United Nations
ducational, Scientific and
Cultural Organization

联合国教育、
科学及文化组织

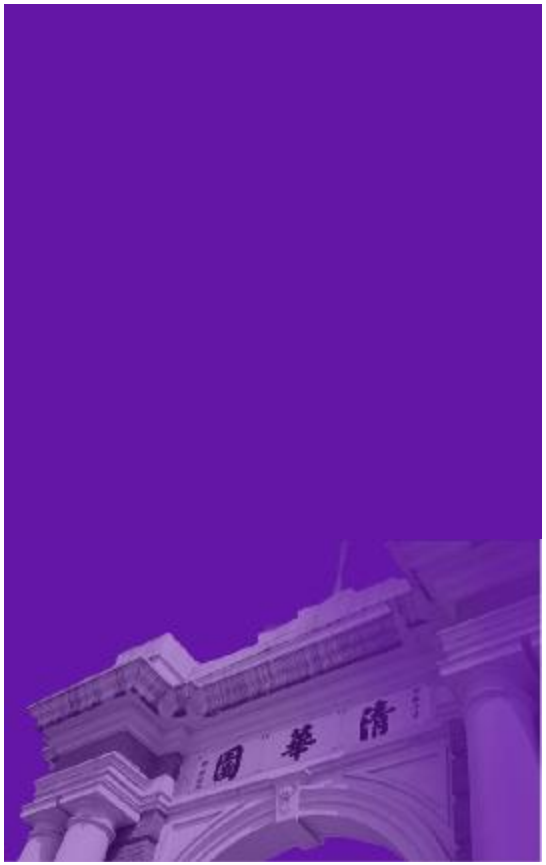
ICEE

International Centre for
Engineering Education
under the auspices of UNESCO

国际工程教育中心

World Federation of Engineering Organizations
Fédération Mondiale des Organisations d'Ingénieurs

Engineering
for Sustainable Development



Proposed changes to Knowledge and Attitude Profile (Table 3) of the framework

Prof. Kang Jincheng, Strategic Specialist of ICEE

Prof. Wang Sunyu, Dr. Qiao Weifeng, Dr. Xu Lihui

An overview of Table 3 Knowledge and Attitude profile

Three level programme

- Washington Accord programme (WK1-9), 4-5 years
- Sydney Accord programme (SK1-9) , 3-4 years
- Dublin Accord programme (DK1-9), 2-3 years

Responses to many changes in engineering education

- UN SDG goals setting
- Engineering discipline development
- Ethics challenges
- Meet needs of society – communication, stakeholders
- Emerging technologies, so need for lifelong learning
- Need for intellectual agility, critical thinking
- New modes of learning and teaching
- …

Proposed change 1

WK1: A systematic, theory-based understanding of the natural sciences applicable to the discipline and awareness of the relevant social sciences	**SK1:** A systematic, theory-based understanding of the natural sciences applicable to the sub-discipline and awareness for the relevant social sciences	**DK1:** A descriptive, formula-based understanding of the natural sciences applicable in a sub-discipline and awareness for the relevant social sciences .

Proposed changes 2

WK2: Conceptually-based **mathematics**, numerical and **data analysis**, statistics and formal aspects of computer and information science to support analysis and modelling applicable to the discipline	**SK2:** Conceptually-based **mathematics**, numerical and **data analysis**, statistics and aspects of computer and information science to support analysis and use of models applicable to the sub-discipline	**DK2:** Procedural **mathematics**, numerical analysis, statistics applicable in a sub-discipline

Proposed changes 3

WK3: A systematic, theory-based formulation of **engineering fundamentals** required in the engineering discipline	**SK3:** A systematic, theory-based formulation of **engineering fundamentals** required in an accepted sub-discipline	**DK3:** A coherent procedural formulation of **engineering fundamentals** required in an accepted sub-discipline

Proposed changes 4

WK4: Engineering **specialist** **knowledge** that provides theoretical frameworks and bodies of knowledge for the accepted practice areas in the engineering discipline; much is at the forefront of the discipline.	**SK4:** Engineering **specialist** **knowledge** that provides theoretical frameworks and bodies of knowledge for an accepted sub-discipline	**DK4:** Engineering **specialist** **knowledge** that provides the body of knowledge for an accepted sub-discipline

Proposed changes 5

WK5: Knowledge of efficient resource use, minimum waste and environmental impacts, whole-life cost ,resource re-use, net zero carbon and the like that supports **engineering design** in a practice area.	**SK5:** Knowledge of efficient resource use, minimum waste, whole-life cost net zero carbon and the like that supports **engineering design** using the technologies of a practice area.	**DK5:** Knowledge of efficient resource use, minimum waste, whole-life cost net zero carbon and the like that supports **engineering design** based on the techniques and procedures of a practice area

Proposed changes 6

WK6: Knowledge of **engineering practice** (technology) in the practice areas in the engineering discipline	**SK6:** Knowledge of **engineering technologies** applicable in the sub-discipline	**DK6:** Codified **practical engineering knowledge** in recognised practice area.

Proposed changes 7

WK7: Comprehension of the role of engineering in society and identified issues in engineering practice in the discipline: ~~ethics and~~ the professional responsibility of an engineer to public safety and benefits to advance the UN Sustainable Development Goals for economic, environmental and social benefits for all ~~cultural, environmental and sustainability~~	**SK7: Comprehension of** the role of technology in society and identified issues in applying engineering technology: ~~ethics and~~ impacts~~:~~ ~~economic, social, environmental and sustainability~~ of the technology in the context of UN Sustainable Development Goals	**DK7: Knowledge** of issues and approaches in engineering technician practice: ~~ethics,~~ financial, cultural, environmental and sustainability impacts in the context of UN Sustainable Development Goals

Proposed changes 8

WK8: Engagement with selected knowledge in the **research literature** of the discipline, and, awareness of the power of critical thinking and creative approaches to incorporate broader emerging issues	**SK8:** Engagement with the **technological literature** of the discipline; awareness of the power of critical thinking	**DK8:** no requirements

Proposed changes 9

WK9: **Ethical attitude and** **behavior**; Awareness and ability to work in diverse teams by ethnicity, gender, age, physical ability etc. with mutual understanding and respect, and inclusive attitudes.	**SK9**: **Ethical attitude and** **behavior**; Awareness and ability to work in diverse teams by ethnicity, gender, age, physical ability etc. with mutual understanding and respect, and inclusive attitudes.	**DK9**: **Ethical attitude and** **behavior**; Awareness and ability to work in diverse teams by ethnicity, gender, age, physical ability etc. with mutual understanding and respect, and inclusive attitudes.

United Nations
ducational, Scientific and
Cultural Organization

联合国教育、
科学及文化组织

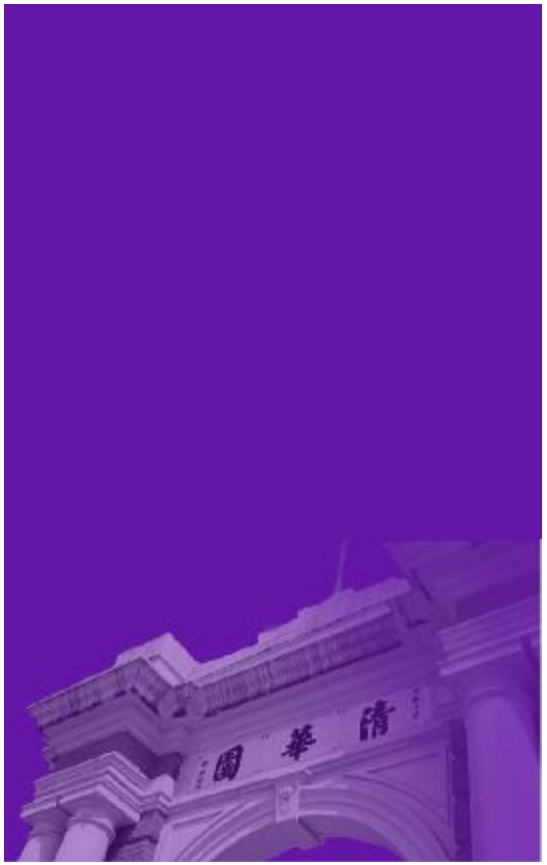
ICEE

International Centre for
Engineering Education
under the auspices of UNESCO

国际工程教育中心

World Federation of Engineering Organizations
Fédération Mondiale des Organisations d'Ingénieurs

ENGINEERING
FOR SUSTAINABLE DEVELOPMENT



Thanks for listening and look forward to your comments