

the learning ideas conference

2026 Conference Program

Online-Only Days: [Thursday, May 28th](#) | **Friday, May 29th**

Hybrid Days: [Wednesday, June 10th](#) | [Thursday, June 11th](#) | [Friday, June 12th](#)

Friday, May 29th, 2026 (Online Only)

All times are Eastern time. All sessions will be streamed online and recorded for registered attendees.

TRACK 2 – SESSION 2D

Session Chair: Pallavi Chhabra, Ph.D., Washington University in St. Louis, St. Louis, Missouri, USA

9:15 AM – 10:45 AM

Learning-to-Teach with Digital Devices to Nurture “Informed Citizens”: Role of *Habitus* in Field Experiences

P Chhabra, CA Grant
The Educational Forum, 1-19

MISSOURI SCHOOL DISCIPLINE TRENDS: ANALYZING INEQUITIES IN OUT-OF-SCHOOL SUSPENSIONS

P Chhabra, T Wilson

Novice Teachers’ Knowledge of Racial Literacies

X Chen, A Tondreau, C Lammert, R Hylton, P Chhabra, MR Goins, ...
Literacy Research and Instruction, 1-23

Using latent variable models to make gaming-the-system detection robust to context variations

Y Huang, S Dang, J Elizabeth Richey, P Chhabra, DR Thomas, MW Asher, ...
User Modeling and User-Adapted Interaction 33 (5), 1211-1257

Scenario-based training and on-the-job support for equitable mentoring

DR Chine, P Chhabra, A Adeniran, J Kopko, C Tipper, S Gupta, ...
The Learning Ideas Conference, 581-592

Exploring the factors that influence how (and why) community college instructors teach communication and teamwork skills in computer technology courses

MT Hora, P Chhabra, BB Smolarek
Community College Journal of Research and Practice 46 (6), 396-415

Session Chair

Pallavi Chhabra

Postdoctoral Research Associate



TRACK 2 – SESSION 2D

Session Chair: Pallavi Chhabra, Ph.D., Washington University in St. Louis, St. Louis, Missouri, USA

9:15 AM – 10:45 AM

10:15 AM – 10:45 AM



Introducing Social Service through Engineering Education

Kanmani Buddhi, Ph.D., BMS College of Engineering (*Retired*), Karnataka, India

Social service is emphasized in higher education. This component usually involves students taking up community service during semester breaks, and is a mandatory internship to be successfully completed. This community engagement often takes the students to places away from the location of the college/institution: for example; (i) students from our city go to a village; (ii) students from the USA go to Africa for engaging in community service. The activities that students engage in usually address one/more of the SDGs. It becomes a good practice to identify engineering problems/engineering projects/engineering products that can benefit the community that the students are engaged with. This practice exists and is successful.



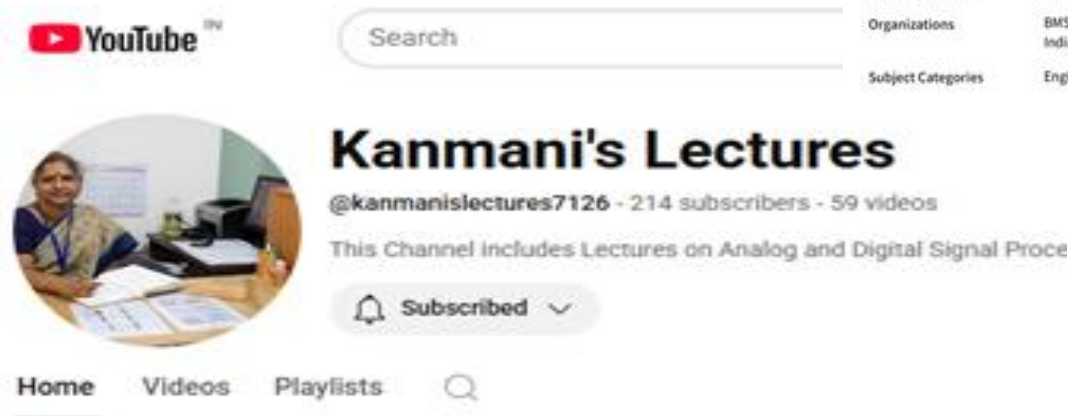
Research Interests:

- Signal Processing
- Signal Processing Education
- Engineering Education
- Pedagogy

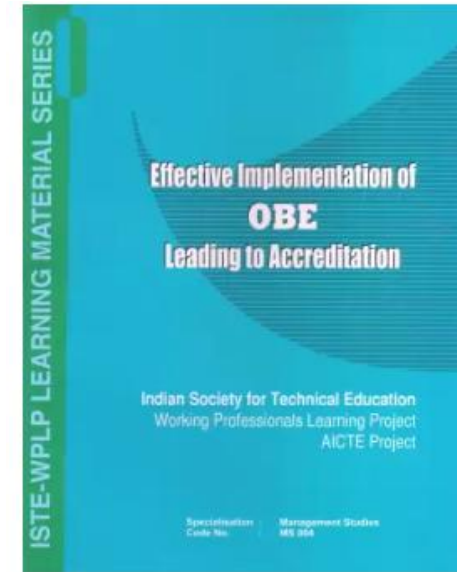
Kanmani Buddhi, Ing.Paed.IGIP
(IGIP International Educator)

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YouTube Channel



Books Published



Web of Science™ Smart Search Advanced Search Research Assistant

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Organizations BMS College of Engineering
Indian Institute of Science (IISc) - Bangalore

Subject Categories Engineering; Computer Science; Education & Educational Research; Optics

Web of Science Core Collection metrics

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180	41	7
Citations by 150 documents	Documents	<u>h-index</u>

The Work

Introducing Social Service through Engineering Education

The Sequence of Presentation

- **Higher Education**
- **Introduction to Outcome Based Education (OBE)**
- **Ensuring OBE through the Curriculum**
- **Social Service through Engineering Education**
- **Explore Service at Home**

Higher Education

Education

‘Education is a weapon, whose effect depends on who holds it in his hands, and at whom it is aimed’, – *Joseph Stalin, Russia*

‘Education is the most powerful weapon with which we can change the world’, – *Nelson Mandela*

AI - Generated

Higher Education

**Little boys and girls join Institutes of Higher Learning
Responsible Men and Women emerge from the Learning**

**There is the transition, from being nurtured by their parents;
to becoming responsible citizens/ responsible adults;
capable of taking decisions;
contribute to society;
contribute to the home;**

The Measure of Higher Education

Acquire a degree:

Placed/

Secure admission for Higher studies /

Entrepreneurs

In addition, the measure of the Higher Education is:

the Values of the Society;

the Health of the Society;

The recipe for improving Higher Education

Outcome Based Education (OBE)

Outcome Based Education (OBE)

[Washington Accord](#)[Sydney Accord](#)[Dublin Accord](#)[Become a Signatory](#)[HOME / ACCORDS](#)

Accords

An Accord is an international agreement between bodies responsible for accrediting engineering education.

[HOME / ACCORDS](#)

Washington Accord

The Washington Accord is an international agreement between organisations responsible for accrediting professional engineering degree programmes.

[Overview](#)[Graduate Attributes](#)[Signatories](#)[Executive Committee](#)

<https://www.internationalengineeringalliance.org/accords/washington-accord>

Full Signatories (25)

There are currently 25 full signatories of the Washington Accord, representing engineering accreditation bodies that ensure consistent undergraduate engineering education standards worldwide.

The Knowledge and Attitude Profile

The Washington Accord establishes a knowledge and attitude profile defining essential knowledge for professional engineering practice. The knowledge & attitude profile covers core engineering principles, mathematical foundations, and technical skills. The graduate attributes emphasises ethical reasoning, professional responsibility, and lifelong learning. Together, these profiles ensure graduates meet internationally recognised standards for engineering practice.

The Accreditation Body represents the Country

The Graduate Attributes Profile

The International Engineering Alliance's Graduate Attributes and Professional Competencies framework establishes international benchmarks for engineering education, emphasising sustainability, ethics, and global competence recognition.



United States

Accreditation Board for
Engineering and Technology
(ABET)



India

National Board of
Accreditation (NBA)



<https://www.internationalengineeringalliance.org/accords/washington-accord#list-of-signatories>

The National Board of Accreditation represents India



NATIONAL BOARD OF ACCREDITATION

PROMOTING INTERNATIONAL QUALITY STANDARDS FOR TECHNICAL EDUCATION IN INDIA



ABOUT

ACCREDITATION

APPLYING FOR ACCREDITATION

ACCREDITED PROGRAMS

PUBLICATIONS

WOSA

WORKSHOPS

VISION AND MISSION

[Home](#) / [About Us](#) / Vision and Mission

ABOUT US

- > Introduction
- > Vision and Mission
- > Objectives
- > Organizational Structure
- > Major Milestones
- > MoA



VISION

To be an accrediting agency of international standard by ensuring the highest degree of credibility in assurance of quality and relevance to professional education and come up to the expectations of its stakeholder's viz., academicians, corporates, educational institutions, government, industry, regulators, students and their parents.



MISSION

To stimulate the quality of teaching, self-evaluation and accountability in the higher education system, which help institutions realize their academic objectives and adopt teaching practices that enable them to produce high-quality professionals and to assess and accredit the programs offered by the institutions imparting technical and professional education.

The International Engineering Alliance (IEA)
defined
Graduate Attributes and Professional Competencies (GAPC)

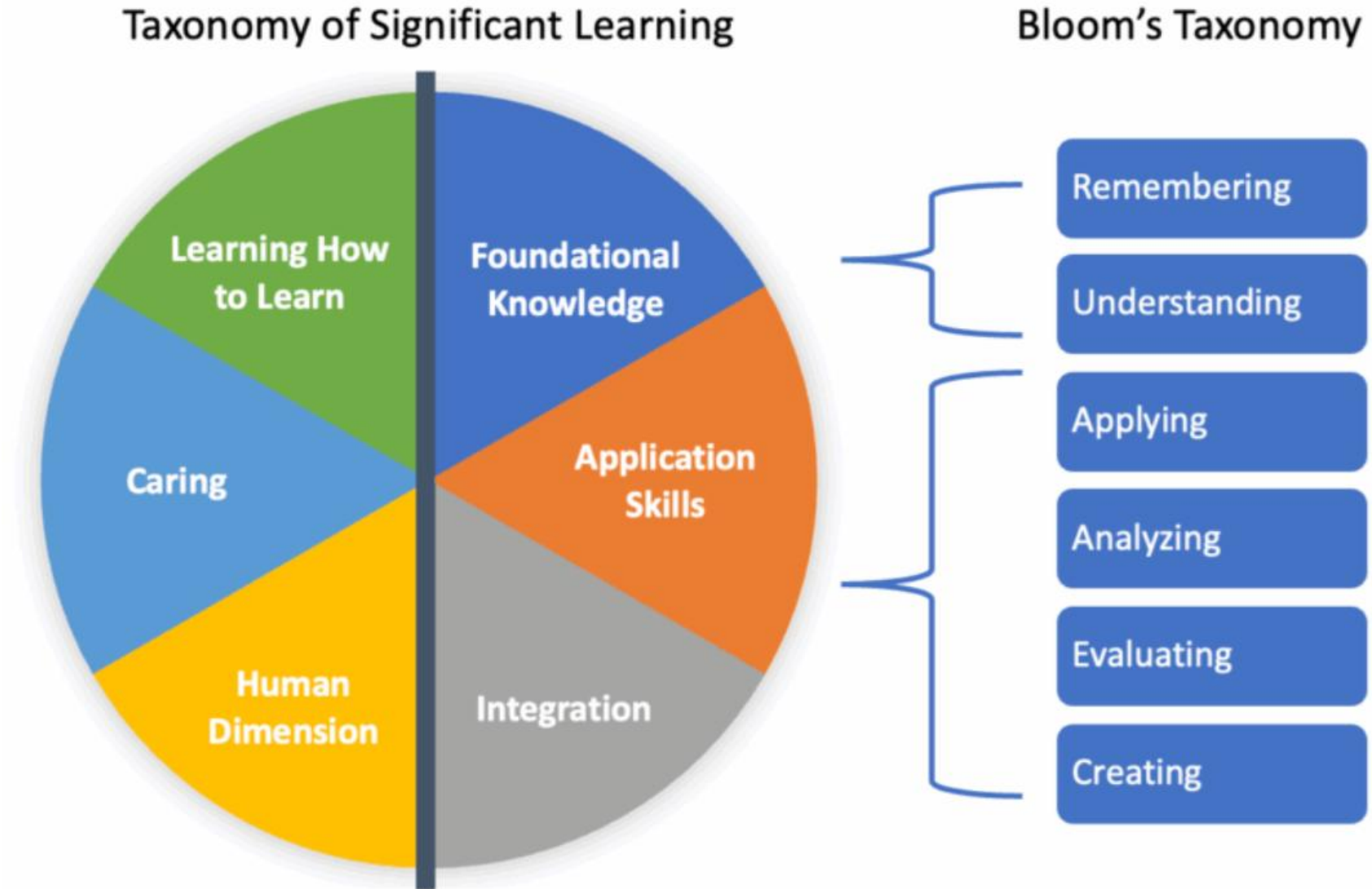
The National Board of Accreditation (NBA)
has revised and aligned
The Program Outcomes (POs)
with the GAPC

Engineering Education in India

Program Outcomes (POs)	
PO1	Engineering Knowledge
PO2	Problem Analysis
PO3	Design/Development of Solution
PO4	Conduct Investigations of Complex Problems
PO5	Engineering Tool Usage
PO6	The Engineer and The World
PO7	Professional Ethics
PO8	Individual and Team work
PO9	Communicate Effectively
PO10	Project Management and Finance
PO11	Life-Long Learning

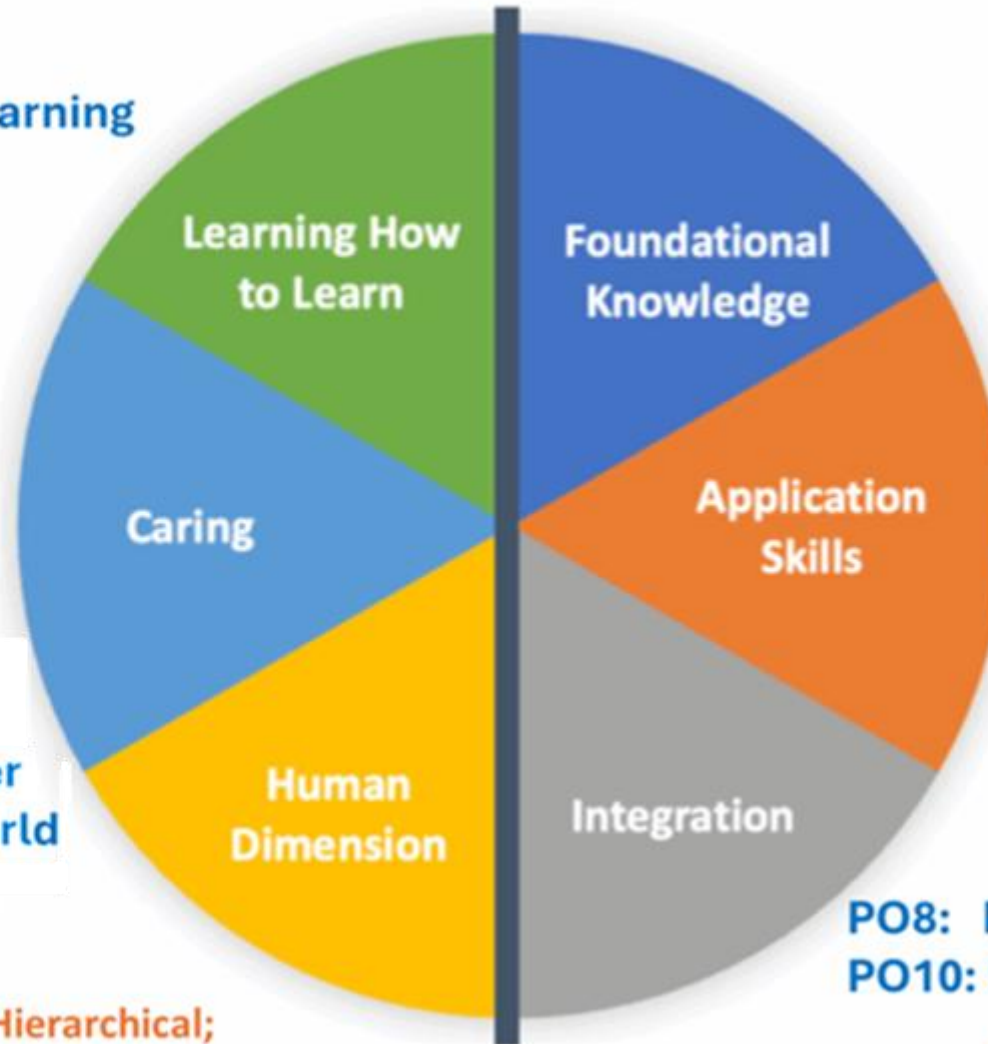
A comparison Program Outcomes (POs) Bloom's Taxonomy Levels Fink's Taxonomy Levels

Fink's Taxonomy by Dr. L. Dee Fink



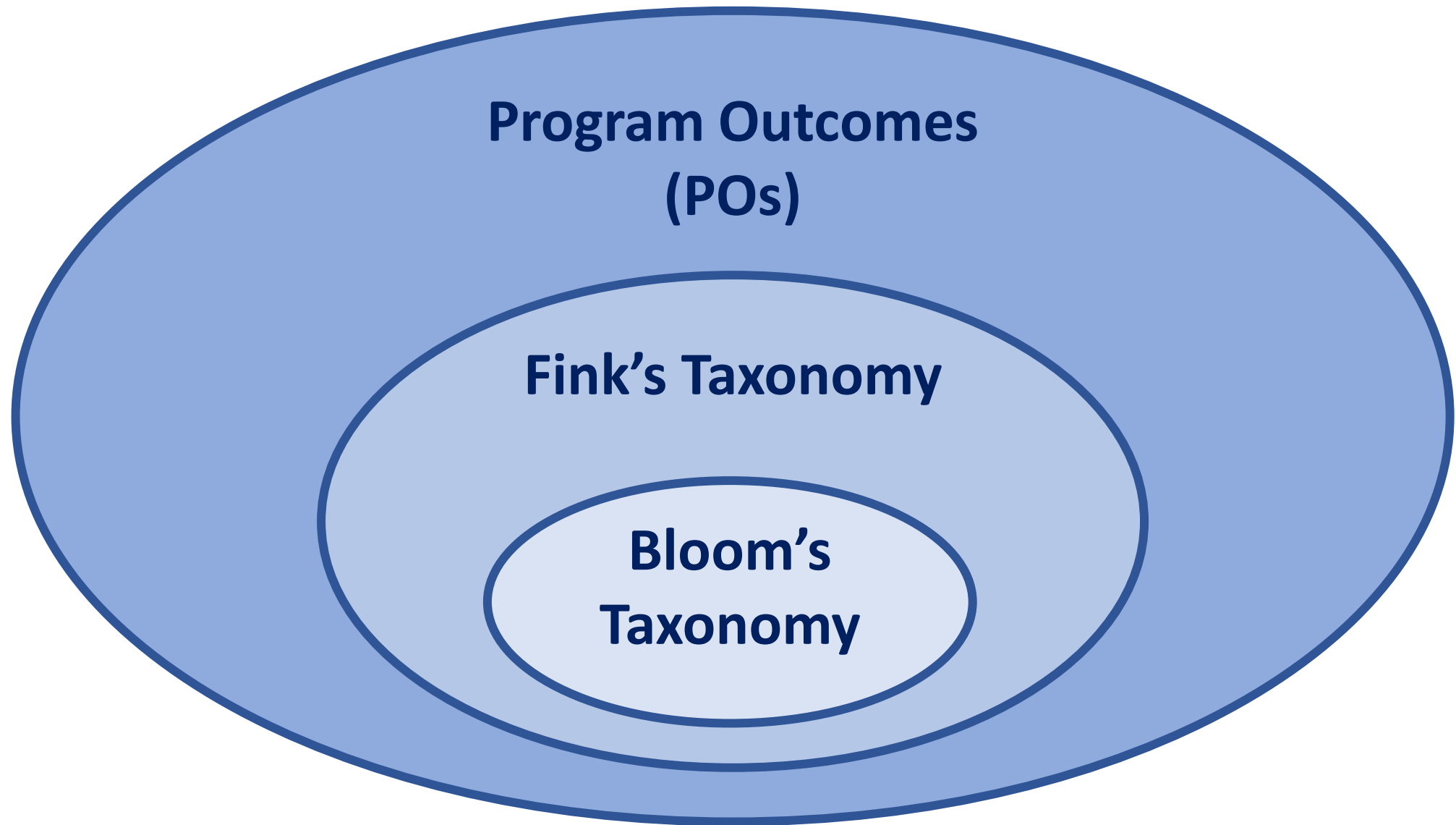
Fink's Taxonomy of Significant Learning and the Program Outcomes (POs)

PO11: Life-Long Learning



PO6: The Engineer and The World

The Fink's Taxonomy is Not Hierarchical;
The Fink's Taxonomy is Integrated



Engineering Education

- Focus on developing the POs defined by NBA
- Since the POs by NBA are aligned to the GAPC of IEA
- Define Course Outcomes (COs) aligned to the POs
- Consider the action Verbs of:
 - Bloom's Taxonomy
 - Fink's Taxonomy

The Program Outcomes (POs)

- POs are developed in every student, during the program
- POs defined by NBA, are common for all programs
- Hence, there is provision to define 2-3 PSOs
- POs are measured at the time of graduation of the student
- POs are addressed significantly through the Curriculum
- POs are also addressed through the Co-curricular and Extra-Curricular activities on campus

Outcomes Based Education (OBE)
and is addressed
through the
Course Outcomes (COs) of the Curriculum
supported by
Effective Pedagogy and Relevant Assessments

Outcome Based Education through The Curriculum



Engineering Accreditation Commission

CRITERIA FOR ACCREDITING
ENGINEERING PROGRAMS

Core Competency

https://www.abet.org/wp-content/uploads/2024/11/2025-2026_EAC_Criteria.pdf

Electrical, Computer, Communications, Telecommunication(s), and Similarly Named Engineering Programs

Lead Society: IEEE

Cooperating Society for Computer Engineering Programs: CSAB

These program criteria apply to engineering programs that include “electrical,” “electronic(s),” “computer,” “communication(s),” telecommunication(s), or similar modifiers in their titles.

1. Curriculum

The structure of the curriculum must provide both breadth and depth across the range of engineering topics implied by the title of the program.

The curriculum must include probability and statistics, including applications appropriate to the program name; mathematics through differential and integral calculus; sciences (defined as biological, chemical, or physical science); and engineering topics (including computing science) necessary to analyze and design complex electrical and electronic devices, software, and systems containing hardware and software components.

The curriculum for programs containing the modifier “electrical,” “electronic(s),” “communication(s),” or “telecommunication(s)” in the title must include advanced mathematics, such as differential equations, linear algebra, complex variables, and discrete mathematics.

The curriculum for programs containing the modifier “computer” in the title must include discrete mathematics.

The curriculum for programs containing the modifier “communication(s)” or “telecommunication(s)” in the title must include topics in communication theory and systems.

The curriculum for programs containing the modifier “telecommunication(s)” must include design and operation of telecommunication networks for services such as voice, data, image, and video transport.

Skills of the 21st Century

21 st Century Skills	
S1	Critical Thinking
S2	Cognitive Flexibility
S3	Creativity
S4	Coordinating with others
S5	Negotiation
S6	Complex Problem Solving
S7	Decision Making
S8	Service Orientation
S9	Emotional Intelligence
S10	People Management

National Education Policy (NEP 2020)

- **Multidisciplinary Component**
- **Holistic Education**
- **Projects through Open Electives**
- **Open Electives Beyond Engineering**

The National Education Policy 2020, by the Ministry of Education,
https://www.mhrd.gov.in/sites/upload_files/mhrd/files/NEP_Final_English_0.pdf

The First Five Program Outcomes (POs)

PO1	Engineering Knowledge: Apply knowledge of mathematics, natural science, computing, engineering fundamentals and an engineering specialization as specified in WK1 to WK4 respectively to develop to the solution of complex engineering problems
PO2	Problem Analysis: Identify, formulate, review research literature and analyse complex engineering problems reaching substantiated conclusions with consideration for sustainable development (WK1 to WK4)
PO3	Design/Development of Solutions: Design creative solutions for complex engineering problems and design/develop systems/ components/processes to meet identified needs with consideration for the public health and safety, whole-life cost, net zero carbon, culture, society and environment as required (WK5)
PO4	Conduct Investigations of Complex Problems: Conduct investigations of complex engineering problems using research-based knowledge including design of experiments , modelling, analysis & interpretation of data to provide valid conclusions (WK8)
PO5	Engineering Tool Usage: Create, select and apply appropriate techniques, resources and modern engineering & IT tools, including prediction and modelling recognizing their limitations to solve complex engineering problems (WK2 and WK6)

The Higher Six Program Outcomes (POs)

PO6	The Engineer and The World: Analyze and evaluate societal and environmental aspects while solving complex engineering problems for its impact on sustainability with reference to economy, health, safety, legal framework, culture and environment (WK1, WK5, and WK7)
PO7	Ethics: Apply ethical principles and commit to professional ethics, human values, diversity and inclusion; adhere to national & international laws (WK9)
PO8	Individual and Collaborative Team work: Function effectively as an individual, and as a member or leader in diverse/multi-disciplinary teams
PO9	Communication: Communicate effectively and inclusively within the engineering community and society at large, such as being able to comprehend and write effective language, and learning differences
PO10	Project Management and Finance: Apply knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, and to manage projects and in multidisciplinary environments
PO11	Life-Long Learning: Recognize the need for, and have the preparation and ability for i) independent and life-long learning ii) adaptability to new and emerging technologies and iii) critical thinking in the broadest context of technological change (WK8)

The Nine Knowledge and Attitude Profile (WKs)

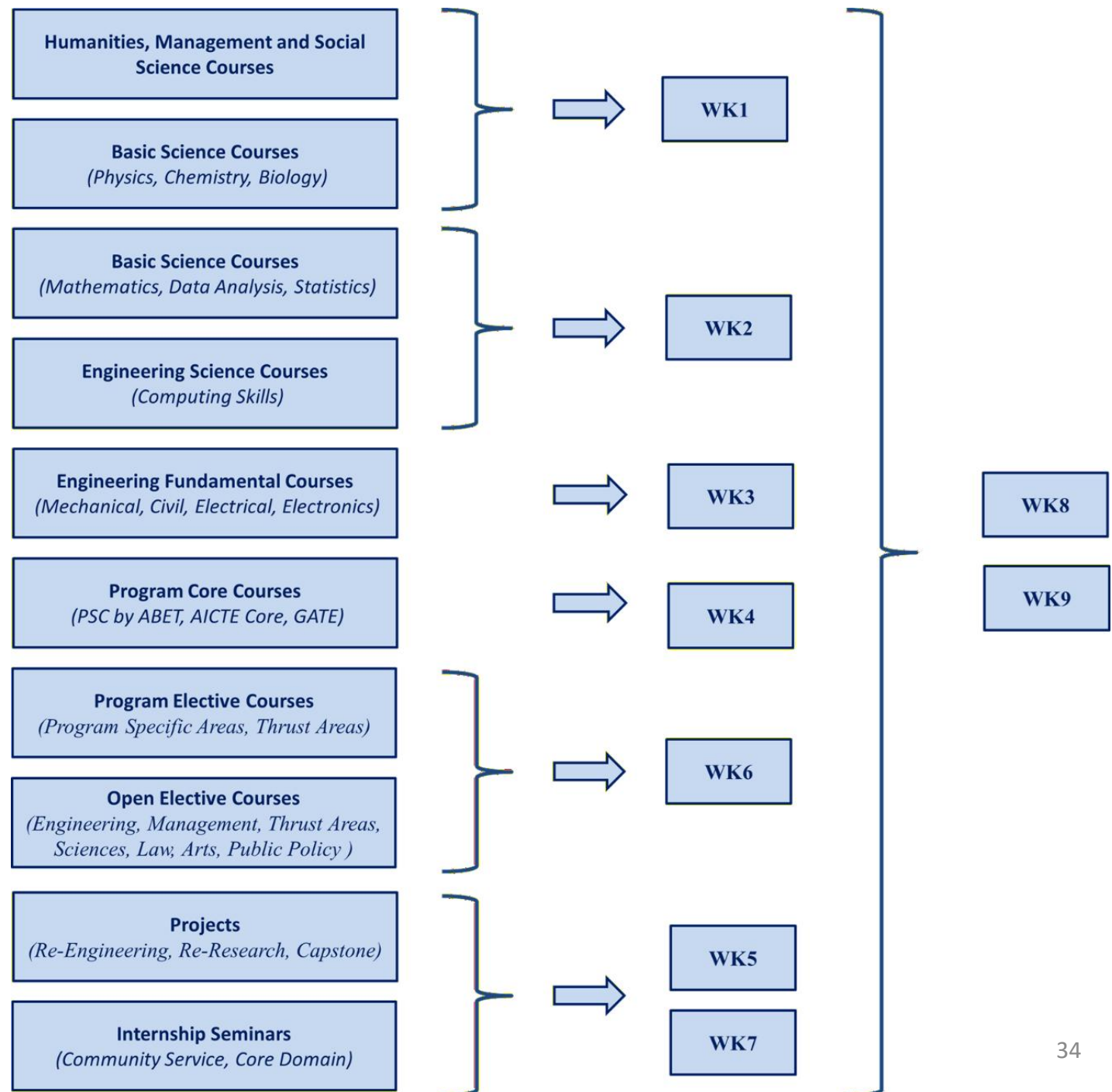
WK1	A systematic, theory-based understanding of the natural sciences applicable to the discipline and awareness of relevant social sciences
WK2	Conceptually-based mathematics, numerical analysis, data analysis, statistics and formal aspects of computer and information science to support detailed analysis and modelling applicable to the discipline
WK3	A systematic, theory-based formulation of engineering fundamentals required in the engineering discipline
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
WK5	Knowledge, including efficient resource use , environmental impacts, whole-life cost, re-use of resources, net zero carbon, and similar concepts, that supports engineering design and operations in a practice area
WK6	Knowledge of engineering practice (technology) in the practice areas in the engineering discipline
WK7	Knowledge of the role of engineering in society and identified issues in engineering practice in the discipline, such as the professional responsibility of an engineer to public safety and sustainable development
WK8	Engagement with selected knowledge in the current research literature of the discipline , awareness of the power of critical thinking and creative approaches to evaluate emerging issues
WK9	Ethics, inclusive behavior and conduct. Knowledge of professional ethics, responsibilities, and norms of engineering practice. Awareness of the need for diversity by reason of ethnicity, gender, age, physical ability etc. with mutual understanding and respect, and of inclusive attitudes

Derived from the AICTE-Model Syllabus

<https://www.aicte-india.org/education/model-syllabus>

Curricular Component		Credits	Percentage
BS	Basic Science (WK1, WK2)	23	14%
ES	Engineering Science (WK3)	13	8%
CS	Computing Skill (WK2)	8	5%
PC	Professional Core (WK4)	57	36%
HS	Humanities, Social Science, Management (WK1)	15	9%
PE	Professional Elective (WK6)	12	8%
OE	Open Elective (WK6)	12	8%
PR	Project (WK5, WK7, WK8)	12	8%
SM	Seminar, including Seminars based on Internships (Wk5, WK6, WK7)	8	4%
NC	Non-Credit Mandatory Course (WK9)	--	8 Units
Total		160	100%

Addressing Wks Through Curricular Components



Typical Semester Articulation Matrix (SAM)

Course	1	2	3	4	5	6	7	8	9	10	11
Course-1	3	3	3	2	3		1		1		1
Course-2	3	3		2	3		1		1		1
Course-3	3	3	2		2	1	1	1	2		2
Course-4	3	2			2		1	1	2	1	2
Course-5	3	3	1	3	3	1	1	1		1	3
Course-6	3	3	1	3	3	1	1	1		1	3
Non-Credit						✓	✓				

Every Semester, Every PO addressed by at least one Course

Social Work

Social Work through the Curriculum

Courses in the Curriculum:

- **Indian Knowledge Systems**
- **Universal Human Values**
- **Environmental Studies**

Semester Break Internship:

- **Four to six weeks of Community Engagement**
- **Evaluated through seminar/report during the semester**

The need to earn 100 Activity Points

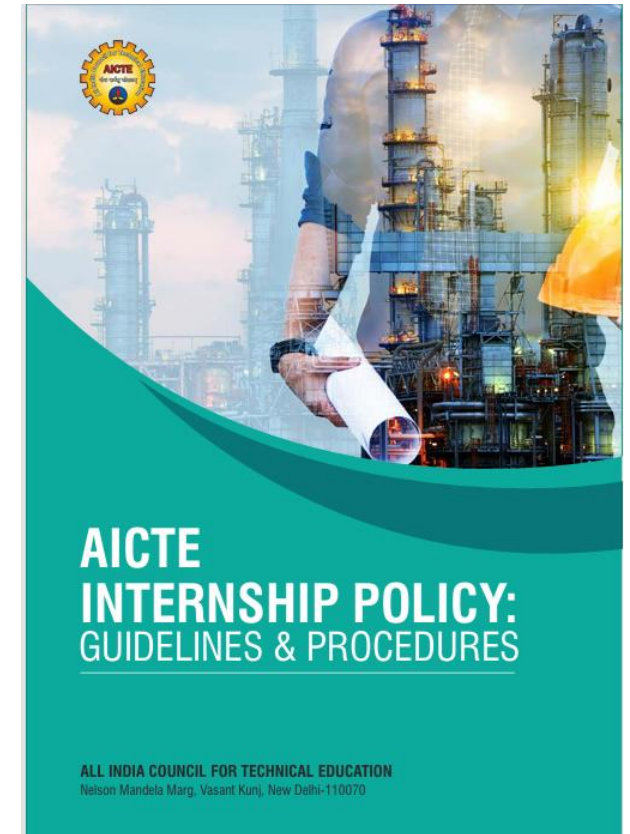
The suggested Plan for earning activity points:

- The points are earned during **semester breaks**
- 20 Activity points for 80 to 90 hours of association
- Maximum **20 activity points** under a component
- Students to earn from **any five** of the fifteen activities listed
- The student may choose any activities and earn 100 points

Guidelines for Internships during semester breaks,

<https://aicte-india.org/sites/default/files/AICTE%20Internship%20Policy.pdf>

ACITE Internship Policy (Chapter 6)



The Activity Points map to the SDGs

THE SUSTAINABLE DEVELOPMENT GOALS



<https://sdgs.un.org/goals>

The AICTE Activity Points: Sample Activities

Activity 1	Prepare and implement plan to create local job opportunities	SDG1, SDG8
Activity 2	Prepare and implement plan to improve education quality in village	SDG4
Activity 3	Prepare an actionable DPR for Doubling the village Income	SDG1, SDG8
Activity 4	Developing Sustainable Water Management system	SDG6
Activity 5	Prepare and Improve a plan to improve health parameters of villagers	SDG3, SDG11
Activity 6	Developing and implementing of Low Cost Sanitation facilities	SDG3, SDG12
Activity 7	Prepare and implement plan to promote Local Tourism through Innovative Approaches	SDG8, SDG11
Activity 8	Implement/Develop Technology solutions which will improve quality of life	SDG8, SDG9

The AICTE Activity Points: Sample Activities

Activity 9	Prepare and implement solution for energy conservation	SDG7, SDG12
Activity 10	Prepare and implement plan to Skill village youth and provide employment	SDG8
Activity 11	Develop localized techniques for Reduction in construction Cost	SDG11, SDG12
Activity 12	Prepare and implement plan of sustainable growth of village	SDG9, SDG11
Activity 13	Setting of Information imparting club for women leading to contribution in social and economic issues	SDG5, SDG10
Activity 14	Developing and managing Efficient garbage disposable system	SDG9, SDG11
Activity 15	Contribution to any national level initiative of Government of India. For eg. Digital India/ Skill India/ Swachh Bharat Internship etc	SDG4

Social Work by Engineering Students

Almost Every year:

Students from the National Service Scheme (NSS)

Engage in Social Work

Associate with a community from a village; Contribute

Adopt a School

Contribute through Knowledge

Social Work by Engineering Students

Around Two Decades ago:

During ASEE 2015

Witnessed a presentation by a team of students who went to Africa, and engaged in social work

All Good!

A Personal Experience

An Unforgettable Experience

Around fifteen years ago:

My Younger Brother's daughter, in the USA.

She was a little school girl. As part of her home assignment, she had to help her Mother. Her Mother asked her to fold the clothes. Instinctively, I jumped to help my niece. But the Mother was firm. She did this task all by herself and the Mother certified the same.

Some Thoughts

When students join the Engineering Program

List all unpaid work elders engage at home

Insist on support by our students at home

Certified by the Elders

Trust the validation by the Elders

Can we incorporate into our Academic Process?

Social Work begins at Home!

A Personal thought

- *Happy and Prospering Homes*
- *Every Member Eager to get back Home*
- *Homes with Sustainable Relationships*
- *The Home is the smallest entity of Society*

Leads to Sustainable Communities

Another Thought

Every Graduating Engineer

Graduates with Two Skills (Two Passion)

- **The Technical Passion** *(related to the Core Engineering Domain)*
- **Non-Technical Passion** *(Sports/ Singing/ Dancing/ Photography/ Art/ Media/ Agriculture/ Cooking/ Baking/ Stitching/ Social Work/ Any other)*

Nurture additional Skills that AI cannot take away!

The Success of Education Process

- Improvement in Student performance
- Acceptance by Industry
- Enhanced Placements
- Successful Entrepreneurs
- National/International- Awards
- Publications
- Succeed in Competitive Examinations
- Life-long Learners
- Socially responsible citizens

Additional Parameters

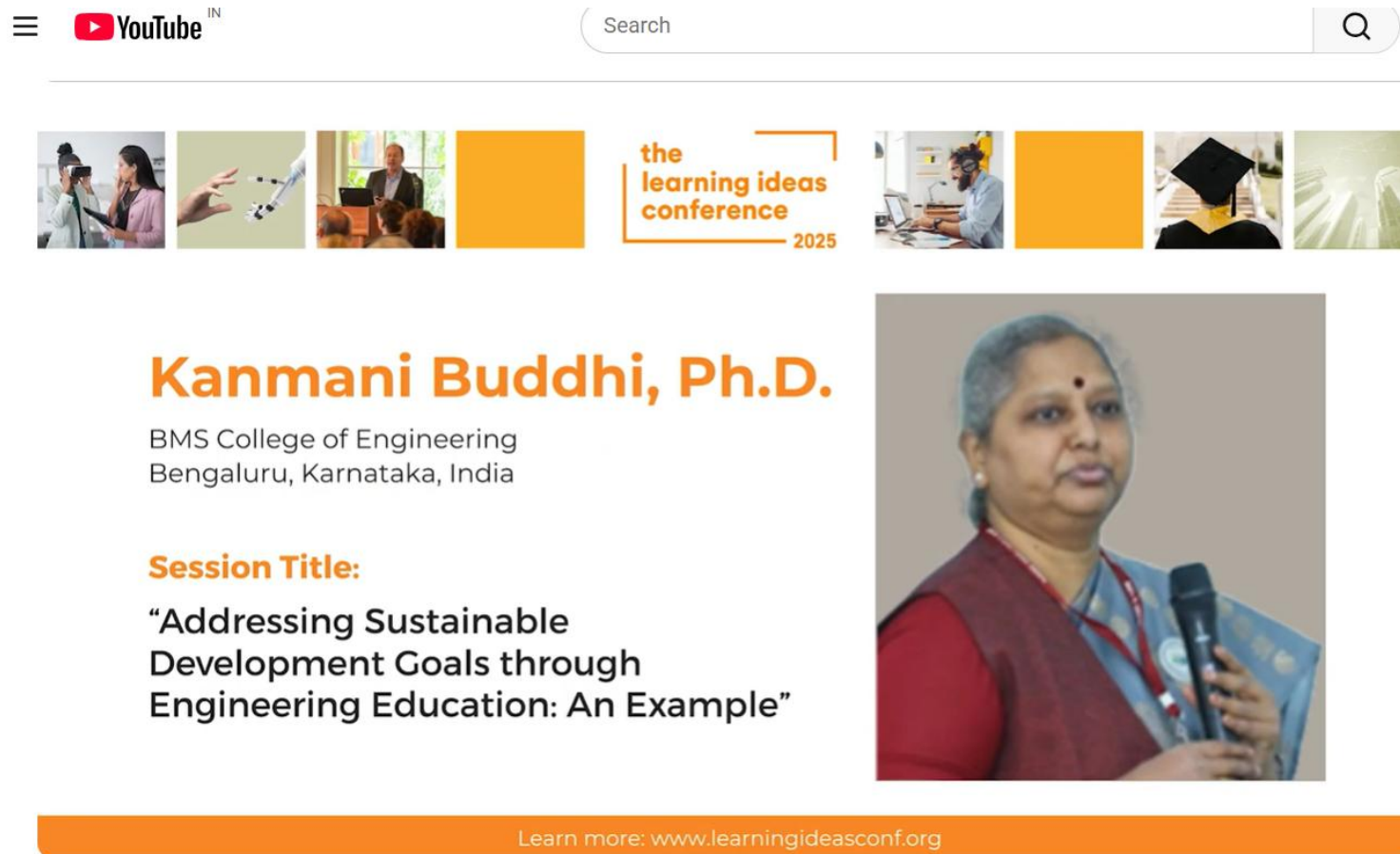
- Support the Parents/Grandparents
- Happy and Successful Families

Reduction in

- Old Age Homes
- Counseling Centers

Title: Addressing Sustainable Development Goals through Engineering Education: An Example

The Learning Ideas Conference
New York (Online mode)
May 29, 2025



YouTube

Search

the learning ideas conference 2025

Kanmani Buddhi, Ph.D.
BMS College of Engineering
Bengaluru, Karnataka, India

Session Title:
"Addressing Sustainable Development Goals through Engineering Education: An Example"

Learn more: www.learningideasconf.org

<https://www.youtube.com/watch?v=6X6B5Ch7zII>
For The Learning Ideas Conference 2026, by Kanmani Buddhi

Acknowledgements

- **BMS College of Engineering** (*Career of Three Decades*)
- **National Board of Accreditation** (*NBA*)
- **Indo Universal Collaboration for Engineering Education** (*IUCEE*)

Personal Understanding

Acknowledgements

The Learning Ideas Conference (TLIC)

- The presentation available for all on the conference portal
- On-line presentation
- Permission to share the presentations on YouTube
- No fixed templates
- Opportunity to present as a Book Chapter if interested

Thank you!