Department of Engineering and Technology Management Summer Term 2018

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Class days and time: Fridays Jun 29 – September 14, 2018 5:30 – 9:10pm

Class Room: PSU Campus FAB 48 - Map Location: http://www.pdx.edu/map.html

Introduction:

This course builds upon the preparation of Engineering and Technology students for management positions in the fields of engineering & technology research, development and management. Students will learn the key concepts of financial and cost management for an organization's functional departments including; cost and cash flow components of projects, financial responsibilities of departmental managers and the alignment of operational and business portfolios with the financial aspects of organizations. Course work is designed for the study of the overall financial structure of business operations (R&D, product development, manufacturing, supply chain, etc.) in organizations. Participants will gain a solid understanding of the financial operations of the firm, measures for financial success, and their relationship with the organizational goals. Furthermore students will specifically learn how the cost of project management aligns with the financial components, the business strategies, and the business environment for critical decision making for engineering and operations.

This is an elective course that fulfills the ETM requirements towards the sixteen credit hours needed for the **Graduate Certificate in New Product Development Management**. Students are required to take four of the following six courses:

- ETM 543/643 Front End Management for NPD
- ETM 547/647 New Product Development
- ETM 549/649 Managing Technological Innovation
- ETM 555/655 Technology Marketing
- ETM 556/556 User Centered Innovation
- ETM 558 Engineering Financial Management

Course Text Books:

Course Primary Text: (BOOK) The Essentials of Finance and Accounting for Nonfinancial Managers, by Edward Fields (2nd Edition) for learning the fundamentals and necessities of financial management.

Supplemental Text: (Case) Finance for Nonfinancial Managers by *Robert A. Cooke* (3rd Edition) for case study review and homework assignments

Course Objective:

The development of this course is in line with ETM's objective, which is the first choice "knowledge source" for world-class industry and students striving to be leaders in engineering and technology management.

The primary objective of the course is to prepare students with the financial and business knowledge to fit the role of an Engineering Manager in industry.

Course Objective Components:

Throughout the course students will:

- Refresh any previous knowledge on the key concepts of business strategy, financial management, and project management for alignment with an organizations' business performance
- Understand how projects work across departments to benefit programs and support portfolios while meeting business financial goals
- Understand the cost and cash flow components of projects and their effect on business
- Understand how successful management of projects becomes a key element of "revenue increasing / cost reducing" business operations
- Learn and understand the financial aspects and cost management of a business and understand department operations by aligning business strategy with the objective of increasing financial revenue
- Understand the foundation of business financial and cost management in alignment with a global standard (AACE)

To accomplish the above, participants will use: text readings, individual assignments, class discussions on relevant business strategies and financial events, case studies, and team projects.

ACHIEVEMENT OF COURSE OBJECTIVES

Individual and Team Assignments, Project Work Expectations and Basis for Grading

Text Readings: Participants are <u>expected</u> to have completed all readings <u>before</u> class. Any additional readings will be made available on the D2L site and participants are expected to purchase the two textbooks. *(These will be a valuable resource for your future)*

Exam: A one-week take home exam will be administered.

Class Contribution: You are expected to attend the class and to contribute to the class discussions. Standards for assessing the quality of your class contribution are provided below; see *Standards for Class Contribution* and the *Peer Evaluation Procedure* below. Evaluation forms are included for use for the team project and homework assignments.

This is important>>>> Expect your grade to drop one grade level if you are not participating during class.

Individual Homework Assignments & Presentations: During the term each participant will have several homework assignments to complete as well as their '*Pick-of-the-Week'* selections. Some assignments require a brief (less than one page) written submission as well as a brief presentation/discussion as indicated by the specific assignment. The writeups and presentations will be graded on an "All" or "Nothing" basis and contribute to the course grade.

Team Project Assignments, Team Project and Presentations: During the term each participant will also be part of a Project Team that will be responsible for various assignments, assessments and presentations. The teams will deliver brief presentations as indicated by the specific assignment. Teams will be asked to develop a Team Project based on criteria provided, make a presentation to a course appointed board of directors and executives and submit a written report in the format of a Business Case including primary supporting and secondary tier documents.

COURSE GRADING

Individual assignments:

Individual Project (Mid Term): 25% or 250pts (iBP due at Week 7 (Feb 24-2017))

Individual & Team HW's: 20 % or 200pts (iHW#1- 4 and tHW#1 & 2) Pick of the week: 5 % or 50pts (minimum of two (2) Picks per individual)

Final Exam: 20% or 200pts (Week 9 (March 10-2016))

Team Project: 30 % or 300pts (includes thw#3, tHW#4 & tHW#5)

TOTAL POSSIBLE POINTS 1000pts

Grades are based on the total points earned (930 - 1000 for A, 900 - 929 for A-, 870 - 899 for B+, 830 - 869 for B, 800 - 829 for B-, 770 - 799 for C+, 730 - 769 for C, 700 - 729 for C-, 670 - 699 for D+, 630 - 669 for D, 600 - 629 for D-.

<u>Course Guiding Principle:</u> To achieve the most learning and knowledge from this course instruction, one is highly encouraged to attend all classes. The overall learning achievement is cumulative and builds upon each week's outcomes. This is important>>> On assignments, the same principle applies as in a professional work environment – make arrangements to complete ones' responsibilities prior to the absence or assignment due dates.

Knowing that ones' life has its unknowns and existing priorities, if one must miss a class:

Please inform the professor as soon as possible of your forecasted absence and inquire about make-up options Please look to your fellow team members and course mates to supplement the missing knowledge Please complete any individual or team homework assignment prior to the absence and provide it to your team or arrange for someone to present your work. And......

This is important>>>>As a practice I offer to individuals that need to miss a class for one reason or another, an opportunity to make up the session in the form of a brief write-up of their understanding of the course lecture/discussion that was missed. There exists the basis for individuals not to review or study the missed topic, there is the risk of the missed learning of new knowledge. Therefore, I encourage individuals to review/study the session slides from the missed session and submit a one page write-up, such that they can earn their full graded score. The alternative is to forgo 50 points towards the final grade. I leave it up to the individual for their choice.

The slide decks will be on D2L and the write-up should address the major components of the session. What are those components and how do they fit into EFM? If you elect to score the points, the assignment is due in a hard copy format the Friday immediately following the missed session.

If you have any questions or need a clarification on this optional assignment, please reach out at your earliest opportunity.

COURSE HOMEWORK AND CLASSROOM EXERCISES

Legend of abbreviations:

Book = refers to the primary course text: The Essentials of Finance and Accounting for Nonfinancial Managers

Case = refers to the supplemental text for readings and cases: Finance for Nonfinancial Managers

iHW = indicates individual homework assignment, research, presentation or submission

tHW = indicates team homework assignment, discussion/presentation, submission or classroom exercise/presentation

iBP = indicates the individual Business Plan assignment including the submission and presentation

tPR – indicates Team Project Report assignment and presentation

Pick of the Week: All participants are required to prepare for and verbally summarize <u>two</u> 'Pick of Week' selected readings including leading the classroom discussion on the selection. Each class night will include individuals presenting a Pick of the Week selection. This item is considered Individual Homework and graded as such. (Remember, this is a financial management class, please select appropriate readings from the business & financial world)

iHW – **Individual Homework:** There are four (4) iHW's during the course term, with each building upon the previous week's assignment. In several situations, the product of this assignment will be used during the class either as a brief presentation, as a class exercise with the project team or a combination of both. If a presentation is indicated, the presentation should last no more than 5 to 7 minutes and graded on an "All" or "Nothing" basis.

iBP – **Individual Business Plan:** This homework assignment is considered a mid-term assessment and will consist of the application of the learning to that point in the form of an individual business plan that one might use to secure a bank (financial institution) loan to start or expand a private business. The assignment includes both a submitted report (not to exceed five pages) and a brief presentation (not to exceed 10 minutes) containing the key financial components and business projections to support the bank application for funding. The focus of the IB should be based on the individuals' ETM field of study. Research: Perform some research into businesses that best align with your ETM field of study. Select one, prepare a finding brief and be prepared to present/discuss your findings, including its business strategy, its profit zone and its forecasted financial returns.

tHW – **Team Homework:** There are five (5) tHW's during the course term. Some build upon iHW assignments, others are some are classroom exercises and others are team work assignments which build towards the final Team Project presentation and submission. Please see the following Team Project Report & Team Project Presentation instructions.

tPR – Team Project Report: (See detailed description below)

(tPR) TEAM PROJECT REPORT

GOAL

Put yourselves in the shoes of a Department or Engineering Manager for a major corporation that is planning to expand or launch a major initiative. Your job, along with your associated departmental manager's (team members) is to develop the strategy and planning (Business Case) along with the financial attributes to implement the initiative should you obtain senior executive approval for your Business Case. The parameters and components of this initiative will simulate real business circumstances, situations and adjustments that affect the situation. The foundation and environment for the project will be established as the course progresses.

PRODUCT/Deliverable

To meet this objective, you will pick a corporation (fictitious or real) in which that you can focus and incorporate your engineering background and experience. Assume that this corporation is preparing to launch a significant initiative to expand the business or consolidate operations. Each team member will represent a different department or discipline within that corporation. You are that team and your team project will be to prepare, present and submit a Business Case Proposal describing and supporting the strategy and financial components to meet the initiatives primary goals and objectives. Describe in your report:

- The situation analysis of the corporation including the existing financial aspects, the forecasted financial aspects and strategy and the big picture plan on how that strategy is to be accomplished. It will need to include perspectives and financial considerations from each department represented.
- Make sure the report is well integrated and you will have done an excellent job.
- Use all of your knowledge and some imagination to exceed requirements. Maximum length of the report is seven (7) pages, single-spaced. In addition you may have as many appendices as necessary to present data, graphs, and other details supporting your findings in the body of the report. The report <u>must</u> have a half-a-page executive summary which provides the justification for your proposal and strategy.
- Turn in a copy of the report the day it is due and provide an electronic copy to the course TA. These reports will be confidential and not shared or posted on the ETM project site.

TEAM PROJECT REPORT PRESENTATION

Goal

Visualize you have been requested, no, make that directed by senior management, to prepare a Business Case satisfying the initiative criteria in the form of a proposal. The Executive Board has called a meeting and awaits your recommendation.

Product

Your team is to prepare a script (you do <u>not</u> turn in this script) depicting the business case and implementation of your recommended strategy. No limits are set to your creativity in terms of "How" you accomplish the strategy, however, keep in mind this is an engineering financial management course and 'money still does not grow on trees'. In other words, how is the strategy to be funded, financed and paid for?

(Note: This is an EFM course so the focus must reflect financial aspects and not deliberate for pages on engineering)

Each team will be responsible for delivering its team project presentation in the classroom as if it were the organization you have described in the report. The performance is limited to <u>up to</u> 20 minutes including a 20 minute (maximum) question and answer period. The point is: we want you to tap your potential and present something valuable to this class. You are to choose the format of the presentation. Innovative and creative presentation formats are encouraged. Keep in mind that you are presenting to senior executives that you work for and you may not want to jeopardize your career potential with that corporation. Every team member shall take part in the presentation.

STANDARDS FOR CLASS CONTRIBUTION

Individual Class Contribution Practices

Here are some practices to consider for your individual class contribution:

- Providing thoughtful insight, questions and awareness pertaining to the course text and selected readings.
- Making observations that integrate concepts and discussions and voice these.
- Citing relevant personal examples.
- Asking key questions not only of the Professor but also your colleagues that lead to learning discussions.
- Asking short and concise questions that may provide concepts, issues, or practices from your experience, even if it challenges or disagrees with the course material and perspectives.

Standards for Assessing the Quality of Class Comments

These include:

- Does the comment contribute to class process and participant understanding of the concept under discussion?
- Does the comment enlighten the instructor and/or class members?
- Does the comment provide a new angle on the instructor's presentation of a concept that makes grasping the point easier?
- Does an example provide a good demonstration of a concept and thus assist others to comprehend how things work?
- Can you assume the role of "re-capper" in a way that effectively paraphrases key learning points? And
- Speaking during class.

PEER EVALUATION PROCEDURE

In human organizations it is not uncommon for one's performance and one's rewards to be dependent upon the actions and performance of others. This condition will be replicated in this course through the vehicle of team products, which are evaluated by the instructor.

In addition, in organizations we are constantly being evaluated by our peers and frequently, teams have the power to give some rewards to individual members. This aspect of organizations will also be replicated in the course through a process of peer evaluation and subsequent adjustment of the team product grade. As outlined below, the individual members of a team may receive different grades for a given product.

The purpose of this replication is not merely to simulate reality but also to highlight several aspects of a functioning team. These are:

- Peer evaluation and its impact on a team
- Group pressure, both positive and negative
- AAA The impact of differential rewards on team performance and internal relationships
- Individual influence and potential to resolve problems resulting from disagreements
- Value and impact of open discussion of differing contributions to team performance.

You are encouraged to establish explicit criteria for peer evaluation using the two forms included in this outline and to openly discuss those evaluations so that each member has the benefit of others' perception of his/her actions. Peer evaluation is to be considered a combination of the team homework assignments and also for the Team Project.

Method

- Team projects will be graded by the instructor. Grades will be numerical.
- 2. Each team member will turn in an evaluation sheet indicating the other team members for contribution towards the grade and evaluation by the professor. The sheet is due one class meeting before the last session. The Peer Evaluation is done as a private score. It is important for teams to check-in part way through the team work so as to inform team members of how well they are doing or where improvement is needed. Do not wait until the end of the course to inform your teammates that a poor score is forthcoming, instead work together to improve everyone's scores. This is what one of the primary functions that department managers are responsible for in their relationship with employees.
- 3. Contribution must be indicated by the range of values indicated on the scoring forms and can vary between the between the indicted values as well, such as 94% or 91% or 88%.
- 5. A percentage of 0 must be given to team members who do not participate, for any reason whatsoever, in production of a particular team product. This is the only reason which can be used to assign a 0 percentage for individual contribution. Requests for excuses from participation in a team product can be made to the instructor but will be granted only under exceptional circumstances.
- The grades (as to the team products) of individuals will be determined by multiplying the team grade times the 6. contribution percentage average assigned to the individuals.

CLASS PRESENTATIONS

What does a class presentation mean? A class presentation simply means that you and in several instances your team, are responsible for presenting results of your research, your assignment or the specific team homework deliverable.

- Don't be overly concerned at first! The professor is here to help you by explaining what material to cover, how much time can be expended and what type of materials or presentation supports your assignment. The professor will be involved in discussions and ask tough questions of you and everybody else. The Professor will also help you summarize parts of the session material if needed.
- To facilitate your presentation, your job is to announce your assignment and to ask question/sub-questions of the audience of students, to lead the discussion, to seek clarification from students that respond with questions, answers or comments on your topic. Your job is to know the topic and provide some reality for discussions that will shed light on engineering financial management.

Gutline for assignments and deliverables is in revision for summer 2018

Week	Date	Session Topic	Detailed Content	Reading / Book	Classroom Activities/ Discussions & Presentations	Individual Assignments & Deliverables	Team Assignments & Deliverables
1	29 Jun	Introduction to the course * Review of financial basics: key elements of finance for a company * How project management fits into business operations Every week there will be a "Pick of the Week" discussion on the "weekly" business and finance related news, based on the articles / news /research or top news stories. Each class member must bring two Picks during the course duration.	Introduction session & Key Course Topics 1. What the course will be about 2. What the structure of business operations looks like: financial and organizational goals, CSFs, key elements and measures of financial success (ROI, profit, cost) 3. How project management fits in to the business operations 4. Alignment of project management with business strategy 5. What you'll get from the course?		Class Introduction, topics and expectations. Example of "Pick of the Week" expectations Different strategies for businesses Starbucks, AT&T, Intel, Nike etc. Which business would you like to work for?	iHW#1Assignment Based on a corporations' annual report, do some research and be prepared to discuss your findings on "strategy and project alignment" of a company that you would like to work for and why. Prepare a one page brief supporting your choice, basis or findings Selected Readings: The Profit Zone	
2	06 Jul		No class this week	no class	no class	no class	no class
Week	Date	Session Topics	Detailed content	Readings	Class Activities & Discussions & Presentations	Individual Assignments and Deliverables	Team Assignments & Deliverables
3	13Jul	* Economic and financial analysis *Analysis of Financial Statements, ratios and profit centers. Project planning & estimating Pick of the week	Complete discussions on the Balance sheet, income statement, financial ratios, cash flow, * Main concepts on economic & financial analysis * Business value concept and its use in management	Book: Ch. 6 & 7 Case Ch. 7 & 8	Pick of the week iHW#2 Deliverable Round-table discussion on the various companies chosen that individuals would like to work for.	iHW#2 Deliverable Be prepared to discuss your findings in a Round-table discussions format on the individual business that you would like to work for, including, financials, annual report, ratios etc. iHW#3 Assignment Using the company you chose for iHW #2, submit a detailed report in the form of an Annual Report on i. Business ratios ii.Balance sheet analysis iii.Income statement analysis iv.Cash flow analysis v.Project performance	tHW#1 Assignment continue working on the assignment for developing a Business Improvement Project This assignment is due in Class Week 5. tPR Notification: Teams should begin evaluating businesses that they will be using for their Team Project. See Team Project detail description above.

Week	Date	Session Topics	Detailed content	Readings	Class Activities & Discussions & Presentations	Individual Assignments and Deliverables	Team Assignments & Deliverables
5	27 Jul	Sales and Expenses, Assets & profit centers Pick of the week	Project performance, project cost and alignment of projects to the business strategy. Asset Management Elements of Cost Performance Indicators Forecasting Resources, liabilities: sales, expenses, cost of sales for a company and Forecasting	Book: Chps. 6, 7, 9 & 10 Case: Ch. 12 Case: Chps. 2, 3 & 4	Pick of the week iHW#3 Deliverable individual annual report presentations tHW#1 Team Business Improvement Project Presentations	you acquired from the Guest Speaker and why!! iHW#3 Deliverable Submit and present your deliverable in the form of an Annual Report for the business you have chosen from iHW#1 & #2. Reminder!!! iBP Continue developing your own business (due Week 7) (See also Selected Readings: See internet links on 'How to' in the D2L site	tHW#1 Deliverable: Submit and Present the team developed Business Improvement Project Plan including the components listed in the assignment above. tHW #2: Assignment This assignment begins during this class period and concludes with a written submission of a consolidated financial and performance comparison report at the Week 6 class period. (Max 2 pages) As a team, assess your team members' iHW #3s, compare the financial and performance indicators of each and discuss a consolidated comparison report on your "team members" companies based on "main" and "critical" performance indicators
4	20 Jul	Guest speaker	Financial Management in Action	Catch up on or read ahead the text content	Guest Speaker Only	analysis vi.Business value analysis Reminder!!! iBP Continue developing your own business (due Week 7) (See also Selected Readings: See internet links on 'How to' in the D2L site Guest Speaker Recap - Submit a 1/2 page summary of three (3) knowledge items	Utilize this course break to work on the team project. It is due in Week 5.

6	03 Aug	* Budgeting and Overhead Allocation* Earned value (Cost /Item) fluctuation * Items for Financial Statement for Bank Credit Pick of the week	Assets, Revenue, Liability, Cost, Budgeting, Growth and Expansion Strategy Lecture presentation on the content of the session, based on the summary, review questions and Case Study questions from the Cases book: Optional: Team 1 Case Ch. 9 Budgeting & Planning Team 2: Case Ch.10 Budget Reporting Team 3: Case Ch. 8 Ownership & Equity.	Book: Ch. 8 Case: Chp. 9 & 10	Pick of the week tHW #2 Deliverable consolidated financial and performance comparison presentations	Reminder!!! iBP If you have not done so yet, now is the late start date for developing your iBP. Be prepared to enlighten the class with your idea for a business. Also see Selected Readings: "The Business Plan Start-up Kit" (includes an example, the Q&A's and templates for a business plan. Apply the weekly lectures' teachings to your business plan, and aim for submitting a full financial statement of your business to a bank.	tHW #2 Deliverable and Submission Consolidated Financial and Performance Comparison. tPR Reminder and tHW#3 assignment: As a team prepare the business information on the company you have chosen for the Team project, a Business Case_along with the department and role assignments represented by the team members
7	10 Aug	Departmental Budgets, Financing the Business Pick of the week	Zero-based budgeting (intro) Operational costs, make or buy, buy or lease.	Book: Chps. 11 & 12 Case Chps. 5 & 6	Pick of the week iBP Individual Presentations the iBP Classroom exercises on Benchmarking, business financials, budgeting and course review questions.	iBP - Individual Business Presentations Submission of the individual business plan (5 pages max) + presentation (max 5 slides) And the iBP in hard copy form.	tHW #3 Deliverable: As a team submit the business information on the company you have chosen for the Team Project Business Case along with the department and role assignments represented by the team members tHW#4 Assignment Prepare a business profile and executive summary incorporating the following components which will be used in the business case for the team project. **Departmental finances, forecasts, annual report finances and business strategy ** Teams must have a minimum of three departments represented.
Week	Date	Session Topics	Detailed content	Readings	Class Activities & Discussions &Presentations	Individual Assignments and Deliverables	Team Assignments & Deliverables
8	17 Aug	Organization, Business Design, Benchmarking and metrics for business. Equipment and facilities, make-buy- or lease options Pick of the week	* Business Design * Enterprise, Portfolio and Project * Benchmarking and Metrics for business alignment *	Book: Ch. 12 & 13 Case Chps. 5 & 6 Course textbook and Case book review for exam	Pick of the week tHW #4Teams present their initial Business Profile Exam coverage review and distribute Exam for Take-Home Completion.	iHW #4 Assignment: Each department manager for the Team Project Report must prepare its "own" detailed budget for the business selected by the Team. iHW #4 becomes incorporated into tHW#5 in the form of a consolidated	tHW #4: Deliverable & presentation Business Profile and Executive Summary which incorporates the Requirements for the Business Case tHW #5 Assignment: Consolidate the individual departmental budgets (iHW#4) of the business you have chosen to use for the Team Project and prepare a short presentation

						budget for the business case project. Final Exam Assignment: The exam is a take-home-open-book for Individual completion.	tPR Assignment Reminder and Added information: Business facts will be given by the professor to teams for new deliverables after Week 8 class session which will state the new company goals, consisting of a new corporate initiative
9	24 Jul		No class this week	no class	no class	no class	no class
10	31 Aug	Performance Management *Corporate and Project Metrics *Outsourcing *Investment Decision Making Team Project Presentations Post Exam Review	Performance Management *Corporate and Project Metrics: development and their relationship *Outsourcing: cost/benefit assessment for outsourcing		Exam Feedback tPR Deliverable & Presentation: Team Project Presentation Final Business Case		tPR Deliverable and Presentation: Teams prepare a formal Business Case Proposal presentation including proposal strategy, ROI, project budget and benefits assessment based on team projections. tPR Option: Modify or revise the tPR report based on the feedback received from the tPR presentation.
11	7 Sept	Team Feedback Project Evaluations			Feedback will be provided after this date to each team based on the presentation and the report.		

ETM 558/658 Engineering Financial Management

EVALUATION OF TEAM MEMBERS for HOMEWORKS

Team Number:Evaluator	Date:	
Team Member	Primary Contribution	Level of Contribution

Instructions:

- Team members fill out the above form for each member of the team, except themselves. 1)
- 2) The following numerical values are used for the level of contribution:
 - 5 Very High = 100% 4 High = 90%

 - 3 Medium = 80%
 - 2 Low = 70%
 - 1 Very Low = 60%
 - 0 None = 0%

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EVALUATION OF TEAM MEMBERS for TEAM PROJECT

Team Number:	Date:	
Evaluator		
Team Member	Primary Contribution	Level of Contribution

<u>Instructions:</u>

- 1) Team members fill out the above form for each member of the team, except themselves.
- 2) The following numerical values are used for the level of contribution:
 - 5 Very High = 100%
 - 4 High = 90%
 - 3 Medium = 80%
 - 2 Low = 70%
 - 1 Very Low = 60%
 - 0 None = 0%

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EVALUATION OF TEAM PROJECTS BY THE STUDENTS

Evaluating Team:	 Date:			
	Teams			

	Teams							
Dimension	1	2	3	4	5	6	7	8
Business Initiative Addressed								
2. Business Case Strategy								
3. Data gathering Analysis								
4. Financial Aspects Accounted For								
5. Proposed Recommendation								
6. Conclusions								
7. Presentation								
TOTAL								
			-			-		

Instructions:

- Each team evaluates every other team along the seven dimensions listed above.
- The following numerical values are used for each dimension:
 - 5 Very good
 - 4 Good
 - 3 Medium
 - 2 Poor
 - 1 Very poor

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