

From Teaching to Learning through Coaching (TLC) – Experience from Three Master Level Engineering Courses

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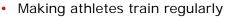
Outline



Introduction
Teaching, Learning and Coaching
How to set a deadline
Selecting tasks that support learning
The student's learning experience
Conclusions

TLC: An analogy from sports

The role of the coach is to support the development of the athlete by



- Selecting harder and harder challenges
- Giving feedback and encouragement
- Encourage team spirit



- Making students learn regularly
- Selecting harder and harder homework
- Giving feedback and encouragement
- Encourage teamwork

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Table 1. Simulation course deadlines and grading, fall 2008



HW	Points	Matlab	CMP	NanoHUB	Deadline	Content
1	10	Yes			Mon 3/11	Solution ODEs
2	10	Yes			Mon 10/11	FDM 1D
3	10		Yes	Yes	Mon 10/11	Diode
4	10	Yes	Yes		Mon 17/11	FDM 2D
5	10	Yes	Yes	Yes	Mon 17/11	Diffusion
6	10			Yes	Mon 24/11	MOSFET
7	10	Yes			Mon 24/11	FEM, Sch-G
8	10	Yes		Yes	Mon 1/12	Transport, Scaling
9	10			Yes	Mon 1/12	Ballistic transport
10	10	Yes			Mon 8/12	Monte Carlo

Homework should be emailed on the date above at 23.59 latest, with your name as filename.

Table 2. Device course deadlines and grading, spring 2008



What	Points	Deadline	nanoHUB	Content	
HW 1	5	Mon 31/3	-	Basics	
HW 2	10	Mon 7/4	-	Scaling/High K	
HW 3	10	Mon 14/4	-	SOI/FinFETs	
LAB 1	15	Mon 21/4	Yes	Scaling of MOSFET	
LAB 2	15	Mon 28/4	Yes	Transport models	
SEM 1	10	Tue 29/4		Article summary and signup	
HW 4	15	Mon 5/5		Strain/nano/interconnect	
SEM 2	10	6, 8, or 9/5	-	Seminar: presentation + QA	
SEM 3	10	Mon 12/5	-	Written summary of seminar	

^{*} A grade > E requires that the student has some points for each area: homework, labs and seminars.

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Grading



Points	Grade	
≥ 90	A	
≥ 80	В	
≥ 70	C	
≥ 60	D	
≥ 50	E	
< 50	Fx	

Tasks that support learning and avoids plagiarism



- Peer assessment of essays
- Requiring drafts
- Using warming-up tasks

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Table 3. Seminars and homework in the Frontiers course, spring 2008

Week	Date	Time	Reading plan / Content		Homework due 10 AM
4	25-jan	13-15	Introduction / Referencing + Plagiarism		
5	1-feb	13-15	Gray pages (all sections) / Info searching	104	Select topic ("Title")
6	8-feb	13-15	I Fundamentals / Summarizing	144	Article search KTHB
7	15-feb		No Class Meeting		Summary of article 1
8	22-feb	13-15	II Technology and analysis / Abstract	112	Summary of article 2
9	29-feb		No Class Meeting		Abstract, keywords
13	28-mar	13-15	III Logic devices / Feedback 1	142	First draft
14	4-apr	13-15	IV Random access memories / Different sources	62	Feedback 1
15	11-apr	13-15	V Mass storage devices / Peer review	76	Source criticism
16	18-apr	13-15	VI Data transmission and interfaces / Feedback 2	86	Second draft
17	25-apr	13-15	VII Sensor arrays and imaging systems +	126	Feedback 2
	-		VIII Displays / Final version		
19	9-maj	13-15	Essays	852	Final essay

Conclusion



- The coaching involves setting clear grading criteria, and selecting tasks of proper difficulty, at suitable time, and giving prompt feedback.
- My experience is that adding more work for the students seems to improve learning.