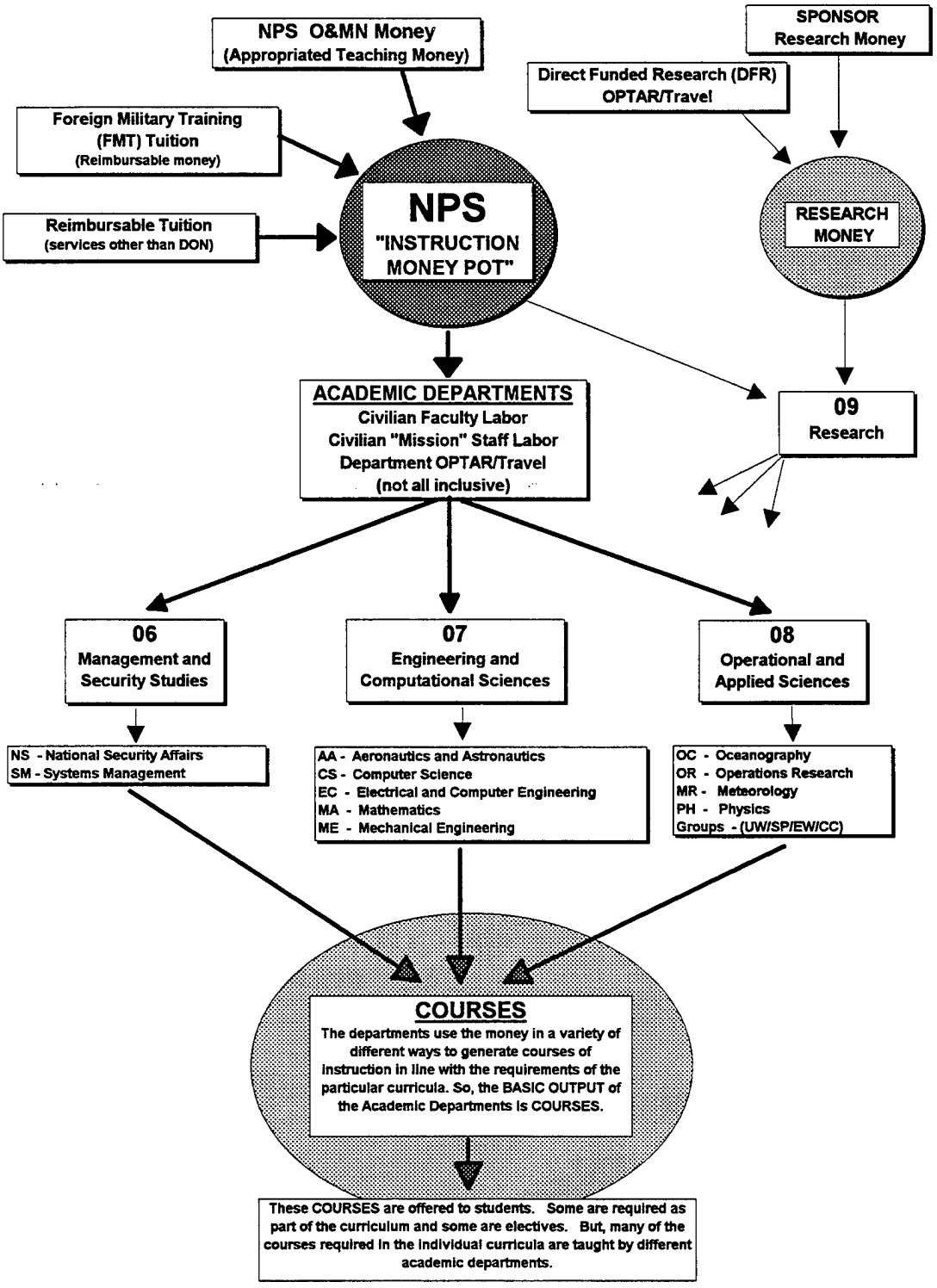
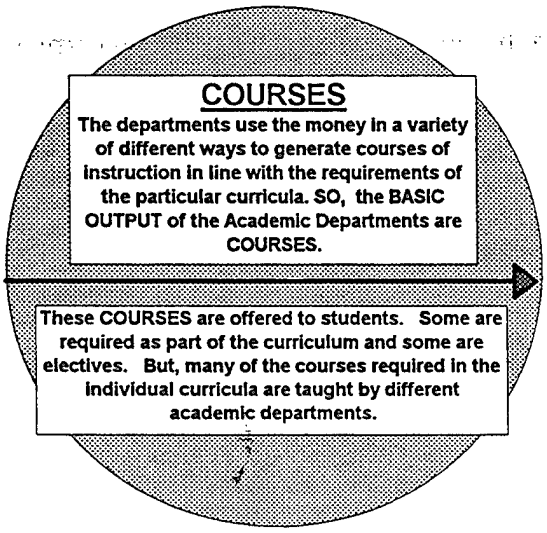


Figure 3-1. Where the Money Goes



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- 823 Intelligence

Figure 3-2. Courses are the Output

student was in, the allocated costs of all the courses to the students can be summed to result in the cost for that particular curriculum for FY96. Then, if the average number of students in each of the curricula is known for FY96, the cost per curriculum can be divided by this number of students to result in an "average cost per student." See Figure 3-3 (continued) for an illustration of this discussion.

Ideally, it was conceived that the direct teaching costs of the course could be determined and the indirect costs could be allocated, to provide a good estimate of the cost per student for each course given. Then, by determining whether or not a new course was required for additional students, some marginal cost could be estimated. However, due to the fact that individual civilian faculty salaries were not available and time did not allow such in depth research, this could not be accomplished. The aggregate faculty salary for each academic department was available, however this meant that the salaries had to be allocated across all the courses that were provided in FY96. Other costs could also be identified and allocated to the courses given in the departments, which is further discussed in the next chapter. However, the model does provide the decision maker with more valuable information, primarily a historical look at the uniqueness of the various curricula at NPS. By identifying other costs associated with teaching and finding a reasonable method of allocating those costs to the courses provided by the academic departments, this model provides better information than was previously available.

Figure 3-3. Cost per Curriculum Model Framework

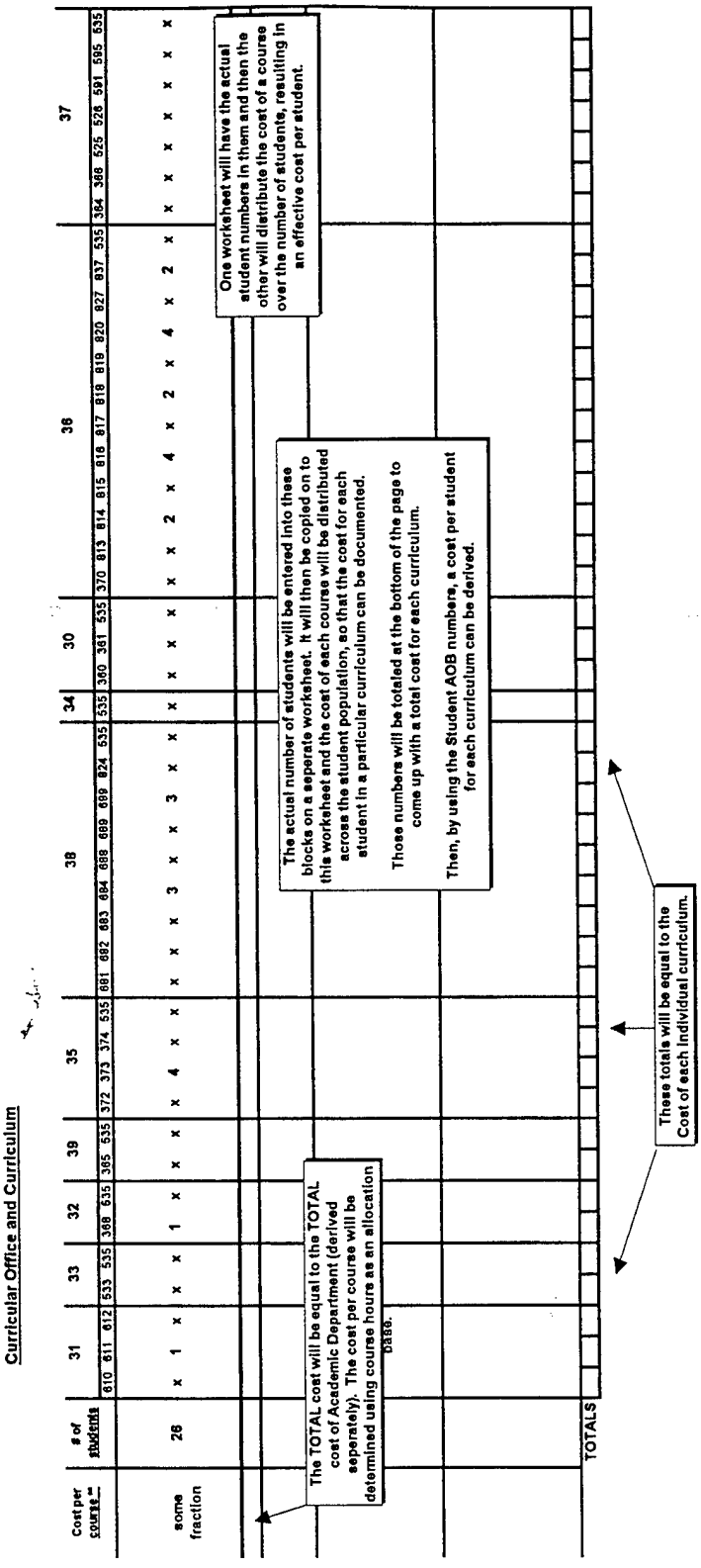


Figure 3-3. Cost per Curriculum Model Framework (Continued)

C. COST PER CURRICULUM MODEL PRESENTATION

A considerable amount of time was spent in the development of this model with the hope that further study could be done to make full use of the model as an aid to decision makers. The Marginal Cost per Student model uses data that were obtained for this one, so some detailed explanation is required.

The data that were required to develop this model answered these questions. "What courses were taught?" "Who taught the courses?" "Who 'paid' for the instruction?" "Which academic department provided the course?" "What are the specifics of the course?" "Who took the course?" Two separate but related sources of data were required to answer these questions; a FY96 Teaching Load Report and a FY96 Teaching Loads Across Curricula Report, each of which will be discussed in the following sections. In order to make the data usable in a model, several manipulations were necessary, and they will be explained. Next, the allocation of academic department costs to the courses is discussed. Finally, the derivation of the average number of students in a particular curriculum is explained.

1. FY96 NPS Teaching Load Report

a. Introduction

Two reports from the NPS Integrated Database System (NIBS), more commonly known as the "Registrar's Database", were used to answer the research questions. The first was the FY1996 NPS Teaching Load Report, which contained the raw data that would eventually be incorporated into the Cost per Curriculum Model. The

relevant information from the report included a listing of each course given during FY96, the segment number, which quarter it was taught in, who taught the course, which academic department the Professor was from, the academic department that sponsored the course, the number of lecture hours, the number of lab hours, and the class size. A full listing of the relevant data extracted from this report is part of the Cost per Curriculum Model and is contained in Appendix A.

The objective of including a listing of all courses given in FY96 was to portray the courses as accurately as possible for costing purposes. Since costs would eventually be allocated to the various courses taught by a particular department, it was important to thoroughly investigate all of the particulars concerning the courses. Team Teaching courses, Distance Learning courses, "Synonym" courses, Continuing Education courses, Special Operations courses and International courses all presented unique problems that will be discussed briefly in the sections to follow.

b. Class size

The FY96 NPS Teaching Load Report contains a listing of all courses that were given during FY96. This includes all Directed Study and Directed Reading courses given, which usually only involve one student. Originally, all courses were included in the model; however, some were subsequently deleted due to cost considerations. These specific courses will be discussed in following sections. The premise behind the model is to allocate the academic department's costs over the courses that it provided during the year. The general rule is that academic departments do not receive budget credit for any courses with less than or equal to four students.[Ref. 9] Because of this, most academic

departments do not give Direct Teaching credit to individual professors for courses with four or fewer students. However, the model allows this assumption to be determined by the user.

c. Team Teaching

Team Teaching courses are those courses that were taught by two or more instructors, meaning that each instructor only teaches a portion of the course. For teaching credit purposes, the course is listed separately for each professor that taught the course. This presented problems because the course is only listed once in the FY96 Teaching Loads across Curricula Report. These Team Teaching courses had to be identified, verified and consolidated into one course. Team teaching courses are designated as TT in Appendix A.

d. Synonym Courses

Sometimes there are courses given that have two different course numbers. Usually, these courses are proposed to the Registrar and, depending on the student enrollment, may or may not be reflected as such in the end of year Teaching Load Report. For example, during the Fall Quarter of academic year 96, MA3301 and OA3201 were the same course, with one instructor. There were just two different course numbers. These courses were identified using memoranda sent from the Scheduler (01B2) and then verified against what was actually listed in the Report. The courses on both reports had to be identified and consolidated in order to reflect the fact that they were indeed the same course. The academic department providing the instructor for the course is essentially reimbursed some of the cost of the course by the other academic department. The courses

are listed under the academic department that provided the instructor. Synonym courses are designated as SYN in Appendix A.

e. Distance Learning Courses

Distance learning courses are those courses that are taught to both students here at NPS in a classroom and to "distant site" students via Video Tele-Conferencing (VTC). The general rule is that distance learning courses can only be taught if both NPS students and VTC students are involved. The distance learning courses were listed separately in the Report, with the same course number, immediately after the course provided to NPS students. The students at distant learning sites that have undeclared curricula are not considered students on board at NPS. However, some have already declared their curricula and, therefore, are considered students on board at NPS. These courses had to be identified and consolidated on both reports. Distance learning courses are designated as DL in Appendix A.

Distance learning courses can be more expensive than the same course given to only students at NPS for a number of reasons, primarily due to the cost of the computer technology involved and the link with the site. It is not clear how these costs are handled, but the assumption is that NPS absorbs those costs. It is beyond the scope of this thesis, but it would be interesting to know just how much distance learning courses cost and compare that to the cost of the courses at NPS. This is the direction NPS is headed in an effort to shorten the length of several curricula, and that is an issue that would warrant future study.

f. Continuing Education Courses

The course AA3250, designated as a Continuing Education course, was taught twice during FY96. Both course listings were left out of the model. No research was done to determine who took the courses or how the courses were paid for. It is clear that two students were identified as being in the "Continuing Education" curricula and one student was a student at NPS. Since the courses involved a total of only three students, it was felt that they would have no significant effect on the model. These courses are listed under the Course Department heading, CE, in Appendix A.

g. Special Operations Courses

Two courses, SO2410 and SO3802, listed under the Special Operations (SO) Department code were given during FY96. At that time, the Special Operations courses were being funded by the National Security Affairs (NSA) department and were therefore included in the model as part of the NSA academic department.

h. International Courses

Two courses, IT1500 and IT1600, were given each quarter during FY96. These courses are specifically for the international students and the instructors are not from the NPS faculty. They are specifically hired to teach the courses. The two courses are English and American Culture. No additional research was done in this area, and these courses are listed in Appendix A but were not included in the model.

2. FY96 Teaching Loads Across Curricula Report

a. Introduction

Still more data were required to answer all the questions posed in the introduction to this section that could not be answered by the FY96 NPS Teaching Load Report alone. Data on every course given and who enrolled in the course by curriculum were contained in the FY96 Teaching Loads Across Curricula Report and then modified and used in the Cost per Curriculum Model. The worksheet used in the model, FY1996 Course Enrollment Sheet, is part of Appendix A. The first task was reconciling the course data in the FY96 NPS Teaching Load Report with the data in the above mentioned report. All of the issues in the reconciliation were mentioned in the previous section. The report listed a total of 48 curricula, so the four additional curricula, in addition to the 44 that were offered during FY96 at NPS, had to be identified and explained. These four "other' curricula will be discussed in the following section. Lastly, and transparent to the reader, the issue of those students that were taking Refresher courses prior to actually starting their curricula matrix course load will be addressed.

b. "Other" Curricula

Of the 48 curricula listed in the report, four are other than those listed in Figure 3-2. Curriculum 555 represents those students taking NPS courses under a Memorandum of Understanding (MOU) with the University of California at Santa Cruz (UCSC). There were only two students that took courses during FY96. The costs of this "curriculum" are calculated in the model, but the course is not associated with any curriculum or students from NPS. No research was done to determine whether or not

there was any monetary compensation for these two courses.

Curriculum 777 is those students taking distance learning courses that have not declared a curriculum. A total of 79 students were identified as taking distance learning courses. The cost of this "curriculum" is calculated in the model, but, as with Curriculum 555, it is not associated with students or curricula at NPS. There are some distance learning students that have declared a curricula and they are counted as such in the model.

Curriculum 888 comprises those two students that took Continuing Education courses. They have been left out of the model, so the cost of that "curriculum" is assumed to be zero, although in reality there must be some costs incurred to teach the course.

Finally, curriculum 999 refers to NPS Staff personnel that took courses during FY96. This brings up an interesting issue. NPS staff, as a whole, attended 254 courses during FY96. These "students" in this curriculum were left out of the model as far as cost per student calculations are concerned and the class size totals in the model do not include the students from the 999 curriculum. "NPS Staff students" attend courses on a space available basis, under the assumption that "empty seats," or an excess capacity, means that the course is "essentially free of charge." In essence, the course is already paid for, or the marginal cost is zero. After finishing the discussion of the Cost per Curriculum Model, the marginal cost issue will be investigated.

c. Refresher Course Students

It should also be mentioned that at various times during the academic year, there are students who are taking "refresher courses" to prepare them for their actual course of study. What curricula they will be in are already identified and recorded as such in the reports. So, in essence, these students have already been included in the model. As will be discussed later, this further complicates the timing issue of the report. Since some curricula are longer in length than others, and the refresher courses simply add to that time, where the students are in the curricula during the report period plays a major role in the determination of an average cost per student.

3. The Allocation of Department Costs

a. Introduction

Now that the data necessary to build the model have been discussed, the costs incurred by the individual academic departments must be allocated to each of the courses that were provided by that department. Initially, it was envisioned that only the indirect costs, i.e., those costs not directly associated with teaching, would have to be allocated. However, due to the complexity of determining each Professor's salary and time spent teaching, all costs that are entered as an input to the model must be allocated to the respective academic department courses. This section will briefly discussed how this was accomplished in the model.

b. Weighted Cost Hours (WCH)

The academic departments are unique, and consequently spend different amounts of money over the course of a year. Because costs cannot be directly associated with every course, some method must be introduced to allocate the academic department costs over their output, the courses. How much a course costs is a function of a number of different variables, which include; the professor's salary, the number of lecture hours, the number of laboratory hours, and the number of students in the class. The number of students enrolled in a course would not be a good indicator of how much a course costs. This is due to the fact that a professor must be paid regardless of the size of the class. Because individual faculty salaries could not be determined, the best allocation base is some combination of lecture hours and laboratory hours.

The model allocates the total academic department cost to the courses given by that department by using a factor that is a combination of lecture hours and lab hours. This allocation base is defined as a Weighted Cost Hour (WCH) and is defined as:

Weighted Cost Hour (WCH) = A x Lecture Hours + B x Laboratory Hours,

Because it is thought that courses with labs generally incur more support costs than courses without labs, the coefficients A and B are assumed to be 1 and 1.5 respectively. While it is recognized that lab support costs vary by department and even by course, the assumption was made for the model run comparisons in Chapter V. The model was developed such that the user can determine what the WCHs are by entering the

coefficients A and B.

4. The Denominator

Before describing in detail how the model works and addressing the assumptions and limitations of the model, the denominator in the cost per student figure needs to be explained. After the model has calculated the total cost per curriculum, based on FY96 cost and course data, it is divided by the average number of students in that particular curriculum, based on the NPS Average on Board (AOB) report. The AOB report is a quarterly "snapshot" of the number of students on board NPS and which curriculum they are in. The average number of students in each curriculum was determined by taking the arithmetic average of the four reports for FY96. This calculation and final average number of students is shown in detail in Appendix C. Final averages are rounded to the nearest whole number, or whole student. The limitations to this method are discussed in the next section.

D. HOW THE MODEL WORKS

Much of the model has been discussed, but how the user interfaces with the model and how the model calculates the cost per student has not been completely explained. The spreadsheet model is a 5.8 megabyte workbook in Microsoft Excel 5.0/7.0. Figure 3-4 is the Cost per Curriculum Input Page, where the user may enter some assumptions before running the model. The model allows the user to input which costs associated with teaching should be included in the model. The specific costs will be discussed in Chapter

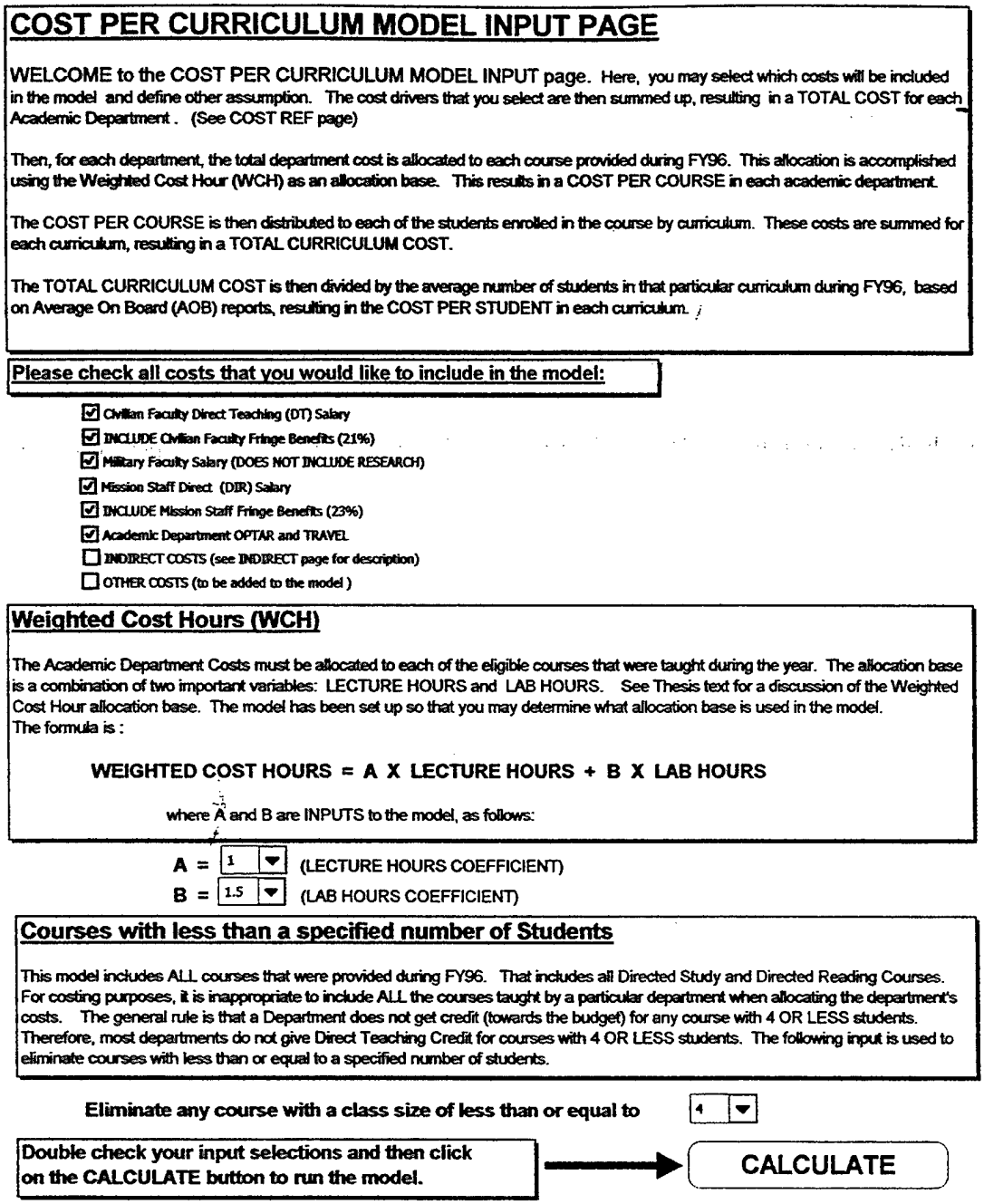
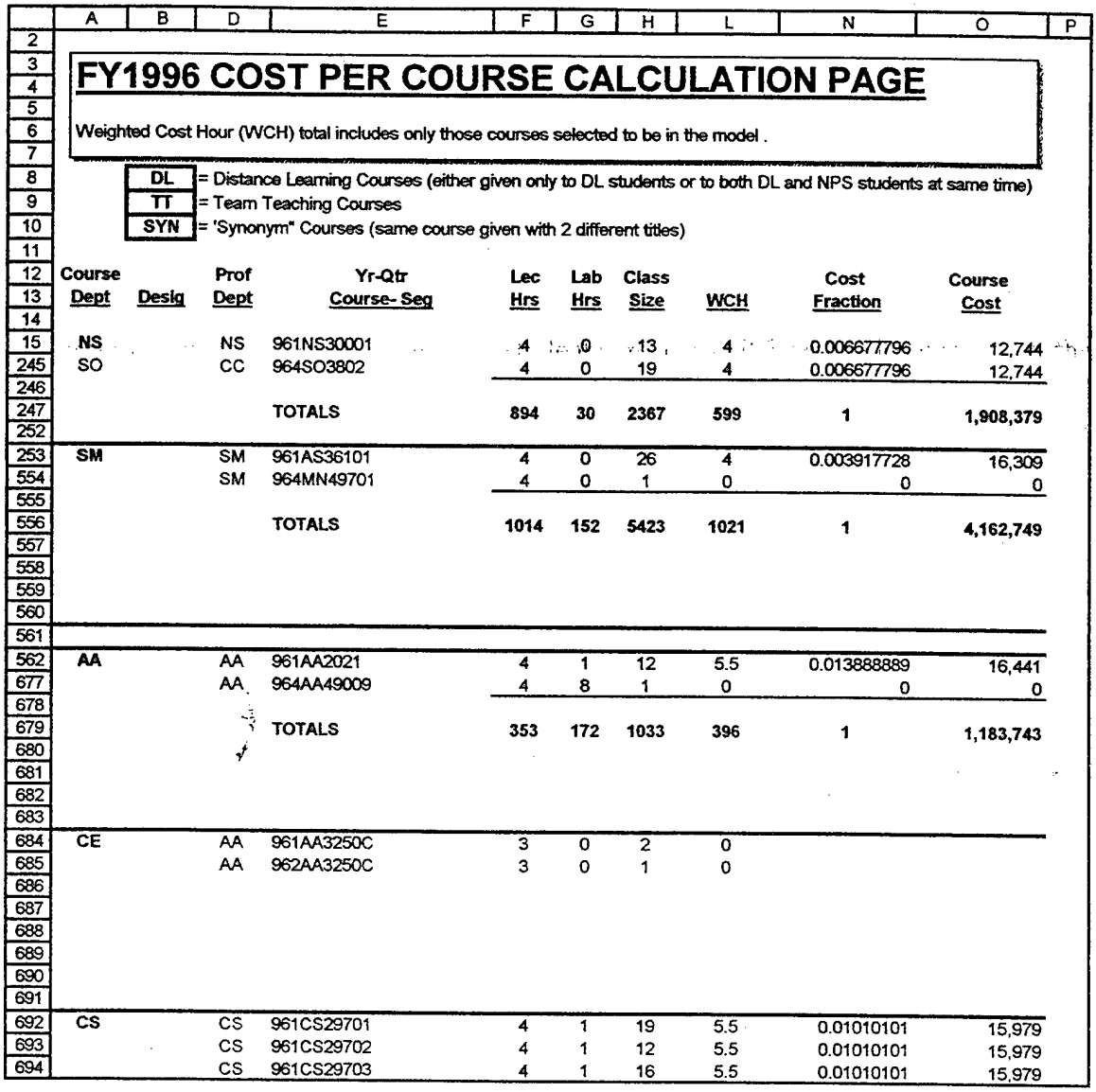


Figure 3-4. Cost per Curriculum Model Input Page

IV. The user can specify the coefficients A and B, to calculate the allocation base, as discussed in a previous section. The user can then determine which courses should be eliminated from the model, based on the class size. Once all the inputs have been verified by the user, the CALCULATE button is "clicked" on to run the model.

When the model runs, the costs that were selected by the user are summed for each academic department. Figure 3-5 depicts the worksheet where this calculation takes place. The WCH is calculated for each course, with a value of zero being assigned to any course with a class size less than what was entered by the user on the input page. The WCH for each course is divided by the total WCHs for the respective department resulting in a cost fraction. This cost fraction is multiplied by the department's total costs resulting in a cost per course. This also can be thought of as determining a cost per WCH and then multiplying that by the number of WCHs for a particular course. Figure 3-6 is a selected view of Appendix A that graphically explains this calculation.

Figure 3-7 and Figure 3-8 are selected views of Appendix A that show an example of how the cost per student in a particular course is calculated. On the Cost per Curriculum Model Calculation Page, Figure 3-8, the number of students in a particular curriculum are divided by the total number of students in a course (not including those "NPS staff students") and then multiplied by the cost of the course. This results in an allocated cost to a particular curriculum for each course. The costs accumulated by each curriculum are then summed, resulting in a cost per curriculum. This total is then divided by the average number of students in that curriculum during FY96. Figure 3-9 is the Cost per Curriculum Model Output Page.



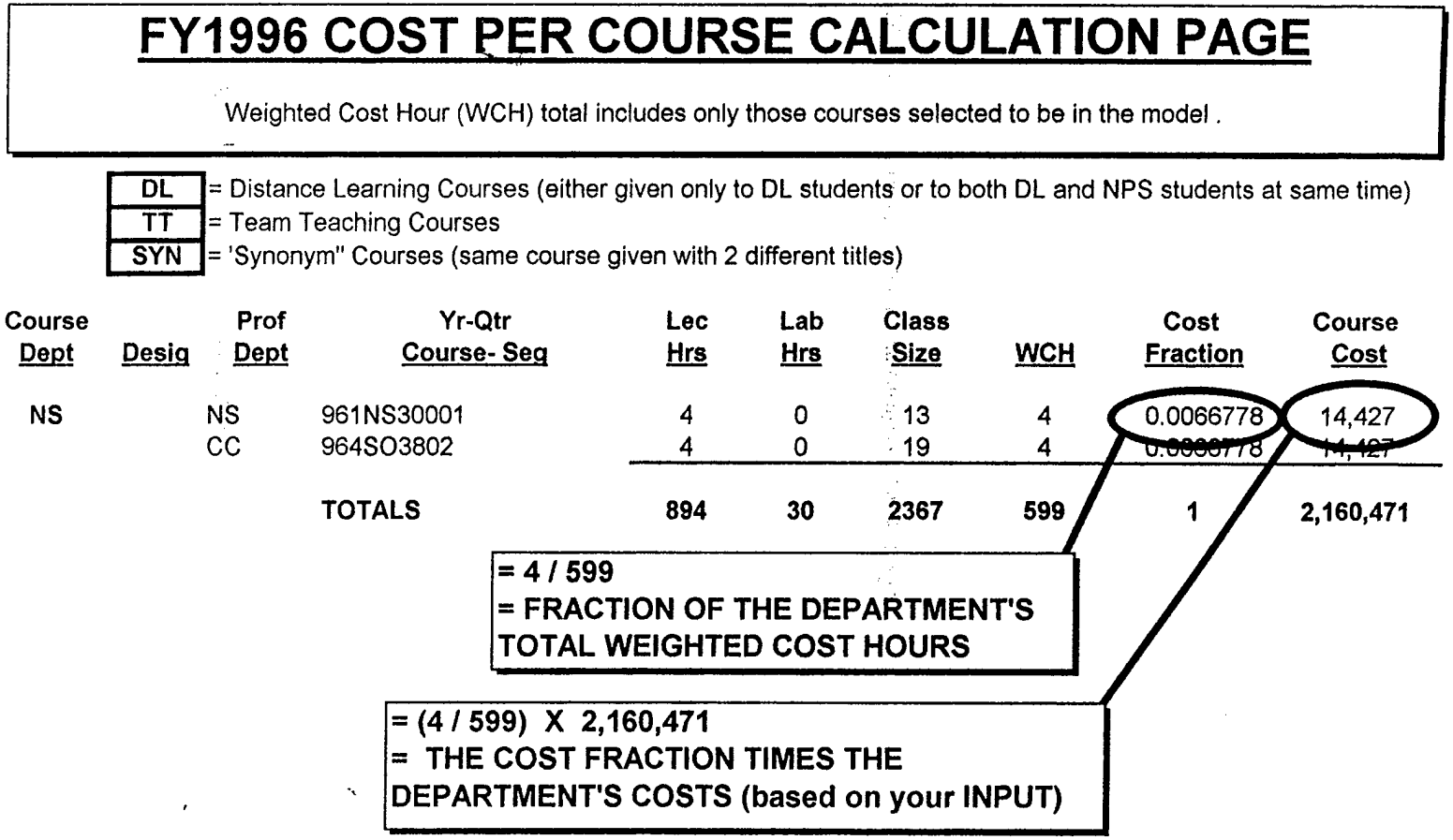
FY1996 COST PER COURSE CALCULATION PAGE

Weighted Cost Hour (WCH) total includes only those courses selected to be in the model .

DL = Distance Learning Courses (either given only to DL students or to both DL and NPS students at same time)
TT = Team Teaching Courses
SYN = 'Synonym" Courses (same course given with 2 different titles)

Course Dept	Desig	Prof Dept	Yr-Qtr Course-Seq	Lec Hrs	Lab Hrs	Class Size	WCH	Cost Fraction	Course Cost
NS		NS	961NS30001	4	0	13	4	0.006677796	12,744
SO		CC	964SO3802	4	0	19	4	0.006677796	12,744
			TOTALS	894	30	2367	599	1	1,908,379
SM		SM	961AS36101	4	0	26	4	0.003917728	16,309
		SM	964MN49701	4	0	1	0	0	0
			TOTALS	1014	152	5423	1021	1	4,162,749
AA		AA	961AA2021	4	1	12	5.5	0.013888889	16,441
		AA	964AA49009	4	8	1	0	0	0
			TOTALS	353	172	1033	396	1	1,183,743
CE		AA	961AA3250C	3	0	2	0		
		AA	962AA3250C	3	0	1	0		
CS		CS	961CS29701	4	1	19	5.5	0.01010101	15,979
		CS	961CS29702	4	1	12	5.5	0.01010101	15,979
		CS	961CS29703	4	1	16	5.5	0.01010101	15,979

Figure 3-5. FY1996 Cost per Course Calculation Sheet



FY1996 COST PER COURSE CALCULATION PAGE

Weighted Cost Hour (WCH) total includes only those courses selected to be in the model .

DL = Distance Learning Courses (either given only to DL students or to both DL and NPS students at same time)
TT = Team Teaching Courses
SYN = 'Synonym" Courses (same course given with 2 different titles)

Course Dept	Desig	Prof Dept	Yr-Qtr Course- Seq	Lec Hrs	Lab Hrs	Class Size	WCH	Cost Fraction	Course Cost
NS		NS	961NS30001	4	0	13	4	0.0066778	14,427
		CC	964SO3802	4	0	19	4	0.0066778	14,427
			TOTALS	**894**	**30**	**2367**	**599**	**1**	**2,160,471**

= 4 / 599
= FRACTION OF THE DEPARTMENT'S TOTAL WEIGHTED COST HOURS

= (4 / 599) X 2,160,471
= THE COST FRACTION TIMES THE DEPARTMENT'S COSTS (based on your INPUT)

Figure 3-6. Sample Calculation of the Cost per Course

FY1996 COURSE ENROLLMENT SHEET

This sheet contains the raw data of who was in each of the courses given in FY96 by curriculum. The data has been modified and sorted to mirror the data on the previous sheet (COST PER COURSE Worksheet).

DL	= Distance Learning Courses (either given only to DL students or to both DL and NPS students at same time
TT	= Team Teaching Courses
SYN	= 'Synonym" Courses (same course given with 2 different titles)

Non-DOD students who are taking NPS Courses under a MOU with UC Santa Cruz

Course Dept	Desig	Yr-Qtr Course-Seq	360	361	364	365	366	368	370	372	373	374	380	440	525	526	533	555	570	590	591
NS		961NS30001	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	1
		961NS30002	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	1	0
		961NS30231	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		961NS30232	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		961NS3024	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		961NS3030	0	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0

=> There was one student from the 380 curriculum who was enrolled in Section 01 of course NS3000 during the first quarter of Academic (fiscal) year 1996.

Figure 3-7. FY1996 Course Enrollment Sheet

COST PER CURRICULUM CALCULATION SHEET

This sheet multiplies the fraction of the number of students from a particular curriculum in a course to total number of students in the course by the cost of the course. This results in a cost per curriculum for each course. These totals are then summed to result in a TOTAL COST PER CURRICULUM.

DL	= Distance Learning Courses (either given only to DL students or to both DL and NPS students at same time)
TT	= Team Teaching Courses
SYN	= 'Synonym" Courses (same course given with 2 different titles)

Course Dept	Desig	Yr-Qtr Course- Seq	360	361	364	365	366	368	370	372	373	374	380	440	525	526
NS		961NS30001	0	0	0	0	1,110	0	0	0	0	0	1,110	0	0	0
		961NS30002	0	0	0	0	1,312	0	0	0	0	0	0	0	1,312	0
		961NS30231	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		961NS30232	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		961NS3024	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		961NS3030	0	0	0	534	534	0	534	0	0	0	0	0	0	0

From the other worksheet, we know that there was one student from the 380 curriculum that was enrolled in NS3000-1. This equation for this block is:

= 1 x (14,427 / 13)

= The ONE student in the 380 curriculum TIMES the COST PER COURSE PER STUDENT

Figure 3-8. Cost per Curriculum Calculation Page

COST PER CURRICULUM MODEL OUTPUT PAGE

Code	Curriculum	Total Cost	FY96 AOB	Cost per Student
30	**Operations Analysis**			
360	Operations Analysis	$1,170,456	114	$10,267
361	Operations Logistics	$266,257	28	$9,509
380	Advanced Science (Applied Math)	$180,366	15	$12,024
			157	
31	**Aeronautical Engineering**			
610	Aeronautical Engineering	$589,093	34	$17,326
611	Aeronautical Engineering with Avionics	$371,713	23	$16,161
612	NPS/TPS	$349,510	16	$21,844
			73	
32	**Electronics and Computer Programs**			
368	Computer Science	$1,223,763	88	$13,906
590	Electronic Systems	$1,429,031	111	$12,874
			199	
33	**Combat Systems Sciences and Technology**			
533	Combat Sciences	$1,630,964	90	$18,122
			90	
34	**Naval/Mechanical Engineering**			
570	Naval/Mechanical Engineering	$1,345,749	74	$18,186
			74	
35	**Meteorology and Oceanography Programs**			
372	Meteorology	$123,611	3	$41,204
373	Meteorology and Oceanography	$1,520,950	46	$33,064
374	Operational Oceanography	$363,739	14	$25,981
440	Oceanography	$167,941	8	$20,993
			71	
36	**Systems Management**			
370	Information Technology Management	$1,897,335	162	$11,712
813	Transportation Logistics Management	$92,965	7	$13,281
814	Transportation Management	$120,752	12	$10,063
815	Acquisition and Contract Management	$398,804	34	$11,730
816	Systems Acquisition Management	$463,041	38	$12,185
817	Allied, DOD, USA,USMC, and USCG	$69,862	10	$6,986
818	Defense Systems Management	$83,405	8	$10,426
819	Systems Inventory Management	$78,217	7	$11,174
820	Resource Planning and Management (INTL)	$122,189	11	$11,108
827	Material Logistics Support Management	$382,638	38	$10,069
837	Financial Management	$642,136	59	$10,884
847	Manpower/Personnel Training Analysis	$612,124	59	$10,375
			445	
37	**Undersea, Space and Information Warfare**			
364	Space Systems Operations International	$30,660	3	$10,220
366	Space Systems Operations	$635,910	37	$17,187
525	Undersea Warfare	$490,250	22	$22,284
526	Undersea Warfare International	$80,553	5	$16,111
591	Space Systems Engineering	$820,704	49	$16,749
595	Information Warfare	$305,669	21	$14,556
596	Information Warfare International	$195,848	14	$13,989
			151	
38	**National Security and Intelligence**			
681	Middle East, Africa, South Asia	$184,197	17	$10,835
682	Far East, Southeast Asia Pacific	$151,879	16	$9,492
683	Western Hemishere	$144,404	13	$11,108
684	Russia, Europe, Central Asia	$225,593	20	$11,280
688	Strategic Planning	$247,366	18	$13,743
689	Civil-Military Relations	$75,216	7	$10,745
699	Special Operations/Low Intensity Conflict	$272,082	32	$8,503
824	Intelligence (Regional Studies)	$120,437	13	$9,264
825	Intelligence (OPINTEL)	$64,117	7	$9,160
			143	
39	**Joint C4I Systems**			
365	Command, Control and Communications	$572,328	27	$21,197
823	Intelligence	$133,618	7	$19,088
			34	
	TOTAL	**$20,447,441**	**1,437**	**$14,229**
			Total #	**per course**
OTHER 555	Non-DOD students under MOU with UCSC.	$3,976	2	$1,988
777	Distance Learning students	$65,354	79	$827
888	Continuing Education Courses	$0	2	$0
999	NPS Staff Personnel taking courses	$0	254	$0
	TOTAL	**$20,516,771**		
	TOTAL COSTS FROM THE INPUT PAGE	**$20,516,771**		

Figure 3-9. Cost per Curriculum Model Output Page

E. MODEL ASSUMPTIONS AND LIMITATIONS

There is obviously no best method for calculating the cost per student per curriculum that takes into account all the variables that affect these costs. There are many assumptions that have been made in the development of this model and there are also some considerable limitations that must be understood before interpreting the output of this model. All too often, the final number is what is argued without understanding what went into calculating that number. Some of the assumptions have already been identified and discussed. Many of them could be argued at length. The purpose here is merely to point them out, as well as identify the limitations that exist.

1. One year's worth of data

This thesis analyzed only one year's worth of data. Some curricula are more than two years long and may commence a new section only once a year. Therefore, the model results are not fully representative of the cost per student in a particular curriculum. The model provides a more refined historic view of how much a curriculum costs based on several assumptions. Some curricula are short and classes start more than once a year, so the result is just a collection of "snapshots" of all the sections of students over the course of a fiscal/academic year. The results are not indicative of how much it costs to graduate a student in a particular curriculum, for all the curricula have courses of study longer than 12 months. This model merely provides a valuable view of the many differences between the curricula at NPS. No attempt was made to explain any of the differences.

2. Allocation of Costs

The allocation of specific teaching costs to individual courses is a difficult issue. For example, in the Cost per Curriculum Model, two different four credit courses would cost exactly the same. Realistically, due to professors' salaries, printing costs, and other course particulars, they may not cost the same.

The assumption that A = 1 and B = 1.5 in the WCH calculation for later comparison is somewhat subjective. More research could be done in this area to come up with a more valid allocation base. The cost relationship between lecture hours and lab hours varies from department to department, and even between individual courses. This allocation issue is definitely one that could be further researched so that a more refined allocation could be determined, better representing reality. The important thing to remember is that the costs incurred by the academic departments are being allocated across the courses, resulting in an average cost per course.

3. Average Number of Students Onboard (AOB)

As previously discussed, the denominator in the cost per student per curriculum calculation is an average number of students in that particular curriculum during FY96. Ideally, one student could be tracked through his/her curriculum matrix and the costs of the courses could be accumulated, but that is not practical. The best measure available is the average number of students on board.

The assumptions and limitations aside, this model presents a valuable tool that can be utilized by decision makers to obtain better information about the cost of providing

education at NPS. However, it is still an average cost per student. The model output can be a more refined estimate of cost per student than has been calculated in the past, but it only provides an average cost per student in FY96. The cost of adding 10 more students in a particular curriculum cannot accurately be determined using this model. On an average, how much they would have cost last year can be determined, but not the marginal cost. The last half of this chapter provides a method for answering the marginal cost question.

F. MARGINAL COST PER STUDENT MODEL PRESENTATION

1. Introduction

The Cost per Curriculum Model calculates a cost per student based on the costs that the reader selects as an input to the model. By only entering costs directly related to teaching, it may seem that the output would approximate the "marginal" cost per student at NPS. However, as just discussed, the output is only a refined and detailed average cost per student. It provides little information as to the cost of adding one more student to a particular curriculum. This marginal issue has been touched on twice already in the thesis. In the discussion of changing the number of reimbursable students at NPS, the marginal cost is the central issue. The excess capacity issue is inferred when NPS staff or other military officers fill empty seats in particular courses. The Marginal Cost per Student Model is a 0.8 Megabyte workbook using Microsoft Excel 5.0/7.0. It uses some of the data from the Cost per Curriculum Model and calculates the marginal cost of adding a

selected number of students to a particular curriculum. How this model was developed, a brief discussion of how it works, and the assumptions and limitations associated with the model follows.

2. The Methodology

Ideally, it would seem that there must be a way to create a model that, given a desired change in the steady state number of students in a curriculum, would take into account all the variables that affect the costs of education resulting in a marginal cost per student. These variables would include the different courses in the curriculum matrix, course validations, refresher courses required, desired electives, the department's many variables associated with providing the courses, and the existing excess capacity. Prior to this thesis, as far as the author knows, no attempt has been made to incorporate these variables in a model, other than some informal assumptions and calculations.

The second model is based on the excess capacity at NPS during FY96. It could easily be modified to include the current excess capacity and even the projected excess capacity, based on a projection of course schedule and student load. This will be addressed again, but the important concept at this point is excess capacity. As will be seen, the marginal cost is highly dependent on the existing excess capacity. In other words, if the school has some excess capacity, then the cost of adding some additional students to the curriculum would be small; but, if the school is operating at capacity, then it may be expensive to add more students.

Similar to the Graduate Education Study [Ref. 3] performed in 1975, the marginal

cost is dependent largely on section sizes. When enough students are added so that a new section is required, then additional costs are incurred in providing education to that section. The concept is rather simple; if a course class size is not at the maximum allowed, for whatever reason, then that course is defined as having "excess capacity." The basis behind this model is that if the number of additional students, as determined by the user, is greater than the excess capacity of a particular course, based on FY96 data, then a new section is required.

This model was developed for only one curriculum, the Financial Management (FM) Curriculum, due to the uniqueness of the curriculum and the time constraints. However, this methodology can be used to build a similar model using courses from any other curriculum. An additional limitation is that the model cannot calculate the marginal cost per student for a decrease in the student population. Both of these limitations will be discussed in a later section.

3. The Financial Management (FM) Curriculum

The Marginal Cost per Student Model only investigates the FM curriculum at NPS. The FM curricula is an 18 month program and the curriculum matrix is shown in Figure 3-10. In order to graduate, a student must take all the courses on the core matrix and two curriculum option electives, assuming no courses are validated. This does not mean that some students do not take additional electives, only that they are not required to. With a very few exceptions, new sections of students begin their course of study twice a year, in January and July. Therefore, at any one time, three different sections of students

FINANCIAL MANAGEMENT CURRICULUM MATRIX			
Quarter	**Course #**	**Hours**	**Course Name**
1	MN2150	(4-0)	Financial Accounting
	MN2031	(4-0)	Economic Decision Making
	MN3333	(4-0)	Managerial Communication Skills
	MA2300	(5-0)	Mathematics for Management
	IS0125	(0-2)	Computer Skills Development
2	MN3161	(4-0)	Management Accounting
	MN3140	(4-0)	Microeconomic Theory
	MN3105	(4-0)	Organization and Management
	OS3101	(4-1)	Statistical Analysis for Management
3	MN4161	(4-0)	Management Control Systems
	MN3172	(4-0)	Public Policy and Budgeting
	MN4162	(4-0)	Cost Management
	OS3006	(4-0)	Operations Research for Management
4	MN3154	(4-0)	Financial Management in the Armed Services
	MN4163	(4-0)	Decision, Cost and Policy Analysis
	IS3183	(4-0)	Management Information Systems
	MN4151	(2-0)	Internal Control and Auditing
5	MN4XXX	(4-0)	Curriculum Option *
	NS3252	(4-0)	Joint and Maritime Strategic Planning
	MN0810	(0-8)	Thesis Research
	MN0810	(0-8)	Thesis Research
6	MN3301	(4-0)	System Acquisition and Project Management
	MN4105	(4-0)	Strategic Management
	MN4XXX	(4-0)	Curriculum Option *
	MN0810	(0-8)	Thesis Research

Figure 3-10. Financial Management Curriculum Matrix

* The Student will select two courses from the following curriculum options	
MN4122	Planning & Control: Measurement & Evaluation
MN4152	Corporate Financial Management
MN4159	Financial Reporting and Analysis
MN4305	Defense Technology and Analysis
MN4153	Seminar in Financial Management
MN4302	Defense Resource Policy and Management
OA4702	Cost Estimation

Figure 3-10. Financial Management Curriculum Matrix (Continued)

in the FM curriculum are on board at NPS.

4. Course Listing

In order to determine the excess capacity during FY96 for the courses that are taken by students in the FM curriculum, some of the data from the previous model must be extracted. This section will briefly describe how the course listing for this model was derived.

Using a spreadsheet, any courses that were taken by students identified as being in the Financial Management curriculum were identified and then copied to a new worksheet. After referring to the FM curriculum matrix, Figure 3-10, these courses were sorted into four categories; those courses required by the curriculum matrix, those electives listed as valid curriculum options, those electives not listed as curriculum options but valid courses in the Systems Management Department, and finally, all other courses taken by students in the FM curriculum. See Appendix B for a complete listing of these four categories. The courses in the fourth category were taken primarily by those students that transferred into

the curriculum from another curriculum. The courses were then sorted by course number and grouped by quarter and segment. Only the courses in the first two categories will be used in the model, primarily because the matrix is generally followed by all students. This does not mean to say that the other courses do not cost anything, only that they introduce additional variables that cannot be addressed in this model. This issue will be further discussed in the assumptions and limitations section.

5. Class Size

In order to determine the excess capacity, some assumption has to be made about the maximum class size. This section will discuss what class size will be compared to the actual class size during FY96 and how it is provided as an input for the user to define. Why a limit was placed on the maximum class size and how "excess capacity" was calculated will also be discussed.

Some maximum class size must be established to compare to the actual class size in order to determine the excess capacity. The maximum class size for each course series, i.e. 1000, 2000, 3000, and 4000 levels courses, is an input to the model as selected by the user. However, the maximum class size has been limited to 30 students. There are not many classrooms that hold more than 30 students. Additionally, it is felt that the quality of teaching starts to suffer as class size approaches 30. While there are some classrooms that can hold more than 30 students, they are few in number and hard to schedule. However, this assumption can affect the results of the model. For instance, IS0125R, the basic computer course offered to all FM students during the second and the fourth quarter

is listed as having 69 and 35 students respectively during FY96. The computer lab in Ingersoll Hall holds about 30 students. In fact, this course was taught to more than one section at different times. This is just one example of many unique cases that exist, as far as class size is concerned. Ideally, all the variables that affect class size should be included in the model, but that is just not possible.

Excess capacity is defined as the difference between the maximum class size, as selected by the user or a maximum of 30 students, and the actual class size during FY96. Figure 3-11 depicts how the spreadsheet determines the excess capacity.

6. New Section Required

Once the excess capacity for each course is known, whether or not a new section is required must be determined. Before that can be done, the fact that several sections of the same course could be offered during the same quarter must be taken into account. In this case, the excess capacities for all the segments are summed, resulting in a total for that course for that quarter. This same calculation is performed for each quarter. See Figure 3-12 for a graphical explanation.

How frequently courses are taught varies. Some courses are taught every quarter, while some may only be offered every other quarter, or even just once a year. Somehow, based on the course excess capacities, it must be determined whether a new section is required. The assumption is that, if during FY96, the selected number of additional students exceeds the excess capacity of a course during ANY QUARTER, then a new section is required. This assumption presents a problem and a clear limitation. For

MARGINAL COST PER STUDENT MODEL CALCULATION PAGE

COURSES THAT ARE REQUIRED IN THE FINANCIAL MANGEMENT CURRICULUM MATRIX

Course Dept	Yr-Qtr Course-Seq	Prof Dept	Lec Hrs	Lab Hrs	Class Size	Type	Max	Exc Cap MAX		Logic			NEW SECTION REQ'D?	The REAL COST
SM	962MN2031	SM	4	0	32	R	30	-2	1	0	-2	1		
	964MN20311	SM	4	0	29	R	30	1		1				
	964MN20312	SM	4	0	13	R	30	17		18				
	964MN20313	SM	4	0	23	R	30	7		25				
	964MN20314	SM	4	0	27	R	30	3	1	0	28		YES	$10,599
	962MN21501	SM	4	0	25	R	30	5		5				
	962MN21502	SM	4	0	21	R	30	9	1	0	14			
	[illegible]	SM	4	0	36	R	30	-6		-6				
	964MN21502	SM	4	0	26	R	30	4		-2				
	964MN21503	SM	4	0	22	R	30	8		6				
	964MN21504	SM	4	0	30	R	30	0	1	0	6	1	YES	$10,599
	961MN3105	SM	4	0	15	R	30	15	1	0	15			
	962MN31052	SM	4	0	19	R	30	11	1	0	11			
	963MN31052	SM	4	0	18	R	30	12	1	0	12			
	964MN31051	SM	4	0	18	R	30	12		12				
	964MN31052	SM	4	0	23	R	30	7		19				
	964MN31053	SM	4	0	24	R	30	6	1	0	25		NO	$0

Excess Capacity = Maximum - Actual =30 - 21 => 9

If the next course is the same as this course (just another section in the same quarter), then enter nothing, otherwise enter a "1."

If this course is the last class of a group (previous column ="0"), then add the last excess capacity sum to this course's excess capacity for a Total Excess Capacity.

If the previous column = "1" (meaning it is the last section in a given quarter), then enter a "0," otherwise add the last excess capacity to the new excess capacity.

Figure 3-11. Marginal Cost per Student Model Calculation Page Example

MARGINAL COST PER STUDENT MODEL CALCULATION PAGE

COURSES THAT ARE REQUIRED IN THE FINANCIAL MANGEMENT CURRICULUM MATRIX

Course Dept	Yr-Qtr Course- Seq	Prof Dept	Lec Hrs	Lab Hrs	Class Size	Type	Max	Exc Cap		Logic			DO WE REALLY NEED IT?	The REAL COST
SM	962IS0125R	SM	0	2	69	R	30	-39	1	0	-39	1		
	964IS0125R	SM	0	2	35	R	30	-5	1	0	-5	1	YES	$10,599
	962MN2031	SM	4	0	32	R	30	-2	1	0	-2	1		
	964MN20311	SM	4	0	29	R	30	1		1				
	964MN20312	SM	4	0	13	R	30	17		18				
	964MN20313	SM	4	0	23	R	30	7		25				
	964MN20314	SM	4	0	27	R	30	3	1	0	28		YES	$10,599
	962MN21501	SM	4	0	25	R	30	5		5				
	962MN21502	SM	4	0	21	R	30	9	1	0	14			
	964MN21501	SM	4	0	36	R	30	-6		-6				
	964MN21502	SM	4	0	26	R	30	4		-2				
	964MN21503	SM	4	0	22	R	30	8		6				
	964MN21504	SM	4	0	30	R	30	0	1	0	6	1	YES	$10,599
	961MN3105	SM	4	0	15	R	30	15	1	0	15			
	962MN31052	SM	4	0	19	R	30	11	1	0	11			
	963MN31052	SM	4	0	18	R	30	12	1	0	12			
	964MN31051	SM	4	0	18	R	30	12		12				
	964MN31052	SM	4	0	23	R	30	7		19				
	964MN31053	SM	4	0	24	R	30	6	1	0	25		NO	$0

Do we need a new section?
Is the INPUT (10) greater than the total excess capacity (6)?
YES = "1" and NO = Nothing

For this particular course (MN2150), if the selected number of additional students is greater than the course excess capacity during ANY of the quarters (previous column ="1"), then a New Section is required.

Figure 3-12. New Section Required?

example, one might ask, "Should the excess capacity be an average of the capacities over the quarters that the course was offered? Is there some other relationship?" While not as clear, excess capacity is largely affected by the expected number of incoming students, which can remain unknown up until a few weeks before classes start. How much lead time the academic departments have to make adjustments to course assignments and offerings affects their ability to accurately determine excess capacity. The lead time issue will be discussed in the assumptions and limitations section.

Once it has been determined that a new section is required, the object is to assign a cost to that new section in order to calculate a marginal cost per student. The next two sections address this process and the options available.

7. Options for providing that Instruction

There are several different options available to the academic departments for providing the instruction for a new section, which have been included in the model as input options that the user may select. This section will discuss the options that are available, the rationale behind determining how much each option costs, and the limitations to these cost determinations. The following options are available for the user to select as inputs to the model: hire a new professor, divert a professor away from research, or contract an instructor from outside NPS. The specifics of the cost of each of these options is discussed in Chapter IV.

a. Hire a New Professor

With the current reality, this option may seem a bit remote, but with large changes in the number of additional students selected, it could become a viable option. How much a new professor costs is not easily answered. It depends on the course required, the existing manning of the affected academic department, and the current funding status, among others. The assumption made for this model is that it would cost the average total civilian faculty salary. The details of this assumption are discussed in the next chapter. This may seem a bit high, but once a professor is hired, that cost should be considered a sunk cost, for at least a period of a year. With additional research, this assumption could be refined and an input could be provided, so that the user could change the assumption. Additionally, the course would incur some fraction of the teaching costs incurred by the academic department over the course of the year.

b. Divert a Professor from Research

The most probable method for providing the instruction would be to divert a professor from research to teach the course. As will be discussed in the next chapter, civilian faculty salaries are broken up into three areas, Direct Teaching (DT) salary, Direct Funded Research (DFR) salary, and Reimbursable Research (RR) salary. The cost of diverting a professor from research would be some fraction of the Direct Teaching salary.

c. Contract an Outside Instructor

The last option is to contract an instructor who is not a faculty member at NPS. This is done infrequently and may not be a feasible solution; however, the current push towards outsourcing in the Department of Defense may change the frequency.

9. The Marginal Cost per Student

Once it is determined that a new section is required and the user has entered how the instruction will be provided for each academic department, the model calculates the total cost of adding the selected number of students. The user may also enter the fraction of the direct teaching salary to be used as the cost of diverting a professor from research and whether fringe benefits should be included in the calculation. This is further explained in Chapter IV. See the Marginal Cost per Student Input Page in Figure 3-13 and also in Appendix B. The model calculates the cost of each new section required. These costs are then summed resulting in a total marginal cost of providing education for the selected number of additional students. This sum is copied to the Marginal Cost Output section of the Input page and then divided by the selected number of additional students to enter the FM curriculum. Realistically, this results is an "average" marginal cost per student.

G. MODEL ASSUMPTIONS AND LIMITATIONS

1. Introduction

The Marginal Cost per Student model doesn't answer all the questions. It is based on certain assumptions and has some limitations in its utility, but, as long as these are understood, the model can be used to answer some important "what-if" questions. This section will discuss some more of the assumptions and limitations that have not already been addressed. There are limitations to the data that were used in the model, problems with the excess capacity assumption, and a lead-time issue.

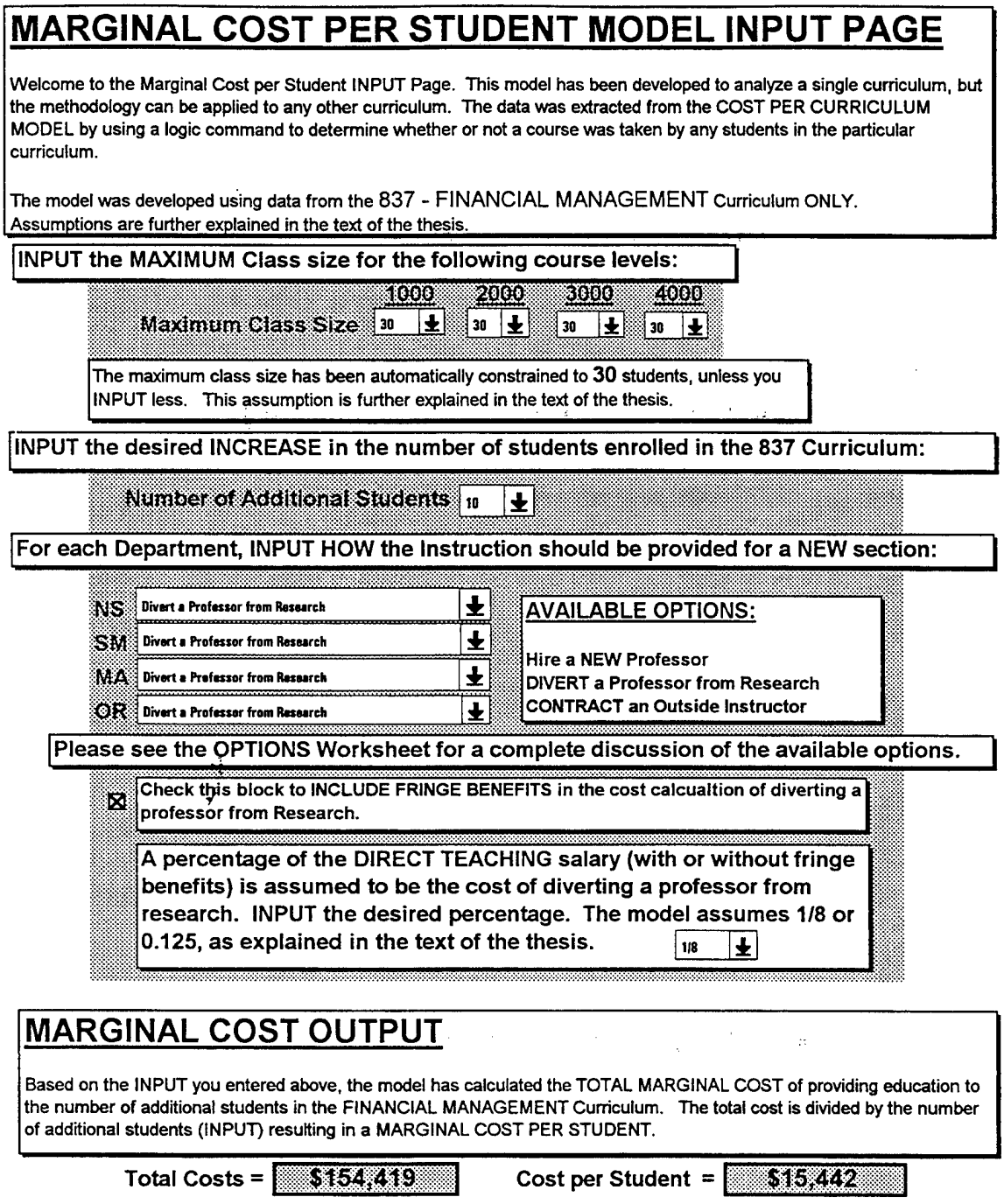


Figure 3-13. Marginal Cost per Student Input Page

2. Data

The data were FY96 numbers, courses, and schedule. In all likelihood, this year's data will not be the same. There are a number of reasons for this. Courses are planned and scheduled based on a projected number of incoming students. This can vary from quarter to quarter due to late starters or students transferring into the curriculum. Considering that one year's worth of data includes three different class sections of FM students, at different stages of instruction at NPS, it could be argued that the data may not be that much different from year to year.

It is possible that current or future plans could be incorporated into the model to give decision makers a view of the current reality of the marginal cost per student. If a projected class schedule was "pasted" over the existing data and a projected student load was included, the model could be modified to answer current "what-if" questions. This is a possibility that is discussed later in Chapter VI.

3. Class Size

The real limitation is determining the true excess capacity. The excess capacity is determined based on some maximum class size. Could classes be rescheduled so that a larger classroom could be used? Is there a way to teach more than 30 students and still get the quality of a graduate level course with a smaller number of students? The maximum class size has been limited to 30 students, as previously discussed. Classroom size does hinder scheduling many courses with more than 30 students. However, the larger factor is the quality of teaching issue. There is a general agreement that the quality

of teaching is hindered when class sizes approach 30 students, especially in the higher level courses. With more research, perhaps a better assumption could be made, and an input could be added to the model to give the user a chance to enter his/her own assumptions.

What is clear, and will be discussed in Chapter VI, is that the marginal cost per student is largely a function of section size and also highly dependent upon the existing excess capacity at the school.

4. Lead Time Issue

While additional students would be commencing their study immediately, some of the courses required, as calculated by the model, would not be taken until much later. This time would give decision makers time to revise their plan to accommodate the additional students. Practically, the marginal cost per student may be influenced heavily by the required courses in the FIRST quarter, implying that planning might be able to significantly lower these marginal costs. The model assumes that all courses are required now. However, in reality, that is not the case. This lead time issue could be incorporated in the model, by discounting the costs of courses that would not be required immediately. The assumption there is that some lead-time results in additional planning that could lower the marginal costs.

The marginal cost in this thesis is only valid for a small change in the number of students. It has been assumed that the "short run" is the relevant time period and therefore, many of the costs associated with the instruction of students are assumed to be fixed. When these costs actually become variable could also be argued, but it is beyond

the scope of this thesis. What we do know is that at some point the costs assumed to be fixed start to become variable, and most probably not all at once, as the number of incoming students is increased. At some point, the infrastructure must expand to meet the support requirements of these additional students. Therefore, it is assumed that the time period is the short run, where most of the support costs of instruction are fixed.

5. Other costs associated with teaching

As will be explained further in Chapter IV, only the direct teaching salary was included in the calculation of the cost of a newly required section. There are certainly other costs that will be incurred by an added course. However, the specifics of those costs were not investigated as part of this thesis. Future research could be done to refine the costs of individual courses, which would result in a more accurate marginal cost per student.

The next chapter will discuss more of the rationale behind the costs that were selected to be included in both of the models, i.e. what these costs are, how they were arrived at, the assumptions in the calculation of the costs, and a discussion of other costs that could be included in the model.

IV. COST DATA

A. INTRODUCTION

This chapter will present the cost data that was used in the models, explain how it was collected and derived, explain what costs were not included and why, and finally, discuss what costs could be included in the model with some modifications. As previously mentioned, this thesis primarily is concerned with the methodology behind developing flexible models that can incorporate numerous other desired assumptions and costs. Many of the costs used in the model were selected because they were considered direct costs of teaching and were particularly relevant to the marginal cost of graduate education.

B. COST DATA

1. Introduction

This section will present the costs that were used in the Costs per Curriculum Model and the Marginal Cost per Student Model. It will discuss how the costs were derived, how the costs were allocated to the academic departments and some of the assumptions that were made. Finally, costs that were not included in the models will be mentioned.

2. Cost per Curriculum Model Costs

The cost categories used in the Cost per Curriculum Model are listed as inputs to the model in Figure 3-4 and Appendix A, and are discussed in the following sections. The final section will discuss what costs were not included in the Cost per Curriculum Model.

a. Civilian Faculty Direct Teaching Salary

When discussing marginal costs, the first costs that come to mind are the direct costs of instruction, which includes the salaries of the professors and military instructors that teach the courses. The Cost per Curriculum Model includes the Direct Teaching (DT) salaries of the civilian faculty. Faculty salaries are broken into three categories, Direct Teaching (DT), Direct Funded Research (DFR), and Reimbursable Research (RR), as can be seen in Figure 4-1. All the salary costs are presented here, because the average total civilian faculty salary is used later as the average cost of hiring a new professor. For the purposes of trying to estimate the marginal cost per student at NPS, only the Direct Teaching salaries were selected to be included in the model. Civilian Faculty Fringe[1] is calculated as a percentage of the salary, and was 21% for FY96. This results in a Fringe factor of 1.21 that should be included in the direct teaching salary. Fringe has been included as an input to the model, so that the user can decide whether to include it or not. These costs were extracted from the FY96 Faculty Budget Plan/Execution Summary Report.

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[1]Fringe benefits, or "Fringe" represent the cost of the government's share of civilian employee retirement , life insurance, health insurance, social security, and thrift savings plans.

FY96 FACULTY BUDGET PLAN / EXECUTION SUMMARY

dtd 02 Oct 96

NPS Code	Code	Academic Department	Direct Teach W/Y's	Direct Teach Salary	Direct Funded Research W/Y's	Direct Funded Research Salary	Reimbursable Research W/Y's	Reimbursable Research Salary	Total	Fringe	Total	FY1996 W/Y's	Average Salary per W/Y
	NS	National Security Affairs	19.52	1,381,308	3.36	240,233	6.18	464,195	2,085,736	1.21	2,523,741	29.07	$86,816
06	SM	Systems Management	31.84	2,699,879	5.64	452,592	21.71	1,775,483	4,927,954	1.21	5,962,824	59.19	$100,740
		Total	51.36	4,081,187	9.00	692,824	27.89	2,239,678	7,013,689	1.21	8,486,564	88.26	$96,154
	AA	Aeronautics and Astronautics	9.70	918,512	1.89	183,330	6.86	616,363	1,718,205	1.21	2,079,028	18.45	$112,684
	CS	Computer Science	11.60	995,924	2.52	206,864	7.49	586,440	1,789,228	1.21	2,164,966	21.60	$100,230
	EC	Electrical and Computer Engineering	20.26	1,742,558	2.43	211,664	12.04	943,691	2,897,913	1.21	3,506,475	34.73	$100,964
07	MA	Mathematics	14.87	1,243,373	3.10	248,852	2.02	152,073	1,644,298	1.21	1,989,601	20.00	$99,480
	ME	Mechanical Engineering	11.57	1,030,522	1.88	166,839	8.41	651,787	1,849,148	1.21	2,237,469	21.86	$102,354
		Total	68.00	5,930,889	11.82	1,017,549	36.82	2,950,355	9,898,793	1.21	11,977,540	116.64	$102,688
	OC	Oceanography	7.28	626,793	1.17	96,215	11.84	827,173	1,550,181	1.21	1,875,719	20.29	$92,445
	OR	Operations Research	15.65	1,398,871	2.82	259,187	9.31	844,314	2,502,372	1.21	3,027,870	27.78	$108,995
	MR	Meteorology	6.15	537,810	0.99	81,162	11.40	735,213	1,354,185	1.21	1,638,564	18.54	$88,380
08	PH	Physics	14.21	1,254,461	3.03	254,091	8.50	731,828	2,240,380	1.21	2,710,860	25.74	$105,317
	GRPS	Groups (UW/SP/EW/CC)	7.92	706,859	1.63	142,423	3.90	338,458	1,187,740	1.21	1,437,165	13.44	$106,932
		Total	51.21	4,524,794	9.64	833,077	44.95	3,476,987	8,834,858	1.21	10,690,178	105.79	$101,051
		TOTAL	170.57	14,536,870	30.46	2,543,450	109.66	8,667,020	25,747,340	1.21	31,154,281	310.69	$100,274

Note 1: Data extracted from the FY96 Faculty Budget Plan/Execution Summary Report

Figure 4-1. FY96 Faculty Budget Plan/Execution Summary

b. Military Faculty Salary

This section will present the list of military instructors that were attached to NPS during FY96 and list their composite salaries, see Figure 4-2. The assumption is that military instructors are paid the same whether they are fully involved with research or with teaching, so that their salary can be considered somewhat of a fixed cost. However, if the student enrollment was to decrease, would these billets still exist? Are the military instructor billets a function of the number of students at NPS? No research was conducted to address this issue, so the assumption is that they do need to be included in the marginal cost discussion. Additionally, no research was conducted to determine how many courses military instructors taught during FY96, other than the course listing in Appendix A, nor was there any attempt to allocate their particular salaries to the courses that they taught. A list of the Military Faculty on board NPS during FY96 was obtained from the Office of Academic Planning.[Ref. 10] The number of work-years was assigned to each military faculty member based on how long they were assigned to NPS, regardless of employment. Additional research could accurately match military faculty salaries with a specific course, but that was not performed in conjunction with this thesis. The military faculty salaries used are pay rates included in a Defense Finance and Accounting Service (DFAS) instruction entitled, FY96 Navy and Marine Corp Composite Standard Military Rates, and includes pay and benefits which make the composite salaries equivalent to the civilian salaries with fringe benefits.

MILITARY INSTRUCTOR SALARIES

FY97 Navy /Marine Corps Composite Military Standard Rate

Rank	Composite Rate
06	$118,498
05	$102,463
04	$85,983
03	$72,343
02	$58,399

Dept Code	Academic Dept	Rank	W/Y's	Composite Military Rate	TOTAL (Salary X W/Y's)
	NS	06	1.00	118,498	$118,498
	NS	06	1.00	118,498	$118,498
			NS	**TOTAL**	**$236,996**
	SM	04	1.00	85,983	$85,983
	SM	05	1.00	102,463	$102,463
	SM	05	1.00	102,463	$102,463
	SM	05	1.00	102,463	$102,463
06	SM	04	1.00	85,983	$85,983
	SM	04	1.00	85,983	$85,983
	SM	05	0.83	102,463	$85,386
	SM	05	0.75	102,463	$76,847
	SM	05	0.75	102,463	$76,847
	SM	04	0.67	85,983	$57,322
	SM	05	0.17	102,463	$17,077
	SM	05	0.17	102,463	$17,077
			SM	**TOTAL**	**$895,895**
	AA	03	1.00	72,343	$72,343
			AA	**TOTAL**	**$72,343**
	CS	05	1.00	102,463	$102,463
	CS	04	1.00	85,983	$85,983
	CS	05	1.00	102,463	$102,463
	CS	04	1.00	85,983	$85,983
07					
			CS	**TOTAL**	**$376,892**
	EC	04	1.00	85,983	$85,983
			EC	**TOTAL**	**$85,983**
	MA				$0
			MA	**TOTAL**	**$0**
	ME	04	1.00	85,983	$85,983
			ME	**TOTAL**	**$85,983**

Figure 4-2. Military Instructor Salaries

MILITARY INSTRUCTOR SALARIES

Dept Code	Academic Dept	Rank	W/Y's	Composite Military Rate	TOTAL (Salary X W/Y's)
	MR	05	1.00	102,463	$102,463
			MR	**TOTAL**	**$102,463**
	OC	05	0.33	102,463	$34,154
			OC	**TOTAL**	**$34,154**
	OR	05	1.00	102,463	$102,463
	OR	04	1.00	85,983	$85,983
	OR	05	1.00	102,463	$102,463
08	OR	06	1.00	118,498	$118,498
	OR	05	1.00	102,463	$102,463
	OR	05	1.00	102,463	$102,463
			OR	**TOTAL**	**$614,333**
	PH	04	1.00	85,983	$85,983
			PH	**TOTAL**	**$85,983**
	GRPS/C3	04	1.00	85,983	$85,983
	GRPS/C3	04	1.00	85,983	$85,983
	GRPS/C3	06	0.08	118,498	$9,875
			GRPS/C3	**TOTAL**	**$181,841**
	GRPS/SP	04	1.00	85,983	$85,983
			GRPS/SP	**TOTAL**	**$85,983**

Figure 4-2. Military Instructor Salaries (Continued)

c. Civilian Mission Staff Salary

This section will discuss the cost of the civilian staff. Only the civilian staff in the academic departments were included in this calculation. Civilian staff salaries include a direct salary, an indirect salary (a fraction of the reimbursable research money that is brought into NPS, in accordance with Navy Comptroller (NAVCOMPT) regulations) and a reimbursable research salary (if applicable). All salary categories are listed in Figure 4-3, but only the direct salaries are included in the model. These numbers were extracted from the FY96 Mission Staff Budget Plan/Execution Summary. The indirect and reimbursable research salaries were left out of the model because it was felt that they were not directly related to teaching, independent of a change in the student enrollment at NPS. For 1996, fringe for civilian staff was determined to be 23%.

d. Academic Department OPTAR and Travel

This section will discuss the allocation of OPTAR/Travel costs to the various academic departments, how the amounts were derived, why some were left out, and finally present the data used in the model. OPTAR/Travel money is money that is allocated to NPS in the form of an operating budget called Operating Target (OPTAR) to spend on the operations of the command. OPTAR Travel money is operating money that is budgeted for and used for education related travel. All OPTAR/Travel money obligated during FY96 is included in the NPS Operating Budget Sub-Cost Center Balance OPTAR Report. Only that OPTAR/Travel obligated in the three academic codes, 06, 07, and 08 were included in the model. Refer to Figure 3-1 for a description of the money flow to the academic departments.

FY96 MISSION STAFF BUDGET PLAN / EXECUTION SUMMARY

dtd 03 Oct 96

NPS Code	Code	Academic Department	TOTAL M/Y's	DIRECT Salary	INDIRECT Salary	RR Salary	Total	Fringe	Total
	NS	National Security Affairs	7.22	123,386	13,561	75,581	212,528	1.23	$261,409
06	SM	Systems Management	21	226,601	66,202	257,419	550,222	1.23	$676,773
		Total	28.22	349,987	79,763	333,000	762,750	1.23	$938,183
	AA	Aeronautics and Astronautics	15.9	524,693	20,179	50,031	594,903	1.23	$731,731
	CS	Computer Science	25.3	519,748	26,097	425,315	971,160	1.23	$1,194,527
	EC	Electrical and Computer Engineering	23.03	731,918	43,698	103,508	879,124	1.23	$1,081,323
07	MA	Mathematics	3.3	90,237	8,222	0	98,460	1.23	$121,106
	ME	Mechanical Engineering	11.3	399,474	28,383	26,479	454,336	1.23	$558,833
		Total	78.83	2,266,070	126,579	605,333	2,997,983	1.23	$3,687,519
	OC	Oceanography	18.76	284,654	49,801	402,038	736,492	1.23	$905,885
	OR	Operations Research	18.01	391,120	28,126	255,382	674,627	1.23	$829,791
	MR	Meteorology	12.01	379,107	53,417	25,010	457,534	1.23	$562,767
08	PH	Physics	17.6	549,743	28,501	142,407	720,651	1.23	$886,401
	GRPS	Groups (UW/SP/EW/CC)	21.24	252,206	27,824	493,257	773,287	1.23	$951,143
		Total	87.62	1,856,830	187,669	1,318,094	3,362,591	1.23	$4,135,987
		TOTAL	194.67	4,472,887	394,011	2,256,427	7,123,324	1.23	$8,761,689

Note 1: Data extracted from the FY96 Mission Staff Budget Plan/Execution Summary Report

Figure 4-3. Civilian Mission Staff Salaries

OPTAR/Travel money not associated with a specific academic department was allocated to the departments using several different allocation bases. The allocation numbers were calculated for each academic department and for all the departments as a whole. See Figure 4-4 for a listing of these percentages. Academic Code Dean Costs were allocated to the various academic departments based on the percentage of faculty work-years within the respective Academic Codes. Academic Code printing costs were allocated to the departments based on a percentage of the total number of students taught with the respective academic code. Laboratory Maintenance costs were listed as a Code 07 cost, but include all laboratory maintenance costs. Therefore, this cost was allocated to the academic departments based on the percentage of the total number of lab hours for all the departments. This includes all courses that were taught, as listed in Appendix A. Figures 4-5, 4-6, and 4-7 show the OPTAR/Travel costs and allocation for each Academic Code.

Some of the line items were investigated to determine their relevance to teaching and removed from the OPTAR /Travel total. In Code 06, the OPTAR/Travel identified as being associated with BASE MANAGEMENT was removed from the model after determining that this money was spent primarily on investigating a new curriculum. In Code 08, the OPTAR/Travel identified as being associated with JOINT WARFARE was removed after determining that this money was spent by a number of different entities at NPS and it was not directly related to teaching at NPS. This was a considerable amount of money and an argument could be made for including this. All OPTAR/Travel was included in the allocation of indirect mission support costs, which will be discussed in

ALLOCATION DATA

NPS Code	Dept Code	Academic Department	Civilian Faculty Work-Years	Military Faculty Work-Years	TOTAL Faculty Work-Years	% based on W-Y's	Total # of Students Instructed	% based on Students	Total # of Lab Hours	% based on Lab Hours
	NS	National Security Affairs	29.07	2.00	31.07	31.20%	2,367	30.39%	30	1.66%
06	SM	Systems Management	59.19	9.33	68.52	68.80%	5,423	69.61%	152	8.43%
		Total	88.26	11.33	99.59	100.00%	7,790	100.00%	182	10.09%
	AA	Aeronautics and Astronautics	18.45	1.00	19.45	15.73%	1,033	12.41%	172	9.54%
	CS	Computer Science	21.60	4.00	25.60	20.71%	1,980	23.78%	624	34.61%
	EC	Electrical and Computer Engineering	34.73	1.00	35.73	28.90%	2,456	29.50%	374	20.74%
07	MA	Mathematics	20.00	0.00	20.00	16.18%	1,873	22.50%	63	3.49%
	ME	Mechanical Engineering	21.86	1.00	22.86	18.49%	984	11.82%	108	5.99%
		Total	116.64	7.00	123.64	100.00%	8,326	100.00%	1,341	74.38%
	OC	Oceanography	20.29	1.00	21.29	18.17%	429	8.44%	46	2.55%
	OR	Operations Research	27.78	0.33	28.11	23.98%	2,388	46.96%	57	3.16%
	MR	Meteorology	18.54	6.00	24.54	20.94%	365	7.18%	49	2.72%
08	PH	Physics	25.74	1.00	26.74	22.82%	1,228	24.15%	87	4.83%
	GRPS	Groups (UW/SP/EW/CC)	13.44	3.08	16.52	14.10%	675	13.27%	41	2.27%
		Total	105.79	11.41	117.20	100.00%	5,085	100.00%	280	15.53%
		TOTAL	310.69	29.74	340.43		21,201		1,803	100.00%

Figure 4-4. Allocation Data

CODE 06 - MANAGEMENT AND SECURITY STUDIES OPTAR / TRAVEL REPORT

NPS OB Sub-Cost Center Balance OPTAR/Travel Report dtd 10/22/96

Dept Code	CC	SAG	Dept	Activity*Notes	Ref	Comments/Notes	OPTAR Obligated		
06	06	3K	06	DEAN OF MANAGEMENT	PG18	OPTAR	30,792		
	NS	Allocation based on number of faculty			0.311979	See Figure 4-4		9,606	
	SM	Allocation based on number of faculty			0.688021	See Figure 4-4		21,186	
06	06	3K	06	CODE 06 PRINTING	PG22	OPTAR	39,000		
	NS	Based on number of students taught			0.303851	See Figure 4-4		11,850	
	SM	Based on number of students taught			0.696149	See Figure 4-4		27,150	
07	07	3K	07	LABORATORY MAINTENANCE	PG19	OPTAR		273,622	TOTAL
07	07	3K	07	LAB / OTHER	PG19	OPTAR		142,987	416,609
	NS	Allocated based on Lab Hours of Instruction			0.016639	See Figure 4-4	6,932		
	SM	Allocated based on Lab Hours of Instruction			0.084304	See Figure 4-4	35,122		42,054
NS	07	3K	06	NSA	PG18	OPTAR	53,077		
NS	07	3K	06	NSA	PG18	TRAVEL	18,862		
SM		3K	06	BASE MANAGEMENT	PG18	OPTAR NOT INCLUDED		4,360	
SM		3K	06	BASE MANAGEMENT	PG18	TRAVEL		3,194	
SM	07	3K	06	SYSTEMS MANAGEMENT	PG18	OPTAR	109,728		
SM	07	3K	06	CONRAD CHAIR	PG18	OPTAR	70,758		
SM	07	3K	06	SYSTEMS MANAGEMENT	PG18	TRAVEL	31,538		
SM	07	3K	06	CONRAD CHAIR	PG18	TRAVEL	15,856		
		Code 06 OPTAR Obligated FY96				**TOTAL**	**411,665**		
						SM TOTAL =	**311,337**		
						NS TOTAL =	**100,328**		
							411,665		

Figure 4-5. CODE 06 OPTAR/Travel Report

CODE 07 - ENGINEERING AND COMPUTATIONAL SCIENCES OPTAR / TRAVEL REPORT

NPS OB Sub-Cost Center Balance OPTAR/Travel Report dtd 10/22/96

Dept Code	CC	SAG	Dept	Activity / Notes	Ref	Comments/Notes	OPTAR Obligated		
07	07	3K	07	DEAN OF ENGINEERING	PG19	OPTAR	3,617		
07	07	3K	07	DEAN OF ENGINEERING	PG19	TRAVEL	8,526	12,143	
	AA	Allocated based on Faculty Work-Years			0.15731	See Figure 4-4		1,910	
	CS	Allocated based on Faculty Work-Years			0.20705	See Figure 4-4		2,514	
	EC	Allocated based on Faculty Work-Years			0.28898	See Figure 4-4		3,509	
	MA	Allocated based on Faculty Work-Years			0.16176	See Figure 4-4		1,964	
	ME	Allocated based on Faculty Work-Years			0.18489	See Figure 4-4		2,245	
07	07	3K	07	LABORATORY MAINTENANCE	PG19	OPTAR		273,622	TOTAL
07	07	3K	07	LAB / OTHER	PG19	OPTAR		142,987	416,609
	AA	Allocated based on Lab Hours of Instruction			0.0954	See Figure 4-4	39,743		
	CS	Allocated based on Lab Hours of Instruction			0.34609	See Figure 4-4	144,184		
	EC	Allocated based on Lab Hours of Instruction			0.20743	See Figure 4-4	86,418		
	MA	Allocated based on Lab Hours of Instruction			0.03494	See Figure 4-4	14,557		
	ME	Allocated based on Lab Hours of Instruction			0.0599	See Figure 4-4	24,955	309,857	
07	07	3K	07	CODE 07 PRINTING	PG22	OPTAR	198,000		
	AA	Allocated based on # of students			0.12407	See Figure 4-4		24,318	
	CS	Allocated based on # of students			0.23781	See Figure 4-4		46,611	
	EC	Allocated based on # of students			0.29498	See Figure 4-4		57,816	
	MA	Allocated based on # of students			0.22496	See Figure 4-4		44,092	
	ME	Allocated based on # of students			0.11818	See Figure 4-4		23,164	
AA	08	3K	07	AERO	PG19	OPTAR	46,555		
AA	08	3K	07	AERO	PG19	TRAVEL	5,735		
CS	07	3K	07	COMPUTER SCIENCE	PG19	OPTAR	40,964		
CS	07	3K	07	COMPUTER SCIENCE	PG19	TRAVEL	4,842		
EC	07	3K	07	ECE	PG19	OPTAR	98,579		
EC	07	3K	07	ECE	PG19	TRAVEL	19,293		
MA	07	3K	07	MATH	PG19	OPTAR	48,597		
MA	07	3K	07	MATH	PG19	TRAVEL	9,115		
ME	07	3K	07	MECHANICAL ENGINEERING	PG19	OPTAR	42,048		
ME	07	3K	07	MECHANICAL ENGINEERING	PG19	TRAVEL	7,248		
				Code 07 OPTAR Obligated FY96		**TOTAL**	**840,976**		

AA TOTAL =	118,261
CS TOTAL =	239,115
EC TOTAL =	265,615
MA TOTAL =	118,325
ME TOTAL =	99,660
	840,976

Figure 4-6. CODE 07 OPTAR/Travel Report

CODE 08 - OPERATIONAL AND APPLIED SCIENCES OPTAR / TRAVEL REPORT

NPS OB Sub-Cost Center Balance OPTAR/Travel Report dtd 10/22/96

Dept Code	CC	SAG	Dept	Activity / Notes	Ref	OPTAR Comments/Notes	Obligated		
08	07	3K	08	DEAN OF OPERATIONS	PG20	OPTAR	1,363		
	OC	Allocated based on Faculty Work-Years			0.18166	See Figure 4-4		248	
	OR	Allocated based on Faculty Work-Years			0.23985	See Figure 4-4		327	
	MR	Allocated based on Faculty Work-Years			0.20939	See Figure 4-4		285	
	PH	Allocated based on Faculty Work-Years			0.22816	See Figure 4-4		311	
	GRPS	Allocated based on Faculty Work-Years			0.14096	See Figure 4-4		192	1,363
08	08	3K	08	CODE 08 PRINTING	PG22	OPTAR	96,000		
	OC	Allocated based on # of students			0.08437	See Figure 4-4		8,099	
	OR	Allocated based on # of students			0.46962	See Figure 4-4		45,083	
	MR	Allocated based on # of students			0.07178	See Figure 4-4		6,891	
	PH	Allocated based on # of students			0.24149	See Figure 4-4		23,183	
	GRPS	Allocated based on # of students			0.13274	See Figure 4-4		12,743	96,000
07	07	3K	08	LABORATORY MAINTENANCE	PG19	OPTAR		273,622	TOTAL
07	07	3K	08	LAB / OTHER	PG19	OPTAR		142,987	416,609
	OC	Allocated based on Lab Hours of Instruction			0.02551	See Figure 4-4	10,629		
	OR	Allocated based on Lab Hours of Instruction			0.03161	See Figure 4-4	13,171		
	MR	Allocated based on Lab Hours of Instruction			0.02718	See Figure 4-4	11,322		
	PH	Allocated based on Lab Hours of Instruction			0.04825	See Figure 4-4	20,103		
	GRPS	Allocated based on Lab Hours of Instruction			0.02274	See Figure 4-4	9,474		64,698
OC	07	3K	08	OCEAN	PG20	OPTAR	17,009		
OC	07	3K	08	OCEAN	PG20	TRAVEL	3,076		
OR	07	3K	08	OPS RESEARCH	PG20	OPTAR	63,066		
OR	07	3K	08	OPERATIONS RESEARCH	PG20	TRAVEL	8,702		
MR	07	3K	08	METEOROLOGY	PG20	OPTAR	20,680		
MR	07	3K	08	METEOROLOGY	PG20	TRAVEL	4,278		
PH	07	3K	08	PHYSICS	PG20	OPTAR	45,854		
PH	07	3K	08	PHYSICS	PG20	TRAVEL	5,875		
CC	07	3K	08	GROUPS	PG20	OPTAR	45,226		
CC	07	3K	08	Systems Technology Laboratory	PG20	OPTAR	45,475		
CC	07	3K	08	GROUPS	PG20	TRAVEL	2,492		
JW	08	3K	08	JOINT WARFARE	PG24	OPTAR	NOT INCLUDED	72,782	
JW	06	3K	06	JOINT WARFARE	PG24	TRAVEL		207,045	

Code 08 OPTAR Obligated FY96 **TOTAL** **423,794**

OC TOTAL =	99,061
OR TOTAL =	130,349
MR TOTAL =	43,456
PH TOTAL =	95,326
CC TOTAL =	115,602
	423,794

Figure 4-7. CODE 08 OPTAR/Travel Report

the next section.

e. Indirect Mission Support Cost Allocation

LT Brian Drapp's thesis entitled, Indirect Mission Support Costs at the Naval Postgraduate School [Ref. 11], develops a methodology for allocating the indirect mission support costs at NPS to five cost objects. Three of the five cost objects are the academic codes, 06, 07, and 08. This section will briefly discuss this thesis, discuss the costs that were allocated and present how those costs were allocated to the academic departments, so that they could be included in the model.

In the above mentioned thesis, five cost objects were identified, the Academic codes, 06, 07, and 08, the Research office, code 09, and the Aviation Safety School, code 10. In general, the costs incurred at NPS during FY96 were allocated to those five cost objects. The only costs not included in the model were the direct costs; civilian faculty salaries and the military instructor salaries, both of which have been included in the Cost per Curriculum Model. All OPTAR/Travel that had any relevance to the five cost objects was allocated in Drapp's thesis.

Since the indirect mission costs were only allocated down to the academic codes, a method of allocating that cost to the academic departments had to be derived. Most of the allocation in the thesis was done based on the number of personnel. Depending on the cost incurred, any number of allocation bases may be appropriate. An alternative allocation base to the number of personnel is the WCH, discussed in the last chapter. The allocation of the indirect mission costs is shown in Figure 4-8.

Indirect Mission Support Costs at NPS

In LT Brian Drapp's Thesis entitled, **Indirect Mission Support Costs at the Naval Postgraduate School,** he developed a program that allocates the indirect mission support costs at NPS to 5 Cost objects, 3 of which are the Academic Codes (06,07,08).

The indirect costs are allocated based on WCH (with A=1 and B=1.5) for courses WITH MORE THAN FOUR STUDENTS ONLY.

NPS Code	Code	Academic Department	WCH	%	Indirect Costs
	NS	National Security Affairs	599.0	0.369753086	$3,702,542
06	SM	Systems Management	1021.0	0.630246914	$6,311,011
		Total 10,013,553	1620.0	1.0	$10,013,553
	AA	Aeronautics and Astronautics	396.0	0.153280434	$2,512,994
	CS	Computer Science	544.5	0.210760596	$3,455,367
	EC	Electrical and Computer Engineering	806.0	0.311979872	$5,114,831
07	MA	Mathematics	430.0	0.166440875	$2,728,756
	ME	Mechanical Engineering	407.0	0.157538223	$2,582,799
		Total 16,394,747	2583.5	1.0	$16,394,747
	OC	Oceanography	171.0	0.116326531	$1,683,923
	OR	Operations Research	573.0	0.389795918	$5,642,618
	MR	Meteorology	157.0	0.106802721	$1,546,058
08	PH	Physics	445.5	0.303061224	$4,387,062
	GRPS	Groups (UW/SP/EW/CC)	123.5	0.084013605	$1,216,166
		Total 14,475,826	1470.0	1.0	$14,475,826
		TOTAL 40,884,126	5673.5		$40,884,126

Figure 4-8. Indirect Mission Support Cost Allocation

f. What costs were not included

This section will briefly discuss what costs were not included in the model. Part of the rationale behind developing a flexible model was to include as many relevant costs as possible, so that the reader could choose what costs should be included. This would allow the reader to run the model for different assumptions, resulting in better comparisons with other calculations that have been made. Identifying and allocating all the costs that are relevant to teaching students at NPS is beyond the scope of this thesis, as was stated before. The 1991 thesis entitled Unit Costing at the Naval Postgraduate School allocated many of these costs in accordance with the Department of Defense (DOD) Unit Costing guidelines. Drapp used a computer program to allocate the indirect mission support costs to the academic codes, 06, 07, and 08. Using the methodology introduced in Drapp's thesis, costs could be grouped and made separate inputs to the model. That would let the reader select which costs should or should not be included in the model.

Other than the Direct Funded Research OPTAR/Travel money that was included in Drapp's indirect mission support cost allocation, no other research money was included in the model. At some point there is no clear distinction between teaching and research for costing purposes. Determining how much time a professor spends on research versus teaching is relatively easy to do, but trying to determine how much of his/her research time was spent with students or thesis advising is not so easy. Research is a very important part of the graduate level experience and should not be dismissed. However, trying to place a dollar amount on the research that does go towards a student's

education is beyond the scope of this thesis. For that reason, civilian faculty DFR and RR salaries were not included in the models. Civilian mission staff indirect and RR salaries were not included in the model.

The other cost that has not been included in either model is the Foreign Military Training (FMT) tuition and the tuition from reimbursable students. The tuition is reimbursed to NPS and the money is allocated to a number of different entities throughout the base. Some costs included in the model have FMT and other reimbursable tuition money included. That cost was not subtracted from the salary total. Therefore, the total costs reflect costs incurred by all the students on board at NPS during FY96. In the past, FMT and other student tuition has been subtracted from the costs and the denominator is changed to just Department of the Navy (DON) students, Navy and Marine Corps, in an attempt to calculate the cost per student for just the DON students. The problem with this is that it assumes that FMT and other student reimbursable tuition is covering the education expenses. That is an issue that would require in-depth research, and it was not addressed in this thesis. Obviously, to get an accurate picture of the cost per student, all the funding sources must be included.

3. Marginal Cost per Student Model Costs

In addition to the costs included in the Cost per Curriculum Model, there were some costs and assumptions that went into the Marginal Cost per Student Model, as discussed in the last chapter. This section will briefly discuss the costs associated with the options for providing instruction if a new section of a course is required, per the Marginal

Cost per Student Model. Assumptions had to be made to assign costs to these options, and it is recognized that with additional research, these assumptions could be improved to better represent the various scenarios. Recall the three options, discussed separately below.

a. Hire a new Professor

How much a new instructor would cost depends on numerous variables. As discussed in the previous chapter, hiring a new professor is probably not the preferred option if a new section is required, but should be considered as one of the choices. The cost of a hiring a new professor is largely dependent on what kind of course needs to be taught. A lower level course might not require the same kind of credentials that a higher level course might. However, once a professor is hired, the contract is usually such that NPS is required to pay the professor for some definite period of time. The assumption for the model is that the cost of hiring a new professor is equal to the average total salary for a faculty member in a particular academic department. Faculty members can be paid up to 10 months worth of Direct Teaching salary; the rest comes from DFR or RR money. For new faculty members, who seldom have established research contacts, the remaining two month's salary is paid out of DFR. With additional research, this cost of hiring a new professor assumption could be refined and also included as an input to the model, so that different assumptions could be made. The average total civilian faculty salary is listed in the last column of Figure 4-1.

b. Divert a Professor from Research

Disregarding the research issue, if a professor must be diverted from research to teach a course, the cost will be some fraction of the direct teaching salary for the year. How direct teaching is handled varies somewhat from department to department. Without having access to individual faculty salaries and pay scales, an assumption had to be made that covered most of the scenarios. Assuming that a professor would get credit for one work-year of direct teaching if he/she taught two four-hour courses each quarter, than a new course would be one-eighth (1/8) of that total. Figure 4-9 divides the total direct teaching salaries for each academic department by the total number of direct teaching work-years (W/Y's), with and without Fringe. This represents an average direct teaching salary per one work-year. This salary is multiplied by 1/8 (0.125), resulting in the cost of diverting a professor from research for each of the academic departments. Keep in mind this is only an average cost. This has been included as an input to the model, so that the user can enter the fraction of the direct teaching salary that should be used in the calculation.

c. Contract an outside Instructor

The last option is to contract an instructor from outside NPS. This option is seldom used at NPS, in fact, only twice during FY96. Whether it should be an option could be argued, but it has been included in the model. The issue of outsourcing some of the education requirements at NPS is not addressed in this thesis. As far as placing a cost on hiring an instructor for just one course, there is no historical data to refer to. However, a cost of $7500/course is assumed in the model, based on anecdotal evidence. Further

The Cost of Diverting a Professor from Research

Direct Teaching Cost (WITH FRINGE)to teach ONE course

DEPT	DT	DT Salary	Fringe	Total DT Salary	AVG DT Salary per ONE W/Y	Teach 1 additional course	DT Salary Cost of additional course
NS	19.52	1,381,306	1.21	1,671,380	$85,624	0.125	$10,703
SM	31.84	2,699,879	1.21	3,266,854	$102,602	0.125	$12,825
AA	9.70	918,512	1.21	1,111,400	$114,577	0.125	$14,322
CS	11.60	995,924	1.21	1,205,068	$103,885	0.125	$12,986
EC	20.26	1,742,558	1.21	2,108,495	$104,072	0.125	$13,009
MA	14.87	1,243,373	1.21	1,504,481	$101,176	0.125	$12,647
ME	11.57	1,030,522	1.21	1,246,932	$107,773	0.125	$13,472
OC	7.28	626,793	1.21	758,420	$104,179	0.125	$13,022
OR	15.65	1,398,871	1.21	1,692,634	$108,156	0.125	$13,519
MR	6.15	537,810	1.21	650,750	$105,813	0.125	$13,227
PH	14.21	1,254,461	1.21	1,517,898	$106,819	0.125	$13,352
GRPS	7.92	706,859	1.21	855,299	$107,992	0.125	$13,499

Direct Teaching Cost (W/O FRINGE)to teach ONE course

DEPT	DT	DT Salary	Fringe	Total DT Salary	AVG DT Salary per ONE W/Y	Teach 1 additional course	DT Salary Cost of additional course
NS	19.52	1,381,306	1.00	1,381,306	$70,764	0.125	$8,845
SM	31.84	2,699,879	1.00	2,699,879	$84,795	0.125	$10,599
AA	9.70	918,512	1.00	918,512	$94,692	0.125	$11,836
CS	11.60	995,924	1.00	995,924	$85,856	0.125	$10,732
EC	20.26	1,742,558	1.00	1,742,558	$86,010	0.125	$10,751
MA	14.87	1,243,373	1.00	1,243,373	$83,616	0.125	$10,452
ME	11.57	1,030,522	1.00	1,030,522	$89,068	0.125	$11,134
OC	7.28	626,793	1.00	626,793	$86,098	0.125	$10,762
OR	15.65	1,398,871	1.00	1,398,871	$89,385	0.125	$11,173
MR	6.15	537,810	1.00	537,810	$87,449	0.125	$10,931
PH	14.21	1,254,461	1.00	1,254,461	$88,280	0.125	$11,035
GRPS	7.92	706,859	1.00	706,859	$89,250	0.125	$11,156

Figure 4-9. Direct Teaching Salary Computation

research could substantiate the costs of contracting an outside instructor.

C. COSTS THAT COULD BE INCLUDED IN THE MODEL

Both models have been developed such that other costs can be incorporated. If costs can be allocated to the academic departments, then they can be used in the model. In the future, if a new accounting system can track the costs of education more accurately, other direct and indirect costs can be identified and included in the model. This would result in a model that is even more flexible and could handle many more assumptions. Additional research on unit costing is anticipated, and those results could be added to the model. More importantly, the costs could be broken down, in order to provide the user with as many options as possible. This way, the user can enter his/her own assumptions.

This flexibility of both models will be evident the next chapter, when the model results, given certain assumptions are compared to previous calculations.

V. ANALYSIS OF RESULTS AND COMPARISON WITH PAST DATA

A. INTRODUCTION

This chapter presents the results of both models. Illustrative results for runs with different inputs and assumptions are tabulated and discussed. The results of the two models are annualized so that they can be more meaningfully compared. Finally, a comparison of the model results with some of the past calculations, discussed in Chapter II, is presented.

B. MODEL RESULTS

The results of various runs of the Cost per Curriculum Model (CCM)are presented in Figure 5-1. The average cost per student is calculated in the model by dividing the total costs entered by the average number of students on board NPS during FY96 (AOB). See Appendix C for AOB calculations. See Appendix D for Input and Output Pages for each of the runs listed in Figure 5-1.

The results indicate a large variation in cost per student across the 44 curricula at NPS. In the past, the "average cost per student" calculations could not show these variations across different curricula. The examination of the reason for such variation was not included as part of this thesis.

COST PER CURRICULUM MODEL RESULTS											
Run #	DT	Fringe	MIL	STAFF	Fringe	OPTAR	IND	Average Cost per Student	FM Curriculum Average Cost per Student	Annualized Curricula Cost per Student Range
1	X	X						$12,197	$8,891	$5,710 - $24,320
2	X	X				X		$13,359	$9,702	$6,223 - $25,890
3	X	X	X					$14,229	$10,884	$6,986 - $41,204
4	X	X	X			X		$15,391	$11,695	$7,509 - $42,774
5	X	X	X	X	X	X		$19,202	$12,694	$8,167 - $57,433
6	X	X	X				X	$42,581	$29,403	$18,917 - $97,091

- X denotes costs entered as input to the model
- WCH coefficients A = 1 and B = 1.5
- Excludes all courses with class sizes of 4 or less

Figure 5-1. Cost per Curriculum Model Results

However, the results provide no insight into the additional costs of education at NPS due to an increased enrollment. The Marginal Cost per Student Model (MCM) provides such cost figure. Results of the MCM are presented, annualized and compared with CCM results in Figure 5-2.

The output of the Cost per Curriculum Model represents the historic average cost per student per year in each curriculum. The output of the Marginal Cost per Student Model represents the marginal cost of a given number of additional students for the Financial Management curriculum, which is 18 months in duration. Dividing the results of the Marginal Cost per Student Model by 1.5 produces an annualized marginal cost per

student. The annualization enables a more reasonable cost comparison across curricula with different durations.

MARGINAL COST PER STUDENT MODEL RUNS			
A **Number of Additional Students**	**B** **Total Cost**	**C** **Cost per Student (= B/A)**	**D** **Annualized Marginal Cost per Student (= C / 1.5)**
5	$89,599	$17,920	**$11,947**
10	$154,419	$15,442	**$10,295**
15	$232,065	$15,471	**$10,314**
20	$281,244	$14,062	**$9,375**
25	$281,244	$11,250	**$7,500**
Max class size =30, professor is diverted from research, WITH FRINGE, 1/8 of DT salary			
COST PER CURRICULUM MODEL RUN			
Faculty DT (w/ Fringe) and Military Salary entered as cost input, A = 1, B = 1.5, excludes all courses with class size ≤ 4 . See Fig 5-1.			**$10,884**

Figure 5-2. FM Curriculum Annualized Cost per Student Comparisons

C. ANALYSIS OF MODEL RESULTS

Based on the comparison in Figure 5-2, it would appear that the marginal cost per student is not that different from the historical average cost per student. However, caution should be taken in concluding that there is any particular quantitative relationship between the average cost and the marginal cost.

There is a complex relationship between the average unit cost and the marginal cost depending on the existing excess capacity and course subsidization. For example, if a

particular curriculum is running at capacity, i.e. most class sizes are near 30, the average cost per student would be lower, while the marginal cost would be higher. Conversely, if there was some excess capacity, the average costs would be higher and the marginal costs would be lower.

The second important variable that will affect the relationship between the average costs and the marginal costs is referred to as course subsidization, or the extent to which students from other curricula are taking courses with students from the curriculum in question. For a given capacity, more of these "other curricula" students enrolled in the course would make the average cost for the curriculum in question lower.

Both of these variables interact such that no simple relationship between the average and marginal costs can be concluded. The important comparison to make between the two models is that the Cost per Curriculum Model is static, it can only provide a historic average cost per student. However, the Marginal Cost per Student model does provides the user with a picture of how costs will vary with student loading.

D. COMPARISONS WITH PAST CALCULATIONS

The flexibility of the models allows the user to compare the results of the models with the calculations performed in the past. Recall the methodology and results of the calculations discussed in Chapter II. Other than the 1975 Graduate Education Study [Ref. 3], the marginal cost per student has not been addressed in the past. The difference between the average costs and the marginal cost per student is clear. For each case, as long as the costs used in the estimates are known, then the Cost per Curriculum model

could be used to calculate an average cost per student per curriculum. The specific comparison of past calculations with the results of the new models could be done, if the costs used in the previous calculations were known and the costs could be allocated to the academic departments. By using the new models, cost differences between the curricula and the effects of changing the student enrollment could be computed.

Using civilian faculty direct teaching salary, military instructor salary and indirect mission support costs as inputs to the model produces results that closely resemble the methodology used in the N81 Study [Ref. 7] and the draft CNA study [Ref. 2]. However, because different costs were used in each case, caution must be taken when comparing the results. With additional research, all the costs used in the previous studies could be compiled, allocated and used in the model. This would result in more comparable information about the average cost of education, specifically by curriculum, than just the average numbers presented in the study.

The Marginal Cost per Student model provides decision makers a valuable tool that could be used to determine the marginal cost of education at NPS. If information about changes in the student enrollment was required, then the Marginal Cost per Student model could be modified to evaluate other curricula. See the results in Figure 5-3.

Study/Cost Estimate	Methodology	Relevant Costs used	Annual Cost/Graduate
Graduate Education Costs [Ref. 7] **N81 Memorandum** **March 1993**	Annual Cost per Student comparison of NPS and CIVINS (excludes military salary, BAQ/VHA)	Academic O&MN BOS (NPS share) MRP (NPS share) FECA HAZMAT Family Service (NPS share) OPN (avg FY94-99) MILCON (avg FY94-99) FHN FMT Tuition (other students) STAFF MPN	**$40,184** (FY94) (ALL students) **$50,512** (FY94) (Only DON students, minus FMT and Other Tuition)
Bottom-Up Assessment of Navy Flagship Schools [Ref. 9] **Center for Naval Analyses** **May 1997**	Looking at annual cost per student at top-tier technical schools (1993-1994) (In accordance with IPEDS definitions)	Expenditures/student/year O&MN, OPN, MPN, Tuition, excludes student salaries AOB = 1461	**$46,880**
		DON (w/out reimbursable tuition) AOB=1074	**$57,570**
		IPEDS Total (1993-1994)	**$55,000**
		IPEDS Educational Cost of Instruction, academic and institutional support, student services, excludes cost of physical plant.	**$28,000** (1993-1994)
A Methodology for Determining the Marginal Cost per Student at NPS Thesis **June 1997**	Marginal Cost Model (based on excess capacity)	FM Curriculum ONLY Marginal Cost per Student for 10 additional students (see Fig. 5-2)	**$10,295** (FY96) (Annualized)
	Cost per Curriculum Model (allocates costs to courses then to students)	Average Cost per Student includes Faculty Direct Teaching Salary Military Instructor Salary Indirect Mission Support Costs	**$42,581** (FY96) (See Fig. 5-1)

Figure 5-3. Comparison with Past Results

VI. CONCLUSIONS AND RECOMMENDATIONS

A. INTRODUCTION

The objective of this thesis was to develop a methodology for determining the marginal cost per student at NPS. The result is two models that provide the user with considerable flexibility in determining and ultimately better information regarding both the average and marginal costs of graduate education at NPS. This last chapter will discuss some of the conclusions reached in the development of the models and recommendations for further study in this area.

B. CONCLUSIONS

1. Marginal Costs

As was discovered in the development of the Marginal Cost Model, the marginal cost is very time dependent. That is, time allows planning, and good planning would likely mitigate some of the costs. The model calculated the marginal cost per student without discounting any of the costs of the required course sections that would have been taken in other than the first quarter. Lead time would lower these costs.

The marginal cost varies depending on what "unit of measure" is being discussed. The relevant unit is a class section. Additional costs are incurred when a new section is required. As long as there is some excess capacity, additional students can be handled with essentially zero marginal costs. If a particular course is at capacity, then an additional section is required, and there are costs associated with that new course section.

This leads to the third conclusion. The marginal cost per student is largely dependent on the existing excess capacity at NPS. If the school is operating at or near capacity, then the marginal costs would be high; whereas, if there is sufficient excess capacity, additional students can be enrolled at a small cost. This also holds true for the converse. Though not investigated in this thesis, it follows that if a small number of students are removed from NPS, there would be no significant cost savings. There would only be a savings when the decrease was significant enough that course sections could be combined, or professors no longer needed.

2. Excess Capacity

The existing excess capacity is dependent on the maximum class size. There are two obvious constraints to the class size. The first is a physical constraint. Courses are assigned classrooms depending on the class size, so how many students a particular classroom can hold will affect the maximum class size. The more important issue is the quality of instruction. Larger class sizes may be suitable for lower level courses, but as the courses become more difficult, the quality of the instruction becomes inversely proportional to the class size. The marginal costs are dependent on what is determined to be the maximum class size. The physical plant may allow class sizes to be increased to accommodate more students, effectively keeping the marginal costs near zero, but at some point the quality of the instruction starts to suffer. Unfortunately, the costs of poor instruction are difficult to quantify.

3. Flexible Model Foundation

The models developed in this thesis provide the user, primarily decision makers at NPS, with a flexible tool that can be used to achieve a better understanding of the true costs of education at NPS. Specifically, by selecting what costs should be included in the model and determining how the costs will be allocated, the user can run the model for various situations. The results are not just an average cost per student, but an average cost per student for each curriculum. Many of differences that are hidden in an average cost per student calculation are now visible and can be further investigated.

In addition to better information regarding the various curricula at NPS, the marginal cost per student can be estimated. The Marginal Cost per Student Model was developed using the Financial Management curriculum only, but the methodology could be used for any other curriculum. Instead of simply guessing at what the marginal cost per student is at NPS, the model could be used to get a more accurate marginal cost for discussion.

C. RECOMMENDATIONS FOR FURTHER STUDY

Four major areas of study are recommended, and are discussed in the following sections.

1. Further allocation of costs to the Academic Departments

Since this thesis was primarily concerned with the development of a marginal cost per student model, an identification and allocation of all the relevant costs of education

was not performed. However, several other studies have accomplished that. As was discussed, in that in these studies the costs were summed and then divided by the average number of students on board, their results are flawed. Follow-up research on Drapp's Thesis [Ref. 11] and the 1991 Unit Costing Thesis [Ref. 5] would provide more accurate cost data that could be run through the Cost per Curriculum Model to better evaluate the true cost of education across the various curricula at NPS. In addition, costs could be included as separate categories, such that the user could select not only which costs to include in the model but also determine the allocation method. This model lends itself well to using the costs categories that have been defined as part of the *IPEDS* guidelines. [Ref. 2, p.106]

2. Model Development for Internal Cost Control Purposes

There are several other uses for the Cost per Curriculum model. There are many differences between the academic departments and it is hard to quantify how effectively and efficiently the instruction is being provided. The model could be used to identify how well the various departments are performing. As more costs can be directly related to instruction, cost per hour of instruction can be calculated.

As NPS strives to reap benefits from efficiencies in the teaching programs, it can use the models to identify those areas in which NPS has a clear competitive advantage. Once these areas are identified, they can be exploited and future funding sought.

3. Research into Reimbursable Tuition

One of the areas that was not addressed in the thesis was reimbursable tuition associated with Foreign Military Training (FMT) and other services. Both remain significant issues. How much students, other than those in DON, should be charged will continue to be a relevant issue, as NPS seeks additional customers. Reimbursable rates are determined with the marginal cost concept in mind. The Marginal Cost per Student model could be the foundation for a tool to set such rates.

4. Application of the Marginal Cost Model to other Curricula

The foundation that has been developed could be used to conduct further studies involving other curricula. Additionally, instead of using past cost data, budget plans and projected courses could be pasted into the model, so that the current excess capacity could be identified and the current marginal costs calculated.

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APPENDIX A. COST PER CURRICULUM MODEL

COST PER CURRICULUM MODEL INPUT PAGE

WELCOME to the COST PER CURRICULUM MODEL INPUT page. Here, you may select which costs will be included in the model and define other assumption. The cost drivers that you select are then summed up, resulting in a TOTAL COST for each Academic Department. (See COST REF page)

Then, for each department, the total department cost is allocated to each course provided during FY96. This allocation is accomplished using the Weighted Cost Hour (WCH) as an allocation base. This results in a COST PER COURSE in each academic department.

The COST PER COURSE is then distributed to each of the students enrolled in the course by curriculum. These costs are summed for each curriculum, resulting in a TOTAL CURRICULUM COST.

The TOTAL CURRICULUM COST is then divided by the average number of students in that particular curriculum during FY96, based on Average On Board (AOB) reports, resulting in the COST PER STUDENT in each curriculum.

Please check all costs that you would like to include in the model:

- ☑ Civilian Faculty Direct Teaching (DT) Salary
- ☑ INCLUDE Civilian Faculty Fringe Benefits (21%)
- ☑ Military Faculty Salary (DOES NOT INCLUDE RESEARCH)
- ☐ Mission Staff Direct (DIR) Salary
- ☐ INCLUDE Mission Staff Fringe Benefits (23%)
- ☐ Academic Department OPTAR and TRAVEL
- ☐ INDIRECT COSTS (see INDIRECT page for description)
- ☐ OTHER COSTS (to be added to the model)

Weighted Cost Hours (WCH)

The Academic Department Costs must be allocated to each of the eligible courses that were taught during the year. The allocation base is a combination of two important variables: LECTURE HOURS and LAB HOURS. See Thesis text for a discussion of the Weighted Cost Hour allocation base. The model has been set up so that you may determine what allocation base is used in the model.
The formula is :

WEIGHTED COST HOURS = A X LECTURE HOURS + B X LAB HOURS

where A and B are INPUTS to the model, as follows:

A = 1 (LECTURE HOURS COEFFICIENT)

B = 1.5 (LAB HOURS COEFFICIENT)

Courses with less than a specified number of Students

This model includes ALL courses that were provided during FY96. That includes all Directed Study and Directed Reading Courses. For costing purposes, it is inappropriate to include ALL the courses taught by a particular department when allocating the department's costs. The general rule is that a Department does not get credit (towards the budget) for any course with 4 OR LESS students. Therefore, most departments do not give Direct Teaching Credit for courses with 4 OR LESS students. The following input is used to eliminate courses with less than or equal to a specified number of students.

Eliminate any course with a class size of less than or equal to 4

Double check your input selections and then click on the CALCULATE button to run the model. → CALCULATE

COST PER CURRICULUM MODEL OUTPUT PAGE

Code	Curriculum	Total Cost	FY96 AQB	Cost per Student
30	**Operations Analysis**			
360	Operations Analysis	$1,170,456	114	$10,267
361	Operations Logistics	$266,257	28	$9,509
380	Advanced Science (Applied Math)	$180,366	15	$12,024
			157	
31	**Aeronautical Engineering**			
610	Aeronautical Engineering	$589,093	34	$17,326
611	Aeronautical Engineering with Avionics	$371,713	23	$16,161
612	NPS/TPS	$349,510	16	$21,844
			73	
32	**Electronics and Computer Programs**			
368	Computer Science	$1,223,763	88	$13,906
590	Electronic Systems	$1,429,031	111	$12,874
			199	
33	**Combat Systems Sciences and Technology**			
533	Combat Sciences	$1,630,964	90	$18,122
			90	
34	**Naval/Mechanical Engineering**			
570	Naval/Mechanical Engineering	$1,345,749	74	$18,186
			74	
35	**Meteorology and Oceanography Programs**			
372	Meteorology	$123,611	3	$41,204
373	Meteorology and Oceanography	$1,520,950	46	$33,064
374	Operational Oceanography	$363,739	14	$25,981
440	Oceanography	$167,941	8	$20,993
			71	
36	**Systems Management**			
370	Information Technology Management	$1,897,335	162	$11,712
813	Transportation Logistics Management	$92,965	7	$13,281
814	Transportation Management	$120,752	12	$10,063
815	Acquisition and Contract Management	$398,804	34	$11,730
816	Systems Acquisition Management	$463,041	38	$12,185
817	Allied, DOD, USA,USMC, and USCG	$69,862	10	$6,986
818	Defense Systems Management	$83,405	8	$10,426
819	Systems Inventory Management	$78,217	7	$11,174
820	Resource Planning and Management (INTL)	$122,189	11	$11,108
827	Material Logistics Support Management	$382,638	38	$10,069
837	Financial Management	$642,136	59	$10,884
847	Manpower/Personnel Training Analysis	$612,124	59	$10,375
			445	
37	**Undersea, Space and Information Warfare**			
364	Space Systems Operations International	$30,660	3	$10,220
366	Space Systems Operations	$635,910	37	$17,187
525	Undersea Warfare	$490,250	22	$22,284
526	Undersea Warfare International	$80,553	5	$16,111
591	Space Systems Engineering	$820,704	49	$16,749
595	Information Warfare	$305,669	21	$14,556
596	Information Warfare International	$195,848	14	$13,989
			151	
38	**National Security and Intelligence**			
681	Middle East, Africa, South Asia	$184,197	17	$10,835
682	Far East, Southeast Asia Pacific	$151,879	16	$9,492
683	Western Hemishere	$144,404	13	$11,108
684	Russia, Europe, Central Asia	$225,593	20	$11,280
688	Strategic Planning	$247,366	18	$13,743
689	Civil-Military Relations	$75,216	7	$10,745
699	Special Operations/Low Intensity Conflict	$272,082	32	$8,503
824	Intelligence (Regional Studies)	$120,437	13	$9,264
825	Intelligence (OPINTEL)	$64,117	7	$9,160
			143	
39	**Joint C4I Systems**			
365	Command, Control and Communications	$572,328	27	$21,197
823	Intelligence	$133,618	7	$19,088
			34	
	TOTAL	$20,447,441	1,437	$14,229
			Total #	per course
OTHER 555	Non-DOD students under MOU with UCSC.	$3,976	2	$1,988
777	Distance Learning students	$65,354	79	$827
888	Continuing Education Courses	$0	2	$0
999	NPS Staff Personnel taking courses	$0	254	$0
	TOTAL	$20,516,771		

COST REFERENCE PAGE

NPS Code	DEPT Code	Academic Department	CIVILIAN FACULTY SALARY DT TRUE	CIVILIAN FACULTY SALARY FRINGE TRUE	MILITARY FACULTY TRUE	MISSION STAFF SALARY DIRECT FALSE	MISSION STAFF SALARY FRINGE FALSE	OPTAR/ TRAVEL FALSE	TOTAL INDIRECT COSTS FALSE	MODEL INPUT
06	NS	National Security Affairs	1,381,308	1.21	236,996	0	1.00	0	0	1,908,379
	SM	Systems Management	2,699,879	1.21	895,895	0	1.00	0	0	4,162,749
	AA	Aeronautics and Astronautics	918,512	1.21	72,343	0	1.00	0	0	1,183,743
	CS	Computer Sciences	995,924	1.21	376,892	0	1.00	0	0	1,581,960
07	EC	Electrical and Computer Engineering	1,742,558	1.21	85,983	0	1.00	0	0	2,194,478
	MA	Mathematics	1,243,373	1.21	0	0	1.00	0	0	1,504,481
	ME	Mechanical Engineering	1,030,522	1.21	85,983	0	1.00	0	0	1,332,915
	OC	Oceanography	626,793	1.21	102,463	0	1.00	0	0	860,883
	OR	Operations Research	1,398,871	1.21	102,463	0	1.00	0	0	1,795,097
08	MR	Meteorology	537,810	1.21	614,333	0	1.00	0	0	1,265,083
	PH	Physics	1,254,461	1.21	85,983	0	1.00	0	0	1,603,881
	GRPS	Groups (UW/SP/EW/CC)	706,859	1.21	267,824	0	1.00	0	0	1,123,123
		TOTALS	14,536,870	1.21	2,927,158	0	1.23	0	0	20,516,771

Weighted Cost Hour Coefficients

A =	1	1	11
B =	1.5	1.5	16

Eliminate courses with class sizes <= 4

4
5

Class Size
0
1
2
3
4
5
6
7
8
9
10

0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
1.1
1.2
1.3
1.4
1.5
1.6
1.7
1.8
1.9
2

FY1996 COST PER COURSE CALCULATION PAGE

Weighted Cost Hour (WCH) total includes only those courses selected to be in the model .

DL	= Distance Learning Courses (either given only to DL students or to both DL and NPS students at same time)
TT	= Team Teaching Courses
SYN	= "Synonym" Courses (same course given with 2 different titles)

Course Dept	Desig	Prof Dept	Yr-Qtr Course-Seq	Lec Hrs	Lab Hrs	Class Size	WCH	Cost Fraction	Course Cost
NS		NS	961NS30001	4	0	13	4	0.006677796	12,744
		NS	961NS30002	4	0	11	4	0.006677796	12,744
		NS	961NS30231	4	0	33	4	0.006677796	12,744
		NS	961NS30232	4	0	27	4	0.006677796	12,744
		NS	961NS3024	4	0	22	4	0.006677796	12,744
		NS	961NS3030	4	0	28	4	0.006677796	12,744
		NS	961NS30401	4	0	24	4	0.006677796	12,744
		NS	961NS30402	4	0	17	4	0.006677796	12,744
		NS	961NS3079A	4	0	1	0	0	0
		NS	961NS3079B	4	0	1	0	0	0
		NS	961NS3079D	4	0	1	0	0	0
		NS	961NS3079E	4	0	1	0	0	0
		NS	961NS30791	4	0	1	0	0	0
		NS	961NS30792	4	0	1	0	0	0
		NS	961NS30793	4	0	1	0	0	0
		NS	961NS30794	4	0	1	0	0	0
		NS	961NS30795	4	0	1	0	0	0
		NS	961NS30796	4	0	1	0	0	0
		NS	961NS30797	4	0	1	0	0	0
		NS	961NS30798	4	0	1	0	0	0
		NS	961NS30799	4	0	1	0	0	0
		NS	961NS3154	4	0	16	4	0.006677796	12,744
		NS	961NS3159	4	0	17	4	0.006677796	12,744
		NS	961NS3160	4	0	17	4	0.006677796	12,744
	TT	NS/NS	961NS3230	4	0	25	4	0.006677796	12,744
		NS	961NS32521	4	0	20	4	0.006677796	12,744
		NS	961NS32522	4	0	22	4	0.006677796	12,744
		NS	961NS32523	4	0	19	4	0.006677796	12,744
		NS	961NS32524	4	0	21	4	0.006677796	12,744
		NS	961NS32525	4	0	20	4	0.006677796	12,744
		NS	961NS32526	4	0	19	4	0.006677796	12,744
		NS	961NS32527	4	0	20	4	0.006677796	12,744
		NS	961NS32528	4	0	10	4	0.006677796	12,744
		NS	961NS3361	4	0	6	4	0.006677796	12,744
		NS	961NS3401	4	0	6	4	0.006677796	12,744
		NS	961NS3620	4	0	12	4	0.006677796	12,744
		NS	961NS3662	4	0	10	4	0.006677796	12,744
		NS	961NS3720	4	0	17	4	0.006677796	12,744
		NS	961NS3900	4	0	11	4	0.006677796	12,744
		NS	961NS4030	4	0	8	4	0.006677796	12,744
		NS	961NS4031	4	0	20	4	0.006677796	12,744
		NS	961NS4032	4	0	6	4	0.006677796	12,744
		NS	961NS4079A	4	0	1	0	0	0
		NS	961NS4079B	4	0	1	0	0	0
		NS	961NS4079D	4	0	1	0	0	0
		NS	961NS4079E	0	4	1	0	0	0
		NS	961NS4079F	4	0	1	0	0	0
		NS	961NS4079G	4	0	1	0	0	0
		NS	961NS4079H	4	0	1	0	0	0
		NS	961NS4079I	4	0	1	0	0	0
		NS	961NS4079J	4	0	1	0	0	0

	NS	961NS4079K	4	0	1	0	0	0
	NS	961NS40791	4	0	1	0	0	0
	NS	961NS40792	4	0	1	0	0	0
	NS	961NS40793	4	0	3	0	0	0
	NS	961NS40794	4	0	1	0	0	0
	NS	961NS40795	4	0	1	0	0	0
	NS	961NS40796	4	0	1	0	0	0
	NS	961NS40797	4	0	1	0	0	0
	NS	961NS40798	4	0	1	0	0	0
	NS	961NS40799	4	0	1	0	0	0
	NS	961NS40801	2	0	24	2	0.003338898	6,372
	NS	961NS40802	2	0	20	2	0.003338898	6,372
	NS	961NS4230	4	0	10	4	0.006677796	12,744
	NS	961NS4300	4	0	7	4	0.006677796	12,744
	NS	961NS4850	4	0	9	4	0.006677796	12,744
	NS	961NS4900	4	0	14	4	0.006677796	12,744
	NS	962NS3011	4	2	31	7	0.011686144	22,302
	NS	962NS3012	4	2	9	7	0.011686144	22,302
	NS	962NS3023	4	0	29	4	0.006677796	12,744
	NS	962NS3025	4	0	12	4	0.006677796	12,744
	NS	962NS30371	4	0	21	4	0.006677796	12,744
	NS	962NS30372	4	0	14	4	0.006677796	12,744
	NS	962NS3041	4	0	24	4	0.006677796	12,744
	NS	962NS3079B	4	0	2	0	0	0
	NS	962NS30791	4	0	1	0	0	0
	NS	962NS30792	4	0	1	0	0	0
	NS	962NS30793	4	0	1	0	0	0
	NS	962NS30794	4	0	1	0	0	0
	NS	962NS30795	4	0	1	0	0	0
	NS	962NS3154	4	0	21	4	0.006677796	12,744
	NS	962NS3159	4	0	8	4	0.006677796	12,744
	NS	962NS32401	4	0	20	4	0.006677796	12,744
	NS	962NS32402	4	0	14	4	0.006677796	12,744
	NS	962NS32521	4	0	25	4	0.006677796	12,744
	NS	962NS32522	4	0	23	4	0.006677796	12,744
TT	OR/OR	962NS32523	4	0	18	4	0.006677796	12,744
	NS	962NS32524	4	0	31	4	0.006677796	12,744
	NS	962NS32525	4	0	24	4	0.006677796	12,744
	NS	962NS32526	4	0	19	4	0.006677796	12,744
	NS	962NS32527	4	0	17	4	0.006677796	12,744
	NS	962NS3300	4	0	5	4	0.006677796	12,744
	NS	962NS3310	4	0	4	0	0	0
	NS	962NS3320	4	0	9	4	0.006677796	12,744
	NS	962NS3400	4	0	6	4	0.006677796	12,744
	NS	962NS3460	4	0	18	4	0.006677796	12,744
	NS	962NS3520	4	0	12	4	0.006677796	12,744
	NS	962NS3663	4	0	10	4	0.006677796	12,744
	NS	962NS3667	4	0	12	4	0.006677796	12,744
	NS	962NS38821	4	0	12	4	0.006677796	12,744
	NS	962NS38822	4	0	14	4	0.006677796	12,744
	NS	962NS4030	4	0	5	4	0.006677796	12,744
	NS	962NS4031	4	0	13	4	0.006677796	12,744
	NS	962NS4032	4	0	5	4	0.006677796	12,744
	NS	962NS40791	4	0	1	0	0	0
	NS	962NS40792	0	4	1	0	0	0
	NS	962NS40793	4	0	1	0	0	0
	NS	962NS40794	4	0	1	0	0	0
	NS	962NS40795	4	0	1	0	0	0
	NS	962NS4080	2	0	4	0	0	0
	NS	962NS4141	4	0	8	4	0.006677796	12,744
	NS	962NS4160	4	0	13	4	0.006677796	12,744
	NS	962NS4200	4	0	18	4	0.006677796	12,744
	NS	962NS4240	4	0	7	4	0.006677796	12,744
	NS	962NS4251	4	0	7	4	0.006677796	12,744
	NS	962NS4280	4	0	17	4	0.006677796	12,744

	NS	962NS4410	4	0	9	4	0.006677796	12,744
	NS	962NS4510	4	0	9	4	0.006677796	12,744
	NS	962NS4660	4	0	6	4	0.006677796	12,744
	NS	962NS4710	4	0	12	4	0.006677796	12,744
	NS	962NS4830	4	0	14	4	0.006677796	12,744
	NS	963NS3000	4	0	21	4	0.006677796	12,744
	NS	963NS30241	4	0	20	4	0.006677796	12,744
	NS	963NS30242	4	0	9	4	0.006677796	12,744
	NS	963NS3030	4	0	32	4	0.006677796	12,744
	NS	963NS3040	4	0	11	4	0.006677796	12,744
	NS	963NS30501	4	0	16	4	0.006677796	12,744
	NS	963NS30502	4	0	9	4	0.006677796	12,744
	NS	963NS3079A	4	0	1	0	0	0
	MA	963NS3079B	0	4	1	0	0	0
	NS	963NS3079E	4	0	1	0	0	0
	NS	963NS3079F	4	0	1	0	0	0
	NS	963NS3079H	4	0	1	0	0	0
	NS	963NS3079I	4	0	1	0	0	0
	NS	963NS3079J	4	0	1	0	0	0
	NS	963NS3079K	4	0	2	0	0	0
	OR	963NS3079L	4	0	1	0	0	0
	NS	963NS3079M	4	0	1	0	0	0
	NS	963NS3079N	4	0	1	0	0	0
	NS	963NS30791	4	0	2	0	0	0
	NS	963NS30792	4	0	1	0	0	0
	NS	963NS30793	4	0	1	0	0	0
	NS	963NS30794	4	0	1	0	0	0
	NS	963NS30795	4	0	1	0	0	0
	MA	963NS30797	0	4	1	0	0	0
	NS	963NS30798	4	0	1	0	0	0
	NS	963NS30799	4	0	1	0	0	0
	NS	963NS3154	4	0	15	4	0.006677796	12,744
	NS	963NS3159	4	0	14	4	0.006677796	12,744
TT	NS/NS/NS	963NS3225	4	0	9	4	0.006677796	12,744
	NS	963NS3250	4	0	11	4	0.006677796	12,744
	NS	963NS32521	4	0	13	4	0.006677796	12,744
	NS	963NS32522	4	0	27	4	0.006677796	12,744
	NS	963NS32523	4	0	21	4	0.006677796	12,744
	NS	963NS32524	4	0	23	4	0.006677796	12,744
	NS	963NS32525	4	0	18	4	0.006677796	12,744
	NS	963NS32526	4	0	12	4	0.006677796	12,744
	NS	963NS3280	4	0	11	4	0.006677796	12,744
	NS	963NS3450	4	0	20	4	0.006677796	12,744
	IW	963NS3880	4	0	23	4	0.006677796	12,744
	NS	963NS3900	4	0	8	4	0.006677796	12,744
	NS	963NS4031	4	0	10	4	0.006677796	12,744
	NS	963NS4032	4	0	3	0	0	0
	NS	963NS4033	4	0	36	4	0.006677796	12,744
	NS	963NS4034	4	0	14	4	0.006677796	12,744
	NS	963NS40791	4	0	1	0	0	0
	NS	963NS40792	4	0	1	0	0	0
	NS	963NS40793	4	0	1	0	0	0
	NS	963NS40794	4	0	1	0	0	0
	NS	963NS40795	4	0	1	0	0	0
	NS	963NS40797	4	0	1	0	0	0
	NS	963NS4080	2	0	13	2	0.003338898	6,372
	NS	963NS4230	4	0	8	4	0.006677796	12,744
	NS	963NS4300	4	0	10	4	0.006677796	12,744
	NS	963NS4560	4	0	5	4	0.006677796	12,744
	NS	963NS4690	4	0	7	4	0.006677796	12,744
	NS	963NS4720	4	0	23	4	0.006677796	12,744
	NS	964NS30001	4	0	14	4	0.006677796	12,744
	NS	964NS30002	4	0	13	4	0.006677796	12,744
	NS	964NS30111	4	2	11	7	0.011686144	22,302
	NS	964NS30112	4	2	10	7	0.011686144	22,302

	NS	964NS30231	4	0	14	4	0.006677796	12,744
	NS	964NS30232	4	0	13	4	0.006677796	12,744
	NS	964NS3036	4	0	15	4	0.006677796	12,744
	NS	964NS3038	4	0	23	4	0.006677796	12,744
	NS	964NS3050	4	0	5	4	0.006677796	12,744
	NS	964NS30791	4	0	1	0	0	0
	AA	964NS30792	4	0	1	0	0	0
	NS	964NS30793	4	0	1	0	0	0
	NS	964NS30794	4	0	1	0	0	0
	NS	964NS31541	4	0	2	0	0	0
	NS	964NS3159	4	0	17	4	0.006677796	12,744
	NS	964NS32301	4	1	14	5.5	0.00918197	17,523
	NS	964NS32302	4	1	12	5.5	0.00918197	17,523
	NS	964NS32521	4	0	23	4	0.006677796	12,744
	NS	964NS32522	4	0	30	4	0.006677796	12,744
TT	OR/OR	964NS32523	4	0	22	4	0.006677796	12,744
	NS	964NS32524	4	0	24	4	0.006677796	12,744
	NS	964NS32525	4	0	23	4	0.006677796	12,744
	NS	964NS32526	4	0	24	4	0.006677796	12,744
	NS	964NS32527	4	0	24	4	0.006677796	12,744
	NS	964NS3300	4	0	13	4	0.006677796	12,744
	NS	964NS3310	4	0	5	4	0.006677796	12,744
	NS	964NS3331	4	0	4	0	0	0
	NS	964NS3400	4	0	10	4	0.006677796	12,744
	NS	964NS3410	4	0	10	4	0.006677796	12,744
	NS	964NS3501	4	0	8	4	0.006677796	12,744
	NS	964NS3510	4	0	9	4	0.006677796	12,744
	NS	964NS3600	4	0	7	4	0.006677796	12,744
	NS	964NS3661	4	0	19	4	0.006677796	12,744
	NS	964NS3700	4	0	13	4	0.006677796	12,744
	NS	964NS3710	4	0	10	4	0.006677796	12,744
	CC	964NS3801	4	0	21	4	0.006677796	12,744
	NS	964NS3902	4	0	11	4	0.006677796	12,744
	NS	964NS40791	4	0	1	0	0	0
	SM	964NS40792	4	0	2	0	0	0
	NS	964NS40793	4	0	1	0	0	0
	MA	964NS40794	0	4	2	0	0	0
	NS	964NS40795	4	0	1	0	0	0
	NS	964NS40797	4	0	1	0	0	0
	NS	964NS4080	2	0	11	2	0.003338898	6,372
	NS	964NS42001	4	0	25	4	0.006677796	12,744
	NS	964NS42002	4	0	16	4	0.006677796	12,744
	NS	964NS4225	4	0	10	4	0.006677796	12,744
	NS	964NS4250	4	0	9	4	0.006677796	12,744
	NS	964NS4280	4	0	11	4	0.006677796	12,744
	NS	964NS4410	4	0	12	4	0.006677796	12,744
	NS	964NS4660	4	0	6	4	0.006677796	12,744
	NS	964NS4880	4	0	12	4	0.006677796	12,744
SO	MA	964SO2410	4	0	16	4	0.006677796	12,744
SO	CC	964SO3802	4	0	19	4	0.006677796	12,744
		TOTALS	**894**	**30**	**2367**	**599**	**1**	**1,908,379**

SM		SM	961AS36101	4	0	26	4	0.003917728	16,309
		SM	961AS36102	4	0	19	4	0.003917728	16,309
		SM	961IS31121	4	1	25	5.5	0.005386876	22,424
		SM	961IS31122	4	1	32	5.5	0.005386876	22,424
	DL	SM	961IS3170Z / IS31702	4	0	45	4	0.003917728	16,309
		SM	961IS31701	4	0	26	4	0.003917728	16,309
	TT	SM/SM	961IS3171	4	1	26	5.5	0.005386876	22,424
		SM	961IS31831	4	0	10	4	0.003917728	16,309
		SM	961IS31832	4	0	17	4	0.003917728	16,309
		SM	961IS35021	3	2	29	6	0.005876592	24,463
		SM	961IS35022	3	2	34	6	0.005876592	24,463
		SM	961IS35023	3	2	29	6	0.005876592	24,463
	TT	SM/SM	961IS4183	4	1	23	5.5	0.005386876	22,424
		SM	961IS4200	4	2	24	7	0.006856024	28,540
		SM	961IS43001	3	2	34	6	0.005876592	24,463
		SM	961IS43002	3	2	24	6	0.005876592	24,463
		CS	961IS48001	0	8	1	0	0	0
		SM	961IS48002	2	0	1	0	0	0
		SM	961IS48003	2	0	2	0	0	0
		SM	961IS48004	3	2	1	0	0	0
		SM	961IS4925	3	2	6	6	0.005876592	24,463
		SM	961IS49251	3	2	2	0	0	0
		SM	961MN21551	4	0	31	4	0.003917728	16,309
		SM	961MN21552	4	0	18	4	0.003917728	16,309
		SM	961MN2302	0	2	55	3	0.002938296	12,231
		SM	961MN2303	0	2	28	3	0.002938296	12,231
		SM	961MN3105	4	0	15	4	0.003917728	16,309
		SM	961MN3111	4	0	19	4	0.003917728	16,309
		NS	961MN31401	4	0	29	4	0.003917728	16,309
		SM	961MN31402	4	0	27	4	0.003917728	16,309
		SM	961MN31403	4	0	26	4	0.003917728	16,309
		SM	961MN31404	4	0	24	4	0.003917728	16,309
		SM	961MN31541	4	0	32	4	0.003917728	16,309
		SM	961MN31542	4	0	33	4	0.003917728	16,309
		SM	961MN31611	4	0	28	4	0.003917728	16,309
		SM	961MN31612	4	0	27	4	0.003917728	16,309
		SM	961MN31613	4	0	25	4	0.003917728	16,309
		SM	961MN31614	4	0	24	4	0.003917728	16,309
		SM	961MN31721	4	0	24	4	0.003917728	16,309
		SM	961MN31722	4	0	20	4	0.003917728	16,309
		SM	961MN3221	2	0	39	2	0.001958864	8,154
		SM	961MN3222	3	2	27	6	0.005876592	24,463
		SM	961MN33011	4	0	18	4	0.003917728	16,309
		SM	961MN33012	4	0	21	4	0.003917728	16,309
		SM	961MN3303	4	0	25	4	0.003917728	16,309
		SM	961MN3305	3	0	15	3	0.002938296	12,231
		SM	961MN3306	3	0	14	3	0.002938296	12,231
		SM	961MN3307	4	0	24	4	0.003917728	16,309
		SM	961MN33091	4	0	2	0	0	0
		SM	961MN3311	1	2	19	4	0.003917728	16,309
		SM	961MN3371	4	0	18	4	0.003917728	16,309
		SM	961MN3373	4	0	13	4	0.003917728	16,309
		SM	961MN3377	4	0	7	4	0.003917728	16,309
		SM	961MN3805	2	0	19	2	0.001958864	8,154
		SM	961MN39021	0	2	17	3	0.002938296	12,231
		SM	961MN39022	0	2	17	3	0.002938296	12,231
		SM	961MN41051	4	0	20	4	0.003917728	16,309
		SM	961MN41052	4	0	14	4	0.003917728	16,309
		SM	961MN41053	4	0	26	4	0.003917728	16,309
		SM	961MN41054	4	0	24	4	0.003917728	16,309
		SM	961MN4106	4	0	21	4	0.003917728	16,309
		SM	961MN41451	4	0	21	4	0.003917728	16,309
		SM	961MN41452	4	0	22	4	0.003917728	16,309
		SM	961MN4151	2	0	15	2	0.001958864	8,154
		SM	961MN4152	4	0	12	4	0.003917728	16,309

SM	961MN4163	4	0	20	4	0.003917728	16,309
SM	961MN43071	4	0	1	0	0	0
SM	961MN43101	4	0	19	4	0.003917728	16,309
SM	961MN43102	4	0	24	4	0.003917728	16,309
SM	961MN43711	4	0	18	4	0.003917728	16,309
SM	961MN43712	4	0	16	4	0.003917728	16,309
SM	961MN43721	4	0	4	0	0	0
SM	961MN4650	4	0	2	0	0	0
SM	961MN49001	2	2	1	0	0	0
SM	961MN49002	4	0	1	0	0	0
SM	962AS4613	4	0	12	4	0.003917728	16,309
SM	962IS0125R	0	2	69	3	0.002938296	12,231
SM	962IS20001	3	1	24	4.5	0.004407444	18,347
SM	962IS20002	3	1	18	4.5	0.004407444	18,347
SM	962IS3020	3	2	26	6	0.005876592	24,463
SM	962IS3183	4	0	27	4	0.003917728	16,309
SM	962IS3503	3	2	22	6	0.005876592	24,463
SM	962IS3504	2	2	20	5	0.00489716	20,386
SM	962IS4182	4	0	29	4	0.003917728	16,309
SM	962IS4185	4	1	25	5.5	0.005386876	22,424
SM	962IS4187	3	2	14	6	0.005876592	24,463
SM	962IS4188	4	0	5	4	0.003917728	16,309
SM	962IS45021	3	2	35	6	0.005876592	24,463
SM	962IS45022	3	2	31	6	0.005876592	24,463
SM	962IS4503	4	0	8	4	0.003917728	16,309
SM	962IS46011	4	0	7	4	0.003917728	16,309
SM	962IS46012	4	0	12	4	0.003917728	16,309
SM	962IS48001	3	0	4	0	0	0
SM	962IS48002	0	4	1	0	0	0
SM	962IS48003	4	0	2	0	0	0
34	962IS48004	4	1	2	0	0	0
SM	962IS48005	4	0	1	0	0	0
SM	962IS48006	0	5	2	0	0	0
SM	962IS49251	4	0	1	0	0	0
EC	962IS49252	4	0	1	0	0	0
SM	962IS49253	4	0	1	0	0	0
SM	962IS49254	4	0	1	0	0	0
SM	962MN2031	4	0	32	4	0.003917728	16,309
SM	962MN2039	4	0	6	4	0.003917728	16,309
SM	962MN2112	0	2	36	3	0.002938296	12,231
SM	962MN21501	4	0	25	4	0.003917728	16,309
SM	962MN21502	4	0	21	4	0.003917728	16,309
SM	962MN2302	0	2	30	3	0.002938296	12,231
SM	962MN2303	0	2	55	3	0.002938296	12,231
SM	962MN31051	4	0	24	4	0.003917728	16,309
SM	962MN31052	4	0	19	4	0.003917728	16,309
SM	962MN31053	4	0	24	4	0.003917728	16,309
SM	962MN31054	4	0	27	4	0.003917728	16,309
SM	962MN31721	4	0	22	4	0.003917728	16,309
SM	962MN31722	4	0	18	4	0.003917728	16,309
SM	962MN3221	2	0	17	2	0.001958864	8,154
SM	962MN32221	3	2	17	6	0.005876592	24,463
SM	962MN32222	3	2	22	6	0.005876592	24,463
SM	962MN3301	4	0	25	4	0.003917728	16,309
SM	962MN3304	5	2	23	8	0.007835455	32,617
SM	962MN3312	3	0	24	3	0.002938296	12,231
SM	962MN33331	4	0	20	4	0.003917728	16,309
SM	962MN33332	4	0	25	4	0.003917728	16,309
SM	962MN33333	4	0	27	4	0.003917728	16,309
SM	962MN3371	4	0	15	4	0.003917728	16,309
SM	962MN3372	4	0	27	4	0.003917728	16,309
SM	962MN3374	4	0	14	4	0.003917728	16,309
SM	962MN3375	4	0	9	4	0.003917728	16,309
SM	962MN3760	4	0	34	4	0.003917728	16,309
SM	962MN41051	4	0	19	4	0.003917728	16,309
SM	962MN41052	4	0	18	4	0.003917728	16,309

	SM	962MN41101	4	1	19	5.5	0.005386876	22,424
	SM	962MN41102	4	1	16	5.5	0.005386876	22,424
	SM	962MN41251	4	0	26	4	0.003917728	16,309
	SM	962MN41252	4	0	24	4	0.003917728	16,309
	SM	962MN4157	0	2	16	3	0.002938296	12,231
	SM	962MN4159	4	0	17	4	0.003917728	16,309
	SM	962MN4161	4	0	26	4	0.003917728	16,309
	SM	962MN4162	4	0	28	4	0.003917728	16,309
	SM	962MN4301	4	0	3	0	0	0
	SM	962MN4304	2	0	12	2	0.001958864	8,154
	SM	962MN4307	4	0	17	4	0.003917728	16,309
TT	SM/SM	962MN4373	4	0	11	4	0.003917728	16,309
	SM	962MN4650	4	0	4	0	0	0
	SM	962MN49001	4	0	1	0	0	0
	SM	962MN49002	4	0	5	4	0.003917728	16,309
	SM	962MN49003	4	0	1	0	0	0
	SM	962MN49701	1	0	1	0	0	0
	SM	962MN49702	4	0	2	0	0	0
	SM	963AS3610	4	0	20	4	0.003917728	16,309
	SM	963IS2000	3	1	13	4.5	0.004407444	18,347
	SM	963IS3112	4	1	20	5.5	0.005386876	22,424
	SM	963IS3171	4	1	42	5.5	0.005386876	22,424
DL	SM	963IS3171Z	4	1	28	5.5	0.005386876	22,424
	SM	963IS31831	4	0	27	4	0.003917728	16,309
	SM	963IS31832	4	0	20	4	0.003917728	16,309
	SM	963IS35021	3	2	23	6	0.005876592	24,463
	SM	963IS35022	3	2	20	6	0.005876592	24,463
TT	EC/SM	963IS41831	4	1	24	5.5	0.005386876	22,424
TT	EC/SM	963IS41832	4	1	27	5.5	0.005386876	22,424
	SM	963IS41871	3	2	1	0	0	0
	SM	963IS41872	3	2	1	0	0	0
	SM	963IS42001	4	2	29	7	0.006856024	28,540
	SM	963IS42002	4	2	22	7	0.006856024	28,540
	SM	963IS4300	3	2	23	6	0.005876592	24,463
	NS	963IS48002	2	0	1	0	0	0
	SM	963IS48003	3	0	2	0	0	0
	SM	963IS49251	1	3	1	0	0	0
	SM	963IS49252	4	1	1	0	0	0
	SM	963IS49253	4	0	1	0	0	0
DL	SM	963MN2150Z	4	0	6	4	0.003917728	16,309
	SM	963MN2155	4	0	17	4	0.003917728	16,309
	SM	963MN2302	0	2	43	3	0.002938296	12,231
	SM	963MN2303	0	2	26	3	0.002938296	12,231
	SM	963MN31051	4	0	21	4	0.003917728	16,309
	SM	963MN31052	4	0	18	4	0.003917728	16,309
	SM	963MN3111	4	0	27	4	0.003917728	16,309
	SM	963MN31401	4	0	14	4	0.003917728	16,309
	SM	963MN31402	4	0	27	4	0.003917728	16,309
	SM	963MN31541	4	0	30	4	0.003917728	16,309
	SM	963MN31542	4	0	45	4	0.003917728	16,309
	SM	963MN31543	4	0	30	4	0.003917728	16,309
	SM	963MN31611	4	0	23	4	0.003917728	16,309
	SM	963MN31612	4	0	22	4	0.003917728	16,309
	SM	963MN3172	4	0	16	4	0.003917728	16,309
	SM	963MN3221	2	0	18	2	0.001958864	8,154
	SM	963MN3222	3	2	7	6	0.005876592	24,463
	SM	963MN3301	4	0	15	4	0.003917728	16,309
	SM	963MN3303	4	0	16	4	0.003917728	16,309
	SM	963MN3305	3	0	24	3	0.002938296	12,231
	SM	963MN3306	3	0	24	3	0.002938296	12,231
	SM	963MN33071	4	0	23	4	0.003917728	16,309
	SM	963MN33072	4	0	25	4	0.003917728	16,309
	CC	963MN3309	4	0	23	4	0.003917728	16,309
	SM	963MN3311	1	2	7	4	0.003917728	16,309
	SM	963MN3371	4	0	21	4	0.003917728	16,309
	SM	963MN3805	2	0	16	2	0.001958864	8,154

	SM	963MN41051	4	0	26	4	0.003917728	16,309
	SM	963MN41052	4	0	20	4	0.003917728	16,309
	SM	963MN41111	4	1	21	5.5	0.005386876	22,424
	SM	963MN41112	4	1	14	5.5	0.005386876	22,424
	SM	963MN4112	4	0	16	4	0.003917728	16,309
	SM	963MN41451	4	0	21	4	0.003917728	16,309
	SM	963MN41452	4	0	22	4	0.003917728	16,309
	SM	963MN41453	4	0	23	4	0.003917728	16,309
	SM	963MN4151	2	0	19	2	0.001958864	8,154
	SM	963MN4152	4	0	14	4	0.003917728	16,309
	SM	963MN4158	0	2	12	3	0.002938296	12,231
	SM	963MN4163	4	0	24	4	0.003917728	16,309
	SM	963MN43021	4	0	1	0	0	0
	SM	963MN43101	4	0	28	4	0.003917728	16,309
	SM	963MN43102	4	0	26	4	0.003917728	16,309
	SM	963MN4312	4	0	11	4	0.003917728	16,309
	SM	963MN4371	4	0	16	4	0.003917728	16,309
	SM	963MN4376	4	0	23	4	0.003917728	16,309
	SM	963MN49001	2	0	1	0	0	0
	SM	963MN49002	2	0	1	0	0	0
	SM	963MN49003	2	0	1	0	0	0
	SM	963MN49004	2	0	1	0	0	0
	SM	963MN4970	4	0	13	4	0.003917728	16,309
	SM	963MN4970A	2	0	1	0	0	0
	SM	963MN49701	2	0	1	0	0	0
	SM	964IS0125R	0	2	35	3	0.002938296	12,231
	SM	964IS30201	3	2	25	6	0.005876592	24,463
	SM	964IS30202	3	2	25	6	0.005876592	24,463
	SM	964IS3170	4	0	13	4	0.003917728	16,309
	SM	964IS3183	4	0	26	4	0.003917728	16,309
	SM	964IS35041	2	2	13	5	0.00489716	20,386
	SM	964IS35042	2	2	14	5	0.00489716	20,386
	SM	964IS41821	4	0	30	4	0.003917728	16,309
	SM	964IS41822	4	0	22	4	0.003917728	16,309
	SM	964IS4320	4	0	9	4	0.003917728	16,309
	SM	964IS4502	3	2	38	6	0.005876592	24,463
	SM	964IS4503	4	0	9	4	0.003917728	16,309
	SM	964IS4601	4	0	9	4	0.003917728	16,309
	SM	964IS48001	2	0	1	0	0	0
	SM	964IS48002	2	2	1	0	0	0
	SM	964IS48003	2	0	1	0	0	0
	34	964IS4925A	3	0	1	0	0	0
	SM	964IS4925B	4	0	1	0	0	0
	SM	964IS49251	4	0	9	4	0.003917728	16,309
	SM	964IS49252	4	0	19	4	0.003917728	16,309
	SM	964IS49253	4	2	2	0	0	0
	34	964IS49254	2	0	1	0	0	0
	SM	964IS49257	2	0	1	0	0	0
	SM	964IS49258	2	0	1	0	0	0
	SM	964IS49259	2	0	1	0	0	0
	SM	964MN20311	4	0	29	4	0.003917728	16,309
	SM	964MN20312	4	0	13	4	0.003917728	16,309
	SM	964MN20313	4	0	23	4	0.003917728	16,309
	SM	964MN20314	4	0	27	4	0.003917728	16,309
	SM	964MN2111	0	2	42	3	0.002938296	12,231
	SM	964MN21501	4	0	36	4	0.003917728	16,309
	SM	964MN21502	4	0	26	4	0.003917728	16,309
	SM	964MN21503	4	0	22	4	0.003917728	16,309
	SM	964MN21504	4	0	30	4	0.003917728	16,309
	SM	964MN2302	0	2	42	3	0.002938296	12,231
	SM	964MN2303	0	2	35	3	0.002938296	12,231
	SM	964MN31051	4	0	18	4	0.003917728	16,309
	SM	964MN31052	4	0	23	4	0.003917728	16,309
	SM	964MN31053	4	0	24	4	0.003917728	16,309
DL	SM	964MN3172Z	4	0	26	4	0.003917728	16,309
	SM	964MN31722	4	0	22	4	0.003917728	16,309

SM	964MN31723	4	0	25	4	0.003917728	16,309
SM	964MN3221	2	1	32	3.5	0.003428012	14,270
SM	964MN3222	3	2	23	6	0.005876592	24,463
SM	964MN33011	4	0	27	4	0.003917728	16,309
SM	964MN33012	4	0	24	4	0.003917728	16,309
SM	964MN3304	5	2	18	8	0.007835455	32,617
SM	964MN3312	3	0	17	3	0.002938296	12,231
SM	964MN33331	4	0	25	4	0.003917728	16,309
SM	964MN33332	4	0	25	4	0.003917728	16,309
SM	964MN33333	4	0	22	4	0.003917728	16,309
SM	964MN33334	4	0	25	4	0.003917728	16,309
SM	964MN3371	4	0	6	4	0.003917728	16,309
SM	964MN3372	4	0	14	4	0.003917728	16,309
SM	964MN33741	4	0	16	4	0.003917728	16,309
SM	964MN33742	4	0	14	4	0.003917728	16,309
SM	964MN3377	4	0	6	4	0.003917728	16,309
SM	964MN39001	4	0	1	0	0	0
SM	964MN41051	4	0	2	0	0	0
SM	964MN4114	4	0	11	4	0.003917728	16,309
SM	964MN41151	4	0	18	4	0.003917728	16,309
SM	964MN41152	4	0	16	4	0.003917728	16,309
SM	964MN41251	4	0	20	4	0.003917728	16,309
SM	964MN41252	4	0	19	4	0.003917728	16,309
SM	964MN41271	2	0	3	0	0	0
SM	964MN41272	2	0	2	0	0	0
SM	964MN4157	0	2	18	3	0.002938296	12,231
SM	964MN4159	4	0	17	4	0.003917728	16,309
SM	964MN4161	4	0	21	4	0.003917728	16,309
SM	964MN4162	4	0	24	4	0.003917728	16,309
SM	964MN4301	4	0	14	4	0.003917728	16,309
SM	964MN4304	2	0	8	2	0.001958864	8,154
SM	964MN4305	4	0	11	4	0.003917728	16,309
SM	964MN4307	4	0	12	4	0.003917728	16,309
SM	964MN4470	4	0	17	4	0.003917728	16,309
SM	964MN4650	4	0	2	0	0	0
SM	964MN47611	4	0	19	4	0.003917728	16,309
SM	964MN47612	4	0	15	4	0.003917728	16,309
SM	964MN4970B	2	0	1	0	0	0
SM	964MN49701	4	0	1	0	0	0
	TOTALS	**1014**	**152**	**5423**	**1021**	**1**	**4,162,749**

AA	AA	961AA2021	4	1	12	5.5	0.013888889	16,441
	AA	961AA2036	3	2	15	6	0.015151515	17,935
	AA	961AA2042	3	2	4	0	0	0
	AA	961AA2339	3	2	17	6	0.015151515	17,935
	AA	961AA3202	3	2	13	6	0.015151515	17,935
	AA	961AA3276	3	2	11	6	0.015151515	17,935
	AA	961AA3402	3	2	8	6	0.015151515	17,935
	AA	961AA3451	3	2	11	6	0.015151515	17,935
	AA	961AA3802	3	2	12	6	0.015151515	17,935
	AA	961AA3815	3	2	13	6	0.015151515	17,935
	AA	961AA3818	3	2	14	6	0.015151515	17,935
	AA	961AA3820	3	2	1	0	0	0
	AA	961AA3852	4	0	7	4	0.01010101	11,957
	AA	961AA39001	3	2	2	0	0	0
	AA	961AA4000	1	0	48	1	0.002525253	2,989
	AA	961AA4318	4	0	11	4	0.01010101	11,957
	AA	961AA4341	3	2	22	6	0.015151515	17,935
	AA	961AA4704	3	2	6	6	0.015151515	17,935
	AA	961AA4830	3	2	22	6	0.015151515	17,935
	AA	961AA4850	3	2	10	6	0.015151515	17,935
	SP	961AA4870	4	0	9	4	0.01010101	11,957
	AA	961AA49001	4	0	1	0	0	0
	SP	961AA49002	3	0	1	0	0	0
	SP	961AA49003	5	0	1	0	0	0
TT	ME/AA	961AA49004	5	0	1	0	0	0
	AA	961AA49005	3	2	1	0	0	0
	AA	961AA49006	2	0	1	0	0	0
	AA	962AAR242	5	0	3	0	0	0
	AA	962AAR261	5	0	2	0	0	0
	AA	962AA2035	3	2	11	6	0.015151515	17,935
	AA	962AA2043	3	2	12	6	0.015151515	17,935
	ME	962AA2440	3	2	17	6	0.015151515	17,935
	AA	962AA2801	3	2	6	6	0.015151515	17,935
	AA	962AA2820	3	2	14	6	0.015151515	17,935
DL	AA	962AA3101Z / AA3101	3	2	15	6	0.015151515	17,935
	AA	962AA3251	4	1	14	5.5	0.013888889	16,441
	AA	962AA3340	3	2	14	6	0.015151515	17,935
DL	AA	962AA3501Z / AA3501	3	2	24	6	0.015151515	17,935
	AA	962AA3804	3	0	13	3	0.007575758	8,968
	AA	962AA3851	3	2	7	6	0.015151515	17,935
	AA	962AA39001	4	0	1	0	0	0
	AA	962AA39002	4	1	1	0	0	0
	AA	962AA39003	3	2	1	0	0	0
	AA	962AA4000	1	0	25	1	0.002525253	2,989
	AA	962AA4103	3	2	6	6	0.015151515	17,935
	AA	962AA4273	3	2	11	6	0.015151515	17,935
	AA	962AA4276	3	2	10	6	0.015151515	17,935
	AA	962AA4304	3	2	8	6	0.015151515	17,935
	AA	962AA4342	3	2	9	6	0.015151515	17,935
	AA	962AA4844	4	0	6	4	0.01010101	11,957
	AA	962AA4871	2	2	10	5	0.012626263	14,946
	AA	962AA49001	1	2	1	0	0	0
	AA	962AA49002	3	0	1	0	0	0
	AA	962AA49003	1	4	1	0	0	0
	AA	962AA49004	2	2	1	0	0	0
	AA	962AA49005	3	0	1	0	0	0
	AA	962AA49006	3	0	1	0	0	0
	AA	962AA49007	4	0	1	0	0	0
	AA	962AA49008	0	2	1	0	0	0
	AA	962AA49009	4	0	1	0	0	0
	AA	963AAR242	5	0	1	0	0	0
	AA	963AA2021	4	1	8	5.5	0.013888889	16,441
	AA	963AA2036	3	2	6	6	0.015151515	17,935
	AA	963AA2042	3	2	6	6	0.015151515	17,935
	AA	963AA2339	3	2	18	6	0.015151515	17,935

DL	AA	963AA3202Z / AA3202	3	2	9	6	0.015151515	17,935
	AA	963AA3272	3	2	5	6	0.015151515	17,935
	AA	963AA3451	3	2	8	6	0.015151515	17,935
	AA	963AA3802	3	2	7	6	0.015151515	17,935
	AA	963AA3811	1	2	17	4	0.01010101	11,957
	AA	963AA3815	3	2	17	6	0.015151515	17,935
	AA	963AA3818	3	2	12	6	0.015151515	17,935
	AA	963AA4000	1	0	34	1	0.002525253	2,989
	AA	963AA4306	3	2	7	6	0.015151515	17,935
	AA	963AA4323	3	2	13	6	0.015151515	17,935
	AA	963AA4341	3	2	14	6	0.015151515	17,935
	AA	963AA4431	3	2	5	6	0.015151515	17,935
	AA	963AA4452	4	0	4	0	0	0
DL	AA	963AA4507Z / AA4507	3	2	8	6	0.015151515	17,935
	AA	963AA4641	3	2	16	6	0.015151515	17,935
	AA	963AA4816	4	0	7	4	0.01010101	11,957
	AA	963AA4831	3	2	21	6	0.015151515	17,935
	SP	963AA4870	4	0	14	4	0.01010101	11,957
	AA	963AA49001	3	2	1	0	0	0
	AA	963AA49002	3	0	1	0	0	0
	AA	963AA49003	2	2	1	0	0	0
	AA	963AA49004	2	0	1	0	0	0
	AA	964AAR242	5	0	8	5	0.012626263	14,946
	AA	964AAR261	5	0	6	5	0.012626263	14,946
	AA	964AA2035	3	2	15	6	0.015151515	17,935
	AA	964AA2043	3	2	18	6	0.015151515	17,935
	AA	964AA2440	3	2	16	6	0.015151515	17,935
	AA	964AA2801	3	2	2	0	0	0
	AA	964AA2820	3	2	3	0	0	0
	AA	964AA3101	3	2	14	6	0.015151515	17,935
DL	AA	964AA3251Z / AA3251	4	1	40	5.5	0.013888889	16,441
	AA	964AA3340	3	2	22	6	0.015151515	17,935
	AA	964AA3501	3	2	11	6	0.015151515	17,935
	AA	964AA3804	3	0	9	3	0.007575758	8,968
	AA	964AA3851	3	2	14	6	0.015151515	17,935
	AA	964AA4000	1	0	24	1	0.002525253	2,989
DL	AA	964AA4201Z / AA4201	4	0	10	4	0.01010101	11,957
	AA	964AA4273	3	2	6	6	0.015151515	17,935
	AA	964AA43421	3	2	1	0	0	0
	AA	964AA4451	3	2	6	6	0.015151515	17,935
	AA	964AA47031	4	1	1	0	0	0
	AA	964AA4871	2	2	14	5	0.012626263	14,946
	AA	964AA4900A	3	2	1	0	0	0
	SP	964AA49001	2	0	1	0	0	0
	AA	964AA49002	4	0	1	0	0	0
	AA	964AA49003	4	0	1	0	0	0
	AA	964AA49004	3	2	1	0	0	0
	AA	964AA49005	0	4	1	0	0	0
	AA	964AA49007	3	2	1	0	0	0
	AA	964AA49008	0	8	1	0	0	0
	AA	964AA49009	4	8	1	0	0	0
		TOTALS	**353**	**172**	**1033**	**396**	**1**	**1,183,743**

CE	AA	961AA3250C	3	0	2	0		
	AA	962AA3250C	3	0	1	0		

CS	CS	961CS29701	4	1	19	5.5	0.01010101	15,979
	CS	961CS29702	4	1	12	5.5	0.01010101	15,979
	CS	961CS29703	4	1	16	5.5	0.01010101	15,979
	CS	961CS29711	3	2	15	6	0.011019284	17,432
	CS	961CS29712	3	2	19	6	0.011019284	17,432
	CS	961CS29713	3	2	20	6	0.011019284	17,432
	CS	961CS30101	4	0	18	4	0.007346189	11,621
	CS	961CS30102	4	0	10	4	0.007346189	11,621
	CS	961CS3030	4	0	12	4	0.007346189	11,621
	CS	961CS3310	4	0	19	4	0.007346189	11,621
	CS	961CS3320	3	1	20	4.5	0.008264463	13,074
	CS	961CS3450	3	2	18	6	0.011019284	17,432
DL	CS	961CS3460Z / CS3460	3	1	46	4.5	0.008264463	13,074
	CS	961CS36001	3	2	18	6	0.011019284	17,432
	CS	961CS36002	3	2	22	6	0.011019284	17,432
	CS	961CS36003	3	2	19	6	0.011019284	17,432
	CS	961CS39201	3	2	6	6	0.011019284	17,432
	CS	961CS41121	3	2	19	6	0.011019284	17,432
	CS	961CS41122	3	2	15	6	0.011019284	17,432
	CS	961CS41131	4	0	1	0	0	0
	CS	961CS4202	3	2	14	6	0.011019284	17,432
	CS	961CS4203	3	2	25	6	0.011019284	17,432
	CS	961CS4311	3	2	9	6	0.011019284	17,432
	CS	961CS4313	4	0	6	4	0.007346189	11,621
	CS	961CS4322	3	1	8	4.5	0.008264463	13,074
	CS	961CS4473	3	2	7	6	0.011019284	17,432
	CS	961CS4530	3	0	8	3	0.005509642	8,716
	CS	961CS4550	4	0	15	4	0.007346189	11,621
	CS	961CS48001	4	0	1	0	0	0
	CS	961CS4900	0	2	17	3	0.005509642	8,716
	CS	961CS4910B	0	4	1	0	0	0
	CS	961CS4910D	0	4	1	0	0	0
	CS	961CS4910E	0	8	1	0	0	0
	CS	961CS49101	0	8	2	0	0	0
	CS	961CS49102	0	8	1	0	0	0
	CS	961CS49103	0	8	1	0	0	0
	CS	961CS49104	0	6	1	0	0	0
	CS	961CS49105	0	6	1	0	0	0
	CS	961CS49106	0	8	3	0	0	0
	CS	961CS49107	4	0	1	0	0	0
	CS	961CS49108	0	8	1	0	0	0
	CS	961CS49109	0	8	1	0	0	0
	CS	961CS49201	3	0	29	3	0.005509642	8,716
	OR	961CS49202	3	0	15	3	0.005509642	8,716
	CS	962CSR100	2	1	19	3.5	0.006427916	10,169
	CS	962CSR101	2	1	17	3.5	0.006427916	10,169
	CS	962CS2970	4	1	8	5.5	0.01010101	15,979
	CS	962CS2971	3	2	22	6	0.011019284	17,432
	CS	962CS29721	3	2	13	6	0.011019284	17,432
	CS	962CS29722	3	2	9	6	0.011019284	17,432
	CS	962CS30301	4	0	22	4	0.007346189	11,621
	CS	962CS30302	4	0	16	4	0.007346189	11,621
	CS	962CS30303	4	0	18	4	0.007346189	11,621
	CS	962CS3111	4	0	22	4	0.007346189	11,621
	CS	962CS32001	3	2	19	6	0.011019284	17,432
	CS	962CS32002	3	2	13	6	0.011019284	17,432
	CS	962CS3300	3	2	24	6	0.011019284	17,432

	UW	962CS3502	4	0	18	4	0.007346189	11,621
	CS	962CS3600	3	2	22	6	0.011019284	17,432
	CS	962CS3601	4	0	24	4	0.007346189	11,621
	CS	962CS36501	4	0	13	4	0.007346189	11,621
	CS	962CS36502	4	0	15	4	0.007346189	11,621
	CS	962CS3700	3	2	15	6	0.011019284	17,432
	CS	962CS39201	0	2	1	0	0	0
	CS	962CS4150	4	0	5	4	0.007346189	11,621
	CS	962CS4312	3	1	15	4.5	0.008264463	13,074
	CS	962CS4314	3	2	6	6	0.011019284	17,432
	CS	962CS4470	3	2	5	6	0.011019284	17,432
DL	CS	962CS4500Z / CS4500	3	1	36	4.5	0.008264463	13,074
	CS	962CS4520	3	0	8	3	0.005509642	8,716
DL	CS	962CS4540Z / CS4540	3	1	37	4.5	0.008264463	13,074
	CS	962CS48001	2	0	1	0	0	0
	CS	962CS48002	0	4	1	0	0	0
	CS	962CS48003	0	8	1	0	0	0
	CS	962CS48004	0	8	1	0	0	0
	CS	962CS48005	0	4	1	0	0	0
	CS	962CS48006	0	4	1	0	0	0
	CS	962CS48007	3	2	1	0	0	0
	CS	962CS48008	0	8	1	0	0	0
	CS	962CS49101	0	4	1	0	0	0
	CS	962CS49102	2	4	1	0	0	0
	CS	962CS49104	0	8	1	0	0	0
	CS	962CS49105	0	4	8	6	0.011019284	17,432
	CS	962CS49106	2	4	3	0	0	0
	CS	962CS49107	0	8	2	0	0	0
	CS	962CS49201	3	2	6	6	0.011019284	17,432
	CS	962CS49202	3	2	8	6	0.011019284	17,432
	OR	962CS49203	3	0	13	3	0.005509642	8,716
	CS	962CS49204	2	1	7	3.5	0.006427916	10,169
	CS	963CS2970	4	1	17	5.5	0.01010101	15,979
	CS	963CS2971	3	2	26	6	0.011019284	17,432
	CS	963CS3010	4	0	17	4	0.007346189	11,621
	CS	963CS3310	4	0	24	4	0.007346189	11,621
	CS	963CS3320	3	1	21	4.5	0.008264463	13,074
	CS	963CS3450	3	2	19	6	0.011019284	17,432
	CS	963CS3460	3	1	20	4.5	0.008264463	13,074
	CS	963CS3505	3	2	17	6	0.011019284	17,432
	CS	963CS36001	3	2	23	6	0.011019284	17,432
	CS	963CS36002	3	2	27	6	0.011019284	17,432
	CS	963CS36003	3	2	19	6	0.011019284	17,432
	CS	963CS39201	1	0	1	0	0	0
	CS	963CS4112	3	2	15	6	0.011019284	17,432
	CS	963CS4150	4	0	6	4	0.007346189	11,621
	MA	963CS4202	3	2	12	6	0.011019284	17,432
	CS	963CS4203	3	2	11	6	0.011019284	17,432
	CS	963CS4313	4	0	8	4	0.007346189	11,621
	CS	963CS4322	3	1	9	4.5	0.008264463	13,074
	CS	963CS4471	3	2	7	6	0.011019284	17,432
	CS	963CS4473	3	2	5	6	0.011019284	17,432
	CS	963CS4550	4	0	9	4	0.007346189	11,621
	CS	963CS48001	0	4	1	0	0	0
	SM	963CS48002	0	4	1	0	0	0
	CS	963CS48003	0	6	1	0	0	0
	CS	963CS48007	0	8	1	0	0	0
DL	CS	963CS4900Z / CS4900	0	2	47	3	0.005509642	8,716
	CS	963CS4910A	0	8	1	0	0	0
	CS	963CS4910B	0	6	1	0	0	0
	CS	963CS4910D	0	6	1	0	0	0
	SM	963CS4910E	0	8	1	0	0	0
	CS	963CS4910F	4	0	1	0	0	0
	CS	963CS4910G	3	0	1	0	0	0
	CS	963CS4910H	0	8	1	0	0	0
	CS	963CS4910I	0	6	1	0	0	0

	CS	963CS49102	0	4	1	0	0	0
	CS	963CS49103	0	4	1	0	0	0
	CS	963CS49104	0	6	1	0	0	0
	CS	963CS49105	0	4	1	0	0	0
	CS	963CS49107	0	5	1	0	0	0
	CS	963CS49108	0	6	1	0	0	0
	CS	963CS49109	0	8	1	0	0	0
DL	CS	963CS4920Z / CS49202	3	0	38	3	0.005509642	8,716
	CS	963CS49201	3	0	4	0	0	0
	UW	963CS49203	3	0	12	3	0.005509642	8,716
	CS	963CS49204	1	2	7	4	0.007346189	11,621
	CS	964CSR1001	2	1	20	3.5	0.006427916	10,169
	CS	964CSR1002	2	1	16	3.5	0.006427916	10,169
	CS	964CSR1011	2	1	24	3.5	0.006427916	10,169
	CS	964CSR1012	2	1	16	3.5	0.006427916	10,169
	CS	964CS2971	3	2	28	6	0.011019284	17,432
	CS	964CS2972	3	2	10	6	0.011019284	17,432
	CS	964CS2973	3	2	20	6	0.011019284	17,432
	CS	964CS30301	4	0	16	4	0.007346189	11,621
	CS	964CS30302	4	0	17	4	0.007346189	11,621
	CS	964CS3111	4	0	23	4	0.007346189	11,621
	CS	964CS3200	3	2	11	6	0.011019284	17,432
	CS	964CS3300	3	2	14	6	0.011019284	17,432
DL	CS	964CS3502Z / CS35021	4	0	47	4	0.007346189	11,621
	CS	964CS35022	4	0	10	4	0.007346189	11,621
	CS	964CS36001	3	2	24	6	0.011019284	17,432
	CS	964CS36002	3	2	27	6	0.011019284	17,432
	CS	964CS36003	3	2	25	6	0.011019284	17,432
	CS	964CS3601	4	0	9	4	0.007346189	11,621
	CS	964CS3650	4	0	23	4	0.007346189	11,621
	CS	964CS4310	4	0	14	4	0.007346189	11,621
	UW	964CS4470	3	2	7	6	0.011019284	17,432
	CS	964CS4472	3	2	13	6	0.011019284	17,432
	MA	964CS4500	3	1	15	4.5	0.008264463	13,074
DL	CS	964CS4520Z / CS4520	3	0	33	3	0.005509642	8,716
	CS	964CS4602	4	0	5	4	0.007346189	11,621
	CS	964CS4800A	0	4	1	0	0	0
	CS	964CS4800C	0	4	1	0	0	0
	CS	964CS4800D	0	6	1	0	0	0
	CS	964CS4800E	0	6	2	0	0	0
	CS	964CS4800F	0	6	1	0	0	0
	CS	964CS4800G	0	6	1	0	0	0
	CS	964CS4800H	0	6	1	0	0	0
	CS	964CS48002	0	8	1	0	0	0
	OR	964CS48004	2	4	1	0	0	0
	CS	964CS48005	0	6	2	0	0	0
	CS	964CS48007	0	6	1	0	0	0
	CS	964CS48008	0	8	2	0	0	0
	CS	964CS48009	0	4	1	0	0	0
	CS	964CS4910A	0	8	1	0	0	0
	CS	964CS4910C	3	2	1	0	0	0
	CS	964CS4910D	0	8	2	0	0	0
	CS	964CS4910E	0	8	1	0	0	0
	CS	964CS4910F	0	8	1	0	0	0
	CS	964CS4910G	0	8	1	0	0	0
	CS	964CS4910H	0	8	1	0	0	0
	OR	964CS4910I	0	4	1	0	0	0
	OR	964CS4910J	0	4	1	0	0	0
	CS	964CS4910K	0	8	1	0	0	0
	CS	964CS4910L	0	4	1	0	0	0
	OR	964CS4910M	0	4	1	0	0	0
	CS	964CS4910N	0	5	1	0	0	0
	CS	964CS49101	0	4	1	0	0	0
	OR	964CS49102	0	8	1	0	0	0
	OR	964CS49103	0	6	1	0	0	0
	CS	964CS49104	0	8	1	0	0	0

	SM	964CS49105	0	8	1	0	0	0
	CS	964CS49107	0	8	1	0	0	0
	CS	964CS49108	0	8	1	0	0	0
	CS	964CS49109	0	8	1	0	0	0
	CS	964CS49201	1	2	5	4	0.007346189	11,621
	CS	964CS49202	4	1	9	5.5	0.01010101	15,979
	OR	964CS49203	0	8	1	0	0	0
	OR	964CS49204	0	4	1	0	0	0
		TOTALS	**388**	**597**	**1974**	**544.5**	**1**	**1,581,960**

EC	EC	961EC1010	1	1	37	2.5	0.003101737	6,807
	EC	961EC2100	4	2	11	7	0.008684864	19,059
	EC	961EC2170	4	2	12	7	0.008684864	19,059
	EC	961EC2220	2	4	13	8	0.009925558	21,781
	EC	961EC2300	3	2	14	6	0.007444169	16,336
	EC	961EC2320	3	0	8	3	0.003722084	8,168
	EC	961EC2400	3	1	30	4.5	0.005583127	12,252
	EC	961EC25001	3	2	16	6	0.007444169	16,336
	SP	961EC25002	3	2	15	6	0.007444169	16,336
	EC	961EC2610	3	1	17	4.5	0.005583127	12,252
	EC	961EC2820	3	2	23	6	0.007444169	16,336
	SP	961EC29901	0	4	1	0	0	0
	EC	961EC29902	0	4	2	0	0	0
	EC	961EC29903	0	8	1	0	0	0
	EC	961EC29904	0	8	1	0	0	0
	EC	961EC3100	3	1	9	4.5	0.005583127	12,252
	EC	961EC3210	3	1	4	0	0	0
	EC	961EC3400	3	1	17	4.5	0.005583127	12,252
	EC	961EC3410	4	0	18	4	0.004962779	10,891
	EC	961EC3450	4	0	11	4	0.004962779	10,891
	EC	961EC3500	4	0	12	4	0.004962779	10,891
	EC	961EC3550	3	1	15	4.5	0.005583127	12,252
	EC	961EC3610	3	2	10	6	0.007444169	16,336
	EC	961EC3800	3	2	13	6	0.007444169	16,336
	EC	961EC3830	3	2	17	6	0.007444169	16,336
	EC	961EC3850	3	0	17	3	0.003722084	8,168
	EC	961EC3910	3	0	13	3	0.003722084	8,168
	EC	961EC3920	3	2	13	6	0.007444169	16,336
	CS	961EC4000	3	0	57	3	0.003722084	8,168
	EC	961EC4130	4	2	6	7	0.008684864	19,059
	EC	961EC4420	3	1	6	4.5	0.005583127	12,252
	EC	961EC4470	3	1	4	0	0	0
	EC	961EC4550	4	0	16	4	0.004962779	10,891
	EC	961EC4580	4	0	16	4	0.004962779	10,891
	EC	961EC4630	3	0	10	3	0.003722084	8,168
	EC	961EC4820	3	1	15	4.5	0.005583127	12,252
	EC	961EC4900A	2	0	1	0	0	0
	EC	961EC4900B	4	0	1	0	0	0
	EC	961EC4900D	1	0	1	0	0	0
	SP	961EC4900E	2	0	1	0	0	0
	EC	961EC49002	3	0	1	0	0	0
	EC	961EC49003	2	0	1	0	0	0
	EC	961EC49004	2	0	2	0	0	0
	EC	961EC49006	4	0	1	0	0	0
	EC	961EC49007	5	0	1	0	0	0
	EC	961EC49008	3	0	1	0	0	0
	EC	961EC49009	3	0	1	0	0	0
	EC	961EC4910	3	0	7	3	0.003722084	8,168
	CS	961EC49101	0	8	1	0	0	0
	EC	961EO2402	4	1	5	5.5	0.006823821	14,975
	EC	961EO2413	4	2	30	7	0.008684864	19,059

	EC	961EO35231	4	2	15	7	0.008684864	19,059
	EC	961EO35232	4	2	21	7	0.008684864	19,059
	EC	961EO35233	4	2	22	7	0.008684864	19,059
	IW	961EO4011	3	2	13	6	0.007444169	16,336
DL	EW	961EO4612Z	4	2	12	7	0.008684864	19,059
	EC	962EC1010	1	1	27	2.5	0.003101737	6,807
	EC	962EC2010	3	1	24	4.5	0.005583127	12,252
	EC	962EC2100	4	2	7	7	0.008684864	19,059
	EC	962EC2170	4	2	8	7	0.008684864	19,059
	EC	962EC2200	3	3	16	7.5	0.009305211	20,420
	EC	962EC2270	4	2	6	7	0.008684864	19,059
	EC	962EC2300	3	2	13	6	0.007444169	16,336
	EC	962EC2400	3	1	12	4.5	0.005583127	12,252
	EC	962EC24101	3	1	15	4.5	0.005583127	12,252
	EC	962EC24102	3	1	18	4.5	0.005583127	12,252
	EC	962EC2500	3	2	6	6	0.007444169	16,336
	EC	962EC2600	4	0	16	4	0.004962779	10,891
	EC	962EC2650	4	2	8	7	0.008684864	19,059
	EC	962EC2800	3	2	13	6	0.007444169	16,336
	EC	962EC2820	3	2	5	6	0.007444169	16,336
	EC	962EC29901	0	8	1	0	0	0
	EC	962EC29902	0	8	1	0	0	0
	EC	962EC3150	3	2	14	6	0.007444169	16,336
	EC	962EC3310	3	2	7	6	0.007444169	16,336
	EC	962EC3420	3	1	9	4.5	0.005583127	12,252
	EC	962EC3510	3	1	14	4.5	0.005583127	12,252
	EC	962EC3600	3	2	17	6	0.007444169	16,336
	EC	962EC3670	4	2	22	7	0.008684864	19,059
	EC	962EC3820	3	1	10	4.5	0.005583127	12,252
DL	EC	962EC3840Z / EC3840	3	2	33	6	0.007444169	16,336
	EC	962EC4210	3	0	3	0	0	0
	EC	962EC4450	4	1	11	5.5	0.006823821	14,975
	EC	962EC4500	3	0	7	3	0.003722084	8,168
	EC	962EC4570	4	0	13	4	0.004962779	10,891
	EC	962EC4590	3	0	15	3	0.003722084	8,168
	EW	962EC4610	3	2	6	6	0.007444169	16,336
	EW	962EC4620	3	2	10	6	0.007444169	16,336
	EC	962EC4870	3	2	15	6	0.007444169	16,336
	EC	962EC4900A	3	0	1	0	0	0
	EC	962EC4900B	4	0	1	0	0	0
	EC	962EC4900D	1	0	1	0	0	0
	EC	962EC4900E	3	0	1	0	0	0
	EC	962EC4900F	2	0	1	0	0	0
	EC	962EC4900G	5	0	1	0	0	0
	EC	962EC4900H	3	3	1	0	0	0
	EC	962EC49001	4	0	1	0	0	0
	EC	962EC49002	3	0	1	0	0	0
	EC	962EC49003	1	0	1	0	0	0
	EC	962EC49004	5	0	1	0	0	0
	EC	962EC49005	2	0	2	0	0	0
	EC	962EC49006	4	0	1	0	0	0
	EC	962EC49007	1	0	1	0	0	0
	EC	962EC49009	4	0	1	0	0	0
	EC	962EC4990	3	0	21	3	0.003722084	8,168
	EC	962EO24131	4	2	12	7	0.008684864	19,059
	EC	962EO24132	4	2	27	7	0.008684864	19,059
	EC	962EO2652	4	1	14	5.5	0.006823821	14,975
	EC	962EO3205	3	1	13	4.5	0.005583127	12,252
	IW	962EO3402	4	1	7	5.5	0.006823821	14,975
	EC	962EO35131	4	2	18	7	0.008684864	19,059
	EC	962EO35132	4	2	13	7	0.008684864	19,059
	SP	962EO3816	3	0	6	3	0.003722084	8,168
	EC	962EO4602	3	0	9	3	0.003722084	8,168
	IW	962EO4622	3	2	11	6	0.007444169	16,336
	EC	963EC1010	1	1	32	2.5	0.003101737	6,807
SYN	EC	963EC2100 / 963EC2170	4	2	13	7	0.008684864	19,059

	EC	963EC2220	2	4	11	8	0.009925558	21,781
	EC	963EC2300	3	2	11	6	0.007444169	16,336
	EC	963EC2320	3	0	13	3	0.003722084	8,168
	EC	963EC2400	3	1	24	4.5	0.005583127	12,252
	EC	963EC2410	3	1	12	4.5	0.005583127	12,252
	EC	963EC2500	3	2	19	6	0.007444169	16,336
	EC	963EC2610	3	1	10	4.5	0.005583127	12,252
	EC	963EC2820	3	2	17	6	0.007444169	16,336
	EC	963EC29901	4	0	1	0	0	0
	EC	963EC29902	0	6	1	0	0	0
	EC	963EC3130	4	2	5	7	0.008684864	19,059
	EC	963EC3200	3	2	14	6	0.007444169	16,336
	EC	963EC3320	3	2	6	6	0.007444169	16,336
	EC	963EC3400	3	1	24	4.5	0.005583127	12,252
	EC	963EC3410	4	0	14	4	0.004962779	10,891
	EC	963EC3500	4	0	19	4	0.004962779	10,891
	EC	963EC3550	3	1	31	4.5	0.005583127	12,252
	EC	963EC3630	3	0	9	3	0.003722084	8,168
	EC	963EC3800	3	2	10	6	0.007444169	16,336
DL	EC	963EC3850Z / EC3850	3	1	37	4.5	0.005583127	12,252
	EC	963EC3910	3	2	14	6	0.007444169	16,336
	EC	963EC39901	0	4	1	0	0	0
	CS	963EC4000	3	0	47	3	0.003722084	8,168
	CC	963EC4010	3	2	15	6	0.007444169	16,336
	EC	963EC43401	3	2	1	0	0	0
	EC	963EC4350	3	1	5	4.5	0.005583127	12,252
	EC	963EC4410	3	1	5	4.5	0.005583127	12,252
	EC	963EC4550	4	0	11	4	0.004962779	10,891
	EC	963EC4580	4	0	5	4	0.004962779	10,891
	EC	963EC4600	3	0	6	3	0.003722084	8,168
	IW	963EC4680	3	3	18	7.5	0.009305211	20,420
	EC	963EC4830	3	1	11	4.5	0.005583127	12,252
	EC	963EC49001	3	2	1	0	0	0
	EC	963EC49002	0	3	1	0	0	0
	EC	963EC49003	4	0	1	0	0	0
	EC	963EC49004	3	2	1	0	0	0
	EC	963EC49005	2	2	1	0	0	0
	EC	963EC49007	0	6	1	0	0	0
	EC	963EC4920	3	0	12	3	0.003722084	8,168
	EC	963EC4940	4	0	14	4	0.004962779	10,891
	EC	963EO2402	4	1	9	5.5	0.006823821	14,975
	EC	963EO24131	4	2	18	7	0.008684864	19,059
	EC	963EO24132	4	2	27	7	0.008684864	19,059
	EC	963EO3513	4	2	26	7	0.008684864	19,059
	EC	963EO3523	4	2	32	7	0.008684864	19,059
	EC	963EO3602	4	2	14	7	0.008684864	19,059
	EC	963EO3802	3	2	10	6	0.007444169	16,336
	EC	964EC1010	1	1	76	2.5	0.003101737	6,807
	EC	964EC2010	3	1	19	4.5	0.005583127	12,252
SY	EC	964EC2100	4	2	23	7	0.008684864	19,059
	EC	964EC2200	3	3	15	7.5	0.009305211	20,420
	EC	964EC2270	4	2	7	7	0.008684864	19,059
	EC	964EC2300	3	2	13	6	0.007444169	16,336
	EC	964EC2400	3	1	5	4.5	0.005583127	12,252
	EC	964EC2410	3	1	25	4.5	0.005583127	12,252
	EC	964EC2500	3	2	21	6	0.007444169	16,336
	EC	964EC2600	4	0	6	4	0.004962779	10,891
	EC	964EC2800	3	2	13	6	0.007444169	16,336
	EC	964EC29901	0	8	1	0	0	0
	EC	964EC29902	0	8	1	0	0	0
	EC	964EC29903	0	8	1	0	0	0
	EC	964EC3310	3	2	8	6	0.007444169	16,336
	EC	964EC3420	3	1	9	4.5	0.005583127	12,252
	EC	964EC3510	3	1	12	4.5	0.005583127	12,252
	EC	964EC3600	3	2	10	6	0.007444169	16,336
DL	EC	964EC3820Z / EC3820	3	1	27	4.5	0.005583127	12,252

	EC	964EC39901	1	2	1	0	0	0
	EC	964EC4150	4	1	7	5.5	0.006823821	14,975
	EC	964EC4220	3	1	5	4.5	0.005583127	12,252
	EC	964EC4300	3	1	6	4.5	0.005583127	12,252
	EC	964EC4450	4	1	5	5.5	0.006823821	14,975
	EC	964EC4560	3	2	12	6	0.007444169	16,336
	EC	964EC4620	3	2	7	6	0.007444169	16,336
	EC	964EC4690	3	3	10	7.5	0.009305211	20,420
	EC	964EC4700	3	0	16	3	0.003722084	8,168
	EC	964EC4800	3	0	19	3	0.003722084	8,168
	EC	964EC4810	3	2	9	6	0.007444169	16,336
	EC	964EC4900A	3	2	1	0	0	0
	EC	964EC4900B	3	0	2	0	0	0
	EC	964EC4900C	3	0	1	0	0	0
	EC	964EC4900D	4	0	1	0	0	0
	EC	964EC4900E	2	0	1	0	0	0
	EC	964EC4900F	4	0	1	0	0	0
	ME	964EC4900G	0	8	1	0	0	0
	EC	964EC4900H	3	0	1	0	0	0
	EC	964EC4900I	4	0	1	0	0	0
	EC	964EC4900J	2	2	1	0	0	0
	EC	964EC4900K	0	4	1	0	0	0
	EC	964EC4900L	3	2	1	0	0	0
	EC	964EC4900M	0	8	1	0	0	0
	EC	964EC4900N	0	8	1	0	0	0
	EC	964EC4900O	0	8	1	0	0	0
	EC	964EC4900P	3	0	1	0	0	0
	EC	964EC49001	3	0	1	0	0	0
	EC	964EC49002	0	8	1	0	0	0
	EC	964EC49003	0	8	1	0	0	0
	EC	964EC49004	2	0	1	0	0	0
	EC	964EC49005	1	2	1	0	0	0
	EC	964EC49007	3	2	1	0	0	0
	EC	964EC49008	3	2	1	0	0	0
	EC	964EC49009	3	0	1	0	0	0
	EC	964EC4970	3	0	8	3	0.003722084	8,168
	EC	964EC49901	3	2	1	0	0	0
	EC	964EO2652	4	1	10	5.5	0.006823821	14,975
	EC	964EO3205	3	1	10	4.5	0.005583127	12,252
	EC	964EO3402	4	1	9	5.5	0.006823821	14,975
	EC	964EO3512	3	2	29	6	0.007444169	16,336
	CC	964EO3513	4	2	48	7	0.008684864	19,059
	EC	964EO3523	4	2	29	7	0.008684864	19,059
	SP	964EO3816	3	0	10	3	0.003722084	8,168
	EC	964EO3911	3	0	19	3	0.003722084	8,168
DL	EC	964EO4612Z / EO4612	4	2	22	7	0.008684864	19,059
		TOTALS	**660**	**374**	**2456**	**806**	**1**	**2,194,478**

MA		MA	961MAR118	3	3	4	0	0	0
		MA	961MAR142	2	0	4	0	0	0
		EC	961MA1043	2	0	16	2	0.004651163	6,998
		MA	961MA1117	5	2	15	8	0.018604651	27,990
		MA	961MA11181	5	2	35	8	0.018604651	27,990
		MA	961MA11182	5	2	53	8	0.018604651	27,990
		MA	961MA2049	3	0	15	3	0.006976744	10,496
		MA	961MA2051	4	1	8	5.5	0.012790698	19,243
		MA	961MA21211	4	0	20	4	0.009302326	13,995
	DL	MA	961MA21212	4	0	32	4	0.009302326	13,995
		MA	961MA21213	4	0	29	4	0.009302326	13,995
		MA	961MA2138	5	0	28	5	0.011627907	17,494
		MA	961MA3025	5	1	29	6.5	0.015116279	22,742
		EC	961MA3030Z / MA3030	4	1	42	5.5	0.012790698	19,243
		MA	961MA30421	4	0	34	4	0.009302326	13,995
	DL	MA	961MA30422	4	0	26	4	0.009302326	13,995
		MA	961MA30423	4	0	10	4	0.009302326	13,995
		MA	961MA3046	4	1	8	5.5	0.012790698	19,243
		MA	961MA3132	4	0	13	4	0.009302326	13,995
		MA	961MA3232Z / MA3232	4	1	9	5.5	0.012790698	19,243
		MA	961MA33931	2	0	1	0	0	0
		MA	961MA4026	4	0	7	4	0.009302326	13,995
		MA	961MA41031	4	0	1	0	0	0
		MA	961MA4248	4	1	12	5.5	0.012790698	19,243
		MA	961MA4362	3	0	9	3	0.006976744	10,496
		MA	961MA4391	4	0	1	0	0	0
		MA	961MA43931	4	0	1	0	0	0
		MA	961MA43932	4	0	1	0	0	0
		MA	961MA43933	3	0	1	0	0	0
		MA	961MA46751	3	0	1	0	0	0
		MA	961MA46931	3	0	1	0	0	0
		MA	962MAR117	3	3	9	7.5	0.01744186	26,241
		MA	962MAR118	3	3	11	7.5	0.01744186	26,241
		MA	962MAR125	3	0	14	3	0.006976744	10,496
		MA	962MAR142	2	0	19	2	0.004651163	6,998
		MA	962MA1025	4	0	5	4	0.009302326	13,995
		MA	962MA1042	2	0	10	2	0.004651163	6,998
		MA	962MA1043	2	0	17	2	0.004651163	6,998
		MA	962MA1117	5	2	51	8	0.018604651	27,990
		MA	962MA1118	5	2	18	8	0.018604651	27,990
		MA	962MA2049	3	0	15	3	0.006976744	10,496
		MA	962MA2121	4	0	20	4	0.009302326	13,995
		MA	962MA23001	5	0	19	5	0.011627907	17,494
		MA	962MA23002	5	0	13	5	0.011627907	17,494
		MA	962MA3046	4	1	21	5.5	0.012790698	19,243
		MA	962MA31101	4	0	30	4	0.009302326	13,995
		MA	962MA31102	4	0	28	4	0.009302326	13,995
		MA	962MA3132	4	0	15	4	0.009302326	13,995
		MA	962MA3139	4	0	29	4	0.009302326	13,995
		MA	962MA3232	4	1	5	5.5	0.012790698	19,243
		MA	962MA3243	4	1	10	5.5	0.012790698	19,243
		MA	962MA3610	3	0	11	3	0.006976744	10,496
		MA	962MA4103	3	0	1	0	0	0
		MA	962MA4248	4	1	1	0	0	0
		OR	962MA4303	4	0	2	0	0	0
		MA	962MA4322	3	0	10	3	0.006976744	10,496
		MA	962MA4393	3	0	3	0	0	0
		MA	962MA43931	3	0	1	0	0	0
		MA	962MA4560	4	0	6	4	0.009302326	13,995
	SY	MA	962MA4565	3	0	2	0	0	0
		MA	962MA4693	3	0	3	0	0	0
		MA	963MAR117	3	3	5	7.5	0.01744186	26,241
		MA	963MAR118	3	3	7	7.5	0.01744186	26,241
		MA	963MAR142 / 963MA1042	2	0	19	2	0.004651163	6,998
		MA	963MA1043	2	0	12	2	0.004651163	6,998

MA	963MA1117	5	2	10	8	0.018604651	27,990
MA	963MA11181	5	2	28	8	0.018604651	27,990
MA	963MA11182	5	2	6	8	0.018604651	27,990
MA	963MA2049	3	0	13	3	0.006976744	10,496
MA	963MA2051	4	1	9	5.5	0.012790698	19,243
MA	963MA21211	4	0	31	4	0.009302326	13,995
MA	963MA21212	4	0	27	4	0.009302326	13,995
MA	963MA2138	5	0	20	5	0.011627907	17,494
MA	963MA3025	5	1	14	6.5	0.015116279	22,742
MA	963MA3030	4	1	9	5.5	0.012790698	19,243
MA	963MA3042	4	0	15	4	0.009302326	13,995
MA	963MA3046	4	1	6	5.5	0.012790698	19,243
MA	963MA3132	4	0	13	4	0.009302326	13,995
MA	963MA3232	4	1	3	0	0	0
MA	963MA3560	3	0	11	3	0.006976744	10,496
MA	963MA3605	3	0	11	3	0.006976744	10,496
MA	963MA36101	3	0	1	0	0	0
MA	963MA4027	4	0	6	4	0.009302326	13,995
MA	963MA4103	3	0	9	3	0.006976744	10,496
MA	963MA4243	3	1	1	0	0	0
OR	963MA4302	3	1	1	0	0	0
MA	963MA4323	3	0	8	3	0.006976744	10,496
MA	963MA43321	3	0	1	0	0	0
MA	963MA4393	3	0	1	0	0	0
MA	963MA43932	3	0	1	0	0	0
MA	963MA46931	3	0	2	0	0	0
MA	963MA46932	3	0	1	0	0	0
MA	964MAR117	3	3	22	7.5	0.01744186	26,241
MA	964MAR118	3	3	27	7.5	0.01744186	26,241
MA	964MAR125	3	0	14	3	0.006976744	10,496
MA	964MAR142	2	0	38	2	0.004651163	6,998
MA	964MA10251	4	0	30	4	0.009302326	13,995
MA	964MA10252	4	0	34	4	0.009302326	13,995
MA	964MA10421	2	0	38	2	0.004651163	6,998
MA	964MA10422	2	0	33	2	0.004651163	6,998
MA	964MA1043	2	0	39	2	0.004651163	6,998
MA	964MA11171	5	2	61	8	0.018604651	27,990
MA	964MA11172	5	2	59	8	0.018604651	27,990
MA	964MA1118	5	2	38	8	0.018604651	27,990
MA	964MA2049	3	0	8	3	0.006976744	10,496
MA	964MA2121	4	0	31	4	0.009302326	13,995
MA	964MA23001	5	0	39	5	0.011627907	17,494
MA	964MA23002	5	0	34	5	0.011627907	17,494
MA	964MA23003	5	0	32	5	0.011627907	17,494
MA	964MA3046	4	1	31	5.5	0.012790698	19,243
MA	964MA3110	4	0	16	4	0.009302326	13,995
MA	964MA3132	4	0	12	4	0.009302326	13,995
MA	964MA3139	4	0	22	4	0.009302326	13,995
MA	964MA3232	4	1	5	5.5	0.012790698	19,243
MA	964MA3243	4	1	5	5.5	0.012790698	19,243
MA	964MA3606	3	0	8	3	0.006976744	10,496
MA	964MA3675	3	0	7	3	0.006976744	10,496
MA	964MA40271	4	0	1	0	0	0
MA	964MA41031	3	0	1	0	0	0
MA	964MA42371	4	0	1	0	0	0
MA	964MA43111	3	0	2	0	0	0
MA	964MA4321	3	0	12	3	0.006976744	10,496
MA	964MA43921	4	0	1	0	0	0
MA	964MA4393	3	0	1	0	0	0
MA	964MA43931	3	0	1	0	0	0
MA	964MA46201	3	0	1	0	0	0
MA	964MA46931	3	0	1	0	0	0
	TOTALS	**459**	**63**	**1871**	**430**	**1**	**1,504,481**

ME		ME	961ME2101	4	1	9	5.5	0.013513514	18,012
		ME	961ME2201	3	2	16	6	0.014742015	19,650
		ME	961ME2440	3	0	18	3	0.007371007	9,825
		ME	961ME2441	0	2	18	3	0.007371007	9,825
		ME	961ME2501	3	0	11	3	0.007371007	9,825
		ME	961ME2801	3	2	9	6	0.014742015	19,650
		ME	961ME3220	3	2	6	6	0.014742015	19,650
	TT	ME/ME	961ME3410	2	4	14	8	0.01965602	26,200
		ME	961ME3440	4	0	20	4	0.00982801	13,100
		ME	961ME3611	4	0	23	4	0.00982801	13,100
		ME	961ME3711	4	1	11	5.5	0.013513514	18,012
		ME	961ME4161	4	0	8	4	0.00982801	13,100
		ME	961ME4240	4	0	8	4	0.00982801	13,100
		ME	961ME4420	4	0	10	4	0.00982801	13,100
		ME	961ME4522	4	0	9	4	0.00982801	13,100
		ME	961ME4811	3	2	9	6	0.014742015	19,650
		ME	961ME49021	4	0	1	0	0	0
		ME	961MS2201	3	2	7	6	0.014742015	19,650
		ME	961MS3202	3	2	21	6	0.014742015	19,650
		ME	961MS3606	3	2	21	6	0.014742015	19,650
		ME	961MS4811	4	0	6	4	0.00982801	13,100
		ME	961MS49021	4	0	1	0	0	0
		EC	961TS3000	3	2	12	6	0.014742015	19,650
	TT	ME/ME	961TS4003	2	4	8	8	0.01965602	26,200
		ME	962ME2502	4	1	12	5.5	0.013513514	18,012
		ME	962ME2601	3	2	14	6	0.014742015	19,650
		ME	962ME3150	4	1	24	5.5	0.013513514	18,012
		ME	962ME3201	3	2	15	6	0.014742015	19,650
		ME	962ME3240	3	0	7	3	0.007371007	9,825
		ME	962ME3241	0	3	7	4.5	0.011056511	14,737
		ME	962ME3521	3	2	13	6	0.014742015	19,650
		ME	962ME3801	3	0	8	3	0.007371007	9,825
		ME	962ME3802	0	2	8	3	0.007371007	9,825
		ME	962ME4220	4	0	8	4	0.00982801	13,100
		ME	962ME4525	4	0	7	4	0.00982801	13,100
		ME	962ME4613	4	0	23	4	0.00982801	13,100
		ME	962ME4823	4	0	13	4	0.00982801	13,100
		ME	962MS2201	3	2	13	6	0.014742015	19,650
		ME	962MS3202	3	2	13	6	0.014742015	19,650
		ME	962MS3214	4	0	6	4	0.00982801	13,100
		ME	962MS4822	4	0	7	4	0.00982801	13,100
		ME	962TS3001	3	2	18	6	0.014742015	19,650
		ME	962TS3002	3	2	15	6	0.014742015	19,650
		PH	962TS3003	3	2	17	6	0.014742015	19,650
		ME	963ME2101	4	1	14	5.5	0.013513514	18,012
		ME	963ME2201	3	2	10	6	0.014742015	19,650
		AA	963ME2440	3	0	12	3	0.007371007	9,825
		AA	963ME2441	0	2	12	3	0.007371007	9,825
		ME	963ME2501	3	0	6	3	0.007371007	9,825
		ME	963ME2801	3	2	12	6	0.014742015	19,650
		ME	963ME3220	3	2	11	6	0.014742015	19,650
	TT	ME/ME	963ME3410	2	4	11	8	0.01965602	26,200
		ME	963ME3440	4	0	8	4	0.00982801	13,100
		ME	963ME3611	4	0	9	4	0.00982801	13,100
		ME	963ME3711	4	1	18	5.5	0.013513514	18,012
		ME	963ME4162	4	0	8	4	0.00982801	13,100
		ME	963ME4163	3	0	7	3	0.007371007	9,825
		ME	963ME4550	3	2	7	6	0.014742015	19,650
		ME	963ME4812	3	0	5	3	0.007371007	9,825
		ME	963ME4813	0	2	5	3	0.007371007	9,825
		ME	963ME4821	3	2	9	6	0.014742015	19,650
		ME	963MS2201	3	2	8	6	0.014742015	19,650
		ME	963MS3202	3	2	4	0	0	0
		ME	963MS3304	3	2	14	6	0.014742015	19,650
		ME	963MS4215	3	2	6	6	0.014742015	19,650

	PH	963TS4000	3	2	16	6	0.014742015	19,650
	ME	963TS4001	3	2	15	6	0.014742015	19,650
	ME	964ME1000	3	0	12	3	0.007371007	9,825
	AA	964ME2502	4	1	10	5.5	0.013513514	18,012
	ME	964ME2601	3	2	17	6	0.014742015	19,650
	ME	964ME3150	4	1	11	5.5	0.013513514	18,012
	MESV	964ME3201	3	2	16	6	0.014742015	19,650
	MESV	964ME3240	3	0	25	3	0.007371007	9,825
	MESV	964ME3241	0	3	25	4.5	0.011056511	14,737
	ME	964ME3521	3	2	16	6	0.014742015	19,650
	ME	964ME3801	3	0	10	3	0.007371007	9,825
	ME	964ME3802	0	2	10	3	0.007371007	9,825
	ME	964ME4160	4	0	9	4	0.00982801	13,100
	ME	964ME4612	4	0	8	4	0.00982801	13,100
	ME	964ME4731	4	0	9	4	0.00982801	13,100
	ME	964ME49021	2	0	2	0	0	0
	ME	964ME49022	4	0	1	0	0	0
	ME	964MS2201	3	2	15	6	0.014742015	19,650
	ME	964MS3202	3	2	9	6	0.014742015	19,650
	ME	964MS4312	3	2	5	6	0.014742015	19,650
	ME	964TS3001	3	2	8	6	0.014742015	19,650
TT	PH/ME	964TS4002	2	4	15	8	0.01965602	26,200
		TOTALS	**265**	**108**	**984**	**407**	**1**	**1,332,915**

OC		OC	961OC3120	4	3	7	8.5	0.049707602	42,792
		OC	961OC3230	4	0	13	4	0.023391813	20,138
		OC	961OC3240	4	2	13	7	0.040935673	35,241
		OC	961OC3260	4	0	24	4	0.023391813	20,138
		OC	961OC3570	2	4	3	0	0	0
		OC	961OC4220	4	1	7	5.5	0.032163743	27,689
		OC	961OC4331	4	0	12	4	0.023391813	20,138
		OC	961OC4413	4	1	21	5.5	0.032163743	27,689
		OC	961OC49001	3	0	1	0	0	0
		SM	962OC2020	1	2	10	4	0.023391813	20,138
		OC	962OC3030	1	2	8	4	0.023391813	20,138
		OC	962OC3150	3	2	10	6	0.035087719	30,206
	TT	MR/OC	962OC3212	4	0	20	4	0.023391813	20,138
		OC	962OC3230	3	1	13	4.5	0.026315789	22,655
		OC	962OC3260	4	0	8	4	0.023391813	20,138
		OC	962OC3610	2	2	4	0	0	0
		OC	962OC4211	4	0	12	4	0.023391813	20,138
		PH	962OC4267	4	0	14	4	0.023391813	20,138
		OC	962OC4335	3	2	6	6	0.035087719	30,206
		OC	962OC49001	4	0	1	0	0	0
		OC	963OC2020	1	2	8	4	0.023391813	20,138
		OC	963OC3120	4	3	13	8.5	0.049707602	42,792
		OC	963OC3240	4	2	20	7	0.040935673	35,241
		OC	963OC3902	3	2	12	6	0.035087719	30,206
		OC	963OC4213	3	1	12	4.5	0.026315789	22,655
		OC	963OC4267	4	0	13	4	0.023391813	20,138
		OC	963OC4331	4	0	19	4	0.023391813	20,138
	TT	OC/OC	963OC49001	1	0	1	0	0	0
		OC	963OC49002	3	0	1	0	0	0
		OC	963OC49003	3	0	1	0	0	0
		OC	963OC49004	3	0	1	0	0	0
		OC	963OC49005	3	0	1	0	0	0
		OC	963OC49007	3	0	2	0	0	0
		OC	963OC49008	3	0	1	0	0	0
		OC	964OC3230	4	0	19	4	0.023391813	20,138
		OC	964OC3266	3	2	14	6	0.035087719	30,206
		OC	964OC3321	4	0	13	4	0.023391813	20,138
		OC	964OC3522	4	2	11	7	0.040935673	35,241
		OC	964OC3570	2	4	12	8	0.046783626	40,275
		OC	964OC4211	4	0	17	4	0.023391813	20,138
		OC	964OC4230	3	0	7	3	0.01754386	15,103
		OC	964OC4323	4	2	8	7	0.040935673	35,241
		OC	964OC4335	3	2	7	6	0.035087719	30,206
		OC	964OC4610	2	2	5	5	0.029239766	25,172
		OC	964OC49001	3	0	1	0	0	0
		OC	964OC49002	1	0	1	0	0	0
		OC	964OC49003	2	0	1	0	0	0
		OC	964OC49004	1	0	1	0	0	0
			TOTALS	148	46	429	171	1	860,883

OR		OR	961OA22001	4	0	31	4	0.006980803	12,531
		OR	961OA22002	4	0	23	4	0.006980803	12,531
		OR	961OA31011	4	1	24	5.5	0.009598604	17,230
		OR	961OA31012	4	1	35	5.5	0.009598604	17,230
		OR	961OA3103	4	1	20	5.5	0.009598604	17,230
	SYN	OR	961OA3201 / 961MA3301	4	1	24	5.5	0.009598604	17,230
		OR	961OA3301	4	0	26	4	0.006980803	12,531
		OR	961OA3401	4	0	20	4	0.006980803	12,531
	SYN	OR	961OA4101 / 961MA4302	3	1	7	4.5	0.007853403	14,098
	SYN	OR	961OA42011 / 961MA4301	4	0	24	4	0.006980803	12,531
		OR	961OA42012	4	0	29	4	0.006980803	12,531
		OR	961OA4203	4	0	5	4	0.006980803	12,531
		OR	961OA4603	3	2	16	6	0.010471204	18,797
		OR	961OA4607	4	0	8	4	0.006980803	12,531
		SM	961OA4701	4	0	10	4	0.006980803	12,531
		CC	961OA4702	4	0	18	4	0.006980803	12,531
		OR	961OA49101	4	0	1	0	0	0
		OR	961OA49102	4	0	1	0	0	0
		OR	961OA49103	4	0	1	0	0	0
		OR	961OA49301	4	0	1	0	0	0
		MA	961OS21031	4	1	22	5.5	0.009598604	17,230
		MA	961OS21032	4	1	17	5.5	0.009598604	17,230
		OR	961OS3002	4	0	10	4	0.006980803	12,531
		OR	961OS3003	4	0	11	4	0.006980803	12,531
		OR	961OS31011	4	1	26	5.5	0.009598604	17,230
		OR	961OS31012	4	1	27	5.5	0.009598604	17,230
		OR	961OS31013	4	1	31	5.5	0.009598604	17,230
	DL	OR	961OS3104Z / OS3104	4	0	16	4	0.006980803	12,531
		OR	961OS31051	4	1	21	5.5	0.009598604	17,230
		OR	961OS31052	4	1	27	5.5	0.009598604	17,230
		OR	961OS31053	4	1	26	5.5	0.009598604	17,230
		OR	961OS3603	3	1	23	4.5	0.007853403	14,098
		SM	961OS4601	4	0	21	4	0.006980803	12,531
		OR	962OAR200	2	2	11	5	0.008726003	15,664
		OR	962OA2900	3	0	6	3	0.005235602	9,398
		OR	962OA31021	4	1	14	5.5	0.009598604	17,230
		OR	962OA31022	4	1	17	5.5	0.009598604	17,230
		OR	962OA31023	4	1	21	5.5	0.009598604	17,230
		OR	962OA3104	3	1	21	4.5	0.007853403	14,098
		OR	962OA32001	4	0	25	4	0.006980803	12,531
		OR	962OA32002	4	0	25	4	0.006980803	12,531
		OR	962OA3302	4	0	21	4	0.006980803	12,531
		OR	962OA3601	4	0	13	4	0.006980803	12,531
		UW	962OA3602	4	0	4	0	0	0
		OR	962OA3610	4	0	16	4	0.006980803	12,531
		OR	962OA4102	4	0	4	0	0	0
		OR	962OA4202	4	0	24	4	0.006980803	12,531
		OR	962OA43011	3	2	24	6	0.010471204	18,797
		OR	962OA43012	3	2	20	6	0.010471204	18,797
		OR	962OA4302	4	0	5	4	0.006980803	12,531
		OR	962OA4303	4	0	3	0	0	0
		OR	962OA4601	4	0	9	4	0.006980803	12,531
		OR	962OA4602	4	0	17	4	0.006980803	12,531
		OR	962OA4604	4	0	23	4	0.006980803	12,531
		OR	962OA4605	3	0	8	3	0.005235602	9,398
		OR	962OA4612	4	0	11	4	0.006980803	12,531
		OR	962OA4654	4	0	23	4	0.006980803	12,531
		OR	962OA4655	4	0	29	4	0.006980803	12,531
		OR	962OA4910	3	0	15	3	0.005235602	9,398
		OR	962OS2103	4	1	8	5.5	0.009598604	17,230
		OR	962OS2210	4	1	6	5.5	0.009598604	17,230
		OR	962OS30041	5	0	27	5	0.008726003	15,664
		OR	962OS30042	5	0	25	5	0.008726003	15,664
		OR	962OS30061	4	0	24	4	0.006980803	12,531
		OR	962OS30062	4	0	24	4	0.006980803	12,531

	OR	962OS30063	4	0	22	4	0.006980803	12,531
	OR	962OS3302	4	0	7	4	0.006980803	12,531
	OR	962OS3604	4	0	25	4	0.006980803	12,531
	OR	963OA2200	4	0	14	4	0.006980803	12,531
	OR	963OA3101	4	1	20	5.5	0.009598604	17,230
	OR	963OA31031	4	1	29	5.5	0.009598604	17,230
	OR	963OA31032	4	1	23	5.5	0.009598604	17,230
	OR	963OA32011	4	1	27	5.5	0.009598604	17,230
	OR	963OA32012	4	1	25	5.5	0.009598604	17,230
	OR	963OA33011	4	0	29	4	0.006980803	12,531
	OR	963OA33012	4	0	21	4	0.006980803	12,531
	OR	963OA34011	4	0	14	4	0.006980803	12,531
	OR	963OA34012	4	0	10	4	0.006980803	12,531
	SM	963OA3501	4	0	11	4	0.006980803	12,531
	OR	963OA4101	3	1	11	4.5	0.007853403	14,098
	OR	963OA4201	4	0	20	4	0.006980803	12,531
	OR	963OA4601	4	0	8	4	0.006980803	12,531
	OR	963OA46021	4	0	21	4	0.006980803	12,531
	OR	963OA46022	4	0	24	4	0.006980803	12,531
	OR	963OA46031	3	2	13	6	0.010471204	18,797
	OR	963OA46032	3	2	15	6	0.010471204	18,797
	SM	963OA4701	4	0	11	4	0.006980803	12,531
	CC	963OA4702	4	0	25	4	0.006980803	12,531
	OR	963OA49101	4	0	1	0	0	0
	OR	963OA49301	2	0	2	0	0	0
	OR	963OA49302	2	0	4	0	0	0
TT	OR/OR	963OS3006	4	0	34	4	0.006980803	12,531
	OR	963OS3008	4	0	24	4	0.006980803	12,531
	OR	963OS31011	4	1	22	5.5	0.009598604	17,230
	OR	963OS31012	4	1	14	5.5	0.009598604	17,230
	OR	963OS3104	4	0	14	4	0.006980803	12,531
	OR	963OS3105	4	1	23	5.5	0.009598604	17,230
	UW	963OS3303	4	1	5	5.5	0.009598604	17,230
	OR	963OS3604	4	0	16	4	0.006980803	12,531
	OR	963OS4601	4	0	23	4	0.006980803	12,531
	OR	964OAR2001	2	2	28	5	0.008726003	15,664
	OR	964OAR2002	2	2	33	5	0.008726003	15,664
	OR	964OA2900	3	0	1	0	0	0
	OR	964OA29001	3	0	23	3	0.005235602	9,398
	OR	964OA29002	3	0	25	3	0.005235602	9,398
	OR	964OA3102	4	1	15	5.5	0.009598604	17,230
	OR	964OA31041	3	1	24	4.5	0.007853403	14,098
	OR	964OA31042	3	1	24	4.5	0.007853403	14,098
	OR	964OA3105	4	0	8	4	0.006980803	12,531
TT	OR/OR	964OA3200	4	0	11	4	0.006980803	12,531
	OR	964OA33021	4	0	17	4	0.006980803	12,531
	OR	964OA33022	4	0	30	4	0.006980803	12,531
	OR	964OA3601	4	0	4	0	0	0
	UW	964OA3602	4	0	10	4	0.006980803	12,531
	OR	964OA4101	3	1	11	4.5	0.007853403	14,098
	OR	964OA42021	4	0	30	4	0.006980803	12,531
	OR	964OA42022	4	0	17	4	0.006980803	12,531
	OR	964OA4301	3	2	22	6	0.010471204	18,797
	OR	964OA4302	4	0	18	4	0.006980803	12,531
	OR	964OA4303	4	0	14	4	0.006980803	12,531
	OR	964OA4501	4	0	9	4	0.006980803	12,531
TT	OR/OR	964OA4601	4	0	6	4	0.006980803	12,531
	OR	964OA4602	4	0	9	4	0.006980803	12,531
	OR	964OA46041	4	0	18	4	0.006980803	12,531
	OR	964OA46042	4	0	20	4	0.006980803	12,531
	OR	964OA4605	3	0	12	3	0.005235602	9,398
	OR	964OA4608	4	0	5	4	0.006980803	12,531
TT	OR/OR	964OA4611	4	0	15	4	0.006980803	12,531
	OR	964OA4654	4	0	11	4	0.006980803	12,531
	OR	964OA4655	4	0	10	4	0.006980803	12,531
	OR	964OA4910	3	0	8	3	0.005235602	9,398

	OR	964OA49101	3	1	3	0	0	0
	MA	964OA49102	4	0	1	0	0	0
	OR	964OA49103	4	0	1	0	0	0
	OR	964OA49104	4	0	1	0	0	0
	OR	964OA49105	1	2	1	0	0	0
	OR	964OA49301	4	0	1	0	0	0
	OR	964OS2103	4	1	6	5.5	0.009598604	17,230
	OR	964OS3004	5	0	19	5	0.008726003	15,664
	OR	964OS30061	4	0	14	4	0.006980803	12,531
	OR	964OS30062	4	0	29	4	0.006980803	12,531
	OR	964OS3104	4	0	6	4	0.006980803	12,531
	OR	964OS3302	4	0	21	4	0.006980803	12,531
	UW	964OS3601	4	0	8	4	0.006980803	12,531
	OR	964OS3603	3	1	15	4.5	0.007853403	14,098
SYN	OR	964OS47011 / 964OA4704	4	0	23	4	0.006980803	12,531
SYN	OR	964OS47012	4	0	19	4	0.006980803	12,531
		TOTALS	**555**	**57**	**2388**	**573**	**1**	**1,795,097**

MR		MR	961MR2020	1	2	16	4	0.025477707	32,231
		MR	961MR2416	2	0	17	2	0.012738854	16,116
		MR	961MR3140	3	2	14	6	0.038216561	48,347
		MR	961MR3222	4	3	6	8.5	0.054140127	68,492
	TT	MR/MR	961MR3252	3	4	12	9	0.057324841	72,521
		MR	961MR3262	3	5	11	10.5	0.066878981	84,607
		MR	961MR3421	3	0	14	3	0.01910828	24,174
	TT	MR/MR	961MR3480	4	1	15	5.5	0.035031847	44,318
		MR	961MR4322	4	0	8	4	0.025477707	32,231
		MR	961MR4416	3	1	11	4.5	0.02866242	36,260
		MR	961MR4520	3	0	4	0	0	0
		MR	961MR49001	3	0	1	0	0	0
		MR	961MR49002	3	0	1	0	0	0
		MR	962MR2210	4	2	6	7	0.044585987	56,405
	TT	MR/MR	962MR3234	4	4	10	10	0.063694268	80,579
		MR	962MR3321	4	0	18	4	0.025477707	32,231
		MR	962MR3522	4	2	22	7	0.044585987	56,405
		MR	962MR4242	3	0	3	0	0	0
		MR	962MR43232	4	2	20	7	0.044585987	56,405
	TT	MR/MR	962MR4414	3	0	4	0	0	0
		MR	962MR4800	3	1	7	4.5	0.02866242	36,260
		MR	962MR49001	3	0	1	0	0	0
		MR	962MR49002	3	0	1	0	0	0
		MR	962MR49003	3	0	1	0	0	0
		MR	963MR3222	4	3	11	8.5	0.054140127	68,492
	TT	MR/MR	963MR3480	4	1	12	5.5	0.035031847	44,318
		MR	963MR4241	3	0	12	3	0.01910828	24,174
		MR	963MR4322	4	0	12	4	0.025477707	32,231
	TT	MR/MR	963MR4413	4	1	12	5.5	0.035031847	44,318
		MR	963MR4416	3	1	6	4.5	0.02866242	36,260
		MR	963MR4900A	3	0	1	0	0	0
		MR	963MR4900B	3	0	1	0	0	0
		MR	963MR49001	3	0	1	0	0	0
		MR	963MR49002	2	0	1	0	0	0
		MR	963MR49003	3	0	1	0	0	0
		MR	963MR49005	3	0	2	0	0	0
		MR	963MR49007	3	0	1	0	0	0
		MR	963MR49009	3	0	1	0	0	0
		MR	964MR3150	3	2	17	6	0.038216561	48,347
	TT	MR/MR	964MR3234	4	4	12	10	0.063694268	80,579
	TT	MR/MR	964MR3252	3	4	18	9	0.057324841	72,521
		MR	964MR4324	3	0	1	0	0	0
		MR	964MR4800	3	1	15	4.5	0.02866242	36,260
		OC	964MR49001	3	2	1	0	0	0
		OC	964MR49002	4	0	1	0	0	0
		MR	964MR49003	2	0	1	0	0	0
			TOTALS	147	48	363	157	1	1,265,083

PH		PH	961PH13221	5	0	15	5	0.011223345	18,001
		PH	961PH13222	5	0	15	5	0.011223345	18,001
		PH	961PH2001	1	0	25	1	0.002244669	3,600
		PH	961PH2203	4	0	8	4	0.008978676	14,401
		PH	961PH2401	3	0	9	3	0.006734007	10,801
		PH	961PH3152	4	0	11	4	0.008978676	14,401
		PH	961PH3172	4	1	18	5.5	0.012345679	19,801
		PH	961PH3352	4	0	14	4	0.008978676	14,401
		PH	961PH3360	4	1	6	5.5	0.012345679	19,801
		PH	961PH3452	4	2	15	7	0.015712682	25,201
		PH	961PH3652	4	1	13	5.5	0.012345679	19,801
		PH	961PH3782	4	0	9	4	0.008978676	14,401
	TT	PH/PH	961PH3800	4	0	14	4	0.008978676	14,401
		PH	961PH4050	4	2	19	7	0.015712682	25,201
		PH	961PH40511	4	0	1	0	0	0
		PH	961PH4054	4	0	10	4	0.008978676	14,401
		PH	961PH42831	4	0	1	0	0	0
		PH	961PH4353	4	0	8	4	0.008978676	14,401
		PH	961PH4911	3	2	16	6	0.013468013	21,601
		PH	961PH49841	4	0	1	0	0	0
		PH	961PH49981	4	0	1	0	0	0
		PH	961PH49982	2	0	1	0	0	0
		PH	961PH49983	4	0	1	0	0	0
		PH	961SE2012	2	3	15	6.5	0.014590348	23,401
	TT	PH/PH	961SE2014	2	3	10	6.5	0.014590348	23,401
		CC	961SE2020	1	0	15	1	0.002244669	3,600
		SP	961SE4021	4	0	11	4	0.008978676	14,401
		PH	962PHR110	5	3	7	9.5	0.021324355	34,202
		PH	962PH1001	4	2	8	7	0.015712682	25,201
		PH	962PH1002	4	2	8	7	0.015712682	25,201
		PH	962PH2001	1	0	11	1	0.002244669	3,600
		PH	962PH2151	4	1	18	5.5	0.012345679	19,801
		PH	962PH2401	3	0	7	3	0.006734007	10,801
		PH	962PH2511	4	0	14	4	0.008978676	14,401
		PH	962PH2514	4	0	9	4	0.008978676	14,401
		PH	962PH2911	3	2	21	6	0.013468013	21,601
		PH	962PH3052	4	0	31	4	0.008978676	14,401
		PH	962PH3171	4	0	12	4	0.008978676	14,401
		PH	962PH3292	4	1	9	5.5	0.012345679	19,801
		PH	962PH3400	4	2	18	7	0.015712682	25,201
		PH	962PH3458	4	0	7	4	0.008978676	14,401
		PH	962PH3653	4	1	15	5.5	0.012345679	19,801
		PH	962PH3855	4	2	5	7	0.015712682	25,201
		PH	962PH3991	4	0	15	4	0.008978676	14,401
		PH	962PH39981	3	0	1	0	0	0
		PH	962PH4001	1	0	1	0	0	0
		PH	962PH4051	4	0	8	4	0.008978676	14,401
		PH	962PH4209	3	2	9	6	0.013468013	21,601
		PH	962PH4454	4	2	14	7	0.015712682	25,201
		PH	962PH4760	4	0	7	4	0.008978676	14,401
		PH	962PH4857	4	0	5	4	0.008978676	14,401
		PH	962PH49981	4	0	1	0	0	0
		PH	962PH49982	4	0	1	0	0	0
		PH	962PH49983	4	0	1	0	0	0
		PH	962PH49984	3	0	1	0	0	0
		PH	962SE2013	2	3	15	6.5	0.014590348	23,401
		PH	962SE3015	2	3	8	6.5	0.014590348	23,401
		PH	962SE4859	3	0	8	3	0.006734007	10,801
		PH	963PH1322	5	0	7	5	0.011223345	18,001
		PH	963PH2351	4	1	19	5.5	0.012345679	19,801
		PH	963PH2401	3	0	4	0	0	0
		PH	963PH2511	4	0	15	4	0.008978676	14,401
		PH	963PH2652	4	1	17	5.5	0.012345679	19,801
		PH	963PH3001	4	0	8	4	0.008978676	14,401
		PH	963PH3119	4	2	9	7	0.015712682	25,201

	PH	963PH3152	4	0	20	4	0.008978676	14,401
	PH	963PH3172	4	1	14	5.5	0.012345679	19,801
	PH	963PH3360	4	1	9	5.5	0.012345679	19,801
	PH	963PH3800	4	0	10	4	0.008978676	14,401
	PH	963PH3998	4	0	9	4	0.008978676	14,401
SY	PH	963PH4001 / 963PH2001	1	0	34	1	0.002244669	3,600
	PH	963PH4050	4	2	12	7	0.015712682	25,201
	PH	963PH4253	4	2	4	0	0	0
	PH	963PH4283	4	0	6	4	0.008978676	14,401
	PH	963PH4455	4	0	16	4	0.008978676	14,401
	PH	963PH4856	4	0	4	0	0	0
	PH	963PH4858	3	0	5	3	0.006734007	10,801
	PH	963PH4911	3	2	14	6	0.013468013	21,601
	PH	963PH4984	4	0	10	4	0.008978676	14,401
	PH	963PH49982	4	0	1	0	0	0
	PH	963PH49983	4	0	1	0	0	0
	PH	963PH49987	2	0	5	2	0.004489338	7,200
	PH	963PH49988	4	0	1	0	0	0
	PH	963PH49989	3	0	3	0	0	0
TT	PH/PH	963SE2012	2	3	14	6.5	0.014590348	23,401
	PH	963SE2014	2	3	15	6.5	0.014590348	23,401
	CC	963SE2020	1	0	10	1	0.002244669	3,600
	SP	963SE4021	4	0	13	4	0.008978676	14,401
	PH	964PHR110	5	3	20	9.5	0.021324355	34,202
	PH	964PH1001	4	2	6	7	0.015712682	25,201
	PH	964PH1002	4	2	6	7	0.015712682	25,201
	PH	964PH1121	4	2	43	7	0.015712682	25,201
	PH	964PH1322	5	0	11	5	0.011223345	18,001
	PH	964PH2001	1	0	16	1	0.002244669	3,600
	PH	964PH2151	4	1	14	5.5	0.012345679	19,801
	PH	964PH2401	3	0	6	3	0.006734007	10,801
	PH	964PH2514	4	0	20	4	0.008978676	14,401
	PH	964PH2911	3	2	14	6	0.013468013	21,601
	PH	964PH3171	4	0	10	4	0.008978676	14,401
	PH	964PH3292	4	1	25	5.5	0.012345679	19,801
	PH	964PH3352	4	0	17	4	0.008978676	14,401
	PH	964PH3400	4	2	7	7	0.015712682	25,201
	PH	964PH3451	4	2	8	7	0.015712682	25,201
	PH	964PH3479	4	0	9	4	0.008978676	14,401
	PH	964PH3653	4	1	16	5.5	0.012345679	19,801
	PH	964PH3991	4	0	17	4	0.008978676	14,401
	PH	964PH3998	4	0	13	4	0.008978676	14,401
	PH	964PH39981	2	0	1	0	0	0
	PH	964PH39982	3	2	1	0	0	0
	PH	964PH39983	4	0	1	0	0	0
	PH	964PH39984	2	0	1	0	0	0
	PH	964PH39985	6	0	1	0	0	0
	PH	964PH4254	4	0	4	0	0	0
	PH	964PH4991	3	0	16	3	0.006734007	10,801
	PH	964PH49981	4	0	1	0	0	0
	PH	964PH49982	3	0	1	0	0	0
	PH	964PH49983	4	0	1	0	0	0
	PH	964PH49984	3	2	1	0	0	0
	PH	964PH49985	2	0	2	0	0	0
	PH	964PH49987	4	0	1	0	0	0
	PH	964PH49988	4	0	2	0	0	0
	PH	964SE2013	3	3	14	7.5	0.016835017	27,001
	PH	964SE3015	2	3	16	6.5	0.014590348	23,401
		TOTALS	**436**	**87**	**1228**	**445.5**	**1**	**1,603,881**

UW		OR	964UW49991	1	2	5	4	0.032388664	36,376
SP		EC	961SS3035	3	2	4	0	0	0
		SP	961SS4000	0	1	69	1.5	0.012145749	13,641
		SP	962SS2001	4	0	16	4	0.032388664	36,376
	TT	SP/SP	962SS3001	3	2	9	6	0.048582996	54,565
		MR	962SS3525	3	2	40	6	0.048582996	54,565
		SP	962SS39001	4	0	1	0	0	0
		SP	962SS39002	1	0	1	0	0	0
		SP	962SS4000	0	1	47	1.5	0.012145749	13,641
		SM	962SS4001	4	2	21	7	0.056680162	63,659
		SP	962SS49001	4	0	1	0	0	0
		EC	963SS3035	3	2	4	0	0	0
		SP	963SS39001	2	0	2	0	0	0
		SP	963SS39002	4	0	1	0	0	0
		SP	963SS39003	1	0	3	0	0	0
		SP	963SS4000	0	1	73	1.5	0.012145749	13,641
	SY	SM/SP/SI	963SS4002	4	0	23	4	0.032388664	36,376
		SM	963SS49001	4	0	1	0	0	0
		SP	963SS49002	3	0	2	0	0	0
	TT	EC/SP	964SS3001	3	2	17	6	0.048582996	54,565
		SM	964SS3041	4	2	13	7	0.056680162	63,659
		OC	964SS3525	3	2	15	6	0.048582996	54,565
		SP	964SS39001	4	1	1	0	0	0
		SP	964SS39002	4	1	1	0	0	0
		SP	964SS39003	1	0	1	0	0	0
		SP	964SS4000	0	1	81	1.5	0.012145749	13,641
		AA	964SS49001	4	0	1	0	0	0
		PH	964SS49002	3	2	6	6	0.048582996	54,565
		OR	964SS49003	4	0	1	0	0	0
		SP	964SS49004	4	0	1	0	0	0
		OR	964SS49005	4	0	1	0	0	0
EW		EC	961EW4990	1	0	13	1	0.008097166	9,094
IW		EW	962IW2000	3	2	20	6	0.048582996	54,565
		EC	964IW4990	1	0	22	1	0.008097166	9,094
CC	TT	CC/CC	961CC3000	4	0	9	4	0.032388664	36,376
		CC	961CC3030	3	2	23	6	0.048582996	54,565
		SM	961CC39001	4	0	1	0	0	0
		EC	961CC4750	3	1	22	4.5	0.036437247	40,924
		CC	962CC3040	3	3	9	7.5	0.060728745	68,206
		OR	962CC3101	4	0	9	4	0.032388664	36,376
		OR	962CC4103	2	4	21	8	0.064777328	72,753
		CC	962CC49001	3	0	1	0	0	0
		CC	963CC3900	4	0	21	4	0.032388664	36,376
		MA	963CC39001	4	0	1	0	0	0
		EC	963CC4750	3	1	8	4.5	0.036437247	40,924
		CC	963CC49001	4	0	1	0	0	0
		CC	963CC4913	4	0	21	4	0.032388664	36,376
		IW	964CC39001	2	0	2	0	0	0
		CC	964CC4101	4	2	9	7	0.056680162	63,659
			TOTALS	142	41	675	123.5	1	1,123,123

XX	XX	961IT1500	4	0	17	4	
	XX	961IT1600	4	2	16	7	
	XX	962IT1500	4	0	17	4	
	XX	962IT1600	4	2	31	7	
	XX	963IT1500	4	0	25	4	
	XX	963IT1600	4	2	18	7	
	XX	964IT1500	4	0	18	4	
	XX	964IT1600	4	2	26	7	

FY1998 COURSE ENROLLMENT SHEET

This sheet contains the raw data of who was in each of the courses given in FY98 by curriculum. The data has been modified and sorted to mirror the data on the previous sheet (COST PER COURSE Worksheet).

DL = Distance Learning Courses (either given only to DL students or to both DL and NPS students at same time)
TT = Team Teaching Courses
SYN = "Synonym" Courses (same course given with 2 different titles)

Non-DOD students who are taking NPS Courses under a MOU with UC Santa Cruz

777 refers to those students who are receiving their education through DISTANCE LEARNING

888 refers to those students taking CONTINUING EDUCATION courses

999 refers to NPS Staff personnel who are taking courses

Course Dept	Desig	Yr-Qtr Course- Seq	360	361	364	365	366	368	370	372	373	374	380	440	626	628	633	655	670	690	691	695	696	810	811	812	851	852	853	854	858	859	899	777	813	814	815	816	817	818	819	820	823	824	825	827	837	847	888	999	TOTAL
NS		961NS30001	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	2	0	0	2	3	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	13
		961NS30002	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	1	0	0	0	11
		961NS30231	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	8	7	4	0	0	9	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	33
		961NS30232	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	3	0	0	10	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	27
		961NS3024	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22
		961NS3030	0	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	3	4	6	4	0	0	0	0	0	0	0	0	1	0	0	0	2	1	0	0	0	0	1	27
		961NS30401	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	6	0	6	4	0	1	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	1	23
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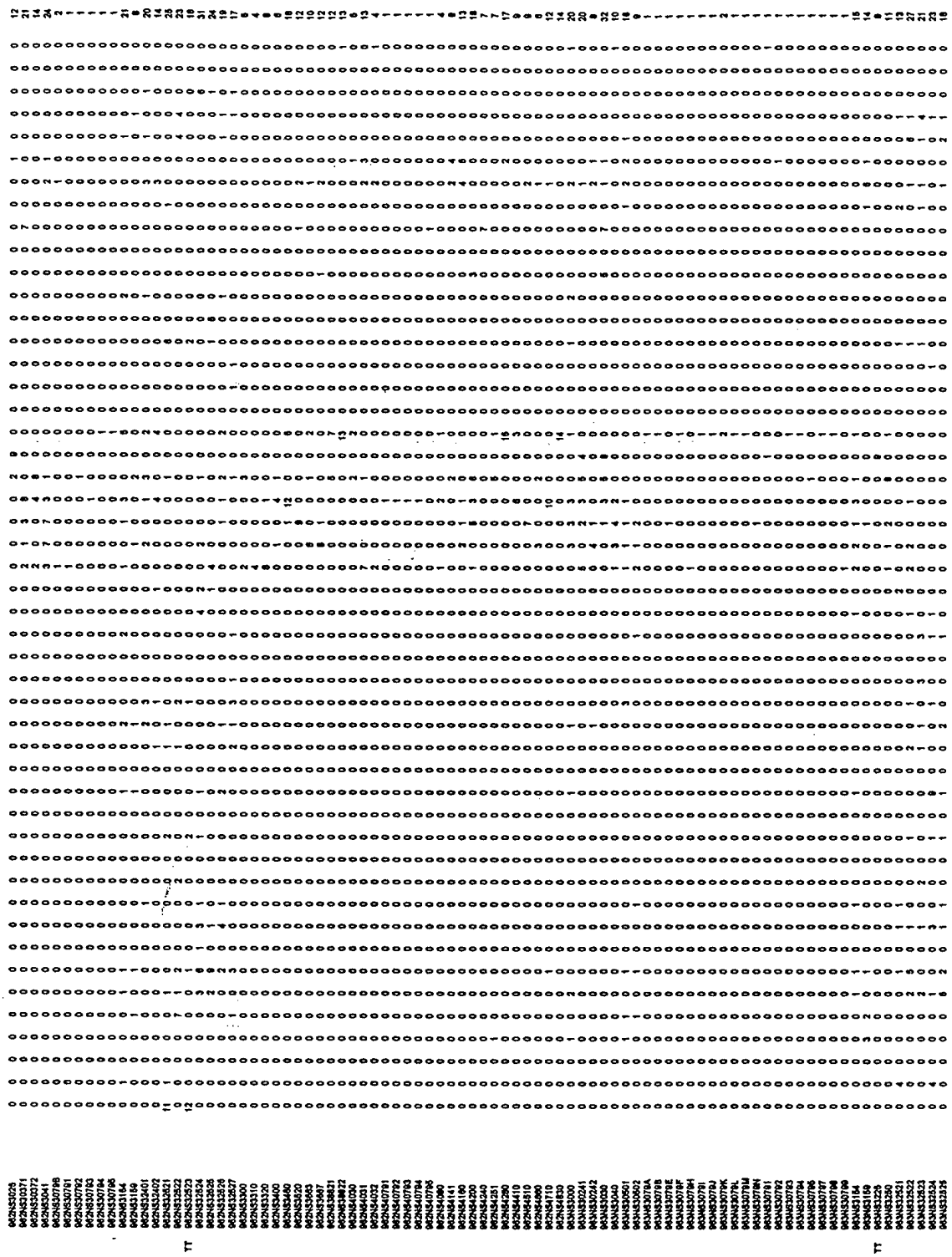

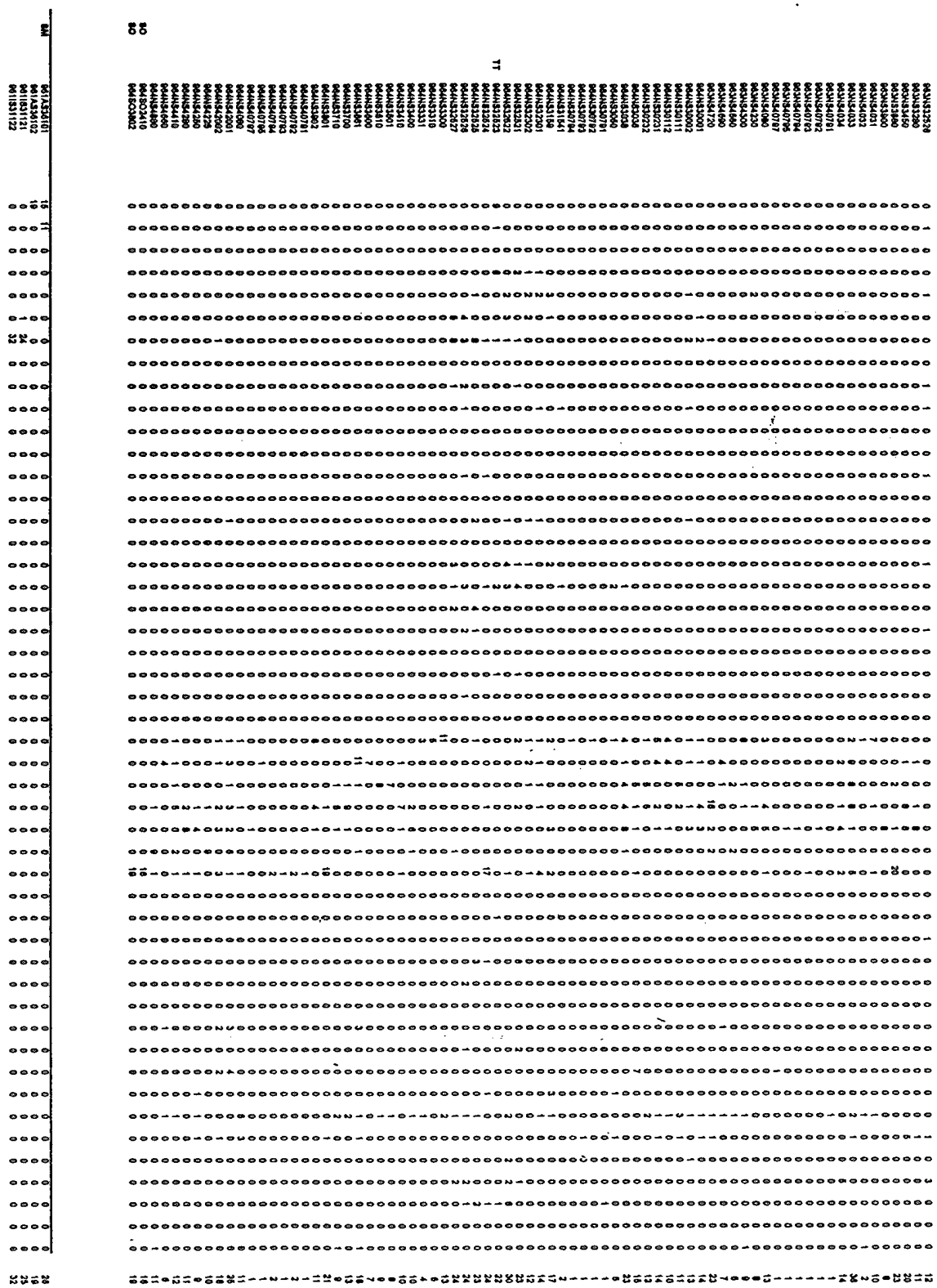

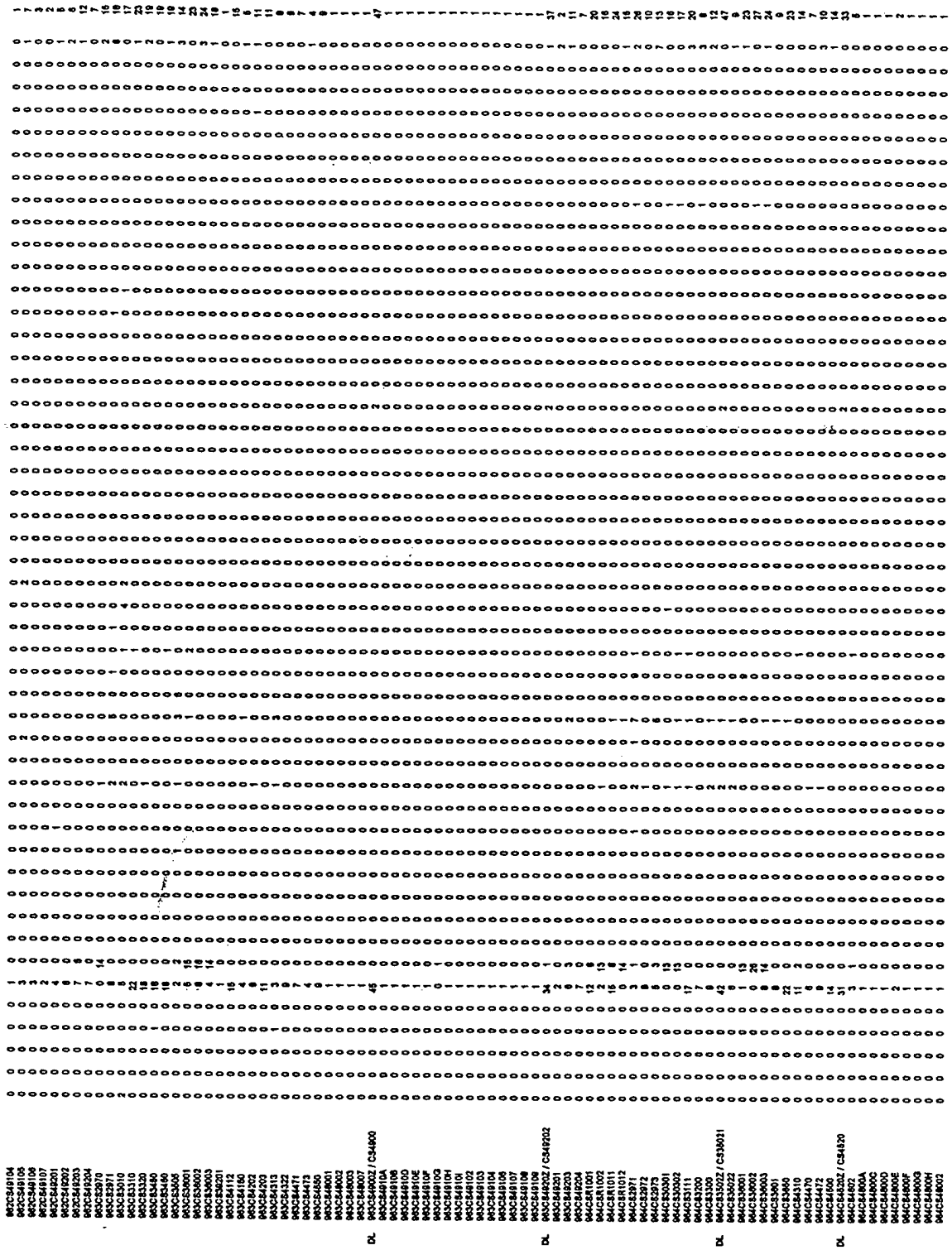

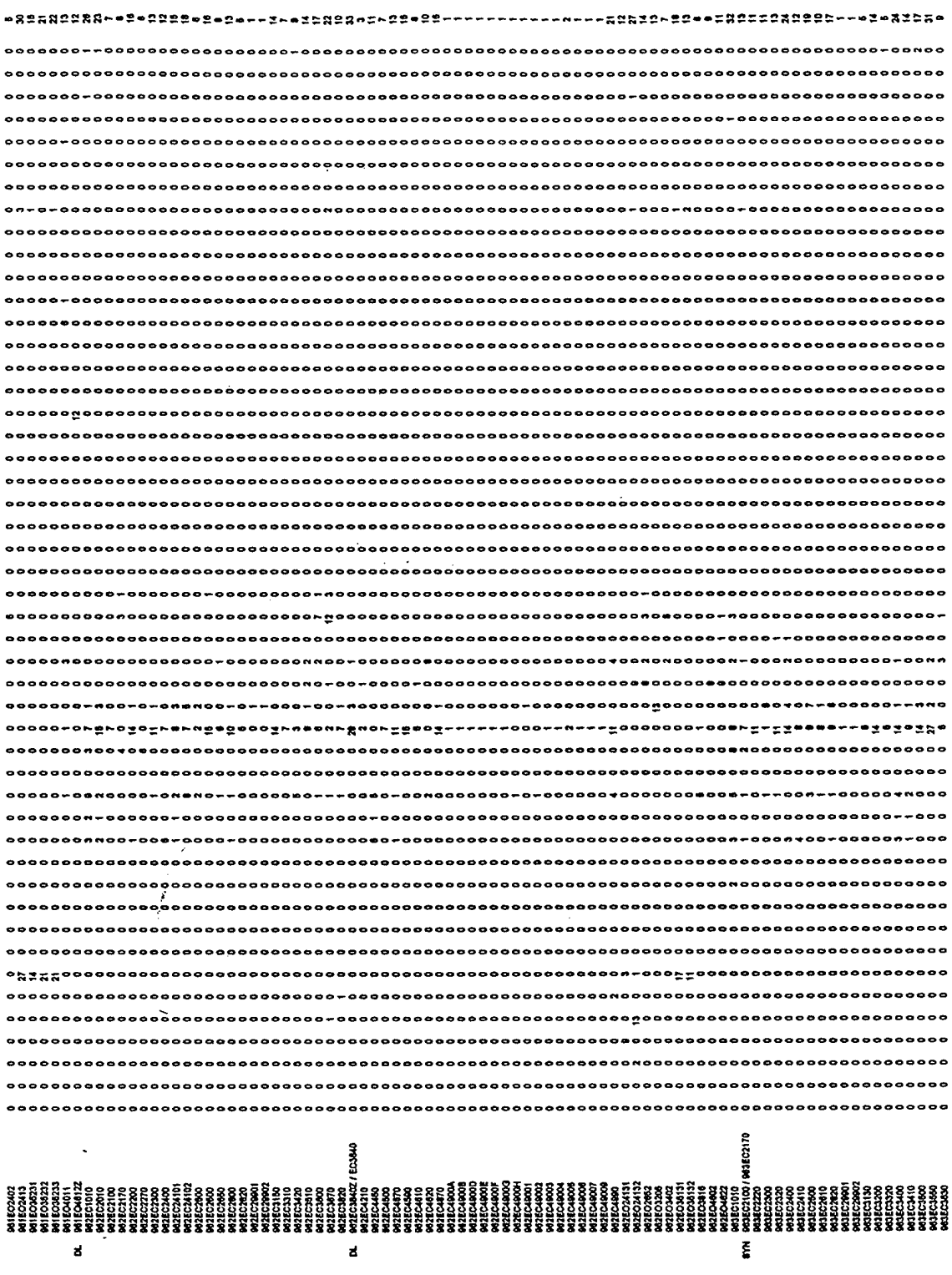

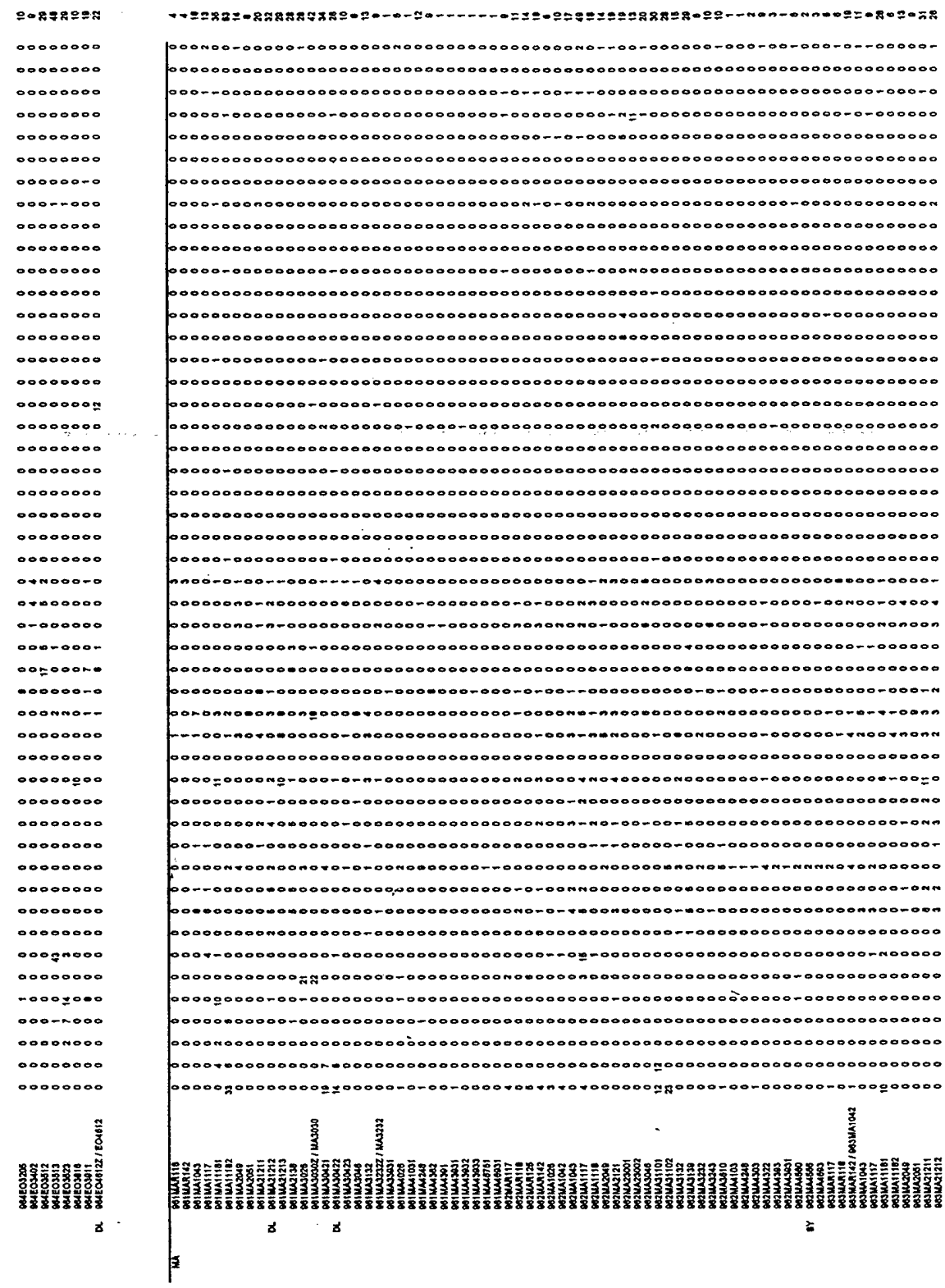

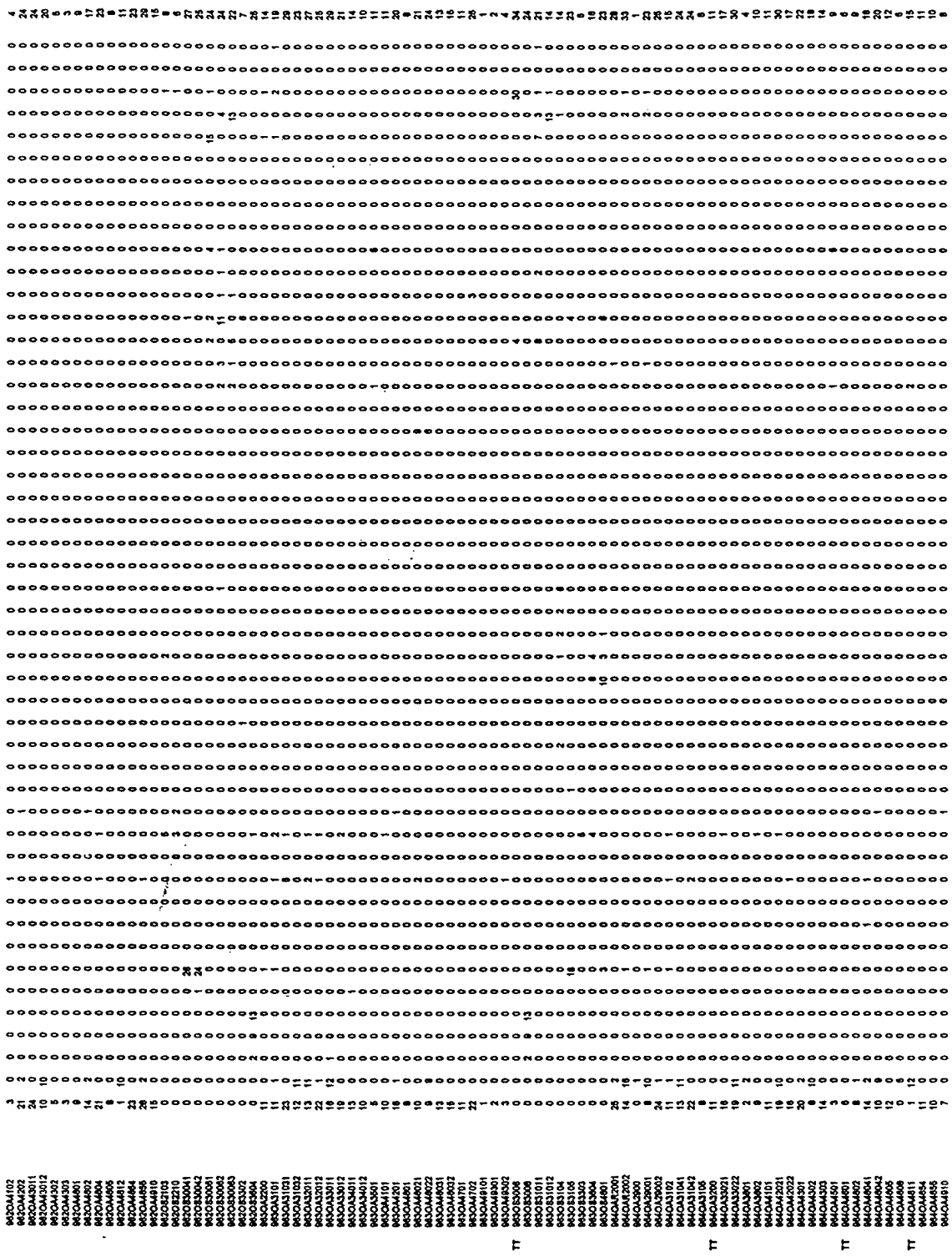

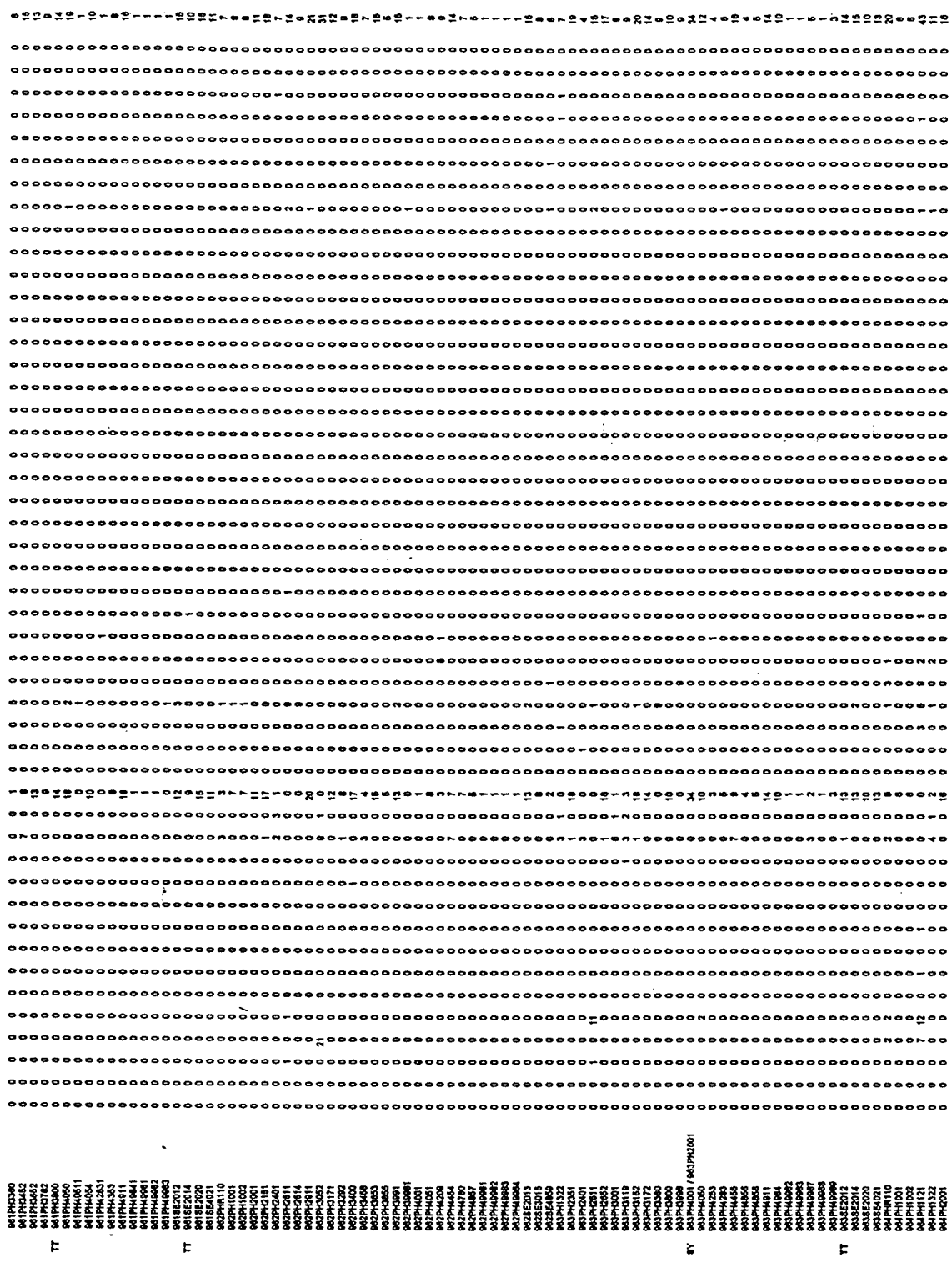

	963CC49001	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	963CC4913	0	0	0	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21
	964CC39001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2
	964CC4101	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
XX	961IT1600	4	0	0	0	0	2	0	0	0	0	0	1	0	0	5	0	1	2	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17
	961IT1600	2	0	0	0	0	0	1	0	0	1	1	1	0	0	1	0	0	6	0	0	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	18
	962IT1600	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	0	8	0	0	0	0	0	0	0	0	0	0	17
	962IT1600	1	0	0	0	0	1	0	0	0	1	0	0	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	1	8	0	0	0	0	0	0	1	5	0	7	0	0	0	0	1	1	0	0	0	0	31
	963IT1600	2	0	0	0	0	2	1	0	0	1	0	1	0	3	1	0	0	0	0	0	1	0	0	0	0	0	0	0	1	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	26
	963IT1600	2	0	0	0	0	0	0	0	1	1	0	0	0	0	1	0	3	6	0	0	1	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	18
	964IT1600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	3	6	0	0	1	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0	0	0	0	19
	964IT1600	1	0	0	0	0	7	0	0	0	0	0	0	0	1	4	0	0	2	0	0	4	0	0	0	0	1	0	2	0	0	0	0	0	0	1	0	0	2	0	0	0	0	0	0	0	1	0	0	0	0	26
																556 2																	777 79														888 2	999 244				

APPENDIX B. MARGINAL COST PER STUDENT MODEL

MARGINAL COST PER STUDENT MODEL INPUT PAGE

Welcome to the Marginal Cost per Student INPUT Page. This model has been developed to analyze a single curriculum, but the methodology can be applied to any other curriculum. The data was extracted from the COST PER CURRICULUM MODEL by using a logic command to determine whether or not a course was taken by any students in the particular curriculum.

The model was developed using data from the 837 - FINANCIAL MANAGEMENT Curriculum ONLY. Assumptions are further explained in the text of the thesis.

INPUT the MAXIMUM Class size for the following course levels:

	1000	2000	3000	4000
Maximum Class Size	30	30	30	30

The maximum class size has been automatically constrained to 30 students, unless you INPUT less. This assumption is further explained in the text of the thesis.

INPUT the desired INCREASE in the number of students enrolled in the 837 Curriculum:

Number of Additional Students: 10

For each Department, INPUT HOW the Instruction should be provided for a NEW section:

NS	Divert a Professor from Research
SM	Divert a Professor from Research
MA	Divert a Professor from Research
OR	Divert a Professor from Research

AVAILABLE OPTIONS:

Hire a NEW Professor
DIVERT a Professor from Research
CONTRACT an Outside Instructor

Please see the OPTIONS Worksheet for a complete discussion of the available options.

☐ Check this block to INCLUDE FRINGE BENEFITS in the cost calcualtion of diverting a professor from Research.

A percentage of the DIRECT TEACHING salary (with or without fringe benefits) is assumed to be the cost of diverting a professor from research. INPUT the desired percentage. The model assumes 1/8 or 0.125, as explained in the text of the thesis. 1/8

MARGINAL COST OUTPUT

Based on the INPUT you entered above, the model has calculated the TOTAL MARGINAL COST of providing education to the number of additional students in the FINANCIAL MANAGEMENT Curriculum. The total cost is divided by the number of additional students (INPUT) resulting in a MARGINAL COST PER STUDENT.

Total Costs = $127,619 **Cost per Student =** $12,762

YES

SECT REQ'D

	NS	SM	MA	OR
with FRINGE	85,624	102,602	101,176	108,156
without FRINGE	70,764	84,795	83,616	89,385

Include Fringe	TRUE	
DT Fraction	0.125	7

Keep in mind that these costs do not include the allocation of OPTAR/Travel costs....that is included in the equation.

The Costs	NS	SM	MA	OR
	2	2	2	2
Hire a new Professor	86,816	100,740	99,480	108,995
Divert a Professor from Research	10,703	12,825	12,647	13,520
Contract an Outside Instructor	7,500	7,500	7,500	7,500
	10,703	12,825	12,647	13,520

Maximum	Level	Maximum
11	1000	30
11	2000	30
11	3000	30
11	4000	30

Number	10

	10
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
15	15
16	16
17	17
18	18
19	19
20	20
21	25
22	30
23	35
24	40
25	45
26	50

20	1/2
21	1/3
22	1/4
23	1/5
24	1/6
25	1/7
26	1/8
27	1/9
28	1/10
29	1/11
30	1/12
	1/13
	1/14
	1/15
	1/16

MARGINAL COST PER STUDENT MODEL CALCULATION PAGE

COURSES THAT ARE REQUIRED IN THE FINANCIAL MANGEMENT CURRICULUM MATRIX

Course Dept	Yr-Qtr Course- Seq	Prof Dept	Lec Hrs	Lab Hrs	Class Size	FM 837	Type	Max	Excess Capacity		Logic			DO WE REALLY NEED IT?	COST	
NS	961NS32521	NS	4	0	20	1	R	30	10		10					
	961NS32523	NS	4	0	19	1	R	30	11		21					
	961NS32526	NS	4	0	19	1	R	30	11		32					
	961NS32527	NS	4	0	20	4	R	30	10	1	0	42				
	962NS32522	NS	4	0	23	4	R	30	7		7					
	962NS32526	NS	4	0	19	1	R	30	11		18					
	962NS32527	NS	4	0	17	1	R	30	13	1	0	31				
	963NS32521	NS	4	0	13	1	R	30	17		17					
	963NS32522	NS	4	0	27	1	R	30	3		20					
	963NS32523	NS	4	0	21	4	R	30	9		29					
	963NS32524	NS	4	0	23	1	R	30	7		36					
	963NS32525	NS	4	0	18	1	R	30	12		48					
	963NS32526	NS	4	0	12	3	R	30	18	1	0	66				
	964NS32521	NS	4	0	23	1	R	30	7		7					
	964NS32522	NS	4	0	30	2	R	30	0		7					
	964NS32526	NS	4	0	24	2	R	30	6		13					
	964NS32527	NS	4	0	24	2	R	30	6	1	0	19		NO	$0	
SM	962IS0125R	SM	0	2	69	11	R	30	-39	1	0	-39	1			
	964IS0125R	SM	0	2	35	7	R	30	-5	1	0	-5	1	YES	$10,599	Note 1
	962MN2031	SM	4	0	32	15	R	30	-2	1	0	-2	1			
	964MN20311	SM	4	0	29	6	R	30	1		1					
	964MN20312	SM	4	0	13	10	R	30	17		18					
	964MN20313	SM	4	0	23	2	R	30	7		25					
	964MN20314	SM	4	0	27	1	R	30	3	1	0	28		YES	$10,599	
	962MN21501	SM	4	0	25	2	R	30	5		5					
	962MN21502	SM	4	0	21	13	R	30	9	1	0	14				
	964MN21501	SM	4	0	36	2	R	30	-6		-6					
	964MN21502	SM	4	0	26	8	R	30	4		-2					

964MN21503	SM	4	0	22	14	R	30	8		6				
964MN21504	SM	4	0	30	1	R	30	0	1	0	6	1	YES	$10,599
961MN3105	SM	4	0	15	7	R	30	15	1	0	15			
962MN31052	SM	4	0	19	1	R	30	11	1	0	11			
963MN31052	SM	4	0	18	8	R	30	12	1	0	12			
964MN31051	SM	4	0	18	3	R	30	12		12				
964MN31052	SM	4	0	23	2	R	30	7		19				
964MN31053	SM	4	0	24	4	R	30	6	1	0	25		NO	$0
961MN31401	NS	4	0	29	4	R	30	1		1				
961MN31402	SM	4	0	27	1	R	30	3		4				
961MN31403	SM	4	0	26	10	R	30	4	1	0	8	1		
963MN31401	SM	4	0	14	6	R	30	16		16				
963MN31402	SM	4	0	27	9	R	30	3	1	0	19		YES	$10,599
961MN31541	SM	4	0	32	10	R	30	-2		-2				
961MN31542	SM	4	0	33	4	R	30	-3	1	0	-5	1		
963MN31541	SM	4	0	30	1	R	30	0		0				
963MN31542	SM	4	0	45	15	R	30	-15		-15				
963MN31543	SM	4	0	30	2	R	30	0	1	0	-15	1	YES	$10,599
961MN31611	SM	4	0	28	1	R	30	2		2				
961MN31612	SM	4	0	27	7	R	30	3		5				
961MN31613	SM	4	0	25	4	R	30	5		10				
961MN31614	SM	4	0	24	5	R	30	6	1	0	16			
963MN31611	SM	4	0	23	6	R	30	7		7				
963MN31612	SM	4	0	22	8	R	30	8	1	0	15		NO	$0
961MN31721	SM	4	0	24	2	R	30	6		6				
961MN31722	SM	4	0	20	2	R	30	10	1	0	16			
962MN31721	SM	4	0	22	14	R	30	8		8				
962MN31722	SM	4	0	18	4	R	30	12	1	0	20			
963MN3172	SM	4	0	16	2	R	30	14	1	0	14			
964MN31721	SM	4	0	15	1	R	30	15		15				
964MN31722	SM	4	0	22	2	R	30	8		23				
964MN31723	SM	4	0	25	15	R	30	5		28				
964MN3172Z	SM	4	0	11	4	ZZ	30	19	1	0	47		NO	$0
961IS31831	SM	4	0	10	4	R	30	20		20				
961IS31832	SM	4	0	17	1	R	30	13	1	0	33			
963IS31831	SM	4	0	27	14	R	30	3		3				
963IS31832	SM	4	0	20	1	R	30	10	1	0	13			
964IS3183	SM	4	0	26	3	R	30	4	1	0	4	1	YES	$10,599

	961MN33011	SM	4	0	18	2	R	30	12		12				
	961MN33012	SM	4	0	21	15	R	30	9	1	0	21			
	962MN3301	SM	4	0	25	3	R	30	5	1	0	5	1		
	963MN3301	SM	4	0	15	5	R	30	15	1	0	15			
	964MN33011	SM	4	0	27	7	R	30	3		3				
	964MN33012	SM	4	0	24	2	R	30	6	1	0	9	1	YES	$10,599
	962MN33331	SM	4	0	20	4	R	30	10		10				
	962MN33332	SM	4	0	25	13	R	30	5	1	0	15			
	964MN33331	SM	4	0	25	5	R	30	5		5				
	964MN33332	SM	4	0	25	5	R	30	5		10				
	964MN33333	SM	4	0	22	16	R	30	8		18				
	964MN33334	SM	4	0	25	3	R	30	5	1	0	23		NO	$0
	961MN41051	SM	4	0	20	6	R	30	10		10				
	961MN41053	SM	4	0	26	3	R	30	4		14				
	961MN41054	SM	4	0	24	15	R	30	6	1	0	20			
	962MN41051	SM	4	0	19	3	R	30	11		11				
	962MN41052	SM	4	0	18	3	R	30	12	1	0	23			
	963MN41051	SM	4	0	26	4	R	30	4		4				
	963MN41052	SM	4	0	20	6	R	30	10	1	0	14		NO	$0
	961MN4151	SM	2	0	15	12	R	30	15	1	0	15			
	963MN4151	SM	2	0	19	18	R	30	11	1	0	11		NO	$0
	962MN4161	SM	4	0	26	19	R	30	4	1	0	4	1		
	964MN4161	SM	4	0	21	17	R	30	9	1	0	9	1	YES	$10,599
	962MN4162	SM	4	0	28	20	R	30	2	1	0	2	1		
	964MN4162	SM	4	0	24	17	R	30	6	1	0	6	1	YES	$10,599
	961MN4163	SM	4	0	20	14	R	30	10	1	0	10			
	963MN4163	SM	4	0	24	19	R	30	6	1	0	6	1	YES	$10,599
MA	962MA23001	MA	5	0	19	2	R	30	11		11				
	962MA23002	MA	5	0	13	11	R	30	17	1	0	28			
	964MA23001	MA	5	0	39	15	R	30	-9		-9				
	964MA23002	MA	5	0	34	2	R	30	-4		-13				
	964MA23003	MA	5	0	32	6	R	30	-2	1	0	-15	1	YES	$10,452
OR	962OS30062	OR	4	0	24	4	R	30	6		6				
	962OS30063	OR	4	0	22	13	R	30	8	1	0	14			
	964OS30061	OR	4	0	14	1	R	30	16		16				
	964OS30062	OR	4	0	29	19	R	30	1	1	0	17		NO	$0
	961OS31011	OR	4	1	26	5	R	30	4		4				

	961OS31012	OR	4	1	27	4	R	30	3		7			
	961OS31013	OR	4	1	31	8	R	30	-1	1	0	6	1	
	963OS31011	OR	4	1	22	3	R	30	8		8			
	963OS31012	OR	4	1	14	13	R	30	16	1	0	24		YES	$11,173

Note 1: IS0125 is a basic computer skills course that is taught in the first quarter. The class size of 69 and 35 reflect the total number of students enrolled in the course. In the past, there have been more than one section. Because of the class size limitation, the model will reflect that this course is needed for any number of additional students. This may be true, but the costs will be overstated.

DESIGNATED CURRICULUM OPTION ELECTIVES IN THE FM CURRICULUM MATRIX

Course Dept	Yr-Qtr Course- Seq	Prof Dept	Lec Hrs	Lab Hrs	Class Size	FM 837	Type	Max	Exc Cap	Logic			DO WE REALLY NEED IT?	COST	
SM	961MN4152	SM	4	0	12	11	E	30	18	1	0	18			
	963MN4152	SM	4	0	14	13	E	30	16	1	0	16	NO	$0	
	962MN4159	SM	4	0	17	16	E	30	13	1	0	13			
	964MN4159	SM	4	0	17	15	E	30	13	1	0	13	NO	$0	
	963MN43021	SM	4	0	1	1	E	30	29	1	0	29			Note 2
	964MN4305	SM	4	0	11	7	E	30	19	1	0	19			

Note 2: Since only two electives are required in the FM curriculum matrix, only two were included in the calculation.

ELECTIVE COURSES THAT WERE TAKEN TO SATISFY THE FM CURRICULUM MATRIX

Course Dept	Yr-Qtr Course-Seq	Prof Dept	Lec Hrs	Lab Hrs	Class Size	FM 837	Type	Max	Exc Cap	Logic				DO WE REALLY NEED IT?	COST
SM	964MN2111	SM	0	2	42	2	SPEC/E	30	-12	1	0	-12	1		$0
	963MN3221	SM	2	0	18	1	E/MC	30	12	1	0	12			
	964MN3221	SM	2	1	32	5	E/MC	30	-2	1	0	-2	1		$0
	961MN3222	SM	3	2	27	1	E/MC	30	3	1	0	3	1		
	962MN32221	SM	3	2	17	2	E	30	13	1	0	13			$0
	962MN3372	SM	4	0	27	1	SPEC/E	30	3	1	0	3	1		$0
	964MN33742	SM	4	0	14	1	SPEC/E	30	16	1	0	16			$0
	961MN3805	SM	2	0	19	11	TQL	30	11	1	0	11			
	963MN3805	SM	2	0	16	13	TQL	30	14	1	0	14			$0
	962MN41251	SM	4	0	26	1	SPEC/E	30	4	1	0	4	1		$0
	961MN41451	SM	4	0	21	1	SPEC/E	30	9	1	0	9	1		$0
	962MN4157	SM	0	2	16	14	CMA	30	14	1	0	14			
	964MN4157	SM	0	2	18	17	CMA	30	12	1	0	12			$0
	963MN4158	SM	0	2	12	11	CMA	30	18	1	0	18			$0
	963MN43102	SM	4	0	26	1	SPEC/E	30	4	1	0	4	1		$0
	964MN4470	SM	4	0	17	1	SPEC/E	30	13	1	0	13			$0
	961MN4650	SM	4	0	2	2	SPEC/E	30	28	1	0	28			
	962MN4650	SM	4	0	4	1	SPEC/E	30	26	1	0	26			$0
	962MN49001	SM	4	0	1	1	SPEC/E	30	29	1	0	29			$0
	963MN49001	SM	2	0	1	1	SPEC/E	30	29	1	0	29			$0
	962MN49003	SM	4	0	1	1	SPEC/E	30	29	1	0	29			$0
	963MN49004	SM	2	0	1	1	SPEC/E	30	29	1	0	29			$0
	962MN49701	SM	1	0	1	1	SPEC/E	30	29	1	0	29			$0
															$127,619

E	CURRICULUM OPTION
SPEC/E	SPECIAL ELECTIVE
E/MC	MARINE CORP ELECTIVE
CMA	CMA REVIEW CLASS
TQL	TQL CLASS

COURSES THAT ARE NOT IN THE FM CURRICULUM MATRIX AND NOT INCLUDED IN THE MODEL

Course Dept	Yr-Qtr Course-Seq	Prof Dept	Lec Hrs	Lab Hrs	Class Size	FM 837	Type	Max	Exc Cap	Logic				DO WE REALLY NEED IT?	COST
NS	961NS3154	NS	4	0	16	1	TR/E	30	14	1	0	14			
	961NS3159	NS	4	0	17	1	TR/E	30	13	1	0	13			
	962NS3159	NS	4	0	8	1	TR/E	30	22	1	0	22			
	963NS4034	NS	4	0	14	5	TR/E	30	16	1	0	16			
AA	962AA2035	AA	3	2	11	1	TR/E	30	19	1	0	19			
	962AA2043	AA	3	2	12	1	TR/E	30	18	1	0	18			
	962AA4000	AA	1	0	25	1	TR/E	30	5	1	0	5	1		
	963AA4000	AA	1	0	34	1	TR/E	30	-4	1	0	-4	1		
CS	961CS36002	CS	3	2	22	1	TR/E	30	8	1	0	8	1		
	961CS4203	CS	3	2	25	1	TR/E	30	5	1	0	5	1		
	962CS3700	CS	3	2	15	1	TR/E	30	15	1	0	15			
	963CS4202	MA	3	2	12	1	TR/E	30	18	1	0	18			
EC	963EC1010	EC	1	1	32	1	TR/E	30	-2	1	0	-2	1		
	964EC2170	EC	4	2	11	1	TR/E	30	19	1	0	19			
MA	961MA11182	MA	5	2	53	1	TR/E	30	-23	1	0	-23	1		
	961MA30422	MA	4	0	26	1	TR/E	30	4	1	0	4	1		
	962MAR117	MA	3	3	9	1	REF	30	21	1	0	21		REFR	
	962MA2121	MA	4	0	20	1	TR/E	30	10	1	0	10			
	962MA3046	MA	4	1	21	1	TR/E	30	9	1	0	9	1		
	963MA1042	MA	2	0	8	1	TR/E	30	22	1	0	22			
	963MA1117	MA	5	2	10	1	TR/E	30	20	1	0	20			
	964MA10251	MA	4	0	30	2	TR/E	30	0	1	0	0	1		
	964MA10421	MA	2	0	38	2	TR/E	30	-8	1	0	-8	1		
	964MA11171	MA	5	2	61	2	TR/E	30	-31	1	0	-31	1		
	964MA1118	MA	5	2	38	1	TR/E	30	-8	1	0	-8	1		
ME	961ME2441	ME	0	2	18	1	TR/E	30	12	1	0	12			
OR	961OA22002	OR	4	0	23	1	TR/E	30	7	1	0	7	1		
	961OA31011	OR	4	1	24	1	TR/E	30	6	1	0	6	1		
	961OS3002	OR	4	0	10	1	TR/E	30	20	1	0	20			
	963OS3104	OR	4	0	14	1	TR/E	30	16	1	0	16			
	964OAR2002	OR	2	2	33	2	REF	30	-3	1	0	-3	1	REFR	
	964OA29001	OR	3	0	23	2	TR/E	30	7	1	0	7	1		
PH	963PH1322	PH	5	0	7	1	TR/E	30	23	1	0	23			
	964PH1121	PH	4	2	43	1	TR/E	30	-13	1	0	-13	1		
SP	964SS4000	SP	0	1	81	1	TR/E	30	-51	1	0	-51	1		
XX	962IT1600	XX	4	2	31	1	INT	30	-1	1	0	-1	1		

APPENDIX C. AVERAGE ON BOARD REPORT

FY96 NPS AOB Report Summary

Code	Curriculum	FY96 AVG	FY96 AVG N/MC ONLY
30	**Operations Analysis**		
360	Operations Analysis	114	62
361	Operations Logistics	28	27
380	Advanced Science (Applied Math)	15	7
	Operational Analysis Subtotal	156	95
31	**Aeronautical Engineering**		
610	Aeronautical Engineering	34	26
611	Aeronautical Engineering with Avionics	23	22
612	NPS/TPS	16	14
	Aeronautical Engineering Subtotal	73	62
32	**Electronics and Computer Programs**		
368	Computer Science	88	40
590	Electronic Systems	111	51
	Electronics and Computer Programs Subtotal	199	92
33	**Combat Systems Sciences and Technology**		
533	Combat Sciences	90	58
	Combat Systems Sciences and Technology Subtotal	90	58
34	**Naval/Mechanical Engineering**		
570	Naval/Mechanical Engineering	74	53
	Naval/Mechanical Engineering Subtotal	74	53
35	**Meteorology and Oceanography Programs**		
372	Meteorology	3	1
373	Meteorology and Oceanography	46	44
374	Operational Oceanography	14	10
440	Oceanography	8	2
	Meteorology and Oceanography Programs Subtotal	70	56
36	**Systems Management**		
370	Information Technology Management	162	115
813	Transportation Logistics Management	7	7
814	Transportation Management	12	12
815	Acquisition and Contract Management	34	25
816	Systems Acquisition Management	38	0
817	Allied, DOD, USA,USMC, and USCG	10	0
818	Defense Systems Management	8	0
819	Systems Inventory Management	7	7
820	Resource Planning and Management (INTL)	11	0
827	Material Logistics Support Management	38	30
837	Financial Management	59	48
847	Manpower/Personnel Training Analysis	59	41
	Systems Management Subtotal	444	284
37	**Undersea, Space and Information Warfare**		
364	Space Systems Operations International	3	0
366	Space Systems Operations	37	31
525	Undersea Warfare	22	22
526	Undersea Warfare International	5	0
591	Space Systems Engineering	49	47
595	Information Warfare	21	18
596	Information Warfare International	14	0
	Undersea, Space and Information Warfare Subtotal	149	118
38	**National Security and Intelligence**		
681	Middle East, Africa, South Asia	17	8
682	Far East, Southeast Asia Pacific	16	5
683	Western Hemishere	13	5
684	Russia, Europe, Central Asia	20	9
688	Strategic Planning	18	15
689	Civil-Military Relations	7	0
699	Special Operations/Low Intensity Conflict	32	10
824	Intelligence (Regional Studies)	13	13
825	Intelligence (OPINTEL)	7	7
	National Security and Intelligence Subtotal	141	72
39	**Joint C4I Systems**		
365	Command, Control and Communications	27	14
823	Intelligence	7	7
	Joint C4I Systems Subtotal	33	21
	TOTAL	1,429	910

FY1996 NPS Average On Board (AOB) Report

Average based on Code, Department and Curriculum	961	as of 10/12/95			962	as of 1/16/96			963	as of 4/15/96			964	as of 7/23/96		
			OTHER				OTHER				OTHER				OTHER	
Code Curriculum	FOR	USN	SERV	TOT	FOR	USN	SERV	TOT	FOR	USN	SERV	TOT	FOR	USN	SERV	TOT
30 Operations Analysis																
360 Operations Analysis	15	58	37	110	15	61	36	112	13	55	35	103	15	73	41	129
361 Operations Logistics	0	25	1	26	0	24	1	25	0	23	1	24	0	34	2	36
380 Advanced Science (Applied Math)	1	7	8	16	1	6	8	15	0	8	8	16	0	7	5	12
Operational Analysis Subtotal	16	90	46	152	16	91	45	152	13	86	44	143	15	114	48	177
31 Aeronautical Engineering																
610 Aeronautical Engineering	5	27	5	37	4	27	4	35	3	23	4	30	3	26	4	33
611 Aeronautical Engineering with Avionics	1	20	0	21	1	22	0	23	1	22	0	23	0	25	0	25
612 NPS/TPS	0	13	1	14	0	15	2	17	0	12	2	14	0	17	2	19
Aeronautical Engineering Subtotal	6	60	6	72	5	64	6	75	4	57	6	67	3	68	6	77
32 Electronics and Computer Programs																
368 Computer Science	19	43	30	92	17	46	30	93	14	36	30	80	21	36	30	87
590 Electronic Systems	36	50	31	117	31	50	27	108	30	48	26	104	29	57	28	114
Electronics and Computer Programs Subtotal	55	93	61	209	48	96	57	201	44	84	56	184	50	93	58	201
33 Combat Systems Sciences and Technology																
533 Combat Sciences	27	64	6	97	25	55	8	88	25	57	8	90	21	55	8	84
Combat Systems Sciences and Technology Subtotal	27	64	6	97	25	55	8	88	25	57	8	90	21	55	8	84
34 Naval/Mechanical Engineering																
570 Naval/Mechanical Engineering	12	66	10	88	10	52	11	73	10	45	12	67	9	48	12	69
Naval/Mechanical Engineering Subtotal	12	66	10	88	10	52	11	73	10	45	12	67	9	48	12	69
35 Meteorology and Oceanography Programs																
372 Meteorology	0	1	2	3	0	1	2	3	0	1	2	3	0	1	2	3
373 Meteorology and Oceanography	1	45	1	47	1	44	0	45	2	44	0	46	2	42	0	44
374 Operational Oceanography	3	10	0	13	4	11	0	15	5	9	0	14	4	8	0	12
440 Oceanography	4	2	2	8	5	2	2	9	5	2	2	9	3	2	1	6
Meteorology and Oceanography Programs Subtotal	8	58	5	71	10	58	4	72	12	56	4	72	9	53	3	65

36 Systems Management																
370 Information Technology Management	8	114	37	159	8	125	39	172	5	108	37	150	5	114	47	166
813 Transportation Logistics Management	0	8	0	8	0	8	0	8	0	5	0	5	0	8	0	8
814 Transportation Management	0	12	1	13	0	12	1	13	0	6	0	6	0	16	1	17
815 Acquisition and Contract Management	0	25	12	37	0	22	8	30	0	22	7	29	1	29	10	40
816 Systems Acquisition Management	1	0	51	52	1	0	37	38	1	0	34	35	1	0	27	28
817 Allied, DOD, USA,USMC, and USCG	11	0	9	20	2	0	5	7	1	0	5	6	0	0	7	7
818 Defense Systems Management	6	0	0	6	9	0	0	9	9	0	0	9	8	0	0	8
819 Systems Inventory Management	0	9	0	9	0	5	0	5	0	5	0	5	0	10	0	10
820 Resource Planning and Management (INTL)	7	0	0	7	14	0	0	14	14	0	0	14	7	0	0	7
827 Material Logistics Support Management	0	32	8	40	0	31	6	37	0	30	6	36	0	27	12	39
837 Financial Management	0	52	11	63	1	44	7	52	1	42	7	50	1	52	16	69
847 Manpower/Personnel Training Analysis	9	39	13	61	8	39	12	59	5	27	7	39	6	58	11	75
Systems Management Subtotal	42	291	142	475	43	286	115	444	36	245	103	384	29	314	131	474
37 Undersea, Space and Information Warfare																
364 Space Systems Operations International	3	0	0	3	3	0	0	3	3	0	0	3	2	0	0	2
366 Space Systems Operations	0	29	6	35	0	29	6	35	0	29	6	35	0	37	7	44
525 Undersea Warfare	0	19	0	19	0	21	0	21	0	22	0	22	0	24	0	24
526 Undersea Warfare International	3	0	0	3	5	0	0	5	5	0	0	5	6	0	0	6
591 Space Systems Engineering	0	60	1	61	0	43	1	44	0	46	1	47	0	40	2	42
595 Information Warfare	0	15	3	18	0	16	3	19	0	16	3	19	0	25	3	28
596 Information Warfare International	13	0	0	13	12	0	0	12	13	0	0	13	16	0	0	16
Undersea, Space and Information Warfare Subtotal	19	123	10	152	20	109	10	139	21	113	10	144	24	126	12	162
38 National Security and Intelligence																
681 Middle East, Africa, South Asia	0	7	9	16	0	10	7	17	0	9	6	15	0	7	11	18
682 Far East, Southeast Asia Pacific	1	8	8	17	1	3	11	15	1	3	11	15	2	6	9	17
683 Western Hemishere	0	6	7	13	0	4	8	12	0	4	6	10	0	7	8	15
684 Russia, Europe, Central Asia	3	11	6	20	5	9	6	20	5	7	6	18	5	8	7	20
688 Strategic Planning	2	18	1	21	3	15	0	18	3	15	0	18	1	13	0	14
689 Civil-Military Relations	0	0	0	0	9	0	0	9	9	0	0	9	9	0	0	9
699 Special Operations/Low Intensity Conflict	0	14	30	44	0	6	17	23	0	6	16	22	0	13	26	39
824 Intelligence (Regional Studies)	0	14	0	14	0	13	0	13	0	12	0	12	0	14	0	14
825 Intelligence (OPINTEL)	0	9	0	9	0	5	0	5	0	6	0	6	0	6	0	6
National Security and Intelligence Subtotal	6	87	61	154	18	65	49	132	18	62	45	125	17	74	61	152
39 Joint C4I Systems																
365 Command, Control and Communications	0	16	14	30	0	16	14	30	0	16	14	30	0	8	8	16
823 Intelligence	0	5	0	5	0	6	0	6	0	7	0	7	0	8	0	8
Joint C4I Systems Subtotal	0	21	14	35	0	22	14	36	0	23	14	37	0	16	8	24
TOTAL	191	953	361	1,505	195	898	319	1,412	183	828	302	1,313	177	961	347	1,485

APPENDIX D. MODEL RUN DATA

COST PER CURRICULUM MODEL INPUT PAGE

WELCOME to the COST PER CURRICULUM MODEL INPUT page. Here, you may select which costs will be included in the model and define other assumption. The cost drivers that you select are then summed up, resulting in a TOTAL COST for each Academic Department. (See COST REF page)

Then, for each department, the total department cost is allocated to each course provided during FY96. This allocation is accomplished using the Weighted Cost Hour (WCH) as an allocation base. This results in a COST PER COURSE in each academic department.

The COST PER COURSE is then distributed to each of the students enrolled in the course by curriculum. These costs are summed for each curriculum, resulting in a TOTAL CURRICULUM COST.

The TOTAL CURRICULUM COST is then divided by the average number of students in that particular curriculum during FY96, based on Average On Board (AOB) reports, resulting in the COST PER STUDENT in each curriculum.

Please check all costs that you would like to include in the model:

- ☑ Civilian Faculty Direct Teaching (DT) Salary
- ☑ INCLUDE Civilian Faculty Fringe Benefits (21%)
- ☐ Military Faculty Salary (DOES NOT INCLUDE RESEARCH)
- ☐ Mission Staff Direct (DIR) Salary
- ☐ INCLUDE Mission Staff Fringe Benefits (23%)
- ☐ Academic Department OPTAR and TRAVEL
- ☐ INDIRECT COSTS (see INDIRECT page for description)
- ☐ OTHER COSTS (to be added to the model)

Weighted Cost Hours (WCH)

The Academic Department Costs must be allocated to each of the eligible courses that were taught during the year. The allocation base is a combination of two important variables: LECTURE HOURS and LAB HOURS. See Thesis text for a discussion of the Weighted Cost Hour allocation base. The model has been set up so that you may determine what allocation base is used in the model.
The formula is :

WEIGHTED COST HOURS = A X LECTURE HOURS + B X LAB HOURS

where A and B are INPUTS to the model, as follows:

A = 1 (LECTURE HOURS COEFFICIENT)

B = 1.5 (LAB HOURS COEFFICIENT)

Courses with less than a specified number of Students

This model includes ALL courses that were provided during FY96. That includes all Directed Study and Directed Reading Courses. For costing purposes, it is inappropriate to include ALL the courses taught by a particular department when allocating the department's costs. The general rule is that a Department does not get credit (towards the budget) for any course with 4 OR LESS students. Therefore, most departments do not give Direct Teaching Credit for courses with 4 OR LESS students. The following input is used to eliminate courses with less than or equal to a specified number of students.

Eliminate any course with a class size of less than or equal to 4

Double check your input selections and then click on the CALCULATE button to run the model. → CALCULATE

COST PER CURRICULUM MODEL OUTPUT PAGE

Code	Curriculum	Total Cost	FY96 AOB	Cost per Student
30	**Operations Analysis**			
360	Operations Analysis	$1,101,278	114	$9,660
361	Operations Logistics	$247,354	28	$8,834
380	Advanced Science (Applied Math)	$177,527	15	$11,835
			157	
31	**Aeronautical Engineering**			
610	Aeronautical Engineering	$552,530	34	$16,251
611	Aeronautical Engineering with Avionics	$350,943	23	$15,258
612	NPS/TPS	$329,780	16	$20,611
			73	
32	**Electronics and Computer Programs**			
368	Computer Science	$960,766	88	$10,918
590	Electronic Systems	$1,344,479	111	$12,112
			199	
33	**Combat Systems Sciences and Technology**			
533	Combat Sciences	$1,532,254	90	$17,025
			90	
34	**Naval/Mechanical Engineering**			
570	Naval/Mechanical Engineering	$1,263,767	74	$17,078
			74	
35	**Meteorology and Oceanography Programs**			
372	Meteorology	$72,959	3	$24,320
373	Meteorology and Oceanography	$992,593	46	$21,578
374	Operational Oceanography	$277,303	14	$19,807
440	Oceanography	$131,664	8	$16,458
			71	
36	**Systems Management**			
370	Information Technology Management	$1,546,931	162	$9,549
813	Transportation Logistics Management	$74,784	7	$10,683
814	Transportation Management	$98,018	12	$8,168
815	Acquisition and Contract Management	$321,417	34	$9,453
816	Systems Acquisition Management	$375,743	38	$9,888
817	Allied, DOD, USA,USMC, and USCG	$57,102	10	$5,710
818	Defense Systems Management	$69,613	8	$8,702
819	Systems Inventory Management	$65,179	7	$9,311
820	Resource Planning and Management (INTL)	$99,744	11	$9,068
827	Material Logistics Support Management	$309,936	38	$8,156
837	Financial Management	$524,550	59	$8,891
847	Manpower/Personnel Training Analysis	$499,976	59	$8,474
			445	
37	**Undersea, Space and Information Warfare**			
364	Space Systems Operations International	$26,817	3	$8,939
366	Space Systems Operations	$531,572	37	$14,367
525	Undersea Warfare	$451,712	22	$20,532
526	Undersea Warfare International	$75,594	5	$15,119
591	Space Systems Engineering	$739,502	49	$15,092
595	Information Warfare	$271,692	21	$12,938
596	Information Warfare International	$181,144	14	$12,939
			151	
38	**National Security and Intelligence**			
681	Middle East, Africa, South Asia	$161,766	17	$9,516
682	Far East, Southeast Asia Pacific	$133,018	16	$8,314
683	Western Hemishere	$126,471	13	$9,729
684	Russia, Europe, Central Asia	$197,577	20	$9,879
688	Strategic Planning	$217,455	18	$12,081
689	Civil-Military Relations	$65,875	7	$9,411
699	Special Operations/Low Intensity Conflict	$239,150	32	$7,473
824	Intelligence (Regional Studies)	$105,517	13	$8,117
825	Intelligence (OPINTEL)	$55,760	7	$7,966
			143	
39	**Joint C4I Systems**			
365	Command, Control and Communications	$454,803	27	$16,845
823	Intelligence	$113,950	7	$16,279
			34	
	TOTAL	**$17,527,565**	**1,437**	**$12,197**
			Total #	**per course**
OTHER 555	Non-DOD students under MOU with UCSC.	$2,414	2	$1,207
777	Distance Learning students	$59,634	79	$755
888	Continuing Education Courses	$0	2	$0
999	NPS Staff Personnel taking courses	$0	254	$0
	TOTAL	**$17,589,613**		
	TOTAL COSTS FROM THE INPUT PAGE	**$17,589,613**		

COST PER CURRICULUM MODEL INPUT PAGE

WELCOME to the COST PER CURRICULUM MODEL INPUT page. Here, you may select which costs will be included in the model and define other assumption. The cost drivers that you select are then summed up, resulting in a TOTAL COST for each Academic Department. (See COST REF page)

Then, for each department, the total department cost is allocated to each course provided during FY96. This allocation is accomplished using the Weighted Cost Hour (WCH) as an allocation base. This results in a COST PER COURSE in each academic department.

The COST PER COURSE is then distributed to each of the students enrolled in the course by curriculum. These costs are summed for each curriculum, resulting in a TOTAL CURRICULUM COST.

The TOTAL CURRICULUM COST is then divided by the average number of students in that particular curriculum during FY96, based on Average On Board (AOB) reports, resulting in the COST PER STUDENT in each curriculum.

Please check all costs that you would like to include in the model:

- [x] Civilian Faculty Direct Teaching (DT) Salary
- [x] INCLUDE Civilian Faculty Fringe Benefits (21%)
- [ ] Military Faculty Salary (DOES NOT INCLUDE RESEARCH)
- [ ] Mission Staff Direct (DIR) Salary
- [ ] INCLUDE Mission Staff Fringe Benefits (23%)
- [x] Academic Department OPTAR and TRAVEL
- [ ] INDIRECT COSTS (see INDIRECT page for description)
- [ ] OTHER COSTS (to be added to the model)

Weighted Cost Hours (WCH)

The Academic Department Costs must be allocated to each of the eligible courses that were taught during the year. The allocation base is a combination of two important variables: LECTURE HOURS and LAB HOURS. See Thesis text for a discussion of the Weighted Cost Hour allocation base. The model has been set up so that you may determine what allocation base is used in the model.
The formula is :

WEIGHTED COST HOURS = A X LECTURE HOURS + B X LAB HOURS

where A and B are INPUTS to the model, as follows:

A = 1 (LECTURE HOURS COEFFICIENT)

B = 1.5 (LAB HOURS COEFFICIENT)

Courses with less than a specified number of Students

This model includes ALL courses that were provided during FY96. That includes all Directed Study and Directed Reading Courses. For costing purposes, it is inappropriate to include ALL the courses taught by a particular department when allocating the department's costs. The general rule is that a Department does not get credit (towards the budget) for any course with 4 OR LESS students. Therefore, most departments do not give Direct Teaching Credit for courses with 4 OR LESS students. The following input is used to eliminate courses with less than or equal to a specified number of students.

Eliminate any course with a class size of less than or equal to 4

Double check your input selections and then click on the CALCULATE button to run the model. → CALCULATE

COST PER CURRICULUM MODEL OUTPUT PAGE

Code	Curriculum	Total Cost	FY96 AOB	Cost per Student
30	**Operations Analysis**			
360	Operations Analysis	$1,187,337	114	$10,415
361	Operations Logistics	$266,778	28	$9,528
380	Advanced Science (Applied Math)	$191,331	15	$12,755
			157	
31	**Aeronautical Engineering**			
610	Aeronautical Engineering	$608,048	34	$17,884
611	Aeronautical Engineering with Avionics	$388,818	23	$16,905
612	NPS/TPS	$362,984	16	$22,687
			73	
32	**Electronics and Computer Programs**			
368	Computer Science	$1,130,306	88	$12,844
590	Electronic Systems	$1,505,792	111	$13,566
			199	
33	**Combat Systems Sciences and Technology**			
533	Combat Sciences	$1,648,001	90	$18,311
			90	
34	**Naval/Mechanical Engineering**			
570	Naval/Mechanical Engineering	$1,369,147	74	$18,502
			74	
35	**Meteorology and Oceanography Programs**			
372	Meteorology	$77,669	3	$25,890
373	Meteorology and Oceanography	$1,053,773	46	$22,908
374	Operational Oceanography	$293,964	14	$20,997
440	Oceanography	$139,380	8	$17,422
			71	
36	**Systems Management**			
370	Information Technology Management	$1,718,372	162	$10,607
813	Transportation Logistics Management	$81,694	7	$11,671
814	Transportation Management	$106,992	12	$8,916
815	Acquisition and Contract Management	$350,867	34	$10,320
816	Systems Acquisition Management	$410,637	38	$10,806
817	Allied, DOD, USA,USMC, and USCG	$62,329	10	$6,233
818	Defense Systems Management	$75,554	8	$9,444
819	Systems Inventory Management	$70,946	7	$10,135
820	Resource Planning and Management (INTL)	$107,943	11	$9,813
827	Material Logistics Support Management	$338,315	38	$8,903
837	Financial Management	$572,416	59	$9,702
847	Manpower/Personnel Training Analysis	$545,561	59	$9,247
			445	
37	**Undersea, Space and Information Warfare**			
364	Space Systems Operations International	$29,642	3	$9,881
366	Space Systems Operations	$590,529	37	$15,960
525	Undersea Warfare	$488,542	22	$22,206
526	Undersea Warfare International	$81,481	5	$16,296
591	Space Systems Engineering	$817,322	49	$16,680
595	Information Warfare	$302,353	21	$14,398
596	Information Warfare International	$202,042	14	$14,432
			151	
38	**National Security and Intelligence**			
681	Middle East, Africa, South Asia	$171,565	17	$10,092
682	Far East, Southeast Asia Pacific	$141,002	16	$8,813
683	Western Hemishere	$134,063	13	$10,313
684	Russia, Europe, Central Asia	$209,437	20	$10,472
688	Strategic Planning	$230,779	18	$12,821
689	Civil-Military Relations	$69,829	7	$9,976
699	Special Operations/Low Intensity Conflict	$254,737	32	$7,961
824	Intelligence (Regional Studies)	$111,878	13	$8,606
825	Intelligence (OPINTEL)	$59,328	7	$8,475
			143	
39	**Joint C4I Systems**			
365	Command, Control and Communications	$510,400	27	$18,904
823	Intelligence	$126,953	7	$18,136
			34	
	TOTAL	**$19,196,835**	**1,437**	**$13,359**
			Total #	**per course**
OTHER 555	Non-DOD students under MOU with UCSC.	$2,562	2	$1,281
777	Distance Learning students	$66,651	79	$844
888	Continuing Education Courses	$0	2	$0
999	NPS Staff Personnel taking courses	$0	254	$0
	TOTAL	**$19,266,048**		
	TOTAL COSTS FROM THE INPUT PAGE	**$19,266,048**		

COST PER CURRICULUM MODEL INPUT PAGE

WELCOME to the COST PER CURRICULUM MODEL INPUT page. Here, you may select which costs will be included in the model and define other assumption. The cost drivers that you select are then summed up, resulting in a TOTAL COST for each Academic Department. (See COST REF page)

Then, for each department, the total department cost is allocated to each course provided during FY96. This allocation is accomplished using the Weighted Cost Hour (WCH) as an allocation base. This results in a COST PER COURSE in each academic department.

The COST PER COURSE is then distributed to each of the students enrolled in the course by curriculum. These costs are summed for each curriculum, resulting in a TOTAL CURRICULUM COST.

The TOTAL CURRICULUM COST is then divided by the average number of students in that particular curriculum during FY96, based on Average On Board (AOB) reports, resulting in the COST PER STUDENT in each curriculum.

Please check all costs that you would like to include in the model:

- ☑ Civilian Faculty Direct Teaching (DT) Salary
- ☑ INCLUDE Civilian Faculty Fringe Benefits (21%)
- ☑ Military Faculty Salary (DOES NOT INCLUDE RESEARCH)
- ☐ Mission Staff Direct (DIR) Salary
- ☐ INCLUDE Mission Staff Fringe Benefits (23%)
- ☐ Academic Department OPTAR and TRAVEL
- ☐ INDIRECT COSTS (see INDIRECT page for description)
- ☐ OTHER COSTS (to be added to the model)

Weighted Cost Hours (WCH)

The Academic Department Costs must be allocated to each of the eligible courses that were taught during the year. The allocation base is a combination of two important variables: LECTURE HOURS and LAB HOURS. See Thesis text for a discussion of the Weighted Cost Hour allocation base. The model has been set up so that you may determine what allocation base is used in the model.
The formula is :

WEIGHTED COST HOURS = A X LECTURE HOURS + B X LAB HOURS

where A and B are INPUTS to the model, as follows:

A = 1 (LECTURE HOURS COEFFICIENT)

B = 1.5 (LAB HOURS COEFFICIENT)

Courses with less than a specified number of Students

This model includes ALL courses that were provided during FY96. That includes all Directed Study and Directed Reading Courses. For costing purposes, it is inappropriate to include ALL the courses taught by a particular department when allocating the department's costs. The general rule is that a Department does not get credit (towards the budget) for any course with 4 OR LESS students. Therefore, most departments do not give Direct Teaching Credit for courses with 4 OR LESS students. The following input is used to eliminate courses with less than or equal to a specified number of students.

Eliminate any course with a class size of less than or equal to 4

Double check your input selections and then click on the CALCULATE button to run the model. → CALCULATE

COST PER CURRICULUM MODEL OUTPUT PAGE

Code	Curriculum	Total Cost	FY96 AOB	Cost per Student
30	**Operations Analysis**			
360	Operations Analysis	$1,170,456	114	$10,267
361	Operations Logistics	$266,257	28	$9,509
380	Advanced Science (Applied Math)	$180,366	15	$12,024
			157	
31	**Aeronautical Engineering**			
610	Aeronautical Engineering	$589,093	34	$17,326
611	Aeronautical Engineering with Avionics	$371,713	23	$16,161
612	NPS/TPS	$349,510	16	$21,844
			73	
32	**Electronics and Computer Programs**			
368	Computer Science	$1,223,763	88	$13,906
590	Electronic Systems	$1,429,031	111	$12,874
			199	
33	**Combat Systems Sciences and Technology**			
533	Combat Sciences	$1,630,964	90	$18,122
			90	
34	**Naval/Mechanical Engineering**			
570	Naval/Mechanical Engineering	$1,345,749	74	$18,186
			74	
35	**Meteorology and Oceanography Programs**			
372	Meteorology	$123,611	3	$41,204
373	Meteorology and Oceanography	$1,520,950	46	$33,064
374	Operational Oceanography	$363,739	14	$25,981
440	Oceanography	$167,941	8	$20,993
			71	
36	**Systems Management**			
370	Information Technology Management	$1,897,335	162	$11,712
813	Transportation Logistics Management	$92,985	7	$13,281
814	Transportation Management	$120,752	12	$10,063
815	Acquisition and Contract Management	$398,804	34	$11,730
816	Systems Acquisition Management	$463,041	38	$12,185
817	Allied, DOD, USA,USMC, and USCG	$69,862	10	$6,986
818	Defense Systems Management	$83,405	8	$10,426
819	Systems Inventory Management	$78,217	7	$11,174
820	Resource Planning and Management (INTL)	$122,189	11	$11,108
827	Material Logistics Support Management	$382,638	38	$10,069
837	Financial Management	$642,136	59	$10,884
847	Manpower/Personnel Training Analysis	$612,124	59	$10,375
			445	
37	**Undersea, Space and Information Warfare**			
364	Space Systems Operations International	$30,660	3	$10,220
366	Space Systems Operations	$635,910	37	$17,187
525	Undersea Warfare	$490,250	22	$22,284
526	Undersea Warfare International	$80,553	5	$16,111
591	Space Systems Engineering	$820,704	49	$16,749
595	Information Warfare	$305,669	21	$14,556
596	Information Warfare International	$195,848	14	$13,989
			151	
38	**National Security and Intelligence**			
681	Middle East, Africa, South Asia	$184,197	17	$10,835
682	Far East, Southeast Asia Pacific	$151,879	16	$9,492
683	Western Hemishere	$144,404	13	$11,108
684	Russia, Europe, Central Asia	$225,593	20	$11,280
688	Strategic Planning	$247,366	18	$13,743
689	Civil-Military Relations	$75,216	7	$10,745
699	Special Operations/Low Intensity Conflict	$272,082	32	$8,503
824	Intelligence (Regional Studies)	$120,437	13	$9,264
825	Intelligence (OPINTEL)	$64,117	7	$9,160
			143	
39	**Joint C4I Systems**			
365	Command, Control and Communications	$572,328	27	$21,197
823	Intelligence	$133,618	7	$19,088
			34	
	TOTAL	$20,447,441	1,437	$14,229
			Total #	per course
OTHER 555	Non-DOD students under MOU with UCSC.	$3,976	2	$1,988
777	Distance Learning students	$65,354	79	$827
888	Continuing Education Courses	$0	2	$0
999	NPS Staff Personnel taking courses	$0	254	$0
	TOTAL	$20,516,771		
	TOTAL COSTS FROM THE INPUT PAGE	$20,516,771		

COST PER CURRICULUM MODEL INPUT PAGE

WELCOME to the COST PER CURRICULUM MODEL INPUT page. Here, you may select which costs will be included in the model and define other assumption. The cost drivers that you select are then summed up, resulting in a TOTAL COST for each Academic Department. (See COST REF page)

Then, for each department, the total department cost is allocated to each course provided during FY96. This allocation is accomplished using the Weighted Cost Hour (WCH) as an allocation base. This results in a COST PER COURSE in each academic department.

The COST PER COURSE is then distributed to each of the students enrolled in the course by curriculum. These costs are summed for each curriculum, resulting in a TOTAL CURRICULUM COST.

The TOTAL CURRICULUM COST is then divided by the average number of students in that particular curriculum during FY96, based on Average On Board (AOB) reports, resulting in the COST PER STUDENT in each curriculum.

Please check all costs that you would like to include in the model:

- ☑ Civilian Faculty Direct Teaching (DT) Salary
- ☑ INCLUDE Civilian Faculty Fringe Benefits (21%)
- ☑ Military Faculty Salary (DOES NOT INCLUDE RESEARCH)
- ☐ Mission Staff Direct (DIR) Salary
- ☐ INCLUDE Mission Staff Fringe Benefits (23%)
- ☑ Academic Department OPTAR and TRAVEL
- ☐ INDIRECT COSTS (see INDIRECT page for description)
- ☐ OTHER COSTS (to be added to the model)

Weighted Cost Hours (WCH)

The Academic Department Costs must be allocated to each of the eligible courses that were taught during the year. The allocation base is a combination of two important variables: LECTURE HOURS and LAB HOURS. See Thesis text for a discussion of the Weighted Cost Hour allocation base. The model has been set up so that you may determine what allocation base is used in the model. The formula is :

WEIGHTED COST HOURS = A X LECTURE HOURS + B X LAB HOURS

where A and B are INPUTS to the model, as follows:

A = 1 (LECTURE HOURS COEFFICIENT)

B = 1.5 (LAB HOURS COEFFICIENT)

Courses with less than a specified number of Students

This model includes ALL courses that were provided during FY96. That includes all Directed Study and Directed Reading Courses. For costing purposes, it is inappropriate to include ALL the courses taught by a particular department when allocating the department's costs. The general rule is that a Department does not get credit (towards the budget) for any course with 4 OR LESS students. Therefore, most departments do not give Direct Teaching Credit for courses with 4 OR LESS students. The following input is used to eliminate courses with less than or equal to a specified number of students.

Eliminate any course with a class size of less than or equal to 4

Double check your input selections and then click on the CALCULATE button to run the model. → CALCULATE

COST PER CURRICULUM MODEL OUTPUT PAGE

Code	Curriculum	Total Cost	FY96 AOB	Cost per Student
30	**Operations Analysis**			
360	Operations Analysis	$1,256,515	114	$11,022
361	Operations Logistics	$285,681	28	$10,203
380	Advanced Science (Applied Math)	$194,171	15	$12,945
			157	
31	**Aeronautical Engineering**			
610	Aeronautical Engineering	$644,611	34	$18,959
611	Aeronautical Engineering with Avionics	$409,587	23	$17,808
612	NPS/TPS	$382,715	16	$23,920
			73	
32	**Electronics and Computer Programs**			
368	Computer Science	$1,393,303	88	$15,833
590	Electronic Systems	$1,590,344	111	$14,327
			199	
33	**Combat Systems Sciences and Technology**			
533	Combat Sciences	$1,746,710	90	$19,408
			90	
34	**Naval/Mechanical Engineering**			
570	Naval/Mechanical Engineering	$1,451,129	74	$19,610
			74	
35	**Meteorology and Oceanography Programs**			
372	Meteorology	$128,321	3	$42,774
373	Meteorology and Oceanography	$1,582,130	46	$34,394
374	Operational Oceanography	$380,400	14	$27,171
440	Oceanography	$175,657	8	$21,957
			71	
36	**Systems Management**			
370	Information Technology Management	$2,068,776	162	$12,770
813	Transportation Logistics Management	$99,874	7	$14,268
814	Transportation Management	$129,726	12	$10,810
815	Acquisition and Contract Management	$428,254	34	$12,596
816	Systems Acquisition Management	$497,935	38	$13,104
817	Allied, DOD, USA,USMC, and USCG	$75,088	10	$7,509
818	Defense Systems Management	$89,346	8	$11,168
819	Systems Inventory Management	$83,985	7	$11,998
820	Resource Planning and Management (INTL)	$130,387	11	$11,853
827	Material Logistics Support Management	$411,018	38	$10,816
837	Financial Management	$690,002	59	$11,695
847	Manpower/Personnel Training Analysis	$657,709	59	$11,148
			445	
37	**Undersea, Space and Information Warfare**			
364	Space Systems Operations International	$33,485	3	$11,162
366	Space Systems Operations	$694,867	37	$18,780
525	Undersea Warfare	$527,080	22	$23,958
526	Undersea Warfare International	$86,440	5	$17,288
591	Space Systems Engineering	$898,524	49	$18,337
595	Information Warfare	$336,330	21	$16,016
596	Information Warfare International	$216,746	14	$15,482
			151	
38	**National Security and Intelligence**			
681	Middle East, Africa, South Asia	$193,996	17	$11,412
682	Far East, Southeast Asia Pacific	$159,864	16	$9,991
683	Western Hemishere	$151,996	13	$11,692
684	Russia, Europe, Central Asia	$237,453	20	$11,873
688	Strategic Planning	$260,690	18	$14,483
689	Civil-Military Relations	$79,170	7	$11,310
699	Special Operations/Low Intensity Conflict	$287,669	32	$8,990
824	Intelligence (Regional Studies)	$126,798	13	$9,754
825	Intelligence (OPINTEL)	$67,685	7	$9,669
			143	
39	**Joint C4I Systems**			
365	Command, Control and Communications	$627,925	27	$23,256
823	Intelligence	$146,621	7	$20,946
			34	
	TOTAL	**$22,116,711**	**1,437**	**$15,391**
			Total #	**per course**
OTHER 555	Non-DOD students under MOU with UCSC.	$4,123	2	$2,062
777	Distance Learning students	$72,371	79	$916
888	Continuing Education Courses	$0	2	$0
999	NPS Staff Personnel taking courses	$0	254	$0
	TOTAL	**$22,193,206**		
	TOTAL COSTS FROM THE INPUT PAGE	**$22,193,206**		

COST PER CURRICULUM MODEL INPUT PAGE

WELCOME to the COST PER CURRICULUM MODEL INPUT page. Here, you may select which costs will be included in the model and define other assumption. The cost drivers that you select are then summed up, resulting in a TOTAL COST for each Academic Department. (See COST REF page)

Then, for each department, the total department cost is allocated to each course provided during FY96. This allocation is accomplished using the Weighted Cost Hour (WCH) as an allocation base. This results in a COST PER COURSE in each academic department.

The COST PER COURSE is then distributed to each of the students enrolled in the course by curriculum. These costs are summed for each curriculum, resulting in a TOTAL CURRICULUM COST.

The TOTAL CURRICULUM COST is then divided by the average number of students in that particular curriculum during FY96, based on Average On Board (AOB) reports, resulting in the COST PER STUDENT in each curriculum.

Please check all costs that you would like to include in the model:

- ☑ Civilian Faculty Direct Teaching (DT) Salary
- ☑ INCLUDE Civilian Faculty Fringe Benefits (21%)
- ☑ Military Faculty Salary (DOES NOT INCLUDE RESEARCH)
- ☑ Mission Staff Direct (DIR) Salary
- ☑ INCLUDE Mission Staff Fringe Benefits (23%)
- ☑ Academic Department OPTAR and TRAVEL
- ☐ INDIRECT COSTS (see INDIRECT page for description)
- ☐ OTHER COSTS (to be added to the model)

Weighted Cost Hours (WCH)

The Academic Department Costs must be allocated to each of the eligible courses that were taught during the year. The allocation base is a combination of two important variables: LECTURE HOURS and LAB HOURS. See Thesis text for a discussion of the Weighted Cost Hour allocation base. The model has been set up so that you may determine what allocation base is used in the model.
The formula is :

WEIGHTED COST HOURS = A X LECTURE HOURS + B X LAB HOURS

where A and B are INPUTS to the model, as follows:

A = 1 (LECTURE HOURS COEFFICIENT)

B = 1.5 (LAB HOURS COEFFICIENT)

Courses with less than a specified number of Students

This model includes ALL courses that were provided during FY96. That includes all Directed Study and Directed Reading Courses. For costing purposes, it is inappropriate to include ALL the courses taught by a particular department when allocating the department's costs. The general rule is that a Department does not get credit (towards the budget) for any course with 4 OR LESS students. Therefore, most departments do not give Direct Teaching Credit for courses with 4 OR LESS students. The following input is used to eliminate courses with less than or equal to a specified number of students.

Eliminate any course with a class size of less than or equal to 4

Double check your input selections and then click on the CALCULATE button to run the model. → CALCULATE

COST PER CURRICULUM MODEL OUTPUT PAGE

Code	Curriculum	Total Cost	FY96 AOB	Cost per Student
30	**Operations Analysis**			
360	Operations Analysis	$1,516,937	114	$13,306
361	Operations Logistics	$340,718	28	$12,169
380	Advanced Science (Applied Math)	$214,712	15	$14,314
			157	
31	**Aeronautical Engineering**			
610	Aeronautical Engineering	$902,952	34	$26,557
611	Aeronautical Engineering with Avionics	$561,781	23	$24,425
612	NPS/TPS	$519,593	16	$32,475
			73	
32	**Electronics and Computer Programs**			
368	Computer Science	$1,824,468	88	$20,733
590	Electronic Systems	$2,092,536	111	$18,852
			199	
33	**Combat Systems Sciences and Technology**			
533	Combat Sciences	$2,387,091	90	$26,523
			90	
34	**Naval/Mechanical Engineering**			
570	Naval/Mechanical Engineering	$1,908,729	74	$25,794
			74	
35	**Meteorology and Oceanography Programs**			
372	Meteorology	$172,300	3	$57,433
373	Meteorology and Oceanography	$2,130,896	46	$46,324
374	Operational Oceanography	$510,217	14	$36,444
440	Oceanography	$238,091	8	$29,761
			71	
36	**Systems Management**			
370	Information Technology Management	$2,380,601	162	$14,695
813	Transportation Logistics Management	$107,925	7	$15,418
814	Transportation Management	$139,672	12	$11,639
815	Acquisition and Contract Management	$460,574	34	$13,546
816	Systems Acquisition Management	$542,777	38	$14,284
817	Allied, DOD, USA,USMC, and USCG	$81,674	10	$8,167
818	Defense Systems Management	$96,237	8	$12,030
819	Systems Inventory Management	$93,126	7	$13,304
820	Resource Planning and Management (INTL)	$139,100	11	$12,645
827	Material Logistics Support Management	$443,647	38	$11,675
837	Financial Management	$748,936	59	$12,694
847	Manpower/Personnel Training Analysis	$716,718	59	$12,148
			445	
37	**Undersea, Space and Information Warfare**			
364	Space Systems Operations International	$43,110	3	$14,370
366	Space Systems Operations	$875,001	37	$23,649
525	Undersea Warfare	$696,033	22	$31,638
526	Undersea Warfare International	$113,056	5	$22,611
591	Space Systems Engineering	$1,214,582	49	$24,787
595	Information Warfare	$441,736	21	$21,035
596	Information Warfare International	$289,675	14	$20,691
			151	
38	**National Security and Intelligence**			
681	Middle East, Africa, South Asia	$209,348	17	$12,315
682	Far East, Southeast Asia Pacific	$171,942	16	$10,746
683	Western Hemishere	$163,480	13	$12,575
684	Russia, Europe, Central Asia	$255,393	20	$12,770
688	Strategic Planning	$282,696	18	$15,705
689	Civil-Military Relations	$85,152	7	$12,165
699	Special Operations/Low Intensity Conflict	$312,721	32	$9,773
824	Intelligence (Regional Studies)	$136,518	13	$10,501
825	Intelligence (OPINTEL)	$73,827	7	$10,547
			143	
39	**Joint C4I Systems**			
365	Command, Control and Communications	$773,392	27	$28,644
823	Intelligence	$183,302	7	$26,186
			34	
	TOTAL	$27,592,971	1,437	$19,202
			Total #	per course
OTHER 555	Non-DOD students under MOU with UCSC.	$5,627	2	$2,813
777	Distance Learning students	$96,259	79	$1,218
888	Continuing Education Courses	$0	2	$0
999	NPS Staff Personnel taking courses	$0	254	$0
	TOTAL	$27,694,857		
	TOTAL COSTS FROM THE INPUT PAGE	$27,694,857		

COST PER CURRICULUM MODEL INPUT PAGE

WELCOME to the COST PER CURRICULUM MODEL INPUT page. Here, you may select which costs will be included in the model and define other assumption. The cost drivers that you select are then summed up, resulting in a TOTAL COST for each Academic Department. (See COST REF page)

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The COST PER COURSE is then distributed to each of the students enrolled in the course by curriculum. These costs are summed for each curriculum, resulting in a TOTAL CURRICULUM COST.

The TOTAL CURRICULUM COST is then divided by the average number of students in that particular curriculum during FY96, based on Average On Board (AOB) reports, resulting in the COST PER STUDENT in each curriculum.

Please check all costs that you would like to include in the model:

- ☑ Civilian Faculty Direct Teaching (DT) Salary
- ☑ INCLUDE Civilian Faculty Fringe Benefits (21%)
- ☑ Military Faculty Salary (DOES NOT INCLUDE RESEARCH)
- ☐ Mission Staff Direct (DIR) Salary
- ☐ INCLUDE Mission Staff Fringe Benefits (23%)
- ☐ Academic Department OPTAR and TRAVEL
- ☑ INDIRECT COSTS (see INDIRECT page for description)
- ☐ OTHER COSTS (to be added to the model)

Weighted Cost Hours (WCH)

The Academic Department Costs must be allocated to each of the eligible courses that were taught during the year. The allocation base is a combination of two important variables: LECTURE HOURS and LAB HOURS. See Thesis text for a discussion of the Weighted Cost Hour allocation base. The model has been set up so that you may determine what allocation base is used in the model.
The formula is :

WEIGHTED COST HOURS = A X LECTURE HOURS + B X LAB HOURS

where A and B are INPUTS to the model, as follows:

A = 1 (LECTURE HOURS COEFFICIENT)
B = 1.5 (LAB HOURS COEFFICIENT)

Courses with less than a specified number of Students

This model includes ALL courses that were provided during FY96. That includes all Directed Study and Directed Reading Courses. For costing purposes, it is inappropriate to include ALL the courses taught by a particular department when allocating the department's costs. The general rule is that a Department does not get credit (towards the budget) for any course with 4 OR LESS students. Therefore, most departments do not give Direct Teaching Credit for courses with 4 OR LESS students. The following input is used to eliminate courses with less than or equal to a specified number of students.

Eliminate any course with a class size of less than or equal to 4

Double check your input selections and then click on the CALCULATE button to run the model. → CALCULATE

COST PER CURRICULUM MODEL OUTPUT PAGE

Code	Curriculum	Total Cost	FY96 AOB	Cost per Student
30	**Operations Analysis**			
360	Operations Analysis	$4,464,006	114	$39,158
361	Operations Logistics	$983,500	28	$35,125
380	Advanced Science (Applied Math)	$554,646	15	$36,976
			157	
31	**Aeronautical Engineering**			
610	Aeronautical Engineering	$1,809,904	34	$53,232
611	Aeronautical Engineering with Avionics	$1,164,130	23	$50,614
612	NPS/TPS	$1,073,969	16	$67,123
			73	
32	**Electronics and Computer Programs**			
368	Computer Science	$3,818,223	88	$43,389
590	Electronic Systems	$4,573,158	111	$41,200
			199	
33	**Combat Systems Sciences and Technology**			
533	Combat Sciences	$5,717,970	90	$63,533
			90	
34	**Naval/Mechanical Engineering**			
570	Naval/Mechanical Engineering	$3,981,814	74	$53,808
			74	
35	**Meteorology and Oceanography Programs**			
372	Meteorology	$291,272	3	$97,091
373	Meteorology and Oceanography	$3,770,068	46	$81,958
374	Operational Oceanography	$973,306	14	$69,522
440	Oceanography	$463,640	8	$57,955
			71	
36	**Systems Management**			
370	Information Technology Management	$5,325,212	162	$32,872
813	Transportation Logistics Management	$249,445	7	$35,635
814	Transportation Management	$321,642	12	$26,803
815	Acquisition and Contract Management	$1,057,339	34	$31,098
816	Systems Acquisition Management	$1,263,947	38	$33,262
817	Allied, DOD, USA,USMC, and USCG	$189,169	10	$18,917
818	Defense Systems Management	$227,113	8	$28,389
819	Systems Inventory Management	$229,756	7	$32,822
820	Resource Planning and Management (INTL)	$325,384	11	$29,580
827	Material Logistics Support Management	$1,024,882	38	$26,971
837	Financial Management	$1,734,777	59	$29,403
847	Manpower/Personnel Training Analysis	$1,667,486	59	$28,262
			445	
37	**Undersea, Space and Information Warfare**			
364	Space Systems Operations International	$95,563	3	$31,854
366	Space Systems Operations	$1,686,277	37	$45,575
525	Undersea Warfare	$1,659,853	22	$75,448
526	Undersea Warfare International	$283,827	5	$56,765
591	Space Systems Engineering	$2,454,590	49	$50,094
595	Information Warfare	$964,814	21	$45,944
596	Information Warfare International	$657,990	14	$46,999
			151	
38	**National Security and Intelligence**			
681	Middle East, Africa, South Asia	$545,919	17	$32,113
682	Far East, Southeast Asia Pacific	$446,547	16	$27,909
683	Western Hemishere	$424,571	13	$32,659
684	Russia, Europe, Central Asia	$663,278	20	$33,164
688	Strategic Planning	$741,478	18	$41,193
689	Civil-Military Relations	$221,146	7	$31,592
699	Special Operations/Low Intensity Conflict	$803,655	32	$25,114
824	Intelligence (Regional Studies)	$354,570	13	$27,252
825	Intelligence (OPINTEL)	$186,311	7	$26,616
			143	
39	**Joint C4I Systems**			
365	Command, Control and Communications	$1,373,330	27	$50,864
823	Intelligence	$369,602	7	$52,800
			34	
	TOTAL	**$61,188,781**	**1,437**	**$42,581**
			Total #	per course
OTHER 555	Non-DOD students under MOU with UCSC.	$9,573	2	$4,787
777	Distance Learning students	$202,542	79	$2,564
888	Continuing Education Courses	$0	2	$0
999	NPS Staff Personnel taking courses	$0	254	$0
	TOTAL	**$61,400,897**		
	TOTAL COSTS FROM THE INPUT PAGE	**$61,400,897**		

MARGINAL COST PER STUDENT MODEL INPUT PAGE

Welcome to the Marginal Cost per Student INPUT Page. This model has been developed to analyze a single curriculum, but the methodology can be applied to any other curriculum. The data was extracted from the COST PER CURRICULUM MODEL by using a logic command to determine whether or not a course was taken by any students in the particular curriculum.

The model was developed using data from the 837 - FINANCIAL MANAGEMENT Curriculum ONLY. Assumptions are further explained in the text of the thesis.

INPUT the MAXIMUM Class size for the following course levels:

	1000	2000	3000	4000
Maximum Class Size	30	30	30	30

The maximum class size has been automatically constrained to **30** students, unless you INPUT less. This assumption is further explained in the text of the thesis.

INPUT the desired INCREASE in the number of students enrolled in the 837 Curriculum:

Number of Additional Students: 5

For each Department, INPUT HOW the Instruction should be provided for a NEW section:

NS	Divert a Professor from Research
SM	Divert a Professor from Research
MA	Divert a Professor from Research
OR	Divert a Professor from Research

AVAILABLE OPTIONS:

Hire a NEW Professor
DIVERT a Professor from Research
CONTRACT an Outside Instructor

Please see the OPTIONS Worksheet for a complete discussion of the available options.

☒ Check this block to INCLUDE FRINGE BENEFITS in the cost calcualtion of diverting a professor from Research.

A percentage of the DIRECT TEACHING salary (with or without fringe benefits) is assumed to be the cost of diverting a professor from research. INPUT the desired percentage. The model assumes 1/8 or 0.125, as explained in the text of the thesis. 1/8

MARGINAL COST OUTPUT

Based on the INPUT you entered above, the model has calculated the TOTAL MARGINAL COST of providing education to the number of additional students in the FINANCIAL MANAGEMENT Curriculum. The total cost is divided by the number of additional students (INPUT) resulting in a MARGINAL COST PER STUDENT.

Total Costs = $89,599 Cost per Student = $17,920

MARGINAL COST PER STUDENT MODEL INPUT PAGE

Welcome to the Marginal Cost per Student INPUT Page. This model has been developed to analyze a single curriculum, but the methodology can be applied to any other curriculum. The data was extracted from the COST PER CURRICULUM MODEL by using a logic command to determine whether or not a course was taken by any students in the particular curriculum.

The model was developed using data from the 837 - FINANCIAL MANAGEMENT Curriculum ONLY. Assumptions are further explained in the text of the thesis.

INPUT the MAXIMUM Class size for the following course levels:

	1000	2000	3000	4000
Maximum Class Size	30	30	30	30

The maximum class size has been automatically constrained to **30** students, unless you INPUT less. This assumption is further explained in the text of the thesis.

INPUT the desired INCREASE in the number of students enrolled in the 837 Curriculum:

Number of Additional Students: 10

For each Department, INPUT HOW the Instruction should be provided for a NEW section:

NS	Divert a Professor from Research
SM	Divert a Professor from Research
MA	Divert a Professor from Research
OR	Divert a Professor from Research

AVAILABLE OPTIONS:

Hire a NEW Professor
DIVERT a Professor from Research
CONTRACT an Outside Instructor

Please see the OPTIONS Worksheet for a complete discussion of the available options.

☒ Check this block to INCLUDE FRINGE BENEFITS in the cost calcualtion of diverting a professor from Research.

A percentage of the DIRECT TEACHING salary (with or without fringe benefits) is assumed to be the cost of diverting a professor from research. INPUT the desired percentage. The model assumes 1/8, or 0.125, as explained in the text of the thesis. 1/8

MARGINAL COST OUTPUT

Based on the INPUT you entered above, the model has calculated the TOTAL MARGINAL COST of providing education to the number of additional students in the FINANCIAL MANAGEMENT Curriculum. The total cost is divided by the number of additional students (INPUT) resulting in a MARGINAL COST PER STUDENT.

Total Costs = $154,419 Cost per Student = $15,442

MARGINAL COST PER STUDENT MODEL INPUT PAGE

Welcome to the Marginal Cost per Student INPUT Page. This model has been developed to analyze a single curriculum, but the methodology can be applied to any other curriculum. The data was extracted from the COST PER CURRICULUM MODEL by using a logic command to determine whether or not a course was taken by any students in the particular curriculum.

The model was developed using data from the 837 - FINANCIAL MANAGEMENT Curriculum ONLY. Assumptions are further explained in the text of the thesis.

INPUT the MAXIMUM Class size for the following course levels:

	1000	2000	3000	4000
Maximum Class Size	30	30	30	30

The maximum class size has been automatically constrained to **30** students, unless you INPUT less. This assumption is further explained in the text of the thesis.

INPUT the desired INCREASE in the number of students enrolled in the 837 Curriculum:

Number of Additional Students: 15

For each Department, INPUT HOW the Instruction should be provided for a NEW section:

NS	Divert a Professor from Research
SM	Divert a Professor from Research
MA	Divert a Professor from Research
OR	Divert a Professor from Research

AVAILABLE OPTIONS:

Hire a NEW Professor
DIVERT a Professor from Research
CONTRACT an Outside Instructor

Please see the OPTIONS Worksheet for a complete discussion of the available options.

☒ Check this block to INCLUDE FRINGE BENEFITS in the cost calcualtion of diverting a professor from Research.

A percentage of the DIRECT TEACHING salary (with or without fringe benefits) is assumed to be the cost of diverting a professor from research. INPUT the desired percentage. The model assumes 1/8 or 0.125, as explained in the text of the thesis. 1/8

MARGINAL COST OUTPUT

Based on the INPUT you entered above, the model has calculated the TOTAL MARGINAL COST of providing education to the number of additional students in the FINANCIAL MANAGEMENT Curriculum. The total cost is divided by the number of additional students (INPUT) resulting in a MARGINAL COST PER STUDENT.

Total Costs = $232,065 **Cost per Student = $15,471**

MARGINAL COST PER STUDENT MODEL INPUT PAGE

Welcome to the Marginal Cost per Student INPUT Page. This model has been developed to analyze a single curriculum, but the methodology can be applied to any other curriculum. The data was extracted from the COST PER CURRICULUM MODEL by using a logic command to determine whether or not a course was taken by any students in the particular curriculum.

The model was developed using data from the 837 - FINANCIAL MANAGEMENT Curriculum ONLY. Assumptions are further explained in the text of the thesis.

INPUT the MAXIMUM Class size for the following course levels:

	1000	2000	3000	4000
Maximum Class Size	30	30	30	30

The maximum class size has been automatically constrained to **30** students, unless you INPUT less. This assumption is further explained in the text of the thesis.

INPUT the desired INCREASE in the number of students enrolled in the 837 Curriculum:

Number of Additional Students: 20

For each Department, INPUT HOW the Instruction should be provided for a NEW section:

NS	Divert a Professor from Research
SM	Divert a Professor from Research
MA	Divert a Professor from Research
OR	Divert a Professor from Research

AVAILABLE OPTIONS:

Hire a NEW Professor
DIVERT a Professor from Research
CONTRACT an Outside Instructor

Please see the OPTIONS Worksheet for a complete discussion of the available options.

☒ Check this block to INCLUDE FRINGE BENEFITS in the cost calcualtion of diverting a professor from Research.

A percentage of the DIRECT TEACHING salary (with or without fringe benefits) is assumed to be the cost of diverting a professor from research. INPUT the desired percentage. The model assumes 1/8 or 0.125, as explained in the text of the thesis. 1/8

MARGINAL COST OUTPUT

Based on the INPUT you entered above, the model has calculated the TOTAL MARGINAL COST of providing education to the number of additional students in the FINANCIAL MANAGEMENT Curriculum. The total cost is divided by the number of additional students (INPUT) resulting in a MARGINAL COST PER STUDENT.

Total Costs = $281,244 Cost per Student = $14,062

MARGINAL COST PER STUDENT MODEL INPUT PAGE

Welcome to the Marginal Cost per Student INPUT Page. This model has been developed to analyze a single curriculum, but the methodology can be applied to any other curriculum. The data was extracted from the COST PER CURRICULUM MODEL by using a logic command to determine whether or not a course was taken by any students in the particular curriculum.

The model was developed using data from the 837 - FINANCIAL MANAGEMENT Curriculum ONLY. Assumptions are further explained in the text of the thesis.

INPUT the MAXIMUM Class size for the following course levels:

	1000	2000	3000	4000
Maximum Class Size	30	30	30	30

The maximum class size has been automatically constrained to **30** students, unless you INPUT less. This assumption is further explained in the text of the thesis.

INPUT the desired INCREASE in the number of students enrolled in the 837 Curriculum:

Number of Additional Students: 25

For each Department, INPUT HOW the Instruction should be provided for a NEW section:

NS	Divert a Professor from Research
SM	Divert a Professor from Research
MA	Divert a Professor from Research
OR	Divert a Professor from Research

AVAILABLE OPTIONS:

Hire a NEW Professor
DIVERT a Professor from Research
CONTRACT an Outside Instructor

Please see the OPTIONS Worksheet for a complete discussion of the available options.

☒ Check this block to INCLUDE FRINGE BENEFITS in the cost calcualtion of diverting a professor from Research.

A percentage of the DIRECT TEACHING salary (with or without fringe benefits) is assumed to be the cost of diverting a professor from research. INPUT the desired percentage. The model assumes 1/8 or 0.125, as explained in the text of the thesis. 1/8

MARGINAL COST OUTPUT

Based on the INPUT you entered above, the model has calculated the TOTAL MARGINAL COST of providing education to the number of additional students in the FINANCIAL MANAGEMENT Curriculum. The total cost is divided by the number of additional students (INPUT) resulting in a MARGINAL COST PER STUDENT.

Total Costs = $281,244 Cost per Student = $11,250

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