ENED FINAL REVIEW Cheat Sheet

by apkhil via cheatography.com/171269/cs/35932/

ACADEMIC AND PROFESSIONAL ETHIC

Who defines ethics	Global organization (UN, WHO, etc.) –Countries/societies –Local communities –Professional organizations –Teams, clubs, etc. –Families
4 basic attributes of a profession	**1.** Requires sophisticated skills, judgment, and discretion **2.** Extensive formal education versus apprenticeship **3.** Self regulation **4.** Significant public good results from practice
Being a professional requires you to	–Be competent in your discipline –Take on an attitude of “life-long” learning to enhance your technical knowledge and skills –Act in a way that shows respect for your profession
Codes of Ethics	-Designed to help professionals distinguish right from wrong in order to govern their decision making –Give guidance on how to approach problems and the standards to which the employees are held –Outline the mission and values of an organization
NSPE Code of Ethics	1. Hold paramount the safety, health, and welfare of the public. 2. Perform services only in areas of their competence. 3. Issue public statements only in an objective and truthful manner. 4. Act for each employer or client as faithful agents or trustees. 5. Avoid deceptive acts. 6. Conduct themselves honorably, responsibly, ethically, and lawfully so as to enhance the honor, reputation, and usefulness of the profession.

Engineering Design Process

Empathize	Develop a deep understanding of the challenge
Define	Clearly articulate the problem (goals and criteria
Ideate	Brainstorm potential solutions, select and develop solutio
Prototype	Design prototype(s) to test all or part of your solutio
Test	Engage in shortcycle test process to refine and improve solutio
Implement	Deliver a compelling experience to the user

Constraints:
- Money and Time – almost always
- Materials
- Vendors
- Environmental factors

Criteria:
- Specification design must meet to be successful
- Functions
- Features

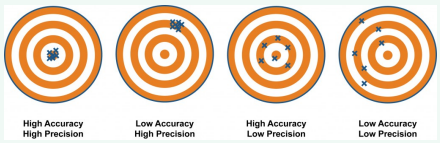
BASIC SKILLS FOR TEAM EFFECT-IVENESS

Team develo-pment stages	1.) Forming 2.) Storming 3.) Norming 4.) Performing 5.) Adjourning
Team roles	- Meeting Coordinator - Recorder/Scribe - Time-Keeper - Encourager/Gatekeeper - Devil's Advocate

BASIC SKILLS FOR TEAM EFFECT-IVENESS (cont)

Character-istics of a successful student team	- Positive Interdependence (team members rely on each other to complete project) Goal Specification (what needs to be accomplished and when) Cohesiveness (estab-lishing a bond between team members) Effective and Respectful Communication Roles and Norms
Character-istics of a successful student team	- Positive Interdependence (team members rely on each other to complete project) Goal Specification (what needs to be accomplished and when) Cohesiveness (estab-lishing a bond between team members) Effective and Respectful Communication Roles and Norms

Accuracy vs precision



Python Snippets

User Input	`user1 = int(in put - ("Enter the first digit: "))`
Condit ionals	`if(user1 == rand1): numbCo rrect = numbCo - rrect + 1`
For-loop	`for x in range( 1000): numbCo rrect = 0`
While-loop	`while x != 1: #code to loop`

- When taking numeric inputs make sure to specify the data type (int, float..)
- With the while loop we can execute a set of statements as long as a condition is true.

Ethical Approaches

The Utilit-arian Approach	Which option will produce the most good and do the least harm?
The Rights Approach	Which option best respects the rights of all who have a stake?
The Justice Approach	Which option treats people as I want to be treated?
The Ethic of Care Approach	Which option is best for those most in need?
The Virtue Approach	Which option leads me to act as a respectable person?

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Project management

• Project Management helps us to keep track of all the tasks associated with completing a design process to make sure things get done on time and in the right order

• Systems Thinking helps us to break down our complex problem/solution into smaller, easier to manage problems that are less daunting to solve

• Project Management Tools

o 1. Work Breakdown Structure (WBS): figure out what “things” are needed to achieve the project deliverable

o 2. Precedence Network (PN): depict the order in which items from the WBS need to be completed to achieve the project deliverable

o 3. Critical Path Method (CPM): add timing to each item in the PN to determine amount of time needed to achieve the project deliverable

o 4. Gantt Chart: visual diagram showing the items/tasks and timeline for achieving the project deliverable

• System Thinking- thinking about a complex system as a combination of components or processes that work together towards a common goal

Units

Dimension	Abbreviation	SI (Metric)	US Customary	American Engineering
Mass	M	kg (kilogram)	slug (slug)	lb_m (pound-mass)
Length	L	m (meter)	ft (foot)	ft (foot)
Time	t	s (second)	s (second)	s (second)
Temperature	T	K (kelvin)	R (Rankine)	R (Rankine)
Electric Current	I	A (ampere)	A (ampere)	A (ampere)
Amount of Light (Luminous Intensity)	C	cd (candela)	cd (candela)	cd (candela)
Amount of Matter	n	mol (mole)	mol (mole)	mol (mole)

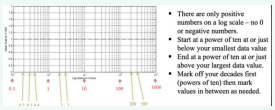
Secondary Units

Dimension	Abbreviation	SI (Metric)	US Customary	American Engineering
Force	F	$N = kg*m/s^2$	$lb_f = slugs*ft/s^2$	$lb_f = 32.2\ lbm*ft/s^2$
Acceleration	a	m/s^2	ft/s^2	ft/s^2
Pressure	p	$Pa = N/m^2$	$psf = lb_f/ft^2$	$psi = lb_f/in^2$
Energy	E	$J = N*m$	$ft{\cdot}lb_f = slugs*ft^2/s^2$	$ft{\cdot}lb_f = 32.2\ lb_m*ft^2/s^2$
Power	P	$W = J/s$	$hp = slugs*ft^2/s^3$	$hp = 32.2\ lb_m*ft^2/s^3$
Frequency	f	$Hz = s^{-1}$	$Hz = s^{-1}$	$Hz = s^{-1}$

PPM

Problem Statement --> Diagram --> Theory --> Assumptions --> Solution steps --> Verify --> Conclusion

Log graph



Academic Misconduct @ UC

Examples of Cheating

> Obtaining assistance with or answers to examination questions from another person with or without that person’s knowledge.

What are the Penalties?

> Zero on a test/assignment • Failure in a course • Expulsion from the program • Expulsion from the college

What's the process?

> Upon receiving a Notification Form, you have two options:
> Option 1: Accept responsibility for the misconduct and the proposed sanction; OR
> Option 2: Respond to the instructor to challenge the allegation of misconduct and/or to discuss if the sanction(s) are commensurate to the violation.

What's the process? (Option 1)

> If the student chooses Option 1, they must send the Notification Form back to the instructor within 5 days. The instructor will then forward this to their C.C.A., and the student must complete the agreed upon sanctions.

What's the process? (Option 2)

> If you choose Option 2, you must meet with the instructor within 5 business days of the instructor's receipt of the Notification Form back from you.

Academic Misconduct @ UC (cont)

College hearing panel? (final step)

> - You can ask for a College Hearing Panel, you and the instructor will be asked if you would like to appear at the hearing and provide any evidence supporting your position.
> -The chair consists of the hearing chair, one representative selected by the college faculty, and one representative selected either by the college tribunal of Student Government for undergraduates, or by the graduate college tribunal of Graduate Student Governance Association for graduate students.
> - Within three (3) days, the hearing chair of the C.H.P. will notify the student of the C.H.P.’s decision and appeal procedures.

Sig Fig Rules

• Multiplication/division: round the result to the least number of significant digits among the values in the calculation

• Addition/subtraction: round the result to the least precise value (i.e. fewest number of decimal points) among the values in the calculation

• Addition/subtraction and multiplication/division: perform the computation in steps following the correct order of operations, keeping track of the number of significant digits/decimal places as you go but only rounding the value to the correct number of significant digits at the end of the calculation

What graphs to use (linear, log etc)

LINEAR:	POWER:	EXPONENTIAL:
y=mx+b	y=bx^m --> LOG LOG	y=be^mx --> linear on X axis and Log on y axis