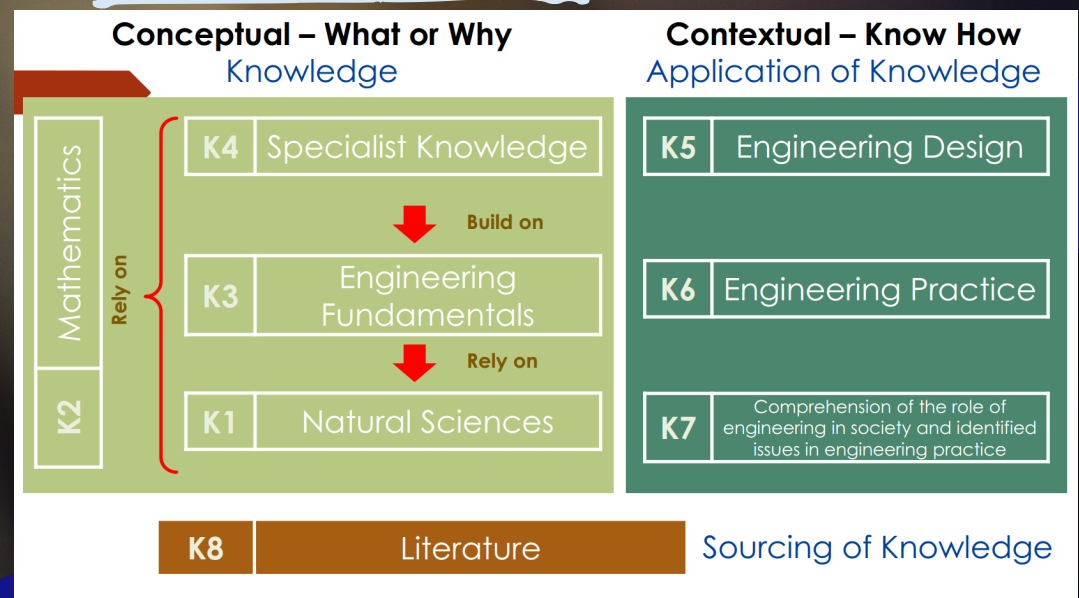


SA = PO

SK

ETAC Graduate Attributes 2020		ETAC Graduate Attributes 2020	
PO1 - Engineering Knowledge	Apply knowledge of mathematics, science, engineering fundamentals and an engineering specialisation to defined and applied engineering procedures, processes, systems or methodologies. (SK1, SK2, SK3, SK4)	PO7 - Environment and Sustainability	Understand the impact of engineering technology solutions of broadly defined engineering problems in societal and environmental context and demonstrate knowledge of and need for sustainable development. (SK7)
PO2 - Problem Analysis	Identify, formulate, research literature and analyse broadly-defined engineering problems reaching substantiated conclusions using analytical tools appropriate to their discipline or area of specialisation. (SK1, SK2, SK3, SK4)	PO8 - Ethics	Understand and commit to professional ethics and responsibilities and norms of engineering technology practice. (SK7)
PO3 - Design/Development of Solutions	Design solutions for broadly-defined engineering technology problems and contribute to the design of systems, components or processes to meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations. (SK5)	PO9 - Individual and Team work	Function effectively as an individual, and as a member or leader in diverse technical teams.
PO4 - Investigation	Conduct investigations of broadly-defined problems : locate, search and select relevant data from codes, data bases and literature, design and conduct experiments to provide valid conclusions. (SK8)	PO10 - Communication	Communicate effectively on broadly-defined engineering activities with the engineering community and with society at large, by being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions;
PO5 - Modern Tool Usage	Select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to broadly-defined engineering problems , with an understanding of the limitations. (SK6)	PO11 - Project Management and Finance	Demonstrate knowledge and understanding of engineering management principles and apply these to one's own work, as a member and leader in a team and to manage projects in multidisciplinary environments.
PO6 - The Engineer and Society	Demonstrate understanding of the societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering technology practice; and solutions to broadly-defined engineering problems (SK7)	PO12 - Lifelong learning	Recognize the need for, and have the ability to engage in independent and life-long learning in specialist technologies.



PO vs SK/SP/TA

Broadly Defined Engineering Problem, SP : SP1 + 2SPx: SP2-SP7 (Min 3 SPs)						
GRADUATE ATTRIBUTES (Keywords)	PROFESSIONAL ENGINEERING GRADUATES - Complex Engineering Problems		TECHNOLOGIST GRADUATES - Broadly Defined Engineering Problems		TECHNICIAN GRADUATES - Well-Defined Engineering Problems	
	WA-WK's	WP/EA	SA-SK's	SP/TA	DA-DK's	DP/DA
1. Engineering Knowledge	WK1-WK4	WP	SK1-SK4	SP	DK1-DK4	DP
2. Problem Analysis	WK1-WK4	WP	SK1-SK4	SP	DK1-DK4	DP
3. Design/Development of Solutions	WK5	WP	SK5	SP	DK5	DP
4. Investigation	WK8	WP	SK8	SP	-	DP
5. Modern Tool Usage	WK6	WP	SK6	SP	DK6	DP
6. The Engineer and Society	WK7	WP	SK7	SP	DK7	DP
7. Environment and Sustainability	WK7	WP	SK7	SP	DK7	DP
8. Ethics	WK7		SK7		DK7	
9. Individual and Team work						
10. Communication		EA		TA		DA
11. Project Management and Finance						
12. Life Long Learning						

Assessments Provide Adequate Feedback To The Programme To Identify Strengths And Weaknesses For CQI

SK & SP

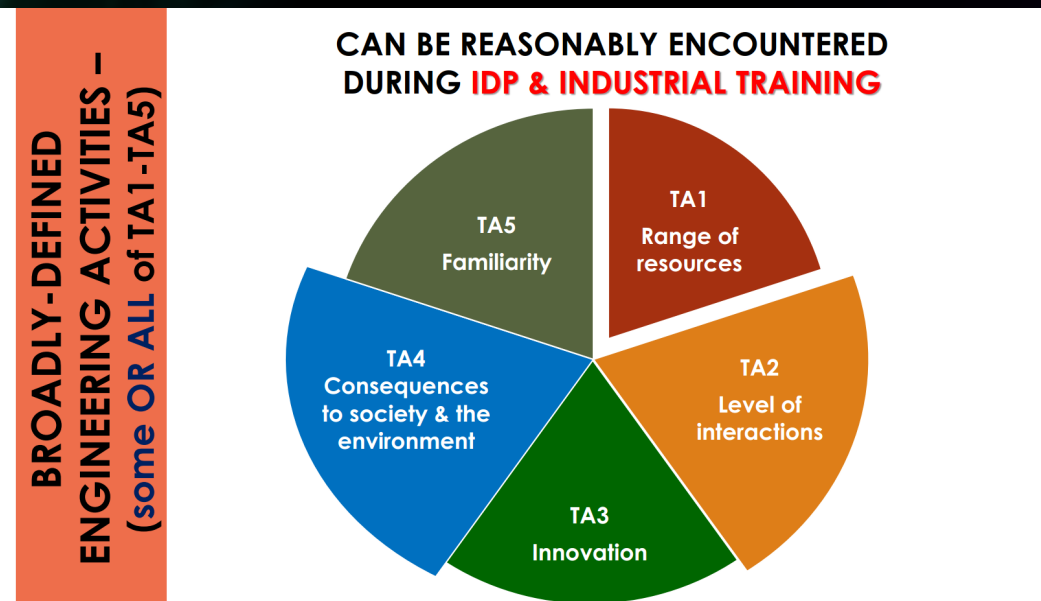
SK / Knowledge Profile - CHARACTERISTIC			BROADLY-DEFINED PROBLEMS have characteristic of SP1 and some or all of SP2 to SP7 (ETAC 2020, B-5)	SP / Broadly-Defined Problems - CHARACTERISTIC		
SK1	Natural Sciences	A systematic, theory-based understanding of the natural sciences applicable to the sub-discipline		SP1	Depth of Knowledge	SP1 cannot be resolved without engineering knowledge at the level of one or more of SK4, SK5, and SK6 supported by SK3 with a strong emphasis on the application of developed technology
SK2	Mathematics	Conceptually-based mathematics , numerical analysis, statistics and aspects of computer and information science to support analysis and use of models applicable to the sub-discipline		SP2	Conflicting requirement	SP2 involve a variety of factors which may impose conflicting constraints
SK3	Engineering fundamentals	A systematic, theory-based formulation of engineering fundamentals required in an accepted sub-discipline		SP3	Depth of analysis	SP3 can be solved by application of well-proven analysis techniques
SK4	Specialist knowledge	Engineering specialist knowledge that provides theoretical frameworks and bodies of knowledge for an accepted sub-discipline		SP4	Familiarity of issues	SP4 belong to families of familiar problems which are solved in well-accepted ways
SK5	Engineering design	Knowledge that supports engineering design using the technologies of a practice area	POs	SP5	Extent of applicable codes	SP5 may be partially outside those encompassed by standards or codes of practice
SK6	Engineering practice	Knowledge of engineering technologies applicable in the sub-discipline	PO1 - EK	SK1 - SK4	X	SP6 involve several groups of stakeholders with differing and occasionally conflicting needs
SK7	Comprehension	Comprehension the role of technology in society and identified issues in applying engineering technology; ethics and impacts: economic, social, environmental and sustainability	PO2 - PA	SK1 - SK4	X	SP7 are parts of, or systems within complex engineering problems
SK8	Technological literature	Engagement with the technological literature of the discipline	PO3 - Design	SK5	X	
			PO4 - I	SK8	X	
			PO5 - MT	SK6	X	
			PO6 - ES	SK7	X	
			PO7 - EvS	SK7	X	

Broadly Defined Engineering Problem, SP : SP1 + 2SPx: SP2-SP7 (Min 3 SPs)

7 POs ~ SP

TA

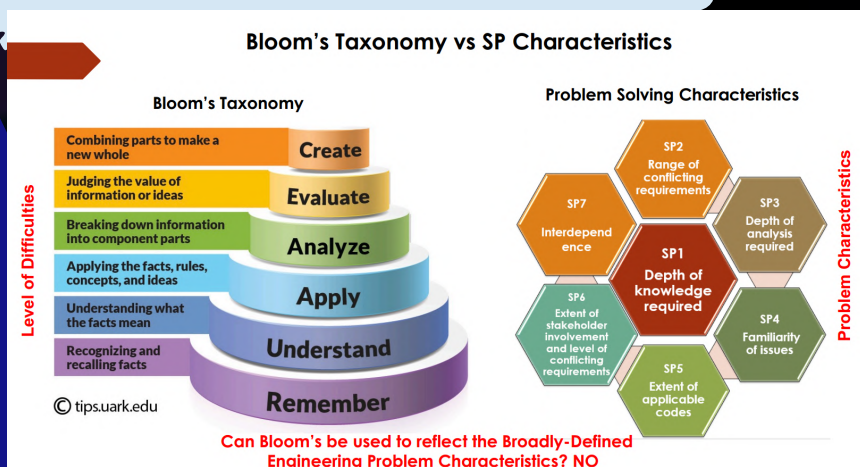
TA Detail



KEYWORD	COMPLEX ENGINEERING ACTIVITIES (TA1-TA5) CHARACTERISTICS
Range of resources	TA1 Involve a variety of resources (and for this purposes resources includes people, money, equipment, materials, information and technologies)
Level of interactions	TA2 Require resolution of occasional interactions between technical, engineering and other issues, of which few are conflicting
Innovation	TA3 Involve the use of new materials, techniques or processes in non-standard ways
Consequences to society and the environment	TA4 Have reasonably predictable consequences that are most important locally, but may extend more widely
Familiarity of issues	TA5 Require a knowledge of normal operating procedures and processes

Bloom T. vs SP

Summary



- Student Attribute (SA) = Programme Outcome (PO): 12 POs
- Knowledge Profile (SK), SK1-SK8, is fixed/tied with the PO.
- Broadly Defined Engineering Problem (SP): Min.3 SPs (SP1 + 2SPx (SP2-SP7), PO1-PO7.
- Broadly Defined Engineering Activities (TA): Min 2 TAs (TA1-TA5), and only for PO10 (Communications)