UC DAVIS Chemical Engineering & Materials Science

EMS-162L: Structure and Characterization of Materials Laboratory

Engineering Budgets — Winter Quarter, 2006

Knowing the costs of doing the experiments in this course helps immensely in understanding to cost of doing engineering work and research and in placing a value on your own time and talents. It also helps in planning or designing an experiment since it forces you to think it through, list the supplies and other resources needed, and of course estimate how much time it will take to complete the experiment or project. The budget and cost exercises used in this course require the use of spreadsheets to create your budgets. The attached models should help you get started.

Personnel and Instrument Costs
Set up a spreadsheet that will allow you to determine the hourly cost of personnel and compile a list of the costs of operating the instruments. This information will be used to establish budgets for each of the experiments.

Each Experiment
Before each experiment, set up new sheet in which you estimate the cost of performing it, analyzing the data, and producing the report. Bring this budget to the laboratory session.

After the experiment, duplicate your budgets sheet and enter the times and costs actually involved in doing the experiment. Attach this sheet to the end of your report.

For each succeeding experiment, duplicate the budget and final costs sheets and simply change the values of the time using the instruments, costs of supplies, etc.

Final Budget Summary and Report
For the report, provide very brief descriptions of the goals and outcomes of each experiment. Wrap these in a brief introduction that states the objectives of the course and a final conclusion that gives a brief statement as to the overall outcomes.

For the budget summary, set up one more sheet where you summarize the budgeted and actual costs of doing each experiment, the total costs, and subtotals that break down the costs of instrumentation, supplies, personnel, and any other cost categories. Print out this sheet and attach it to your report.

File: EMS-162L Budgets.qpw
Owner: Mike Meier
Created: 04-Jan-2005
Revised: 09-Dec-2005
Today: 09-Dec-2005

Description: Budgeting and Costs of the EMS-162L Experiments

Summary of Costs

Table 1. Cost of Experiments

Experiment	Title	Budgeted	Expended
1	Optical Microscopy	ERR	$0
2	X-ray Diffraction, Basics	ERR	$0
3	X-ray Diffraction, Phase ID and Quant.	ERR	$0
4	X-ray Diffraction, Crystallite Size	ERR	$0
5	X-ray Diffraction, Vegard's Law	ERR	$0
	Totals:	ERR	$0

Table 2. Costs by Category

	Budgeted		Expended	
Category	Amount	Percentage	Amount	Percentage
Instrumentation and Analyses	$0	ERR	$0	0.00%
Supplies and Services	$0	ERR	$0	0.00%
Personnel	ERR	ERR	$0	0.00%
Totals:	ERR	ERR	$0	0.00%

Table 3. Costs by Activity

	Budgeted		Expended	
Category	Amount	Percentage	Amount	Percentage
Laboratory Work	$0	0.00%	$0	0.00%
Data Analysis	$0	0.00%	$0	0.00%
Report Preparation	$0	0.00%	$0	0.00%
Totals:	$0	0.00%	$0	0.00%

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2. Basic Instrument, Supplies, and Personnel Costs

Instrument	Abbr.	Basic Hourly Rate	Technical Support Rate
FEI High-resolution Scanning Electron Microcope	SEM	$30.00	$40.00
Philips CM-12 Transmission Electron Microscpe	TEM	$27.00	$40.00
JEOL Scanning Transmission Electron Microscope	STEM	$40.00	$40.00
Scintag X-ray Diffractometer	XRD	$15.00	$40.00
Bruker/AXS Nanostar Small-Angle X-ray Sactterin	SAXS	$20.00	$40.00
Optical Microscopy	OM	$0.00	$40.00
Acoustic Microscopy	AM	$0.00	$40.00
X-ray Radiography	XRR	$0.00	$40.00
Bruker Vertex 70 FTIR	FTIR	$0.00	$40.00
Bruker RFS/100 S Raman Systel	Raman	$25.00	$0.00
VCR XLA Ion Mill	XLA	$10.00	$40.00

Personnel

Annual Hours:	0 hours
Holidays:	0 hours
Vacation:	0 hours
Sick Leave:	0 hours
Net Hours:	0 hours
Meetings, etc.:	0 hours
Training:	0 hours
Other:	0 hours
Net Productive Hours:	0 hours

Title:	
Salary:	$0
Benefits Rate:	0.00%
Benefits:	$0
Employee Cost:	$0
Hourly Employee Rate:	ERR

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3. Experiment 1, Optical Microscopy

1. Laboratory Instrumentation and Analyses

	Instrumentation Costs			Technician Support			
Instrument	**Rate**	**Hours**	**Cost**	**Rate**	**Hours**	**Cost**	**Total**
SEM	$30.00	0	$0.00	$40.00	0	$0.00	$0.00
TEM	$27.00	0	$0.00	$40.00	0	$0.00	$0.00
STEM	$40.00	0	$0.00	$40.00	0	$0.00	$0.00
XRD	$15.00	0	$0.00	$40.00	0	$0.00	$0.00
SAXS	$20.00	0	$0.00	$40.00	0	$0.00	$0.00
OM	$0.00	0	$0.00	$40.00	0	$0.00	$0.00
AM	$0.00	0	$0.00	$40.00	0	$0.00	$0.00
XRR	$0.00	0	$0.00	$40.00	0	$0.00	$0.00
FTIR	$0.00	0	$0.00	$40.00	0	$0.00	$0.00
Raman	$25.00	0	$0.00	$0.00	0	$0.00	$0.00
XLA	$10.00	0	$0.00	$40.00	0	$0.00	$0.00
	Total:	0	$0.00	Total:	0	$0.00	$0.00

2. Supplies and Services

	Cost	Percentage
Metallography Supplies:	$0.00	ERR
EM Sample Preparation:	$0.00	ERR
Chemicals:	$0.00	ERR
Film and Darkroom:	$0.00	ERR
Office and Computer Supplies:	$0.00	ERR
Other:	$0.00	ERR
Total:	$0.00	ERR

3. Personnel

Engineer Rate: ERR per hour

	Hours	Cost	Percentage
Research, Preparation:	0	ERR	ERR
Laboratory Work:	0	ERR	ERR
Data Analysis:	0	ERR	ERR
Report Preparation:	0	ERR	ERR
Report Presentation:	0	ERR	ERR
Other:	0	ERR	ERR
Total:	0	ERR	ERR

4. Summary

	Cost	Percentage
Instrumentation and Analyses:	$0.00	ERR
Supplies and Services:	$0.00	ERR
Personnel:	ERR	ERR
Total:	ERR	ERR