



FOCUS ON EITHER IS BETTER!

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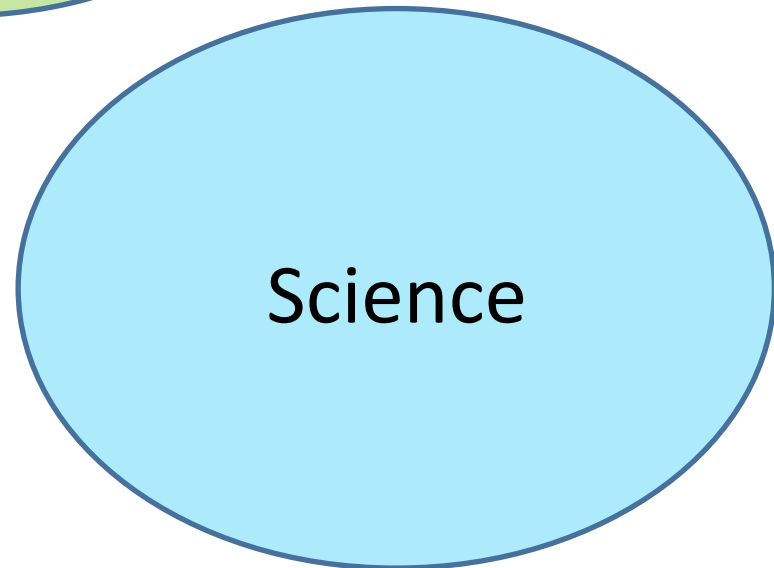
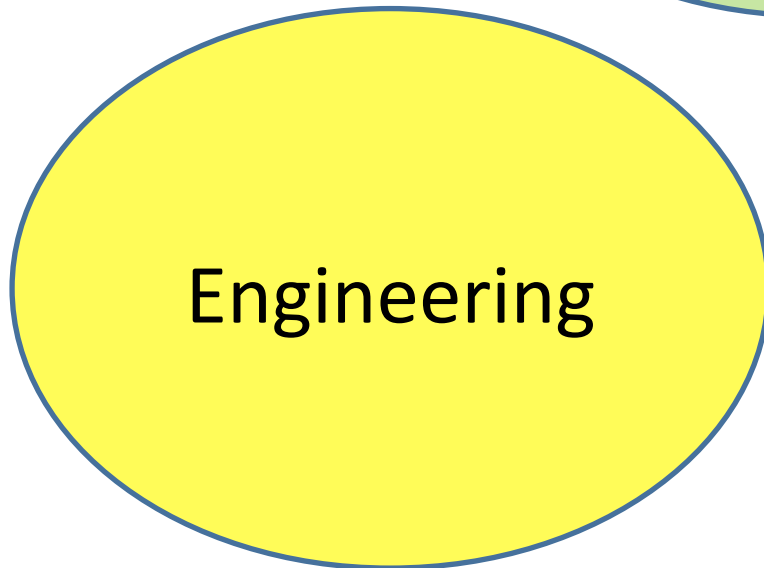
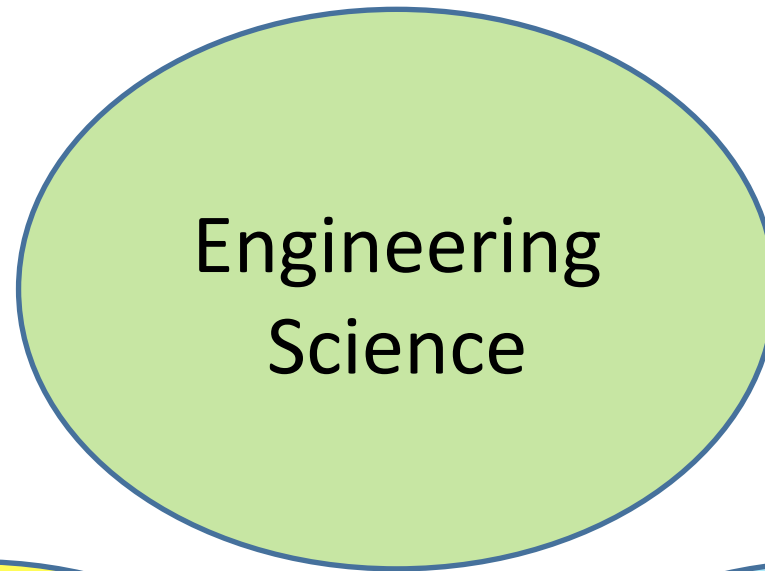


Outline

- What is Engineering Science?
- Comparison
 - Osaka University
 - N.U.S
 - U.C. Berkeley
- Conclusion
 - NO common concept for “Engineering Science” (difficult to define)

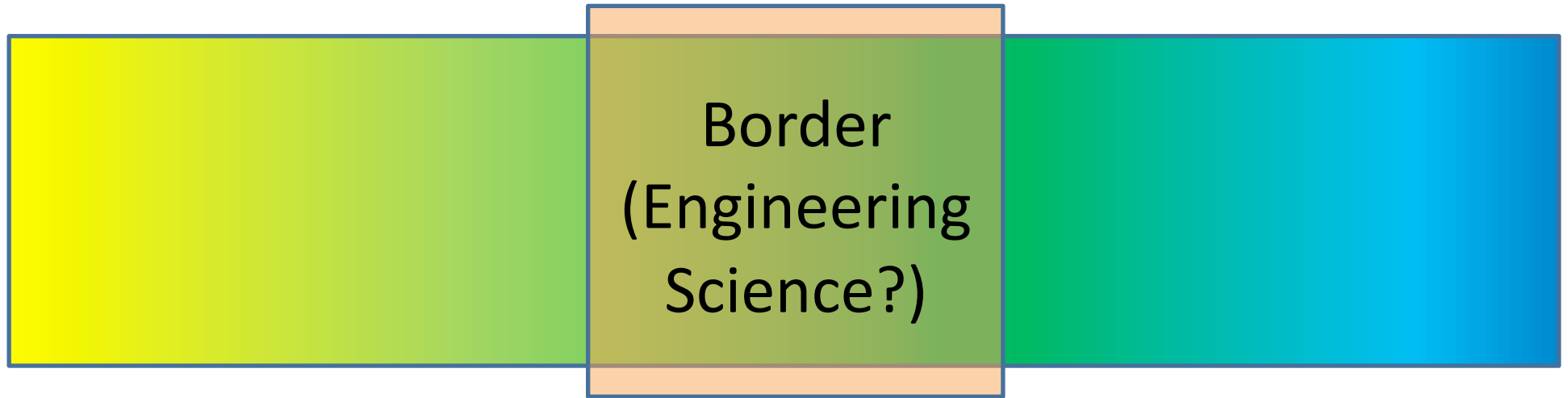


Ideal Image





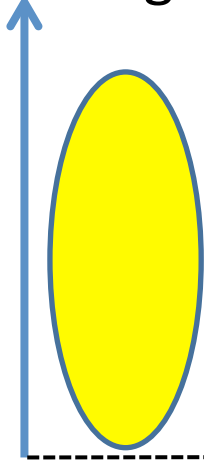
Real Image



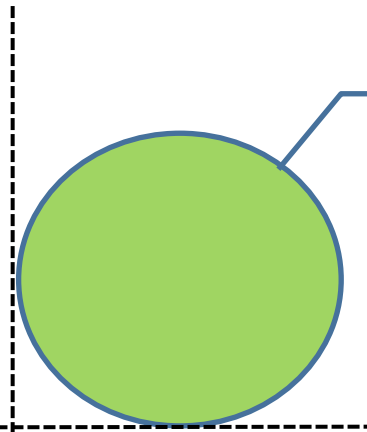


New Image

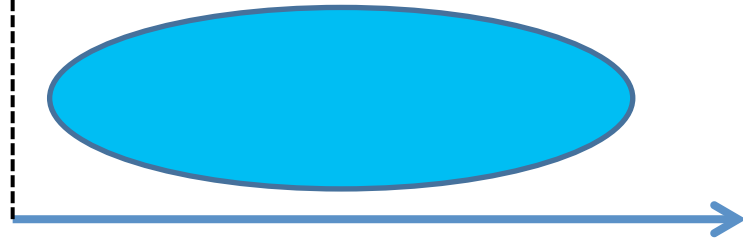
Engineering



Engineering
Science



Science





Courses in Engineering Science

Osaka Univ.	National Univ. Singapore	UC Berkeley
Electronics and Material Physics	Nanoscience & Nanotechnology	Engineering Physics
Chemical Science and Engineering	Computational Engineering Science	Engineering Math & Statistics
Systems Science	Photonics & Optics	Environmental Engineering Science
Information and Computer Sciences	Energy Systems	Energy Engineering



Ex) Osaka University

	Master	Doctor	Rate
Science	8387	2759	32.9%
Engineering	25797	4437	17.2%
Engineering Science	10029	1753	17.5%

<http://www.osaka-u.ac.jp/ja/guide/about/data/students.html>

⇒ Engineering Science and Engineering have

Basically Same Role?

Ex) Osaka University

Engineering Science Engineering

必修科目	3001	システム科学序説
	0011	数 学 A
	0012	数 学 B
	0021	数 学 C
	3101	材 料 力 学
	3103	機 械 力 学
	3105	熱 工 学 A
	3107	流 体 工 学
	3109	設 計 工 学
	3111	コンピュータ基礎
	3051	情報処理演習
	3181	コンピュータ基礎演習
	3182	数値計算法演習
	3183	機械構造計画演習
	3184	機械工学総合演習
	3195	機械工学実験
	0090	防 災 特 論
	0099	特 別 研 究

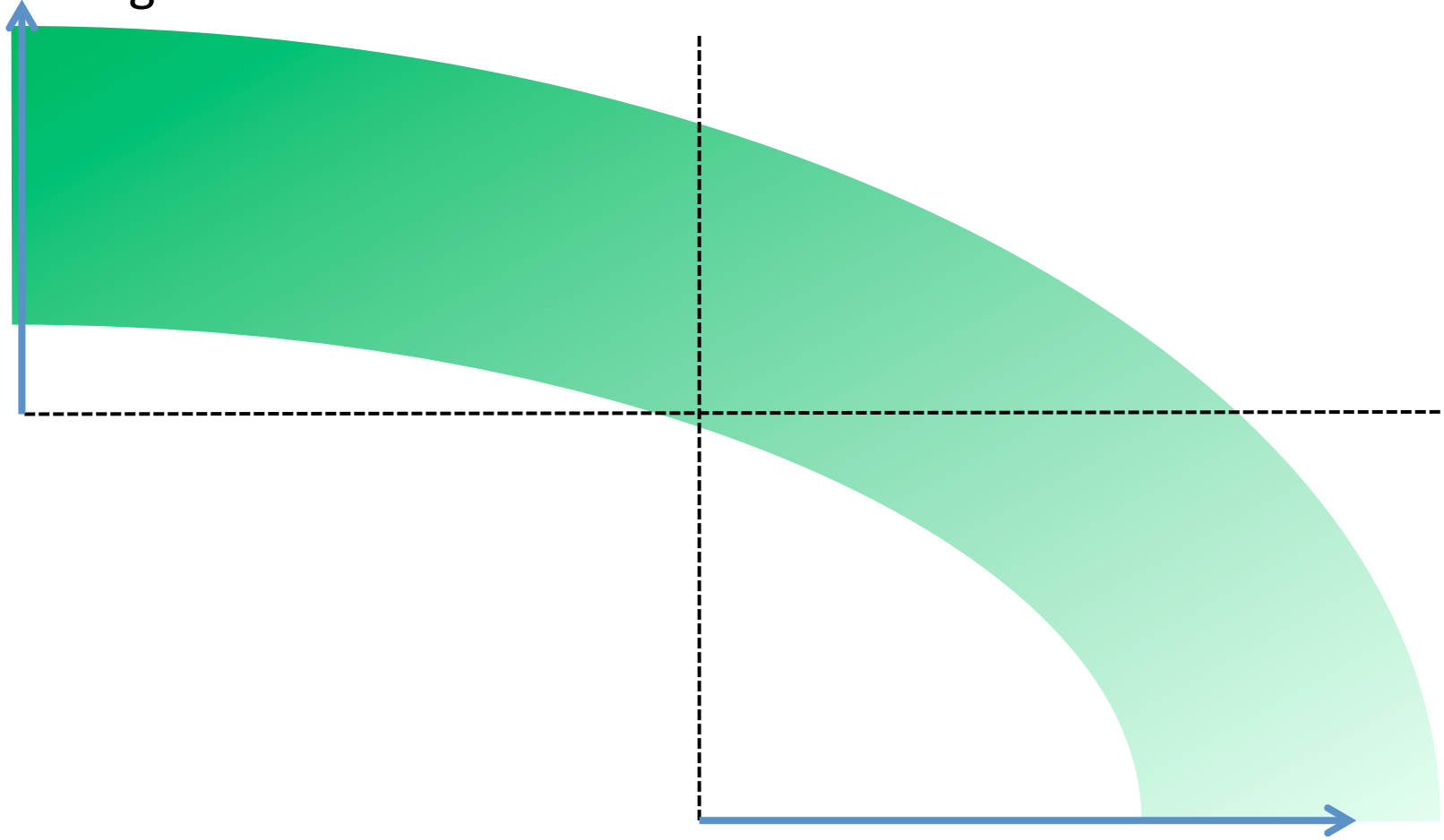
必修	応用理工学序論 I
	応用理工学序論 II
	電気工学実験
	材料力学
	材料力学演習・実験
	機械力学
	機械力学演習・実験
	流れ学
	流れ学演習・実験
	熱力学
	熱力学演習・実験
	動的システムのモデリングと制御
	動的システムのモデリングと制御 演習・実験
	機械のしくみ
	機械創成工学実習 I
	機械創成工学実習 II
	機械創成工学実習 III
	機械工学実験 I
機械工学実験 II	
工学倫理	

必修科目

必修



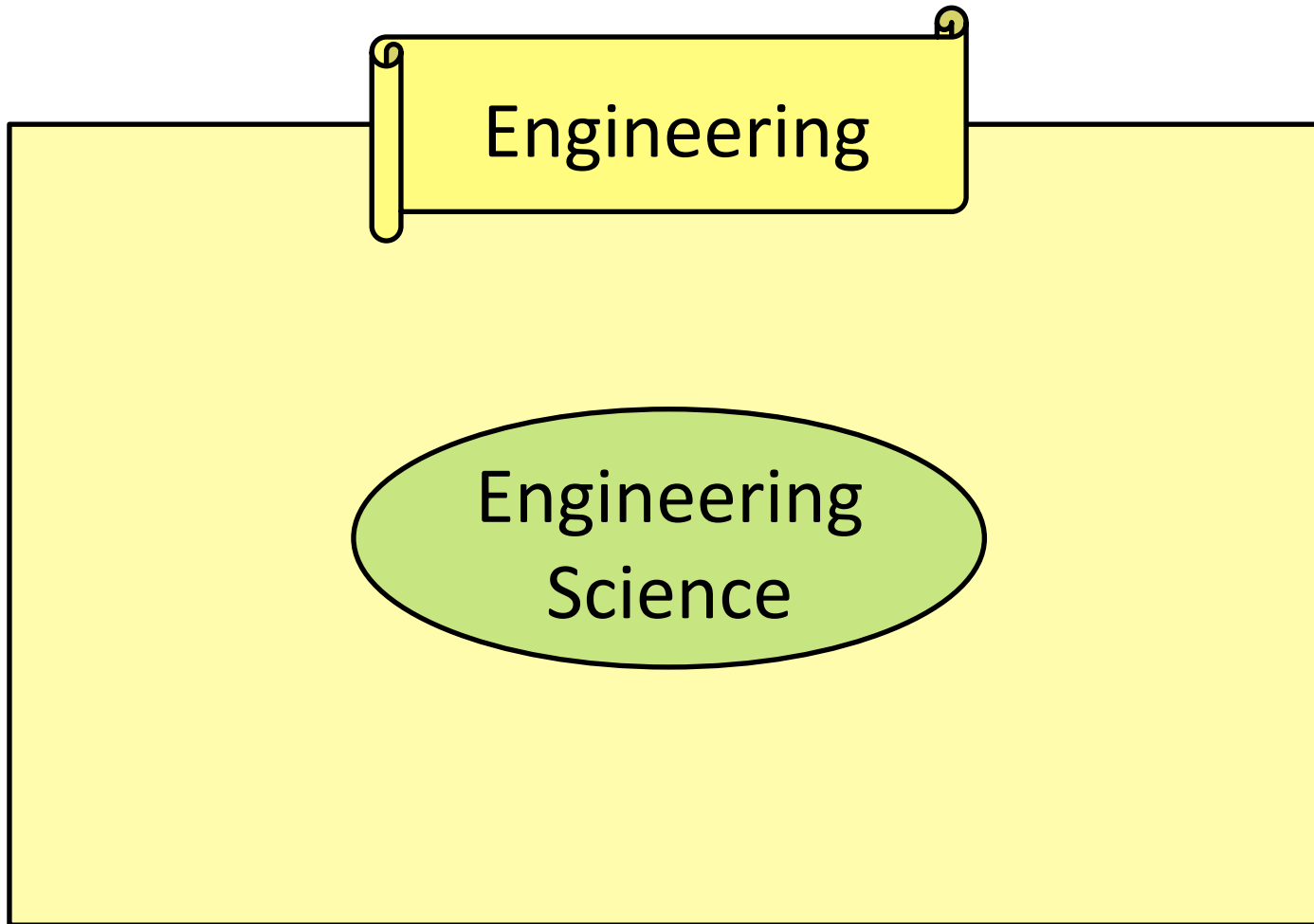
Engineering



Science



Ex) N.U.S.



Ex) U.C. Berkeley

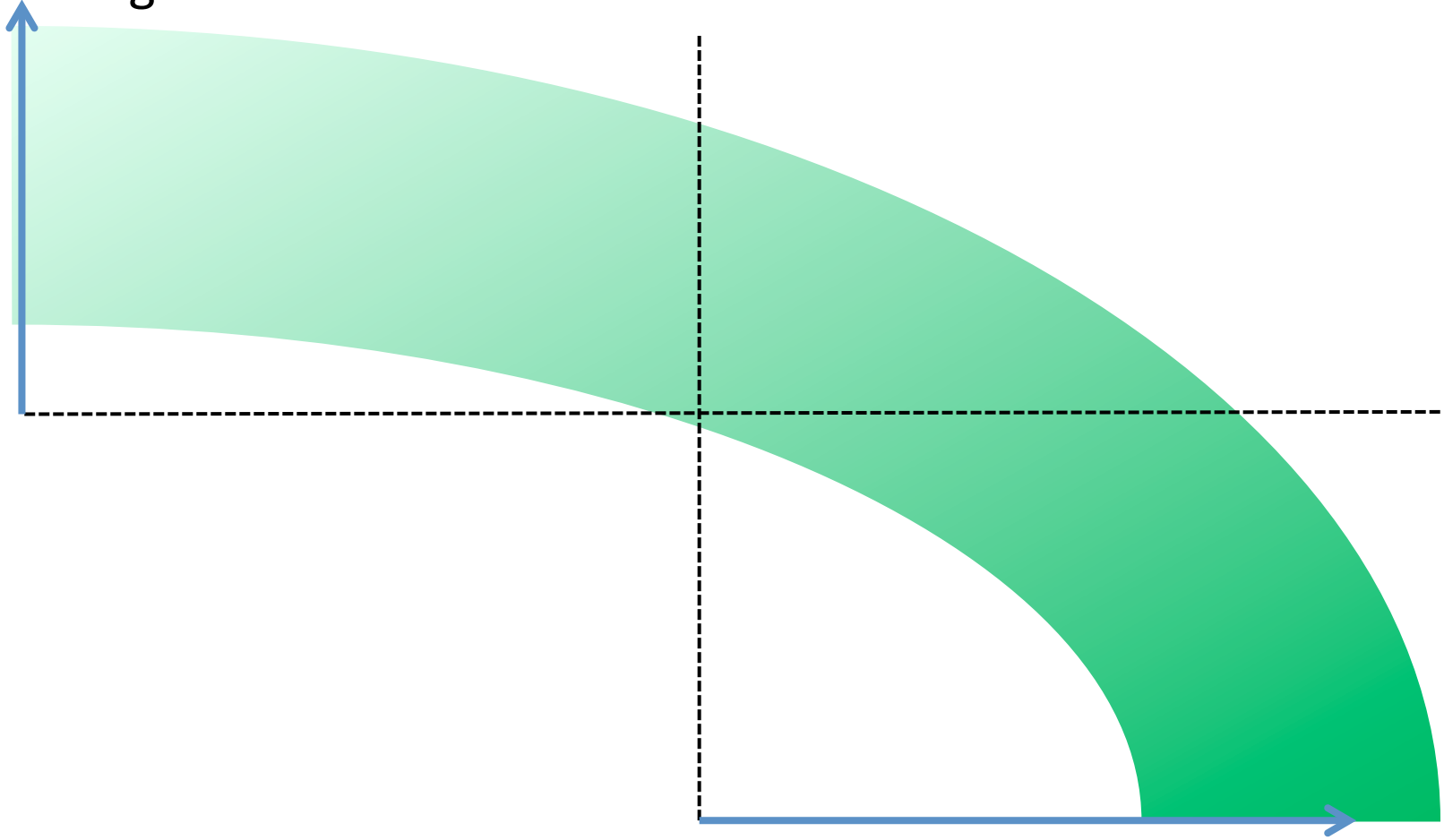
Physics Major Program (3 rd /4 th year)
Physics 112 – Statistical & Thermal Physics
Physics 105 – Analytic Mechanics
Physics 137A – Quantum Mechanics
Physics 137B – Quantum Mechanics
Physics 111A – Modern Physics Lab
Physics 111B – Advanced Lab
Physics 110A – Electromagnetism & Optics
Physics elective

Engineering Physics, Engineering Math & Statistics
 Environmental Engineering Science
 Energy Engineering

Engineering Physics Program (3 rd /4 th year)		
<i>Junior Year</i>		
E 115 – Engineering Thermodynamics <i>or</i> Physics 112 – Introduction to Statistical and Thermal Physics	-	3-4
Mathematics 104 – Introduction to Analysis and Mathematics 185 – Introduction to Complex Analysis, <i>or</i> Mathematics 121A and 121B – Mathematical Tools for the Physical Sciences	4	4
ME 104 – Engineering Mechanics <i>or</i> Physics 105 – Analytic Mechanics	3-4	-
Physics 137A – Quantum Mechanics	4	-
Physics 137B – Quantum Mechanics	-	4
Technical Electives ²	-	3-4
Third Additional Humanities/Social Science Course ¹	3-4	-
Total	14-16	14-16
<i>Senior Year</i>		
EE 143 – Microfabrication Technology, <i>or</i> NE 104 – Nuclear Instrumentation Lab, <i>or</i> Physics 111A – Modern Physics and Advanced Electrical Lab ³	3-4	-
ME 185 – Introduction to Continuum Mechanics <i>or</i> ME 106 – Fluid Mechanics	-	3
Physics 110A and 110B – Electromagnetism and Optics	4	3-4
EE 117 ⁴ – Electromagnetic Fields and Waves and either EE 119 – Introduction to Optical Engineering <i>or</i> BioE 164 – Optics and Microscopy		
MSE 111 – Electric and Magnetic Properties of Materials <i>or</i> Physics 141A – Solid State Physics	3-4	-
Technical Electives ²	4-5	5-6
Fourth Additional Humanities/Social Science Course	-	3-4
Total	14-17	14-17



Engineering



Science



Goal?

- Engineering \Rightarrow Industry
- Science \Rightarrow Theory
- Engineering Science \Rightarrow ??



Conclusion

- Concept is too unclear!
⇒ Make clear and define!

But...

Is it Possible?

Engineering Science is

Not Necessary