

Engineering and Computing Education for the 21st Century:

A Student Primer

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Association for
Computing Machinery

Advancing Computing as a Science & Profession

Dr. Junaid Qadir 

Based in Lahore, Pakistan

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Education for the 21st Century

Engineering Education, Moving into 2020s: *Essential Competencies for Effective 21st Century Electrical & Computer Engineers*

Junaid Qadir¹, Kok-Lim Alvin Yau², Muhammad Ali Imran³, Ala Al-Fuqaha⁴

¹ Information Technology University, Lahore, Pakistan

² Sunway University, Malaysia

³ University of Glasgow, UK

⁴ Hamad bin Khalifa University, Qatar; Western Michigan University, USA



Engineering Education in the Era of ChatGPT: Promise and Pitfalls of Generative AI for Education

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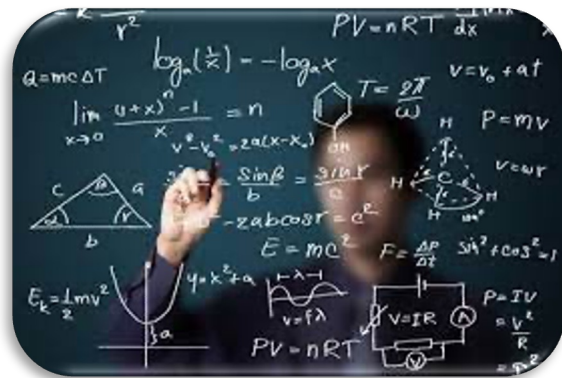
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Mathematics

Mathematical Modeling
Mathematical Analysis



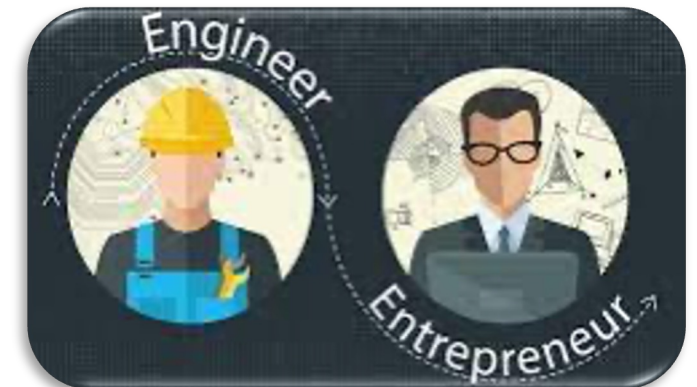
Coding

Programming
Simulation

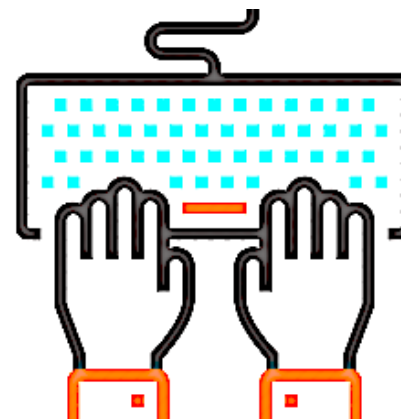


Engineering

Entrepreneurship
Resourcefulness

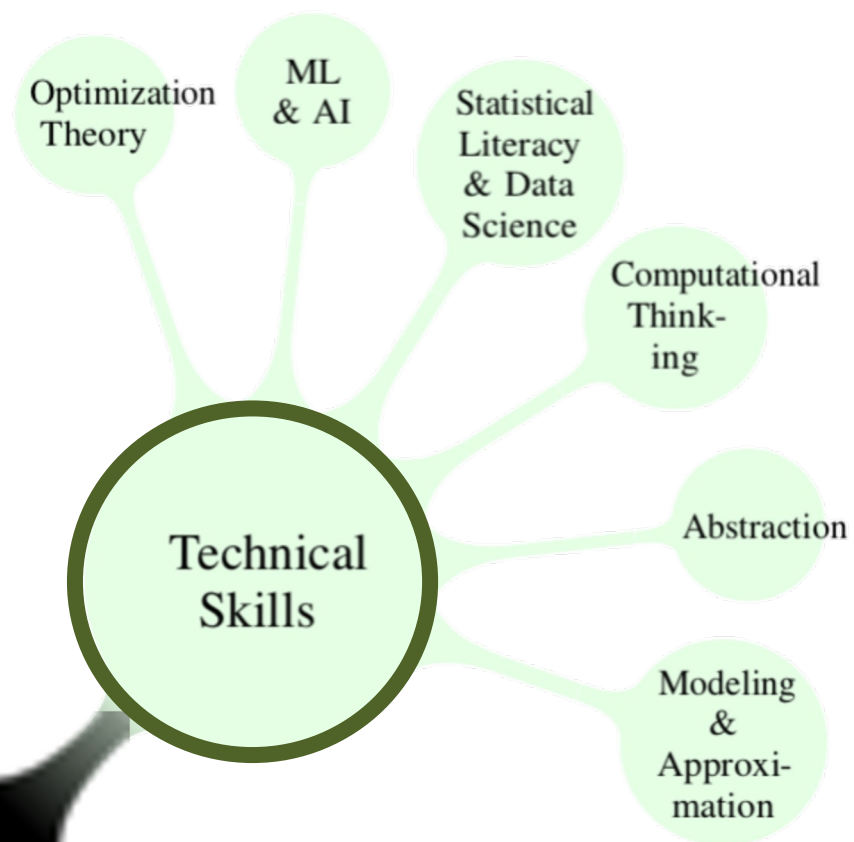


Engineering
is a hands on
discipline



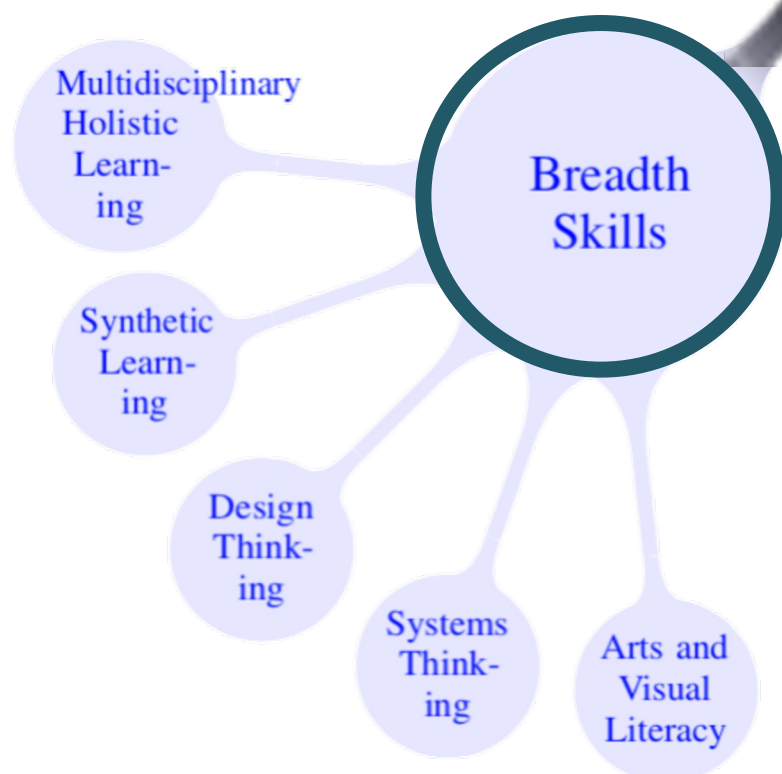
"Hands-on"
Tinkerer
"Hacker Mindset"
"Design Thinking"

1



3

2



4

Essential
Competencies
for Future
Electrical &
Computer
Engineers

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IMPROVING ONE'S METACOGNITIVE SKILLS



Avoid common mistakes



Learn about most effective techniques



Matthew Effect in Education:

When students acquire meta-skills such as learning how to learn, they bring this skill to every course and reap its exponential benefits

(Becoming AI/Bot Proof)

How to become effective in times of exponential technologies?

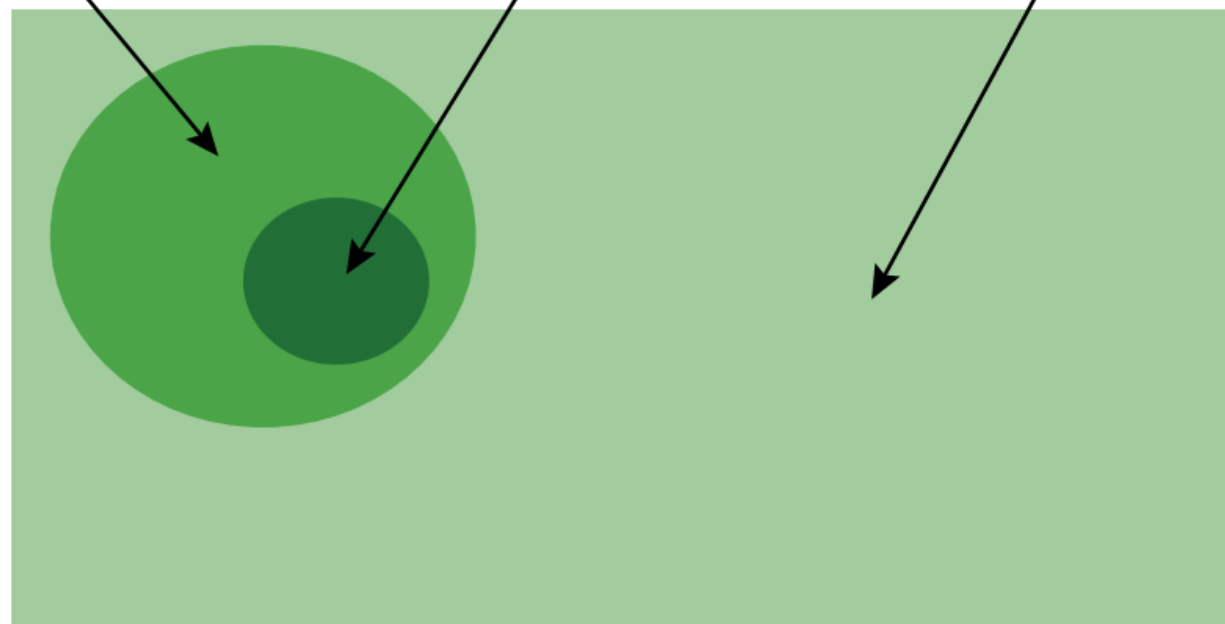
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Tasks That
Humans Can Do

Human Tasks
That Machines
Could Automate

New Tasks That
Humans Can Do with
the Help of Machines



Learning with AI should be:

(1) Human-Centered; and (2) based on Intelligence Augmentation

Good luck for your event!

Lifelong learning



“Teach a man to fish, and
you feed him for a lifetime.”

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