# DEFENSE ACQUISITION UNIVERSITY
## BCF 204 – Intermediate Cost Analysis

160331

***Course Learning/Performance Objectives followed by its enabling learning objectives on separate lines if specified.***

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| 1 | Apply the cost estimating process in the construction of a cost estimate. |
| | Describe the five steps in the Cost Estimating Process. |
| | Differentiate between the various types of estimates. |
| | Summarize the content and purpose of the Cost Analysis Requirements Document/Description (CARD). |
| | Explain the role of a cost analyst for documenting and presenting an estimate. |
| | Put the cost estimating process into practice in the preparation of group cost estimates. |
| 2 | Apply normalization techniques to transform the raw data to data readably usable for a given requirement (i.e. modeling, programmatic adjustments) given a scenario. |
| | Discuss normalization for content. |
| | Explain the concept of normalizing for quantity and the application of cost improvement curves. |
| | Convert dollars between then-year (TY), constant-year (CY), and base-year (BY) dollars by selecting the appropriate inflation index. |
| | Construct a simple weighted index. |
| | Calculate the cost impact to a program in TY$ where that program, expressed in TY$, is being stretched out and/or compressed |
| 3 | Formulate a cost estimate following the steps in the cost modeling process. |
| | List the steps in the cost modeling process . |
| | Give examples of what is to be accomplished during each of the steps in the cost modeling process. |
| | Explain the importance of each step in the cost modeling process and why the steps are sequenced as they are. |
| | Prepare a cost estimate using the steps in the process. |
| | Differentiate between examples of cost models which were properly or improperly developed, and for the improperly developed models, hypothesize which step(s) in the cost modeling process was either skipped or misapplied. |
| 4 | Apply parametric and / or non-parametric statistical concepts and tests to make inferences concerning cost estimating data |
| | Given Normal sample data, compute a Prediction Interval. |
| | Apply the Chi-Square Test to determine whether data are likely to have arisen from a particular probability distribution |
| | Apply the Wilcoxon Two-Sample Test to determine whether there is a significant difference between two groupings |
| | Apply Spearman Rank Correlation to determine whether there is a significant relationship between two variables, and compare the results to the Pearson correlation coefficient |
| 5 | Apply properties of the log-normal distribution to make inferences concerning cost estimating data |
| | Identify lognormally distributed data. |
| | Specify lognormal probability distributions using two different sets of parameters. |
| 6 | Justify a cost model selection given statistical software analysis. |
| | Apply the Least Squares Best Fit (LSBF) is a quantitative technique used to derive an equation for a linear estimate |
| | Evaluate assumptions of the model, recognize violations of these assumptions, and recommend remedial measures. |
| | Explain what is being measured by standard error calculations. |
| 7 | Analyze ANOVA Goodness of Fit Statistics |
| | Calculate total variation (SST), explained variation (SSR), the unexplained variation (SSE). |
| | Construct an analysis of variance table. |
| | Interpret the meaning of the statistics such as the MSE, MST, and the degrees of freedom. |
| | Calculate goodness of fit statistics such as the coefficient of determination and coefficient of correlation. |
| 8 | Evaluate potential outliers and influential observations using various criteria, and recommend remedial measures. |
| | Discuss the occurrence of outliers. |
| | Determine which observations are influential observations. |
| | Calculate measures for determining which observations are outliers. |
| | Conduct analysis to determine which remedial measures are necessary to deal with outliers. |
| 9 | Contrast different independent variable transformation techniques utilized to obtain a linear transformation of cost estimating data. |
| | Summarize how transformations of the independent variable can be used in a linear function to model intrinsically linear data. |
| | Formulate logarithmic transformations of both the dependent and independent variables in dealing with intrinsically linear data. |
| | Describe the relationship between statistics in log space and statistics in unit space. |
| 10 | Defend a selected model using a statistical software package to construct and compare multiplicative models analyzing the resulting statistics to determine strengths and weaknesses of each model. |

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| | Analyze the resulting regression statistics to determine strengths and weaknesses and multiplicative cost estimating equations examined given a sample data set and statistical software package. |
| | Justify the best model to choose given competing relationships/models. |
| | Justify a preferred equation and support the recommendation given a group of different CERs. |
| | Apply statistical concepts to analyze the strengths and weaknesses of a multiplicative cost estimating equation. |
| 11 | Prepare a cost estimate using the techniques/procedures discussed in this class |
| | Analyze a case study to determine what costs to calculate |
| | After analysis select the best estimating technique to use with a given cost element estimate and prepare the estimate |
| | Incorporate the requirements for full funding into your facilities construction calculation date |
| | Prepare and deliver a briefing based on the total cost estimate calculated |
| 12 | Using a statistical software package construct and compare multivariate linear models analyzing the resulting statistics to determine strengths and weaknesses of each model. Recommend and defend your selected model. |
| | Apply the Least Squares Best Fit (LSBF) as a quantitative technique used to derive an equation for a linear estimate |
| | Defend whether an estimating equation with predictor variables X1, X2 is generally preferred to an estimating equation with one or more variables removed based upon the t-statistic corresponding to each predictor variable. |
| | Determine the t-statistic based on the calculation of the partial F-stat. |
| | Explain the concept of multicollinearity, how to detect and evaluate it. Evaluate what it does and does not affect and recommend a treatment for it. |
| | Calculate and explain the limitations of the R2 and explain the construction and purpose of the adjusted R2. |
| | Determine whether you should evaluation an equation using R2 or adjusted R2. |
| 13 | Recommend a model given a choice of cost models and the associated data. Justify your choice. |
| | Identify measures to be evaluated when comparing cost models. |
| | Analyze model diagnostics. |
| | Identify the best model and defend your choice. |
| 14 | Calculate future production costs using learning curve techniques. |
| | Discuss the concept of cost improvement and explain the unit and cumulative average theories. |
| | Calculate manual and computer applications for cost improvement, unit and cumulative averages. |
| | Discuss the relationship between development hardware and production hardware. |
| 15 | Calculate future production costs using learning curve techniques that assess the impacts associated with model selection and step-down functions |
| | Explain what a step down function is and how it is determined |
| | Analyze competing prototype models and select the most appropriate relationship to calculate a step down relationship |
| | Calculate the appropriate cost element after selection of step down function and defend your solution. |
| 16 | Calculate future production costs using learning curve techniques given breaks in production. |
| | Explain what factors are affected concerning the learning curve when production breaks occur |
| | Discuss procedures for incorporating production breaks calculations into your revised system cost estimate. |
| | Calculate the revised cost for your system due to production breaks and brief and defend your answer. |
| 17 | Calculate future production costs using learning curve techniques with fixed cost models |
| | Discuss formulation of fixed cost models |
| | Explain advantages/disadvantages of fixed cost models and contrast with other techniques |
| 18 | Determine future production costs using learning curve techniques with production rate models |
| | Predict the impacts of production rate changes on future production costs. |
| | Explain the advantages/disadvantages of production rate models and contrast with other techniques. |
| 19 | Apply concepts and principles of various cost estimate time phasing techniques in development. |
| | Discuss the concept of incremental funding. |
| | Apply time phasing methodologies to phasing development estimates. |
| | Discuss the concept of full funding. |
| | Apply the most appropriate spreading method given an estimating case and available data. |