NATIONAL BOARD OF ACCREDITATION

REPORT ON

AWARENESS WORKSHOP

ON

"Outcome Based Education & Accreditation"







ORGANISED BY

HARYANA STATE HIGHER EDUCATION COUNCIL

IN COLLABORATION WITH

NATIONAL BOARD OF ACCREDITATION

NATIONAL BOARD OF ACCREDITATION

J.C. BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY, YMCA, FARIDABAD

Enhancing Learning

Driving Quality

Ensuring Excellence

Building Future

QUALITY EDUCATION. MEASURABLE OUTCOMES. GLOBAL RECOGNITION.

TABLE OF CONTENTS

#	TITLE	Pg. No.
1	Executive Summary	1
2	Workshop Background	3
3	Workshop At A Glance	4
4	Outcomes of the Workshop	7
5	Glimpses of the Workshop	9
6	Proceedings of the Workshop	11
7	Welcome Address by Prof. R.S. Rathore, SPD, HSHEC	11
8	Workshop Objectives by Dr. Anil Kumar Nassa, Member Secretary, NBA	11
9	Address by Dr. Y.P.S. Berwal, Director, Technical Education, Government of Haryana	14
10	Address by Prof. Rajive Kumar, Vice Chancellor, JC Bose University of Science & Technology, YMCA, Faridabad	15
11	Address by Shri Prabhjot Singh, IAS, Director General, Technical Education, Haryana	17
12	Address by Prof. Kailash Chandra Sharma, Chairperson, Haryana State Higher Education Council	19
13	NBA Accreditation: Introduction, Assessment Methodology, Washington Accord & it membership advantages, GAPV version 4.0 and NBA future plan by Dr. Anil Kumar Nassa, Member Secretary, NBA	21
14	Methods of Assessments & Evaluation: Assessment Tools, Assessment of POs, PSOs, PEOs, & COs and thoughts on closing the loop for continuous improvement by Prof. Sanjay Agrawal, Dean (Academic Affairs), NITTTR, Bhopal	24
15	Self-Assessment Report (SAR) 2024: How to prepare SAR and effect improvements during the process (UG Engg.) by Prof. RV Ranganath, Dean (Academics), M.S. Ramaiah University of Applied Sciences, Bengaluru	29
16	Question & Answer Session	32
17	Annexures	36

EXECUTIVE SUMMARY

The Awareness Workshop on "Outcome-Based Education (OBE) and NBA Accreditation" was organised on 13 May 2026 at J.C. Bose University of Science and Technology by Haryana State Higher Education Council in collaboration with the National Board of Accreditation and the Department of Technical Education, Haryana. The workshop was organised as a strategic capacity-building initiative to strengthen institutional preparedness for accreditation, academic quality assurance, and implementation of learner-centric educational reforms aligned with NEP 2020, AICTE guidelines, NBA accreditation standards. The initiative emerged from recommendations made during the Workshop on National Institutional Ranking Framework (NIRF) organised by HSHEC earlier in January 2026, wherein the need for dedicated orientation on OBE and NBA accreditation was strongly emphasised.

The workshop was graced by senior academic administrators i.e. Prof. Kailash Chandra Sharma, Chairperson, HSHEC; Sh. Prabhjot Singh, IAS, Director General, Technical Education, Haryana; Prof. S.K. Gakhar, Vice Chairperson, HSHEC; Prof. Rajive Kumar, Vice Chancellor, JC Bose University of Science & Technology; Prof. R.S. Rathore, State Project Director, HSHEC & Dr. Y.P.S. Berwal, Director, Technical Education, Haryana. The expert sessions were delivered by accreditation experts on NBA Accreditation: Introduction, Assessment Methodology, Washington Accord & it membership advantages, GAPV version 4.0 and NBA future plan by Dr. Anil Kumar Nassa, Member Secretary, NBA; Methods of Assessments & Evaluation: Assessment Tools, Assessment of POs, PSOs, PEOs, & COs and thoughts on closing the loop for continuous improvement by Prof. Sanjay Agrawal, Dean (Academic Affairs), NITTTR, Bhopal; and Self-Assessment Report (SAR) 2024: How to prepare SAR and effect improvements during the process (UG Engg.) by Prof. RV Ranganath, Dean (Academics), M.S. Ramaiah University of Applied Sciences, Bengaluru. The workshop witnessed participation from Directors IQAC, Deans, Principals, and faculty representatives from state funded universities and engineering colleges across Haryana.

The workshop resulted in institutional awareness regarding OBE implementation, accreditation preparedness, qualitative assessment practices, evidence-based academic processes, and competency-driven curriculum reforms. The successful implementation of Outcome-Based Education requires coordinated participation of multiple stakeholders across the higher education ecosystem. The Higher Education Institutions must ensure curriculum restructuring, adequate faculty deployment, academic governance reforms, documentation systems, and establishment of Continuous Quality Improvement (CQI) mechanisms. Mechanisms should be developed responsible for maintaining evidence-based academic records, monitoring attainment data, coordinating SAR preparation, and institutionalising quality assurance processes. Curriculum design must focus on measurable Course Outcomes (COs), adoption of outcome-oriented pedagogy, implementing CO-PO mapping, and regular analysis of attainment gaps for academic improvement. HEIs should rope in Industry

stakeholders to support curriculum relevance, skill integration, internships, and employability alignment. Students should be encouraged to actively participate in experiential learning, projects, internships, and feedback processes.

Effective coordination among these stakeholders is essential for strengthening accreditation readiness, improving student competencies, enhancing institutional quality culture, and aligning higher education institutions with national and international quality benchmarks.

HSHEC, the Department of Higher Education, and the Department of Technical Education may facilitate the adoption of Outcome-Based Education (OBE) and accreditation-driven quality assurance practices by issuing appropriate policy guidelines and organizing periodic awareness, orientation, and capacity-building programmes on national accreditation frameworks such as NBA, NIRF and NAAC.

To support accreditation readiness and institutional stability, HEIs may align faculty deployment, transfers, deputations, and contractual appointments with accreditation cycles, ensuring continuity in programme delivery, academic leadership, and compliance with prescribed Faculty-Student Ratio (FSR) requirements.

The Universities may also develop and disseminate model guidelines, standard operating procedures, templates, and resource materials to facilitate uniform implementation of OBE across affiliated institutions. Universities may also organize regular workshops, training programmes, and handholding sessions on Outcome-Based Education, Self-Assessment Report (SAR) preparation, attainment methodologies, curriculum mapping, and accreditation processes to build institutional capacity and preparedness.

All HEIs may prepare a comprehensive institutional accreditation roadmap by identifying programmes eligible for accreditation and developing a phased implementation plan with clearly defined milestones. Such a roadmap should include alignment of curricula with OBE principles, establishment of outcome assessment mechanisms, maintenance of prescribed FSR norms, strengthening of documentation and evidence management systems, and continuous quality improvement practices. Further, annual reviews of programme outcomes, attainment levels, student progression, placement outcomes, and stakeholder feedback should be undertaken systematically, with findings translated into documented corrective and improvement actions at state level by the Council in association with Department of Higher Education and Department of Technical Education.

****

WORKSHOP BACKGROUND

In continuation of the quality enhancement initiatives being undertaken in the higher education sector of Haryana, the Haryana State Higher Education Council (HSHEC) has been actively organising capacity-building workshops and policy-oriented deliberations for Higher Education Institutions (HEIs). One of the major initiatives in this direction was the Workshop on National Institutional Ranking Framework (NIRF) organized in collaboration with the Department of Higher Education (DHE), Haryana in January 2026, wherein Directors IQAC, Nodal Officers for Academic Rankings, Principals, accreditation experts, and administrators deliberated upon quality benchmarks, institutional performance indicators, and strategies for improving the national standing of HEIs of Haryana. During the deliberations of the NIRF workshop, it was strongly recommended by the Member secretary, National Board of Accreditation, that a dedicated workshop on Outcome-Based Education (OBE) and National Board of Accreditation (NBA) accreditation processes should be organised for the universities and colleges of the State, particularly technical and professional institutions, to strengthen academic quality assurance mechanisms and align institutional practices with national and global standards.

Acting on these recommendations, HSHEC, in collaboration with NBA, initiated the present workshop in JC Bose University of Science and Technology, Faridabad, on 13.05.2026, to raise awareness of NBA accreditation, Outcome-Based Education frameworks, Self-Assessment Report (SAR) preparation, attainment calculations, student-faculty ratio requirements, curriculum design, and continuous quality improvement processes. The workshop aimed to provide institutional representatives with practical guidance on implementing OBE in alignment with AICTE, NBA, NEP 2020, and Washington Accord expectations.

The workshop also forms part of HSHEC's **broader mandate** to promote academic reforms, institutional excellence, innovation, digital transformation, research culture, employability-oriented education, and quality assurance in higher education across Haryana. In recent years, the Council has undertaken several initiatives, including policy consultations, faculty development programmes, workshops on NIRF and NAAC accreditation, discussions on the implementation of NEP 2020, promotion of multidisciplinary education, and strengthening of institutional governance frameworks. Through these engagements, HSHEC continues to foster a culture of continuous improvement and outcome-oriented higher education within the State.

WORKSHOP AT A GLANCE

The awareness workshop on "Outcome-Based Education (OBE) and NBA Accreditation", structured as an intensive academic and policy-oriented deliberation to strengthen institutional preparedness for quality assurance, accreditation, and learner-centric reforms in higher education, was organised by the National Board of Accreditation in collaboration with J.C. Bose University of Science and Technology, YMCA, Faridabad and the Haryana State Higher Education Council on 13.5.2026 at J.C. Bose University of Science and Technology, YMCA, Faridabad. The workshop brought together the following administrators, senior academicians, accreditation experts, institutional leaders, and faculty representatives from the National Board of Accreditation, the Department of Technical Education, Haryana, the Haryana State Higher Education Council, Universities, and Colleges across the State of Haryana:

1. Prof. Kailash Chandra Sharma, Chairperson, HSHEC
2. Sh. Prabhjot Singh, IAS, Director General, Technical Education, Haryana
3. Prof. S.K. Gakhar, Vice Chairperson, HSHEC
4. Prof. Rajive Kumar, Vice Chancellor, JC Bose University of Science & Technology, YMCA, Faridabad
5. Dr Anil Kumar Nassa, Member Secretary, NBA
6. Dr Y.P.S. Berwal, Director, Technical Education, Haryana
7. Prof. R.S. Rathore, State Project Director, HSHEC
8. Prof. Sanjay Agrawal, Dean (Academics), NITTTR, Bhopal
9. Prof. R.V. Ranganath, Dean (Academic Affairs), M.S. Ramaiah University of Applied Sciences, Bengaluru
10. Dean Academics of State Funded Universities in Haryana
11. Director IQAC of State Funded Universities in Haryana
12. HoDs of State Funded Universities in Haryana
13. Principals/ Directors of Engineering colleges in Haryana

The sessions focused not only on the procedural aspects of NBA accreditation but also on the broader transformation of higher education institutions towards continuous quality improvement, student-centric pedagogy, and outcome-oriented learning.

The inaugural session of the workshop began with lighting lamps before Devi Sarasvati and with the Sarasvati Vandana, followed by addresses from Prof. RS Rathore, Dr YPS Berwal, Dr Prabhjot Singh, IAS, Prof. S.K. Gakhar, Prof Kailash Chander Sharma and Prof Anil K Nassa.

The inaugural session laid the workshop's conceptual framework by emphasising the growing national importance of accreditation, quality benchmarks, and academic accountability in higher education. The speakers emphasised that accreditation should not be seen merely as a compliance exercise or a certification process, but as a continuous institutional mechanism for improving academic delivery, learning outcomes, and institutional credibility.

Dr Anil Kumar Nassa highlighted the larger vision behind organising the workshop and appreciated the collaborative efforts of HSHEC, Department of Technical Education, and the host institution for bringing together institutions from across Haryana on a common academic platform. He emphasised that accreditation should not merely be viewed as a certification exercise but as a continuous quality improvement mechanism capable of transforming institutional culture, teaching-learning practices, and faculty members' academic ownership. He also underlined the need to make institutions OBE-centric and to strengthen quality ecosystems in technical education.

Prof. Sanjay Agrawal delivered a detailed technical session on Outcome-Based Education and its practical implementation in higher education institutions. The session elaborated on the philosophy of shifting from teacher-centric systems to student-centric learning ecosystems, where measurable outcomes, competencies, and graduate attributes are central to curriculum design and academic processes. He explained the framework of Program Outcomes (POs), Program Specific Outcomes (PSOs), and Course Outcomes (COs), along with methodologies for CO-PO mapping, attainment calculations, alignment with Bloom's Taxonomy, and continuous improvement mechanisms. Special emphasis was placed on designing assessment tools to evaluate higher-order cognitive skills such as analysis, application, design, and problem-solving.

During the deliberations, Prof. Agrawal also clarified that attainment should not be reduced to a purely numerical exercise. Instead, institutions must focus on the quality of teaching and learning processes, assessment strategies, and the demonstration of actual student learning. Through practical illustrations, he discussed how unrealistic target-setting, inappropriate assessment design, or weak academic processes often lead to attainment gaps.

Prof. R.V. Ranganath conducted a comprehensive session on NBA accreditation procedures and the preparation of the Self-Assessment Report (SAR). The session provided detailed guidance on accreditation criteria, documentation requirements, evidence collection, institutional data management, and departmental preparedness for peer team visits. He emphasised the importance of maintaining systematic academic records, continuous quality improvement documentation, faculty profiles, assessment records, and standardisation of academic processes throughout the academic cycle, rather than preparing documents only during accreditation periods.

A specialised academic session was conducted on the revised credit framework and student learning hours in line with national policy guidelines. Prof. Ranganath explained the transition from teacher-contact-hour-based credit systems to student-learning-based credit frameworks, in which one credit corresponds to 30 hours of total student learning effort. The discussion highlighted the incorporation of self-learning, assignments, tutorials, laboratory work, assessments, and experiential learning into total learning hours. Institutions were advised to gradually redesign their curricula to align with the National Credit Framework (NCrF).

An extensive open-house question-and-answer session formed one of the most engaging segments of the workshop. Faculty members and institutional representatives

raised practical concerns related to accreditation timelines, common deficiencies in accreditation preparation, faculty appointment structures, accreditation of regional language programs, role of institutional reputation vis-à-vis accreditation, implementation of OBE in traditional academic environments, and applicability of accreditation frameworks in architecture, visual arts, and emerging disciplines. The experts responded with detailed procedural and policy clarifications, while repeatedly emphasising that the NBA's evolving framework increasingly prioritises qualitative academic improvement and authentic learning processes over mere quantitative compliance. The interactive discussions also addressed clarifications on the Student-Faculty Ratio (SFR), faculty eligibility, and institutional compliance requirements under NBA norms. The experts clarified that supernumerary seats, including regional-language supernumerary admissions, are generally not included in SFR calculations. Clarifications were also provided regarding treatment of deputation faculty, transferred faculty, contractual appointments, and full-time versus part-time faculty engagement. The speakers emphasised the importance of faculty continuity, institutional ownership, and minimising frequent transfers to strengthen departmental academic culture and long-term quality improvement.

The concluding session was addressed by Dr Anil Kumar Nassa, who acknowledged the collaborative efforts of the Haryana State Higher Education Council, the Directorate of Technical Education, the host institution officials, and the participating institutions. In his remarks, he emphasised that outcome-based education and accreditation should become part of institutional culture rather than being treated as isolated administrative exercises. He further observed that accreditation, when approached as a process of continuous academic improvement, can significantly enhance institutional quality, student learning experiences, and academic competitiveness.

The workshop also witnessed the signing of an MoU between HSHEC and NASSCOM to strengthen skill development, digital competency, and employability among students and faculty across HEIs in Haryana.

The workshop concluded with a collective commitment from participating institutions to strengthen OBE implementation, improve academic processes, institutionalise continuous quality improvement mechanisms, and actively pursue NBA accreditation in a systematic and sustainable manner.

OUTCOMES OF THE WORKSHOP

1. **Enhanced Understanding of Outcome-Based Education (OBE):** Participants developed a clearer understanding of the shift from teacher-centric education to student-centric learning focused on measurable outcomes, competencies, and continuous improvement.
2. **Clarity on NBA Accreditation Framework:** The workshop provided detailed orientation on NBA accreditation procedures, revised criteria, Self-Assessment Report (SAR) preparation, and evidence-based institutional practices.
3. **Awareness of Washington Accord and GAPC Version 4:** Experts explained international accreditation standards, graduate attributes, and competency-based engineering education aligned with global mobility and employability requirements.
4. **Strengthening of Assessment and Attainment Practices:** Faculty members gained insights into qualitative assessment, CO-PO attainment methodologies, Bloom's Taxonomy, rubric-based evaluation, and outcome-oriented question paper design.
5. **Understanding of Continuous Quality Improvement (CQI):** Institutions were encouraged to view accreditation as a process of continuous academic improvement rather than merely a certification exercise.
6. **Guidance on Student-Faculty Ratio (SFR) and Faculty Eligibility:** The sessions clarified important operational issues related to SFR calculations, deputation faculty, contractual appointments, regional language programmes, and accreditation compliance.
7. **Orientation on NEP 2020 and National Credit Framework (NCrF):** Participants were introduced to the concept of student learning hours, multidisciplinary learning, flexible curriculum structures, and credit-based educational reforms.
8. **Improved Institutional Preparedness for Accreditation:** The workshop helped institutions understand documentation requirements, data management, attaining evidence, and best practices necessary for successful NBA accreditation.
9. **Focus on Student Learning and Competency Development:** Discussions emphasised that assessment systems should measure actual learning, analytical ability, problem-solving, and professional competencies rather than rote performance.
10. **Encouragement for OBE-Centric Academic Reforms:** Institutions were motivated to redesign curriculum delivery, pedagogy, and assessment systems in alignment with Outcome-Based Education principles.
11. **Policy-Level Clarifications for Affiliated and State Institutions:** Experts addressed several queries related to affiliated colleges, university examination systems, faculty appointments, accreditation timelines, and governance practices.
12. **Promotion of Quality Culture in Higher Education Institutions:** The workshop reinforced the importance of institutional accountability, stakeholder participation, academic ownership, and systematic quality assurance mechanisms.

13. **Capacity Building of Faculty and Academic Leaders:** The interactive sessions enhanced the capability of faculty members, accreditation coordinators, HoDs, and administrators to implement OBE and manage accreditation processes effectively.
14. **Encouragement for Internationally Benchmarked Education Systems:** Institutions were guided to align academic practices with internationally accepted standards to improve graduate quality, mobility, and recognition.
15. **Strengthened Collaboration Among Institutions and Regulatory Bodies:** The workshop created a collaborative platform connecting higher education institutions, state agencies, NBA experts, and policymakers for future quality enhancement initiatives.

GLIMPSES OF THE WORKSHOP









HSHEC and nasscom join hands on 13 May 2026 at JC Bose University, Faridabad to strengthen skill development, digital competency, and employability among students and faculty across Harvana Higher Educational Institutions.

PROCEEDINGS OF THE WORKSHOP

Welcome Address by Prof. R.S. Rathore, SPD, HSHEC

1. Prof. R.S. Rathore welcomed all the dignitaries, experts, academicians, principals, directors, deans, faculty members, and participants to the workshop on "Outcome-Based Education and Accreditation for Engineering Colleges in Haryana." He stated that the workshop was being jointly organised by the NBA, the Haryana State Higher Education Council (HSHEC), the Directorate of Technical Education, Haryana, and J.C. Bose University of Science and Technology, YMCA, Faridabad.
2. He extended a special welcome to Prof. K.C. Sharma, Chairperson, HSHEC, and acknowledged his leadership and guidance in conceptualising and initiating the workshop. He also welcomed Prof. S.K. Gakhar, Vice-Chairperson, HSHEC, along with other members of the organising team, including Shri Surender and Shri Apoorv Pandey, for their contributions to the successful organisation of the programme.
3. Prof. Rathore further welcomed Shri Prabhjot Singh, Director General, Technical Education, Haryana, and Dr Y.P.S. Berwal, Director, Technical Education Department, Haryana, acknowledging their continuous support and cooperation in strengthening technical education initiatives in the state.
4. Highlighting the objectives of the workshop, he stated that the primary focus was to develop a deeper understanding of Outcome-Based Education (OBE) and the accreditation process, and to guide institutions in effectively implementing accreditation practices within their academic systems.
5. He introduced the eminent resource persons for the workshop, namely Prof. Sanjay Agrawal from NITTTR, Bhopal and Prof. R.V. Ranganath from M.S. Ramaiah University of Applied Sciences, Bengaluru and welcomed them to share their expertise and experience on OBE and accreditation frameworks.
6. In his concluding remarks, Prof. Rathore expressed confidence that the workshop would help institutions strengthen quality assurance mechanisms and enhance preparedness for accreditation. He also mentioned that the organising institutions intended to review the workshop's progress and outcomes after six months, through a follow-up exercise to assess the implementation of Outcome-Based Education practices across institutions.

Workshop Objectives by Dr Anil Kumar Nassa, Member Secretary, NBA

7. Dr Anil Kumar Nassa, Member Secretary, National Board of Accreditation, addressed the participants and explained the objectives and significance of the workshop on Outcome-Based Education (OBE) and Accreditation. He stated that the primary purpose of the workshop was to create awareness regarding Outcome-Based Education and the accreditation ecosystem among engineering institutions in

Haryana. He informed the participants that similar awareness programmes were being conducted across different states of the country, and that this was the first such initiative organised in Haryana, following discussions with Prof. R.S. Rathore and senior state officials.

8. Dr Nassa highlighted that the National Board of Accreditation is a full signatory member of the Washington Accord, an international agreement among 25 signatory countries for mutual recognition of accredited engineering programmes. He explained that engineering graduates from NBA-accredited programmes are treated at par with graduates from other Washington Accord member countries. For example, students graduating from an NBA-accredited Mechanical Engineering programme at J.C. Bose University of Science and Technology would be recognised internationally in many member countries without the need for additional qualifying examinations.
9. He informed the gathering that the International Engineering Alliance, which serves as the secretariat for various international accords, including the Washington Accord, had recently revised the Graduate Attributes and Professional Competencies (GAPC) framework from Version 3 to Version 4. From April 2026 onwards, all review processes of member countries would be based on GAPC Version 4 standards. NBA had already begun implementing the revised Graduate Attributes and Program Outcomes from 1 January 2025.
10. The distinction between Tier-I and Tier-II institutions was explained in the Indian higher education system. Autonomous institutions such as IITs, NITs, state universities, private universities, and deemed universities fall under Tier-I, whereas affiliated colleges are categorised as Tier-II institutions. At present, Washington Accord recognition applies only to Tier-I institutions. However, the NBA has submitted a proposal to include Tier-II institutions under the Washington Accord framework, which is under consideration. He informed that discussions regarding the proposal were expected during the upcoming Washington Accord meeting in South Africa in June 2026, and expressed optimism that affiliated colleges would also become eligible for international recognition in the near future.
11. He also informed the participants that the NBA had applied for membership in the Dublin Accord, which pertains to diploma engineering programmes. Accordingly, the Graduate Attributes, Program Outcomes, and Self-Assessment Report (SAR) formats for diploma programmes had also been revised in accordance with GAPC Version 4 standards.
12. He emphasised that the workshop aimed to align all institutions with the revised international benchmarks prescribed under GAPC Version 4. He informed that detailed technical sessions on revised Program Outcomes and Graduate Attributes would be delivered by Prof. Sanjay Agrawal, while sessions on the Self-Assessment Report and accreditation criteria would be conducted by Prof. R.V. Ranganath.
13. Highlighting the importance of accreditation, he stated that institutions across the state should proactively work toward obtaining NBA accreditation so that students

graduating from Haryana's engineering institutions become globally competitive for higher education and employment opportunities abroad. He highlighted that accreditation based on internationally benchmarked Graduate Attributes significantly enhances academic quality and institutional standards.

14. Dr Nassa also drew attention to the minimum pre-qualifying conditions for accreditation, particularly faculty availability. He explained that while the AICTE-prescribed faculty-student ratio is 1:20, NBA permits a ratio of 1:25 for a three-year accreditation period to account for temporary vacancies and retirements. However, for accreditation up to six years, institutions must maintain the prescribed 1:20 faculty-student ratio. Institutions failing to meet these norms would not be eligible for higher accreditation status.
15. He urged the state government officials and university authorities to take immediate steps to fill vacant faculty positions in government institutions and universities. He clarified that the NBA permits institutions to appoint faculty members on a contractual basis for a minimum duration from 1 September to 30 April to ensure continuity across both academic semesters. He further explained that the NBA does not interfere with remuneration policies of state governments, but focuses primarily on the availability and adequacy of qualified faculty members.
16. He further expressed that each programme seeking accreditation must have at least one regular Professor and one regular Associate Professor in Tier-I institutions, while Tier-II institutions must have at least one regular Professor or Associate Professor.
17. The participants were informed that the International Engineering Alliance would conduct a review visit to NBA during September–October 2026 as part of the periodic evaluation of India's Washington Accord membership. He recalled that India had received unanimous approval for Washington Accord membership in 2014 and again during the 2020 review. The upcoming review team would observe NBA accreditation visits, evaluation mechanisms, and decision-making processes before submitting recommendations regarding the continuation of India's membership.
18. In his concluding remarks, Dr Nassa urged all institutions to actively participate in the accreditation movement and contribute towards strengthening the quality of technical education in India. He emphasised that institutional commitment towards Outcome-Based Education and accreditation would play a crucial role in preparing India to emerge as a global knowledge leader and contribute to the vision of Viksit Bharat by 2047.

Address by Dr. Y.P.S. Berwal, Director, Technical Education, Government of Haryana

19. Dr Y.P.S. Berwal, Director, Technical Education, Government of Haryana, highlighted the significance of NBA accreditation for technical institutions and students. Referring to the points already elaborated by Dr Anil Kumar Nassa, he emphasised that accreditation by the National Board of Accreditation is extremely important for students pursuing diploma, undergraduate, and postgraduate programmes in engineering and technical institutions.
20. He stated that when students from NBA-accredited programmes pursue higher education or employment opportunities abroad, their qualifications are recognised internationally. Without accreditation, students often face hurdles such as additional qualifying examinations, academic verification procedures, financial burdens, and time lost. Therefore, NBA accreditation directly benefits students by improving their global mobility and employability.
21. Dr Berwal informed the participants that the Department of Technical Education, Haryana, was making continuous efforts to help institutions fulfil the quality parameters prescribed by accreditation agencies such as NBA and the National Assessment and Accreditation Council. He noted that the department was fortunate to have leadership with strong technical backgrounds, including senior administrative officials, which had strengthened the state's commitment toward quality enhancement in technical education.
22. Explaining the broader benefits of NBA accreditation, it was stated that accreditation enhances employability, promotes Outcome-Based Education, and improves institutional credibility. He also observed that funding agencies and government bodies tend to prefer accredited institutions and programmes when providing grants and financial assistance.
23. All institutions were encouraged to actively pursue accreditation for their programmes. He expressed confidence that the workshop would help participants gain a deeper understanding of accreditation processes and quality assurance mechanisms.
24. It was further explained that NBA accreditation evaluates institutions across multiple parameters, including academic quality, infrastructure, governance, financial management, energy audits, and institutional processes. Referring to the accreditation framework, it was mentioned that institutions are assessed using a comprehensive marking system and are generally required to secure at least 60 percent of the prescribed score to obtain accreditation for three years. Higher scores may result in accreditation validity for five or six years.
25. The participants were informed that six programmes across three institutions in Haryana's polytechnic sector had already received NBA accreditation. He reiterated that the department was continuously striving to increase the number of accredited

programmes in engineering colleges, universities, and polytechnic institutions across the state.

26. In his concluding remarks, he stated that such initiatives and workshops aligned with the vision of Viksit Bharat 2047, as envisioned by the Hon'ble Prime Minister of India. He expressed hope that, through collective efforts and sustained quality enhancement measures, a large number of technical programmes in Haryana would achieve NBA accreditation in the coming years.

Address by Prof. Rajive Kumar, Vice Chancellor, JC Bose University of Science & Technology, YMCA, Faridabad

27. Prof. Rajive Kumar, Vice Chancellor of J.C. Bose University of Science and Technology, welcomed all dignitaries, experts, faculty members, and participants to the university campus. He stated that the institution, formerly known as YMCA Institute, was established in 1969 to meet the country's technical education needs and has built a strong legacy in engineering and technical education over the decades.
28. He observed that although the university is geographically one of the smallest in Haryana, it caters to the academic needs of more than 7,000 students on campus and offers a wide range of academic programmes across disciplines. He expressed gratitude to the Haryana State Higher Education Council and the National Board of Accreditation for selecting the university as the venue for the workshop on Outcome-Based Education and Accreditation. Referring to Dr. Anil Kumar Nassa's remarks, he noted that this was the first NBA awareness programme organised in Haryana and expressed hope that many such initiatives would continue in the future through collaboration among the Council, the Department of Technical Education, and the university.
29. Prof. Rajive Kumar remarked that the workshop would help participants understand recent changes to the accreditation process, the preparation of the Self-Assessment Report (SAR), and evolving requirements for Outcome-Based Education and NBA accreditation.
30. Sharing the university's experience with accreditation, he informed that all eligible programmes of the university had undergone NBA accreditation and were in the process of re-accreditation. The university had also secured accreditation from NAAC. He emphasized that despite being granted autonomous university status only in 2011, the university had achieved several important milestones in a short period.
31. He highlighted the establishment of multiple Centres of Excellence at the university. These included an Anti-Drone Centre of Excellence funded by the state government, which he described as one of the first such specialised centres in the country. He also mentioned the Electric Vehicle Centre of Excellence and the Artificial Intelligence Centre of Excellence, where an NVIDIA supercomputing system had recently been installed. Additionally, the university was in the process of establishing a Semen

Centre of Excellence after consulting institutions that had already implemented similar facilities.

32. Prof. Rajive Kumar further highlighted the advanced infrastructure available on campus, including a state-of-the-art media centre, modern studios, and advanced laboratories. He particularly emphasised the university's Central Instrumentation Laboratory, describing it as one of the finest facilities among state institutions in North India and comparable to those at premier institutions such as the IITs.
33. He also drew attention to the university's Community College, which caters to nearly 850 students and maintains strong industry linkages. Students undergoing training in the Community College spend significant periods working in industries and receive excellent placement opportunities. He noted that the university's incubation centre was supporting more than 25 startups, including one startup recently valued at over ₹10 crore.
34. Prof. Kumar informed the gathering that various government departments and industries were approaching the university for collaborative initiatives. He noted that the MSME Department had proposed setting up a startup warehouse on campus. He added that the university was increasingly engaging in international collaborations, with faculty members working on long-term research projects with institutions in countries such as Italy and Japan.
35. He also shared that universities from Romania and Dubai had approached the university for collaborative academic programmes in accordance with UGC regulations, and discussions were underway with the state government regarding these partnerships.
36. Reflecting on the university's future potential, Prof. Kumar stated that the institution possessed the capability to emerge as a premier technical institution comparable to leading National Institutes of Technology (NITs). Drawing on his experience with the All India Council for Technical Education, he remarked that the university had exceptional potential and urged policymakers and government authorities to support the institution through dynamic, visionary decision-making rather than routine administrative approaches.
37. He stressed that technical education requires innovation, courage in decision-making, institutional trust, and forward-looking leadership to navigate the rapidly changing educational and technological landscape.
38. In his concluding remarks, Prof. Kumar once again welcomed all participants and expressed confidence that the workshop would greatly benefit faculty members and institutional representatives. He also noted with pride that several faculty members of the university were already serving as NBA experts and evaluators, and that such workshops would further enrich their expertise and contributions to quality assurance in technical education.

Address by Shri Prabhjot Singh, IAS, Director General, Technical Education, Haryana

39. Shri Prabhjot Singh, IAS, Director General, Directorate of Technical Education, Haryana, appreciated the efforts of the National Board of Accreditation and the Haryana State Higher Education Council for organizing the workshop on Outcome-Based Education and Accreditation. He described the workshop as a timely and significant initiative, particularly at a stage when institutions need greater clarity regarding NBA accreditation processes, quality benchmarks, and implementation strategies.
40. He stated that the workshop would address important aspects such as the need for NBA accreditation, its benefits, procedural requirements, and implementation mechanisms. He encouraged all participants to actively engage in the deliberations, raise their questions, and make full use of the opportunity to gain an in-depth understanding of accreditation frameworks.
41. Shri Prabhjot Singh informed the participants about several initiatives undertaken by the Government of Haryana to promote NBA accreditation among technical institutions. Referring to discussions held during meetings of the Haryana State Technical Education Society (HSTES), he shared that the state government had decided to provide financial incentives to institutions obtaining NBA accreditation. Institutions receiving accreditation after 1 April would be awarded an incentive grant of ₹5 lakh, along with reimbursement of the accreditation fee up to ₹2 lakh. Institutions that had secured accreditation prior to 1 April would receive reimbursement of 50 per cent of the accreditation fee, up to ₹1 lakh.
42. He further informed that the government was actively working to address faculty shortages in technical institutions. Recruitment processes through the Haryana Public Service Commission (HPSC) were underway, particularly for polytechnic institutions and State Institutes of Engineering and Technology (SIETs). He mentioned that independent Directors/Principals had recently been appointed in SIET institutions through a comprehensive and professional selection process, which had already contributed positively toward institutional improvement. The department was also in the process of finalising service rules to facilitate regular faculty recruitment in the future.
43. Emphasising the need to improve the quality of technical education, Shri Singh reflected upon the rich legacy of technical institutions in the country, including J.C. Bose University of Science and Technology and the historic engineering institutions established in earlier decades. Drawing from his own educational experiences, he observed that technical education had gradually witnessed a decline in practical learning and workshop-based training. He recalled that earlier engineering education placed strong emphasis on hands-on training through workshops, foundries, carpentry units, and laboratories, whereas many such practices had diminished over time due to changing norms and infrastructure constraints.

44. He also remarked that there was a period when engineering colleges were established rapidly without sufficient emphasis on quality, leading to concerns regarding academic standards. However, he observed that the sector was now gradually consolidating, and institutions needed to focus more seriously on quality enhancement, faculty strength, and academic outcomes.
45. Addressing representatives from private institutions, he stated that the workshop was equally important for private engineering colleges. While acknowledging that private institutions operate under financial constraints, he emphasized that quality standards, student-teacher ratios, and academic excellence must not be compromised. He encouraged institutional representatives to interact with the NBA experts and seek guidance on accreditation requirements and best practices.
46. He also requested NBA officials to further clarify the international advantages of accreditation, particularly in relation to accords such as the Washington Accord and the Dublin Accord, and to explain how NBA accreditation facilitates global recognition of Indian engineering qualifications.
47. Referring to the broader challenges facing higher education, concern was expressed about declining student interest and vacant seats in technical education programmes. He cited reports indicating that only a limited number of students were qualifying for certain entrance examinations, while many seats in higher and technical education institutions remained vacant. He described this as a serious indication that the quality of education required immediate introspection and systemic improvement.
48. He emphasised that workshops such as this one provide an opportunity for institutions to identify gaps, improve academic processes, and strengthen quality assurance mechanisms. According to him, even small corrective measures taken at the institutional level could create a cascading effect in improving the overall quality of higher and technical education.
49. Highlighting the national vision of Viksit Bharat 2047, he stated that education would play the most critical role in transforming India into a developed nation. He noted that challenges such as faculty shortages, lack of quality research, and limited innovation required urgent attention. He appreciated the Haryana Government's initiatives to support research activities and noted that a large number of research proposals had recently been received, particularly from private institutions.
50. He stressed that research, creativity, innovation, and small technological breakthroughs have the potential to transform society, generate employment, and accelerate national development. Therefore, institutions must actively cultivate a culture of research and innovation among faculty members and students.
51. In his concluding remarks, he expressed confidence that the workshop would prove highly beneficial for all participants. He urged institutions to implement the learnings from the workshop upon returning to their campuses and to work collectively to improve the quality standards of higher and technical education in Haryana.

Address by Prof. Kailash Chandra Sharma, Chairperson, Haryana State Higher Education Council

52. Prof. Kailash Chandra Sharma, Chairperson, Haryana State Higher Education Council, expressed his gratitude to Prof. Rajive Kumar, Vice Chancellor of J.C. Bose University of Science and Technology; Shri Prabhjot Singh, Director General, Technical Education, Haryana; Dr. Anil Kumar Nassa; Prof. S.K. Gakhar; Prof. R.S. Rathore; and the distinguished resource persons, Prof. Sanjay Agrawal and Prof. R.V. Ranganath, for their participation and contributions to the workshop.
53. At the outset, Prof. Sharma observed that most dignitaries on the dais came from engineering and technical education backgrounds, whereas he and Prof. Gakhar belonged to the science stream. Nevertheless, he emphasized the growing integration of science, technology, and interdisciplinary education in modern higher education systems.
54. Speaking about the host institution, he described J.C. Bose University of Science and Technology as one of the youngest yet fastest-growing universities in Haryana, particularly in science and technology. Referring to the university's recent achievements, he appreciated the establishment and development of multiple Centers of Excellence in emerging technological domains.
55. Prof. Sharma shared that the university had previously been considered for recognition under the "Multidisciplinary Education and Research University (MERU)" concept envisioned in the National Education Policy (NEP) 2020. However, due to its technical orientation and nomenclature centred on science and technology, the proposal could not progress further under the category intended for multidisciplinary universities. He remarked that while a specialized institutional identity can sometimes be advantageous, it may also create limitations under certain policy frameworks.
56. He encouraged faculty members and institutional representatives to move beyond routine academic practices and focus more on research, innovation, and advanced pedagogical approaches. According to him, higher education institutions must continuously evolve towards innovative teaching-learning methodologies and research-driven academic ecosystems.
57. Referring to NBA accreditation, Prof. Sharma stated that Haryana had lagged behind some other states in participation in NBA-related quality enhancement initiatives. He recalled discussions with NBA officials, during which concerns were expressed about the limited engagement of Haryana institutions. To address this gap, the Higher Education Council had initiated interactions with universities and stakeholders across the state to promote awareness of accreditation processes and quality assurance mechanisms.
58. He emphasized that NBA accreditation and international quality frameworks are closely aligned with global standards in technical education. Accreditation not only enhances institutional quality but also supports the internationalisation of higher

education by improving the global recognition of academic programmes. According to him, internationalisation should not only mean Indian students pursuing education abroad, but should also involve attracting foreign students and faculty to Indian institutions. This objective can be achieved only when institutions align themselves with internationally accepted academic and accreditation standards.

59. Prof. Sharma acknowledged that one of the major challenges facing institutions in Haryana is the shortage of faculty and the difficulty of maintaining prescribed student-faculty ratios. He stated that the government and universities had been actively working on faculty recruitment for the past few years. However, administrative and procedural complexities related to roster clearances and recruitment approvals had often delayed appointments. He informed the participants that revised guidelines had been prepared and forwarded for government approval, which would help streamline recruitment procedures and remove existing impediments.
60. He also referred to the provision discussed by Dr. Anil Kumar Nassa on contractual appointments of faculty members for academic sessions, noting that such flexibility could help institutions temporarily address faculty shortages while meeting accreditation requirements.
61. Moving beyond infrastructure and compliance issues, Prof. Sharma stressed that the true measure of educational quality lies in the overall outcomes of students graduating from institutions. He observed that institutions often evaluate success primarily through placements and admissions to higher education abroad. While these are important indicators, he emphasized that equal importance must be given to attitudinal development, ethical values, emotional well-being, and social responsibility among students.
62. In this context, he expressed concern about the rising incidents of stress and student suicides, even at premier technical institutions such as IITs and NITs. Referring to recent incidents reported in national institutions, he stated that such developments raise serious questions about the emotional and value-based dimensions of education. He stressed that teachers and faculty members play a critical role not only in imparting knowledge and technical skills but also in shaping students' values, attitudes, and personalities.
63. Prof. Sharma emphasised the need to integrate human values and ethical education into technical education. Citing initiatives such as the Universal Human Values courses promoted by the All India Council for Technical Education, he stated that institutions must consciously cultivate humane, socially responsible, and emotionally resilient graduates alongside technically competent professionals.
64. He further remarked that the ultimate objective of education should not merely be employability, but the creation of responsible citizens who can contribute meaningfully to society and lead fulfilling lives.
65. Discussing the future direction of technical institutions in Haryana, Prof. Sharma emphasised the need to gradually transform Tier-II affiliated colleges into

autonomous Tier-I institutions by strengthening academic ecosystems, research culture, governance structures, and institutional capabilities. He noted that this progression would help Haryana's technical institutions achieve greater national and international recognition.

66. In his concluding remarks, Prof. Sharma encouraged all participants to make full use of the workshop and to interact actively with the distinguished NBA experts and resource persons present at the event. He noted that the speakers had extensive experience with organisations such as the NBA and the All India Council for Technical Education, and could therefore provide valuable guidance not only on accreditation parameters but also on effective strategies to achieve them. He expressed confidence that such initiatives would significantly enhance the quality of technical education and increase the number of NBA-accredited programmes and institutions in Haryana.

NBA Accreditation: Introduction, Assessment Methodology, Washington Accord & it membership advantages, GAPV version 4.0 and NBA future plan by Dr. Anil Kumar Nassa, Member Secretary, NBA

67. Dr. Anil Kumar Nassa, Member Secretary, National Board of Accreditation, delivered a detailed technical session on the NBA accreditation process, accreditation requirements, and the Outcome-Based Education (OBE) framework. He informed the participants that the subsequent sessions of the workshop would focus on Outcome-Based Education by Prof. Sanjay Agrawal and on the preparation of the Self-Assessment Report (SAR) by Prof. R.V. Ranganath.
68. At the outset, Dr. Nassa provided a brief overview of the NBA's evolution and its international engagement with the Washington Accord. He explained that the NBA was established in 1994 under Section 10(U) of the AICTE Act. In 2007, the NBA applied for membership of the Washington Accord and initially became a provisional member. During the mentoring process conducted by the Accord, two major observations were made. First, the accreditation and regulatory bodies could not be the same entity. Consequently, in 2010, the NBA was made fully autonomous through amendments to its Memorandum of Association, thereby separating it from the All India Council for Technical Education in terms of governance, administration, financial functioning, and decision-making.
69. Dr. Nassa emphasized that the NBA does not receive grants from the government or regulatory bodies and relies entirely on accreditation fees paid by institutions. He stated that the organization is committed to maintaining a credible, transparent, and accountable accreditation system.
70. Discussing the credibility of NBA, he highlighted that the strength of the accreditation process depends primarily on the integrity, professionalism, expertise, and ethical conduct of evaluators. He clarified that NBA officials do not visit institutions during accreditation assessments; instead, evaluations are conducted by expert visiting teams comprising one Team Chair and two domain experts for each programme. He

described these evaluators as the "face of NBA," whose professional conduct determines the credibility and reputation of the accreditation process.

71. He further explained that the NBA maintains strict quality control over evaluators and immediately retires them from future accreditation activities if repeated negative feedback regarding professionalism or integrity is received.
72. Dr Nassa elaborated on the transparency mechanisms adopted by the NBA. Accreditation reports prepared by visiting teams are discussed in Engineering Accreditation Committee meetings in the presence of all Team Chairs, with peer scrutiny and cross-questioning encouraged. The recommendations are then reviewed by a subcommittee of the Academic Advisory Committee, chaired by the Chairman of NBA and comprising industry representatives. Copies of visiting team reports are shared with institutions, and whenever any change is made between the visiting team recommendation and the final accreditation decision, the reasons for such changes are formally communicated to the concerned institution.
73. He also described the 360-degree feedback mechanism used by the NBA, under which evaluators assess one another, Team Chairs assess evaluators and institutions, and institutions are encouraged to provide honest, unbiased feedback on the visiting teams. He urged institutions to submit objective feedback to maintain the quality and integrity of the accreditation process.
74. Clarifying the purpose of accreditation, Dr. Nassa stated that accreditation is not intended to identify faults or criticise institutions, but rather to assess academic quality, identify strengths and weaknesses, encourage continuous improvement, and establish quality benchmarks aligned with national and international standards.
75. He clarified that the NBA accredits academic programmes, not entire institutions. Therefore, the correct terminology should be "B.Tech. Mechanical Engineering programme accredited by NBA" rather than stating that a college itself is accredited.
76. Dr. Nassa then discussed the core philosophy of Outcome-Based Education and the Graduate Attributes prescribed by the Washington Accord framework. He explained that NBA accreditation is based on demonstrating that graduating students achieve defined Programme Outcomes and Graduate Attributes. The eleven Graduate Attributes include engineering knowledge, problem analysis, design and development of solutions, investigation of complex problems, use of engineering tools, engineers and society, ethics, teamwork, communication, project management and finance, and lifelong learning.
77. He informed the participants that the current accreditation framework aligns with the Graduate Attributes and Professional Competencies (GAPC) Version 4, adopted internationally under the Washington Accord system. Greater emphasis has now been placed on sustainability, ethics, societal responsibilities, collaboration, and lifelong learning.
78. Dr. Nassa further explained the distinction between Tier-I and Tier-II institutions in the NBA framework. Tier-I institutions include autonomous institutions such as IITs, NITs,

universities, deemed universities, and autonomous colleges that have control over the curriculum and examinations. Tier-II institutions are affiliated colleges operating under university-prescribed curricula and examination systems. Although the evaluation criteria remain broadly similar for both categories, differences exist in curriculum autonomy and related academic responsibilities.

79. He outlined the nine accreditation criteria adopted by NBA, namely Vision, Mission and Programme Educational Objectives; Programme Curriculum and Teaching-Learning Processes; Course Outcomes and Programme Outcomes Assessment; Students' Performance; Faculty Information and Contributions; Facilities and Technical Support; Continuous Improvement; Student Support Systems; and Governance, Institutional Support, and Financial Resources. He noted that the first three criteria are strongly aligned with Outcome-Based Education principles.
80. A major portion of the session focused on the pre-qualifiers introduced by NBA to help institutions assess their readiness before submitting full applications. Under the pre-qualifier system, institutions are required to pay only 10 percent of the accreditation fee at the initial stage. The pre-qualifiers assess parameters such as approval from AICTE/UGC or other regulatory authorities, student-faculty ratio, percentage of faculty with Ph.D. qualifications, regular appointment of Heads of Departments, and availability of Professors/Associate Professors as per NBA norms.
81. Dr. Nassa elaborated extensively on faculty requirements for accreditation. For six-year accreditation, institutions must maintain a student-faculty ratio of 1:20, while a ratio of 1:25 is acceptable for three-year accreditation. Similarly, the percentage of faculty with Ph.D. qualifications must be at least 30 percent for six-year accreditation and 20 percent for three-year accreditation in Tier-I institutions. In Tier-II institutions, the minimum Ph.D. requirement for three-year accreditation is 10 percent.
82. He also explained the detailed requirements for Professors and Associate Professors in departments offering single or multiple undergraduate programmes. Departments with multiple programmes must collectively maintain the prescribed number of senior faculty members across all programmes.
83. Dr. Nassa clarified that NBA permits the consideration of contractual faculty members, provided they are appointed on a full-time basis, possess AICTE-prescribed qualifications, and serve continuously for at least two semesters in the academic year. He stated that these provisions were introduced specifically to support government institutions facing delays in regular faculty recruitment.
84. He further informed participants that, as permitted by AICTE regulations, Professors of Practice, Associate Professors of Practice, and Assistant Professors of Practice are also considered by the NBA for faculty calculations within prescribed limits.
85. Explaining accreditation decisions, Dr Nassa stated that the NBA classifies criteria performance into Fully Compliant, Concern, Weakness, and Deficiency categories based on marks obtained. Six-year accreditation requires the absence of weaknesses and deficiencies, with at least six criteria rated Fully Compliant. Three-year

accreditation requires at least three criteria to be Fully Compliant, with no deficiencies.

86. He also highlighted changes introduced by the NBA regarding accreditation validity periods. Previously, accreditation validity ran from July to June, creating ambiguity for graduating batches. To address this, the NBA revised the accreditation cycle to January to December, ensuring that all graduating students during the accreditation period receive accredited degree status.
87. Towards the conclusion of the session, Dr Nassa informed participants that diploma programme accreditation frameworks had also been revised in alignment with GAPC Version 4. New Self-Assessment Report formats and revised programme outcomes had already been introduced, and institutions would gradually transition fully to the updated formats from July 2026 onward.
88. In his concluding remarks, Dr Nassa encouraged institutions to honestly assess their preparedness, strengthen faculty resources, improve academic quality, and systematically adopt Outcome-Based Education practices to achieve NBA accreditation and international recognition for their programmes.

Methods of Assessments & Evaluation: Assessment Tools, Assessment of POs, PSOs, PEOs, & COs and thoughts on closing the loop for continuous improvement by Prof. Sanjay Agrawal, Dean (Academic Affairs), NITTTR, Bhopal

89. Professor Agrawal began by stating that his session would focus on assessment and evaluation methods in Outcome-Based Education, particularly the assessment of Program Outcomes (POs), Program Specific Outcomes (PSOs), and Course Outcomes (COs), as well as the critical process of "closing the loop" in assessment. He emphasized that the present NBA accreditation framework is fully aligned with Outcome-Based Education and that the first three criteria of the Self-Assessment Report (SAR) are entirely based on OBE principles. These criteria include Outcome-Based Curriculum, Teaching-Learning Processes, and Assessment, while the eighth criterion focuses on Continuous Improvement, which effectively closes the assessment loop.
90. He explained that the SAR framework is based on the Graduate Attributes and Professional Competencies (GAPC) Version 4.0 and revolves around three core pillars. The first pillar is Outcome-Based Curriculum, which serves as the blueprint for the academic programme. According to him, the curriculum should clearly define what a student will be able to do after completing the programme. He highlighted that OBE represents a paradigm shift from teacher-centric to student-centric education. In the traditional system, teachers focus on "covering the syllabus," whereas in OBE the focus is on "uncovering" knowledge and ensuring what students actually learn and are capable of doing.

91. Professor Agrawal remarked that in the present era, information is readily available through AI tools and digital resources; therefore, the role of the teacher is no longer limited to content delivery. Instead, teachers must act as facilitators who cultivate curiosity ("jigyasa") among students and guide them towards exploration, application, and innovation. He emphasized that only when outcomes are clearly defined in the curriculum can appropriate pedagogical approaches and assessment methods be designed. The choice of pedagogy, he said, depends entirely on the nature of the intended learning outcomes.
92. He further explained that the graduate attributes prescribed by the NBA are broad programme-level outcomes, whereas Course Outcomes (COs) are specific outcomes defined at the course level. The effectiveness of OBE depends on proper alignment among curriculum design, pedagogy, and assessment mechanisms. He stated that the quality of education in higher and technical education institutions can significantly improve if these three pillars are implemented effectively in the spirit of NEP 2020.
93. Discussing the difference between traditional education and Outcome-Based Education, Professor Agrawal stated that traditional education is largely based on passive learning, with teachers lecturing and students merely listening. Assessment in such systems generally tests only theoretical knowledge through paper-and-pencil examinations and fails to evaluate actual abilities and competencies. In contrast, OBE emphasises active learning and the demonstration of skills.
94. It was emphasised that education should focus on Knowledge, Skills, and Attitude (KSA), which correspond to the cognitive, psychomotor, and affective domains, respectively. While cognitive ability relates to understanding and knowledge, psychomotor ability concerns practical and technical skills, and the affective domain relates to values, ethics, teamwork, communication, and attitudes. He stressed that the affective domain is especially important for holistic development and must be cultivated intentionally among students.
95. Professor Agrawal observed that conventional curricula often focus excessively on topics, lecture hours, and syllabus completion. For example, a course may simply allocate forty-five hours to thermodynamics without considering whether students can apply the concepts. In OBE, however, the emphasis is on what students can perform and demonstrate after learning.
96. He advocated for problem-based learning, project-based learning, laboratory work, team challenges, interdisciplinary activities, and design projects as effective pedagogical strategies. Teachers, he said, must design experiential learning environments where students actively engage in solving problems and developing competencies. He emphasised that ethics cannot be taught in theory alone; they must be demonstrated and absorbed through practice and teacher behaviour. According to him, "Ethics cannot be taught; they must be caught."
97. It was explained that in traditional education, assessments typically consist of examinations covering prescribed topics, quizzes, and written tests, which often fail

to assess communication, teamwork, ethics, creativity, or practical competence. OBE requires demonstration-based assessment, in which students solve real-life problems, work collaboratively, present solutions, and demonstrate competencies through projects and activities, with performance evaluated using rubrics.

98. Professor Agrawal emphasised the importance of rubrics in assessment. According to him, rubrics provide clear criteria and performance indicators for evaluating higher-order skills such as teamwork, communication, ethics, presentations, projects, internships, and laboratory work. He noted that communication skills, for example, cannot be assessed merely by asking students to write short notes in an examination. Instead, students must demonstrate communication through presentations, discussions, and collaborative activities, with these assessed objectively using rubrics.
99. He also distinguished between norm-referenced and criterion-referenced testing. Traditional systems, he observed, largely rely on norm-referenced testing and grading using bell-curve approaches, in which students are ranked relative to one another. OBE, however, requires criterion-referenced assessment, in which students are evaluated against clearly defined competencies and outcomes rather than comparative rankings.
100. Professor Agrawal emphasised the importance of formative assessment, in which continuous feedback is provided during the learning process. He remarked that learning should not merely culminate in pass-fail outcomes. If students fail to achieve learning outcomes, it reflects shortcomings in teaching methods, pedagogy, or assessment systems, and institutions must revisit and improve these processes.
101. Referring to the NBA SAR, he stated that these principles are already embedded in the accreditation framework. Collaborative assessment, individual assessment, multiple opportunities to demonstrate mastery, real-time feedback mechanisms, and outcome-oriented evaluation methods are central to NBA's expectations.
102. He further discussed the Graduate Attributes prescribed by the NBA and the Washington Accord framework. He noted that these attributes are often interpreted superficially by institutions, which focus only on the titles of Programme Outcomes, such as "Engineering Knowledge" or "Problem Analysis", without grasping their full meaning. He clarified that these attributes are intended to prepare graduates to solve complex engineering problems while considering sustainability, societal impact, ethics, the environment, legal frameworks, and human values.
103. Professor Agrawal highlighted that Programme Outcomes PO6 to PO11 particularly emphasize ethics, sustainability, communication, teamwork, lifelong learning, and professional responsibility. He referred to the AICTE course on Universal Human Values as an excellent initiative to inculcate ethical and value-based education among engineering students.
104. He also discussed the concept of the "T-shaped Engineer," which he had encountered at an international conference in Australia. A T-shaped engineer has deep expertise in a specific discipline and broad interdisciplinary knowledge, communication and

teamwork skills, and societal awareness. According to him, the Programme Outcomes collectively aim to develop such holistic engineering professionals.

105. Moving further, he explained the three domains of learning in educational psychology: cognitive, psychomotor, and affective. He clarified that Bloom's Taxonomy addresses only the cognitive domain, whereas holistic education must integrate all three domains. Using the example of driving a car, he illustrated how cognitive understanding, psychomotor skills, and affective behaviour work together.
106. He referred to Krathwohl's taxonomy of the affective domain and explained that values develop progressively through stages such as receiving, responding, valuing, organizing, and characterization. While complete internalization of values may take time, educational institutions must at least ensure that students develop sensitivity and responsiveness to ethical and social issues.
107. Professor Agrawal also discussed psychomotor learning and emphasised the importance of practice and gradual skill development. He cautioned institutions against setting unrealistic assessment targets and stressed that lifelong learning skills are essential in the rapidly evolving technological landscape. Drawing on his own experience, he noted how technologies evolve over time and highlighted the need to cultivate adaptability and continuous learning among students.
108. He then elaborated on the concept of Complex Engineering Problems, which are a crucial component of NBA's OBE framework. He explained that Course Outcomes should be linked to real-world engineering challenges. For example, students may be assigned projects involving big data applications in healthcare, finance, or marketing, requiring them to analyse real-world problems using diverse datasets and dynamic systems. Such projects simultaneously assess technical competencies, teamwork, ethics, sustainability awareness, and communication skills.
109. It was further illustrated that capstone projects should address real societal and industrial challenges. He emphasised that engineering education must produce graduates capable of working for society and solving meaningful problems. Teachers, therefore, must design authentic projects connected to real-world contexts and societal needs.
110. A major portion of his session focused on rubric-based assessment. He demonstrated how rubrics can be used to evaluate laboratory work, seminars, teamwork, projects, internships, industrial visits, presentations, and assignments. Rubrics help reduce subjectivity, increase transparency, and provide students with clear expectations regarding performance levels.
111. He explained that rubrics consist of performance criteria and descriptors across achievement levels such as inadequate, fair, good, and excellent. Such structured assessment methods allow both teachers and students to understand the basis of evaluation objectively.
112. Professor Agrawal strongly asserted that institutions seeking NBA accreditation must develop and implement rubrics comprehensively. According to him, NBA evaluators

specifically verify the existence and application of rubrics during accreditation visits. Criteria related to complex engineering problems, sustainable development goals, projects, laboratory work, and internships all require rubric-based assessment mechanisms.

113. Concluding his session, Professor Agrawal reiterated that assessment is at the core of the teaching-learning system. Curriculum design must originate from real-world job profiles, required skills, and intended outcomes. Pedagogy and assessment should then be aligned with these outcomes. He emphasized that traditional paper-and-pencil examinations are insufficient for evaluating holistic competencies and that institutions must adopt diverse assessment tools capable of evaluating the cognitive, psychomotor, and affective learning domains.
114. Finally, he summarised the philosophy of NBA accreditation in four words: "Say, Do, Prove, Improve." Institutions must clearly state their vision and outcomes ("Say"), implement them effectively through teaching-learning processes ("Do"), demonstrate evidence of attainment ("Prove"), and continuously refine systems through feedback and improvement mechanisms ("Improve"). He concluded by emphasising that true Outcome-Based Education can succeed only when institutions effectively "close the loop" through systematic assessment and continuous improvement.

Self Assessment Report (SAR) 2024: How to prepare SAR and effect improvements during the process (UG Engg.) by Prof. RV Ranganath, Dean (Academics), M.S. Ramaiah University of Applied Sciences, Bengaluru

115. The session served as a comprehensive orientation for faculty members and institutional administrators on preparing the SAR in line with the revised NBA accreditation framework, which is based on Outcome-Based Education (OBE), Washington Accord Graduate Attributes, and global quality assurance practices. Prof. Ranganath emphasized that the SAR is not merely a formal report but the foundational document through which evaluators assess an institution's preparedness, academic systems, governance structure, and quality culture even before the on-site visit. He repeatedly stressed that the SAR's strength lies not in its volume but in the clarity, authenticity, evidence, and systematic articulation of institutional practices.
116. At the outset, he outlined the overall structure of the revised NBA accreditation framework and highlighted the reduction of criteria from ten to nine in the new format. He clarified that Criteria 1 to 8 are primarily evaluated by program evaluators, while Criterion 9 is assessed at the institutional level by the chairperson of the accreditation committee. He also explained the introduction of the "allied or cluster concept," under which related programs within a department are grouped for evaluation of faculty strength, infrastructure, governance, and support systems. He advised institutions not to apply for too many programs simultaneously in a single accreditation cycle, as effective documentation and evidence management become difficult when multiple programs are assessed together.
117. A major portion of the session focused on Criterion 1, covering curriculum design and development. Prof. Ranganath clearly differentiated between vision and mission statements, explaining that the vision represents long-term aspirations, while the mission outlines the actionable strategies adopted to achieve those aspirations. He emphasized that evaluators closely examine whether departmental vision and mission statements are properly aligned with the parent institution's vision and mission and whether they are supported by actual institutional activities and evidence. He illustrated this with examples, explaining that missions must contain actionable elements, whereas visions should describe aspirational goals.
118. He elaborated extensively on Program Educational Objectives (PEOs), describing them as commitments made to students, parents, industry, and society regarding the expected accomplishments of graduates a few years after graduation. He stated that institutions should formulate realistic, measurable PEOs for professional careers, higher education, leadership, communication skills, ethical conduct, and societal contribution. Importantly, he emphasised that the NBA evaluates not only the PEOs themselves but also the process through which they are developed. Institutions must therefore document stakeholder consultations involving faculty, alumni, industry

experts, advisory committees, and academic boards, and maintain photographs, meeting minutes, and records of deliberations.

119. One of the most significant themes of the session was integrating the Washington Accord Graduate Attributes, Knowledge Profiles (WK1–WK8), Program Outcomes (POs), and Program Specific Outcomes (PSOs) into curriculum planning and assessment. Prof. Ranganath explained that the revised NBA framework requires institutions to redesign or review curricula with program outcomes as the central focus, rather than designing courses merely based on faculty expertise or traditional syllabus structures. He emphasized that every course must now be examined through the lens of knowledge profiles and corresponding program outcomes. Faculty members must identify which knowledge profiles each course addresses and map them appropriately to relevant POs.
120. He explained that not all courses can map to all POs and cautioned against the widespread practice of indiscriminate PO mapping. Using examples from engineering courses, he showed that specific courses naturally align only with certain knowledge profiles and can therefore legitimately contribute only to specific program outcomes. He stressed that faculty members must understand the distinction between engineering knowledge, analysis, design, investigation, communication, ethics, and teamwork outcomes when preparing course articulation matrices. He also clarified that Program Specific Outcomes should remain limited, specialised, and discipline-oriented rather than repeating generic POs.
121. The session also dealt extensively with Course Outcomes (COs) and their articulation using measurable action verbs. Prof. Ranganath advised faculty members to formulate outcomes that emphasise higher-order learning domains such as application, analysis, design, and evaluation, rather than simple understanding or memorisation. He warned against poorly written COs and incorrect PO mappings, noting that evaluators carefully scrutinise whether the chosen assessment methods genuinely measure the claimed outcomes. He illustrated how many institutions incorrectly map all course outcomes to multiple POs without sufficient evidence, thereby weakening the credibility of the OBE process.
122. Another major component of the lecture was the concept of Complex Engineering Problems (CEPs), which the revised NBA framework now strongly emphasises. Prof. Ranganath explained that engineering education must move beyond routine textbook exercises and expose students to open-ended, multidisciplinary, realistic, and socially relevant engineering challenges. He referred to the Washington Accord definitions of complex engineering problems and explained how faculty members should integrate them into projects, assignments, case studies, and laboratory work. He encouraged institutions to create semester-long problem-based learning exercises and interdisciplinary projects that require students to apply analytical, investigative, and design skills collectively.

123. Closely linked to CEPs was the incorporation of Sustainable Development Goals (SDGs) into engineering education. Prof. Ranganath clarified that institutions are not expected to map all seventeen SDGs superficially; instead, programs should identify two or three discipline-relevant goals and systematically integrate them into curriculum delivery, projects, and problem-solving activities. He cited examples such as clean water, sustainable cities, energy systems, and environmental management to demonstrate how different engineering disciplines can contribute meaningfully to sustainability education.
124. The session also covered Criteria 2 and 3 on teaching-learning processes and assessment mechanisms. Prof. Ranganath emphasized that institutions must document innovative pedagogical approaches, including collaborative learning, project-based learning, laboratory integration, internships, seminars, NPTEL/SWAYAM integration, mini-projects, and industry-linked activities. He stressed that evaluators examine not only whether such activities exist but also whether they are systematically implemented and properly documented in course files and departmental records.
125. A detailed explanation was provided on calculating attainment for COs and POs. Prof. Ranganath demonstrated how institutions should use direct assessment tools such as examinations, assignments, laboratory work, projects, and presentations, along with indirect methods like surveys and feedback, to compute attainment levels. He explained that attainment analysis should not be treated as a mere compliance exercise; instead, it should guide academic improvement and curriculum refinement. This naturally aligns with Criterion 8 on continuous improvement, where institutions are expected to demonstrate corrective actions taken based on attainment data, stakeholder feedback, and external reviews.
126. While discussing student performance indicators under Criterion 4, he explained formulas for the enrolment ratio, success rate, academic performance, and progression data. He clarified that NBA has become more flexible regarding intake levels and low-enrolment situations, especially in core engineering branches, while maintaining quality expectations. He also discussed the revised faculty-related criteria, including the faculty qualification index, faculty cadre ratio, student-faculty ratio, faculty retention, faculty internships, research publications, consultancy, sponsored projects, patents, and seed funding support.
127. Prof. Ranganath further elaborated on infrastructure and governance criteria. He emphasised the importance of laboratory maintenance, calibration, safety measures, mentoring systems, feedback mechanisms, ERP systems, LMS implementation, entrepreneurship initiatives, incubation activities, community outreach, transparency in governance, and strategic planning. He highlighted that institutions must maintain proper documentation for all such activities, as NBA accreditation is fundamentally evidence-based.

128. At the conclusion, he summarised the key reforms introduced in the revised SAR framework, including alignment with knowledge profiles, a focus on complex engineering problems, integration of sustainability, reduction of POs from twelve to eleven, emphasis on allied department functioning, and stronger expectations for faculty contribution and continuous improvement. He encouraged institutions to move away from isolated departmental functioning and adopt collaborative, outcome-oriented, and evidence-driven academic cultures. Overall, the session provided a detailed and practical roadmap for institutions preparing for NBA accreditation under the revised Outcome-Based Education framework, emphasising that successful accreditation depends on systematic academic processes, measurable outcomes, continuous improvement, and institutional commitment to quality assurance.

Question & Answer Session

129. The workshop concluded with an extensive, highly interactive Question & Answer session, during which faculty members, administrators, deans, directors, and accreditation coordinators from various higher educational institutions across Haryana sought clarifications on NBA accreditation, Outcome-Based Education (OBE), faculty requirements, attainment calculations, Student-Faculty Ratio (SFR), affiliated college challenges, NEP implementation, and institutional preparedness for accreditation.
130. A significant part of the discussion focused on Student-Faculty Ratio (SFR) calculations under NBA accreditation. Participants asked whether supernumerary seats, particularly those introduced for regional language programmes under AICTE provisions, would be counted in SFR calculations. The NBA experts clarified that SFR calculations are based on sanctioned intake and approved admissions, while supernumerary seats, such as regional language batches, are generally excluded from SFR computation. It was also clarified that, in cases where departments offer multiple programmes, such as MCA and B.Tech. Computer Science programmes with common faculty members, all eligible faculty members appointed in the department may be considered collectively for accreditation purposes.
131. Detailed clarifications were also provided on faculty transfers, deputations, and faculty deployment in government institutions. The experts explained that faculty members transferred between government engineering colleges and polytechnics, including those on deputation, may be considered regular faculty for NBA purposes, provided they remain continuously associated with the institution during the relevant assessment period, particularly from 1 September to 30 April. The speakers strongly advised state governments to minimize frequent faculty transfers, emphasizing that institutional stability, faculty ownership, and departmental continuity are essential for quality improvement and sustained accreditation outcomes.

132. Questions were also raised about contractual, hourly-paid, and visiting faculty members. The NBA panel clarified that purely part-time or visiting faculty members who engage in only a few lectures per week are not counted in SFR calculations. However, if faculty members are engaged on a full-time basis, remain available at the institution throughout working hours, and possess valid appointment documentation, they may be considered for accreditation purposes, even if they are not appointed against permanent sanctioned posts. The panel stressed that NBA's primary concern is the actual academic engagement and availability of faculty members for students, rather than administrative nomenclature alone.
133. Several participants sought clarification on the implementation of multiple entry and exit provisions introduced under the National Education Policy. The experts clarified that NBA does not prescribe institutional policies for multiple entry and exit systems; rather, these frameworks are to be developed by universities and state governments in accordance with national policy guidelines. NBA's role is to evaluate how effectively institutions implement academic reforms and maintain quality standards within these frameworks.
134. A major part of the interaction focused on Outcome-Based Education (OBE), attainment calculations, and assessment methodologies. Experts repeatedly emphasised that attainment should not be treated merely as a numerical exercise. They noted that many institutions focus excessively on numerical attainment calculations while overlooking the actual quality of learning. The NBA representatives explained that the revised accreditation framework intentionally reduced excessive quantitative dependence and shifted greater focus towards qualitative evaluation under Criterion 3. Institutions were advised to concentrate on meaningful learning experiences, sound assessment design, cognitive skill development, and evidence-based continuous improvement rather than simply manipulating attainment numbers.
135. The issue of attainment gaps received detailed attention. Faculty members asked how institutions should respond when a significant portion of students fails to achieve target outcomes. In response, the experts explained that institutions must first examine whether the targets themselves are unrealistically ambitious. Secondly, institutions should carefully review teaching-learning methodologies, assessment processes, question paper design, and evaluation practices. The speakers highlighted that examinations should assess whether students have actually learned the prescribed concepts and skills, rather than attempting to confuse or unnecessarily challenge them. They remarked that some traditional examination practices prioritized difficult questions over meaningful assessment of learning, whereas OBE emphasizes student achievement, conceptual understanding, and measurable learning outcomes.
136. The discussion also covered Bloom's Taxonomy and cognitive-level assessment. The experts explained that question papers should be carefully designed with appropriate

action verbs aligned with cognitive levels such as understanding, application, analysis, and design. They emphasised that higher-order analytical and design-oriented questions naturally merit greater weightage and must be reflected appropriately in assessment structures. Institutions were encouraged to adopt assessment practices that genuinely measure student learning outcomes rather than relying solely on rote or memory-based evaluations.

137. Participants from affiliated colleges raised concerns about Course Outcome (CO) attainment, as universities often do not provide CO-wise examination marks. The NBA panel clarified that affiliated institutions may proportionally distribute overall course marks across Course Outcomes and rely substantially on internally conducted formative assessments. The experts further explained that the long-term objective under international accreditation frameworks such as the Washington Accord is to gradually develop systems that enable universities to provide more granular outcome-level assessment data to affiliated institutions.
138. Another important topic discussed during the session was the evolving concept of academic credits under the National Credit Framework. Citing recent Government of India guidelines, the experts explained that one academic credit is now understood to represent approximately 30 hours of total student learning, rather than merely teacher contact hours. Institutions were advised to gradually transition from teacher-centric academic models to student-centric learning systems, where assignments, tutorials, self-learning, laboratory work, experiential activities, assessments, and independent learning all contribute to credit calculations. Faculty members were informed that institutions currently following traditional LTP (Lecture-Tutorial-Practical) structures may continue temporarily but should progressively align their systems with the new student-learning-based credit framework.
139. Questions were also raised about the practical significance of NBA accreditation. One participant noted that students often prioritise institutional reputation over accreditation status during admissions. In response, the NBA experts explained that accreditation should not be seen merely as a certificate or formality but as a framework for continuous quality improvement. While regional admission trends may currently be influenced more by institutional branding, NBA accreditation increasingly affects employability, institutional credibility, national rankings, international academic mobility, and recognition under global quality assurance systems.
140. Specialised academic programmes such as architecture, visual arts, film studies, and management education were also discussed. The NBA representatives clarified that accreditation systems already exist for architecture programmes, whereas frameworks for disciplines such as film-making and visual arts are still evolving and may be developed in the future, depending on institutional demand and academic participation.
141. As the session concluded, the speakers thanked the Haryana State Higher Education Council, the host institution J.C. Bose University of Science and Technology, and all

participating institutions for organizing and attending the workshop. The concluding remarks emphasized that Outcome-Based Education and accreditation should be seen as tools for long-term academic transformation rather than compliance exercises. The experts encouraged institutions across Haryana to adopt OBE principles sincerely, strengthen assessment and academic processes, and foster a culture of continuous quality improvement. They reiterated that accreditation ultimately aims to enhance student learning, institutional excellence, employability, and the global competitiveness of higher education institutions.

****

ANNEXURES

Awareness Workshop on Outcome Based Education & Accreditation at J.C. Bose University of Science and Technology, YMCA, Faridabad On 13th May, 2026

Dr. Anil Kumar Nassa
Member Secretary
National Board of Accreditation
New Delhi-110003

ABOUT NBA

- Established in the year 1994 under Section 10 (u) of AICTE Act.
- NBA became Autonomous in January 2010 and in April 2013 the Memorandum of Association and Rules of NBA were amended to make it completely independent of AICTE, administratively as well as financially.
- NBA now independent in its functioning: decision making as well as financially.
- Does not receive any grant either from the government or from any regulatory body of technical and higher education.

NATIONAL BOARD OF ACCREDITATION

NBA is committed to provide:

1. Credible System of Accreditation
2. Transparent & Accountable System

Credible System of Accreditation

- **Strength** and **credibility** of accreditation process largely lies in the integrity, honesty, expertise and professionalism.
- **Evaluators** – face of NBA.
- **Transparency**-
  - Report discussed in the meetings of EAC in presence of all team chair
  - Recommendations of EAC are considered in Sub-committee of AAC
  - Copy of the report is sent to the Institution
  - Change in decision communicated to the institution with reasons
  - 360 degree feedback

WHAT IS NOT THE PURPOSE OF ACCREDITATION

- **Not to** find faults with the institution but to assess the status-ante of the performance.
- **Not to** denigrate the working style of the institution and its programs but to provide a feed back on their strengths and weaknesses.
- **Not to** demarcate the boundaries of quality but to offer a sensitizing process for continuous improvement in quality provisions.
- **Not to** select only institutions of national excellence but to provide benchmarks of excellence and identification of good practices.

General Policy on Accreditation

The following general policies are the guiding principles for the accreditation of programs:

1. Programs, and not Educational Institutions, are considered for accreditation.

2. Programs from which at least two batches of students have graduated are considered for accreditation.

Outcome-Based Program Accreditation

- Knowledge and competencies profiles
- Graduate Attributes(GAs)/Program Outcomes(POs) which form the student learning outcomes:
  - PO1: Engineering Knowledge
  - PO2: Problem Analysis
  - PO3: Design/Development of Solutions
  - PO4: Conduct Investigations of Complex Problems
  - PO5: Engineering Tool Usage
  - PO6: The Engineer and The World
  - PO7: Ethics
  - PO8: Individual and Collaborative Team work
  - PO9: Communication
  - PO10: Project Management and Finance
  - PO11: Life-Long Learning:

NBA Outcome Based Accreditation

Two Tier System

- Introduction of **Two-Tier System** based on Types of Institutions.
  - **The Tier–I documents**: Applicable to the engineering/technology programs offered by academically **autonomous institutions** and by university departments and constituent colleges of the Universities.
  - **Tier-II documents**: Applicable to **non-autonomous** Institutions, i.e., those Colleges and technical Institutions which are affiliated to a University.
  - **For both** (Tier-I & Tier-II): Same set of criteria have been prescribed for accreditation.

Marks Comparison of SAR of UG Engineering Tier-I & Tier II - (GAPC V4.0)

S. No.	Criteria	UG Engineering	
		Tier-I	Tier-II
1.	Outcome-Based Curriculum	120	120
2.	Outcome-Based Teaching Learning	120	120
3.	Outcome-Based Assessment	120	120
4.	Students' Performance	120	120
5.	Faculty Information	100	100
6.	Faculty Contributions	120	120
7.	Facilities and Technical Support	100	100
8.	Continuous Improvement	80	80
9.	Student Support and Governance	120	120
TOTAL		1000	1000

Program Outcomes (POs)

1. **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.
2. **Problem Analysis**: Identify, formulate, review research literature and analyse complex engineering problems reaching substantiated conclusions with consideration for **Sustainable Development** (WK1 to WK4).
3. **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).
4. **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).

Program Outcomes (POs)

5. **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).
6. **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).
7. **Ethics**: Apply ethical principles and commit to professional ethics, human values, diversity and inclusion; adhere to national & international laws (WK9).
8. **Individual and Collaborative Team work**: Function effectively as an individual, and as a member or leader in diverse/multi-disciplinary teams.

Program Outcomes (POs)

9. **Communication**: Communicate effectively and inclusively within the engineering community and society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations considering cultural, language, and learning differences.
10. **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.
11. **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).

Pre-Qualifiers: TIER-I UG (Engg.,) Program

S.N.	Pre Visit Qualifiers	Current Status	Compliance Status Complied/Not Complied
	Essential qualifiers		
1	Whether approval of the competent authority (Approval of AICTE/UGC/BoG of Universities/ Deemed Universities etc.) for the program under consideration has been obtained for all the years including current academic year		
2	Whether the Student Faculty Ratio (SFR) in the Department and allied Departments is less than or equal to 25:1, averaged over three academic years: CAY, CAYm1, and CAYm2	SFR	
3	Whether the number of faculty having Ph.D degree available in the Department & allied Departments is greater than or equal to 20% of the required number of faculty averaged over two academic years i.e. CAY and CAYm1.		
4	Whether two batches have passed out in the program under consideration		
5	Whether the HOD of the department in which the program under consideration is running should be appointed on regular basis and should possess PhD degree in the Current Academic Year (CAY).		

Pre-Qualifiers: TIER-I UG (Engg.,) Program

S.N.	Pre Visit Qualifiers	Current Status	Compliance Status Complied/Not Complied
	Essential qualifiers		
6	**Case 1:** If the Department/School is not running multiple UG (Engineering) programs and does not have allied departments, which is running undergraduate engineering program, then the program under consideration needs either 2 Professors or 1 Professor and 1 Associate Professor on a regular basis with Ph.D. degree in the current academic year (CAY) and the previous academic year (CAYm1). **Case 2:** If the Department/School, including allied departments, is running multiple UG (Engineering) programs, the program under consideration needs either 2 Professors or 1 Professor and 1 Associate Professor on a regular basis with Ph.D. degree in CAY and CAYm1. Additionally, the remaining UG (Engineering) programs (N*) need N Professors or N Associate Professors in the Department/ School/ Allied departments on a regular basis with Ph.D. degree in CAY and CAYm1 in total.		

Tier – I Grades

% of Marks	Grade
❖ ≈75% & Above	'Y'
❖ ≈ 60% and <75%	'C'
❖ ≈ 40% and <60%	'W'
❖ <40%	'D'

Award of Accreditation UG (Engg.,): Tier-I

Accreditation for Six Years:

1. There should not be any Deficiency (D) or Weakness (W) in any of the criteria and at least six criteria must be fully compliant (Y), with only 'Concerns (C)' in the remaining criteria (Y >=6, W & D=0).

2. The no. of faculty having Ph. D degree available in the Department & allied Departments is greater than or equal to 30% of the required no. of faculty averaged over two academic years i.e. CAY and CAYm1.

3. Student Faculty Ratio (SFR) in the Department and allied Departments should be less than or equal to 20:1, averaged over 3 academic years i.e. CAY, CAYm1 and CAYm2.

4. HoD should be on regular basis and possess Ph.D. degree for the programs under consideration in the CAY.

Award of Accreditation UG (Engg.,): Tier-I

Accreditation for Six Years:

5. Required no. of Professors or Associate Professors

   - **Case 1**: If the Department/School is not running multiple UG (Eng.,) programs and does not have allied departments, which is running UG (Engg.) program, then the Department/School under consideration needs either 2 Professors or 1 Professor and 1 Associate Professor on a regular basis with Ph.D. degree in CAY and CAYm1.

   - **Case 2**: If the Department/School, including allied departments, is running multiple UG (Engg.) programs, the Program under consideration needs either 2 Professors or 1 Professor and 1 Associate Professor on a regular basis with Ph.D. degree in CAY and CAYm1. Additionally, the remaining UG (Engg.,) programs (N*) need N Professors or N Associate Professors in Department/ School/ Allied departments on a regular basis with Ph.D. degree in CAY and CAYm1 in total.

Note*: Exclude the no. of Professors/Associate Professors for the UG (Engg.,) programs that have been running for less than 3 years (CAY, CAYm1)

Award of Accreditation for UG (Engg.,): Tier-I Accreditation for Three Years:

1. There should not be any Deficiency (D) and at least three criteria must be fully compliant (Y).
2. The no. of faculty having Ph. D degree available in the Department & allied Departments is greater than or equal to 20% of the required no. of faculty averaged over two academic years i.e. CAY and CAYm1.
3. Student Faculty Ratio (SFR) in the Department and allied Departments should be less than or equal to 25:1, averaged over 3 academic years i.e. CAY, CAYm1 and CAYm2.
4. HoD should possess Ph.D. degree for the programs under consideration in the CAY.

19

Award of Accreditation for UG (Engg.): Tier-I Accreditation for Three Years

5. Required no. of Professors or Associate Professors

   - **Case 1**: If the Department/School is not running multiple UG (Engg.,) programs and does not have allied departments, which is running UG (Engg.,) program, then the Department/School under consideration needs either 2 Professors or 1 Professor and 1 Associate Professor on a regular basis with Ph.D. degree in CAY and CAYm1.

20

Award of Accreditation for UG (Engg,): Tier-I

No Accreditation of the Program

- **Case 2**: If the Department/School, including allied departments, is running multiple UG (Engg.,) programs, the program under consideration needs either 2 Professors or 1 Professor and 1 Associate Professor on a regular basis with Ph.D. degree in CAY and CAYm1. Additionally, the remaining UG (Engg.,) programs (N*) need N Professors or N Associate Professors in Department/ School/ Allied departments on a regular basis with Ph.D. degree in CAY and CAYm1 in total.

Note*: Exclude the no. of Professors/Associate Professors for the UG (Engg.,) programs that have been running for less than 3 years (CAY, CAYm1)

- If the program fails to meet criteria for award of accreditation for 3 years, the program will not be considered for accreditation.

Pre-Qualifiers: TIER-II UG (Engg.,) Program

S.N.	Pre-Visit Qualifiers	Current Status	Compliance Status(Complied /Not Complied
1	Whether the approval of the AICTE for the programs under consideration has been obtained for the previous five years, starting from the current academic year		
2	Whether the Student Faculty Ratio (SFR) in the Department and allied Departments is less than or equal to 25:1, averaged over three academic years: Current Academic Year (CAY), Current Academic Year Minus One (CAYm1), and Current Academic Year Minus Two (CAYm2)		

Pre-Qualifiers: TIER-II UG (Engg.,) Program

S.N.	Pre-Visit Qualifiers	Current Status	Compliance Status(Complied/ Not Complied)
3	**Case 1:** If the Department/School is not running multiple UG (Engineering) programs and does not have allied departments, which is running undergraduate engineering programs, then the program under consideration needs either 1 Professor or 1 Associate Professor on a regular basis with Ph.D. degree in the current academic year (CAY) and the previous academic year (CAYm1).		

22

Pre-Qualifiers: TIER-II UG (Engg.,) Program

S.N.	Pre-Visit Qualifiers	Current Status	Compliance Status(Complied /Not Complied)
3	**Case 2:** If the Department/School, including allied departments, is running multiple UG (Engineering) programs, the Program under consideration needs either 1 Professor or 1 Associate Professor on a regular basis with Ph.D. degree in CAY and CAYm1. Additionally, the remaining UG (Engineering) programs (N*) need N Professors or N Associate Professors in the Department/ School/ Allied Departments on a regular basis with Ph.D. degree in CAY and CAYm1 in total.		

Note*: Exclude the number of Professors/Associate Professors for the UG programs (Engineering) that have been running for less than 3 years (CAY, CAYm1).

24

Pre-Qualifiers: TIER-II UG (Engg.,) Program

S.N.	Pre-Visit Qualifiers	Current Status	Compliance Status(Complied/ Not Complied)
4	Whether the number of faculty having Ph.D. degree available in the Department & allied Departments is greater than or equal to 10% of the required number of faculty averaged over two academic years i.e. Current Academic Year (CAY) and Current Academic Year Minus One (CAYm1)		
5	Whether two batches have passed out in the program under consideration		
6.	Whether the HOD of the department in which the program under consideration is running is appointed on regular basis and possesses PhD degree in the Current Academic Year (CAY).		

Award of Accreditation: TIER-II UG (Engg.,):

Accreditation for Six Years:

1. There should not be any 'Deficiency (D)' or 'Weakness (W)' in any of the criteria and at least six criteria must be fully compliant (Y), with only 'Concerns (C)' in the remaining criteria (Y >=6, W & D=0).

2. The number of faculty having Ph.D. degree available in the Department & allied Departments is greater than or equal to 30% of the required number of faculty averaged over two academic years i.e. Current Academic Year (CAY) and Current Academic Year Minus One (CAYm1).

Award of Accreditation: TIER-II UG (Engg.,)

Accreditation for Six Years:

3. The Student Faculty Ratio (SFR) in the Department and allied Departments should be less than or equal to 20:1 averaged over 3 academic years i.e. Current Academic Year (CAY), Current Academic Year Minus One(CAYm1), Current Academic Year Minus Two (CAYm2).

4. The HoD of the department in which the program under consideration is running should be appointed on regular basis and should possess Ph.D degree in the Current Academic Year (CAY).

Award of Accreditation: TIER-II UG (Engg.,):

Accreditation for Six Years:

5. **Case 1**:

   Case 1: If the Department/School is not running multiple UG (Engineering) programs and does not have allied Departments, which are running undergraduate engineering program, then the program under consideration needs either 2 Professors or 1 Professor and 1 Associate Professor on a regular basis with Ph.D. degree in the current academic year (CAY) and the previous academic year (CAYm1).

Award of Accreditation: TIER-II UG (Engg.,):

Accreditation for Six Years:

Case 2:

If the Department/School, including allied departments, is running multiple UG (Engineering) programs, the program under consideration needs either 2 Professors or 1 Professor and 1 Associate Professor on a regular basis with Ph.D. degree in CAY and CAYm1. Additionally, the remaining UG (Engineering) programs (N*) need N Professors or N Associate Professors in the Department/ School/ Allied departments on a regular basis with Ph.D. degree in CAY and CAYm1 in total.

Note*: Exclude the number of Professors/Associate Professors for the UG programs (Engineering) that have been running for less than 3 years (CAY, CAYm1).

Award of Accreditation: TIER-II UG (Engg.,):

Accreditation for Three Years:

1. There should not be any Deficiency (D) and at least three criteria must be fully compliant (Y).

2. The number of faculty having Ph. D degree available in the Department & allied Departments is greater than or equal to 10% of the required number of faculty averaged over two academic years i.e. Current Academic Year (CAY) and Current Academic Year Minus One (CAYm1).

Award of Accreditation: TIER-II UG (Engg.,):

Accreditation for Three Years:

3. The Student Faculty Ratio(SFR) in the Department and allied Departments should be less than or equal to 25:1 averaged over 3 academic years i.e. Current Academic Year(CAY),Current Academic Year Minus One (CAYm1), Current Academic Year Minus Two (CAYm2).

4. **Case 1**:

If the Department/School is not running multiple UG (Engineering) programs and does not have allied departments, which are running undergraduate engineering programs, then the program under consideration needs either 1 Professors or 1 Associate Professor on a regular basis with Ph.D. degree in the current academic year (CAY) and the previous academic year (CAYm1).

Award of Accreditation: TIER-II UG (Engg.,):

Accreditation for Three Years:

5. **Case 2**:

If the Department/School, including allied departments, is running multiple UG (Engineering) programs, the program under consideration needs either 1 Professors or 1 Associate Professor on a regular basis with Ph.D. degree in CAY and CAYm1. Additionally, the remaining UG (Engineering) programs (N*) need "N" Professors or "N" Associate Professors in the Department/ School/ Allied departments on a regular basis with Ph.D. degree in CAY and CAYm1 in total.

Note*: Exclude the number of Professors/Associate Professors for the UG programs (Engineering) that have been running for less than 3 years (CAY, CAYm1).

Award of Accreditation: TIER-II UG (Engg.,):

No Accreditation:

If the program fails to meet the criteria for award of accreditation for 3 years, it is awarded "Not Accredited" Status.

Guidelines for Faculty and SAR:

- All faculty, whether regular or contractual will be counted in the respective year, if the faculty has joined on or before 31st August of the same year and continued till 30th April of the subsequent year.
- There is no age limit to the consideration for the emeritus faculty as long as they are physically fit to take classes and engage with students, and are employed on a full time basis.
- The available and required no. of PhD. in the Department shall be truncated to its nearest lower integer.

Guidelines for Faculty and SAR:

- In the disciplines like MBA or PGDM or specialized areas like Biotechnology, all the qualifications relevant and purposeful to those disciplines need to be considered, in addition to the M.Tech/MBA/PGDM degrees.
- All the faculty whether regular or contractual (except part-time or hourly based), will be considered.
- All regular faculty members shall meet the AICTE qualifications and experience requirements.
- The Faculty having a 100% teaching load in the First year will not be counted in FSR.

Guidelines for Faculty and SAR:

- Contractual faculty appointed with any terminology whatsoever, who have taught for 2 consecutive semesters with or without break between the 2 semesters in corresponding academic year on full-time basis shall be considered for the purpose of calculation in the faculty student ratio.
- Following will be ensured in case of contractual faculty:
  - Shall have the AICTE prescribed qualifications and experience.
  - Shall be appointed on full time basis and worked for consecutive two semesters with or without break between the 2 semesters during the particular academic year under consideration.
  - Should have gone through an appropriate process of selection and the records of the same shall be made available to the visiting team during NBA visit.

Guidelines for Faculty and SAR

- Academic year is considered from July to June
- If the SAR is submitted before 30th September, then the CAY shall be the previous academic year and if the SAR is submitted after 30th September, then the CAY shall be the running academic year for the purpose of data consideration and calculations.
  - **CAY**: Current Academic Year
  - **CAYm1**: Current Academic Year Minus 1
  - **CAYm2**: Current Academic Year Minus 2
- The Institutions will have to submit both Pre-Qualifiers and Self Assessment Report (SAR) in the same Academic Year.

Student Faculty Ratio (SFR) Considered by NBA

UG Engineering Programs (Tier I & Tier II):
- 25:1 for the Accreditation of 3 years
- 20:1 for the Accreditation of 6 years

PG Engineering and MCA Programs:
- 25:1 for the Accreditation of 3 years
- 20:1 for the Accreditation of 6 years

Diploma Engineering Programs:
- 30:1 for the Accreditation of 3 years & 6 years

PG Management Programs:
- 25:1 for the Accreditation of 3 years
- 20:1 for the Accreditation of 6 years.

UG & PG Pharmacy Programs:
- 20:1 for the Accreditation of 3 years
- 15:1 for the Accreditation of 6 years

Diploma Pharmacy Programs:
- 25:1 for the Accreditation of 3 years & 6 years

GUIDELINES

NBA decided to consider the Professor of Practice (PoP), Associate Professor of Practice (PoP), and Assistant Professor of Practice (PoP) as per the qualifications and experience prescribed by the AICTE for accreditation of Engineering programs. e.g. For calculation of SFR, Faculty Qualification, Faculty Cadre Proportion, Faculty Retention Ratio and Faculty members participation in STTPs/FDPs.

GUIDELINES

The maximum number of faculty members engaged as Professor of Practice (PoP) with the required faculty strength (Cadre Ratio) as per AICTE norm would be 20% wherein 5% is exclusively reserved for Women Professor of Practice (PoP), Associate /Assistant Professor of Practice (PoP) (Regular basis).

GUIDELINES

NBA has decided to eliminate the current ambiguity regarding coverage of the final year students of a program under the period of accreditation awarded to the program. As per the current policy, accreditation is granted academic session-wise starting from 1st July, which does not cover the final-year students. Henceforth, the Calendar Year will be decided on the basis of Current Academic Year (CAY) considered for evaluation of a program. For example, if a program is evaluated with CAY 2025-2026, the period of accreditation will commence from 1st January 2026 and will remain valid upto 31st December, 2028 or 31st December 2031, depending on whether the program is accredited for 3/6 years respectively.

41

GUIDELINES

The revised process will be applicable for all the visits where the CAY is 2025-2026 and onwards. If there are programs which are already accredited upto 30-06-2026/30-06-2027/30-06-2028; in order to avoid gap and maintain continuity of accreditation in the interest of students, the period of extension will be for 6 months from 1st July, 2026/2027/2028 to 31st December, 2026/2027/2028 and for 3/6 years from 1st January 2027/2028/2029, as the case may be.

42

GUIDELINES

The Institutions will have to submit both Pre-Qualifiers and Self Assessment Report (SAR) in the same Academic Year e.g. 2025-26 (1st October onward).

NEW SELF-ASSESSMENT REPORT (SAR) FOR DIPLOMA (ENGINEERING) PROGRAMS

The National Board of Accreditation (NBA), New Delhi, hereby announces the introduction of a new Self-Assessment Report (SAR) format for Diploma (Engineering) Programs, in accordance with **GAPC Version 4.0**

The new SAR format (**January 2026 document**) shall be applicable with effect from 1st January 2026. From 1st July 2026 onwards, only the new SAR format (January 2026 document) will be applicable for fresh applications



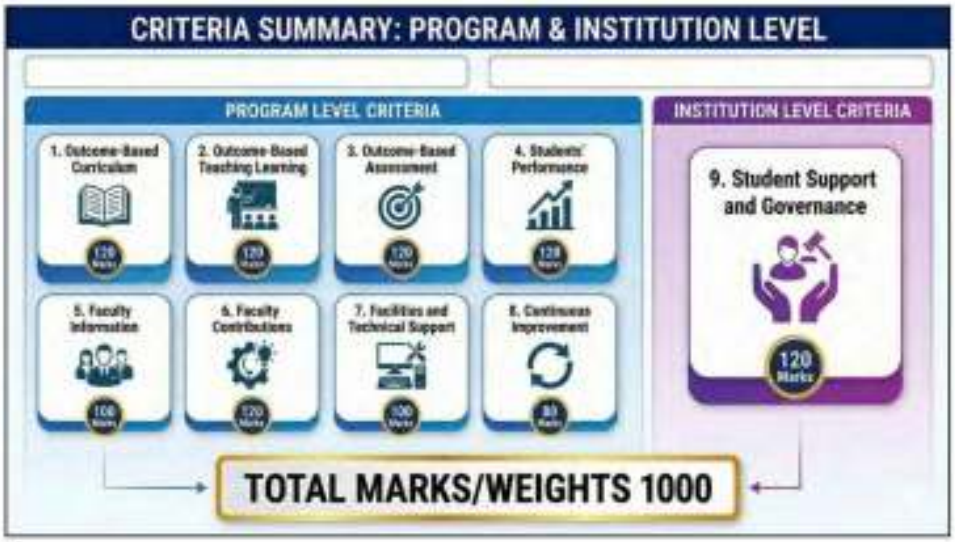
Thank you

Methods of Assessment and Evaluation

Assessment of POs, PSOs and COs – closing the Loop for continuous evaluation

Dr. Sanjay Agrawal
Dean Academic Affair
NITTTR, Bhopal
sagrawal@nitttrbpl.ac.in

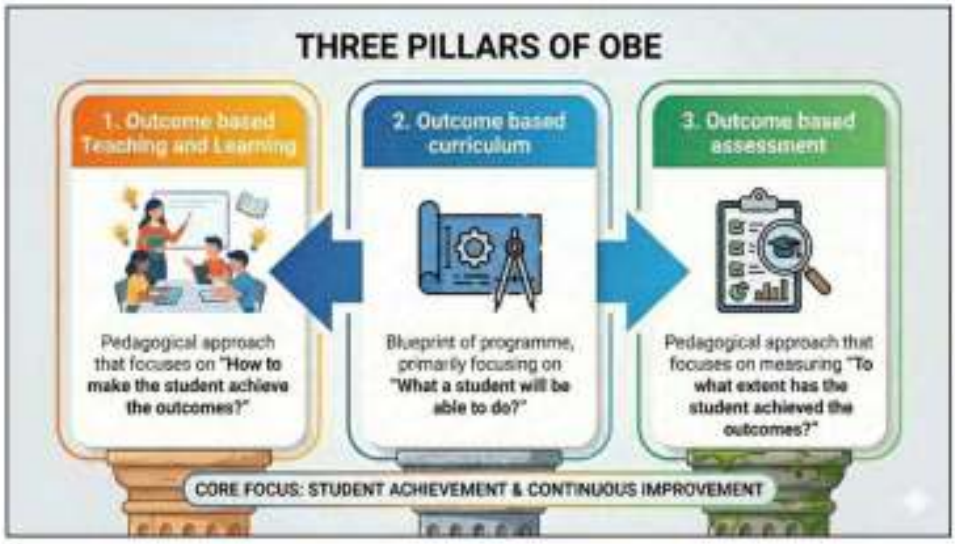
1



2

NBA Awareness Workshop at J.C. Bose University Faridabad. by Dr. Sanjay Agrawal

13-05-2026



3



4

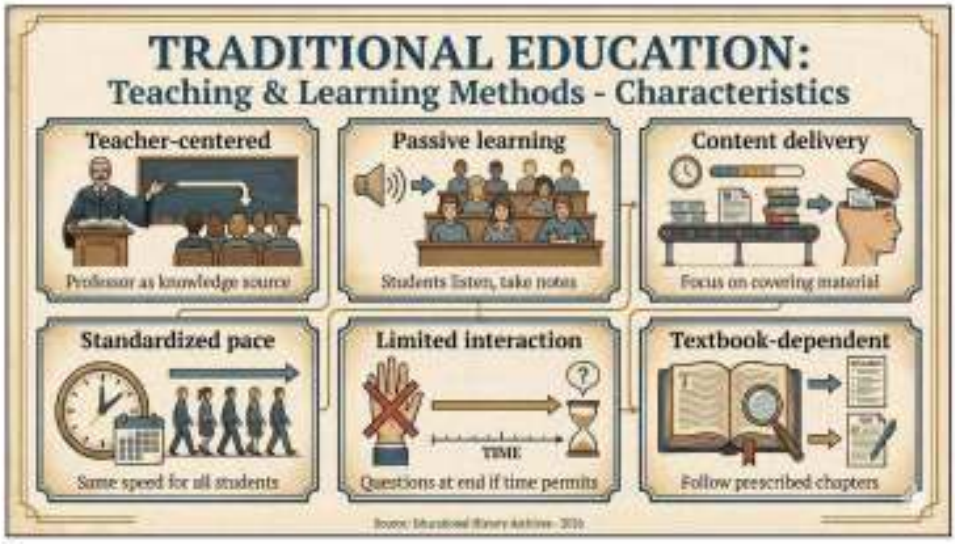
Methods of Assessment and Evaluation - Closing the Loop for Continuous Evaluation

2

NBA Awareness Workshop at J.C. Bose University Faridabad. by Dr. Sanjay Agrawal 13-05-2026



5



6

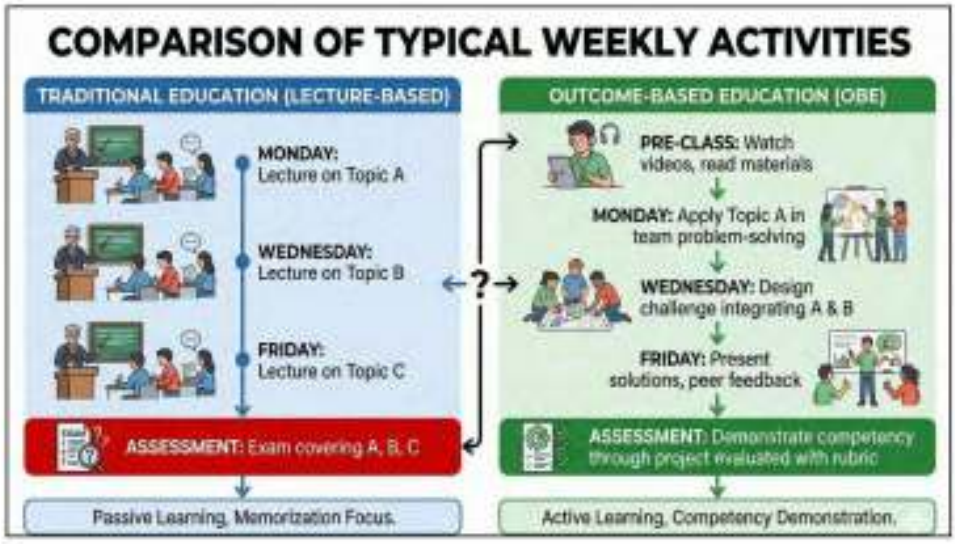
Methods of Assessment and Evaluation - Closing the Loop for Continuous Evaluation 3

NBA Awareness Workshop at J.C. Bose University Faridabad. by Dr. Sanjay Agrawal

13-05-2026



7



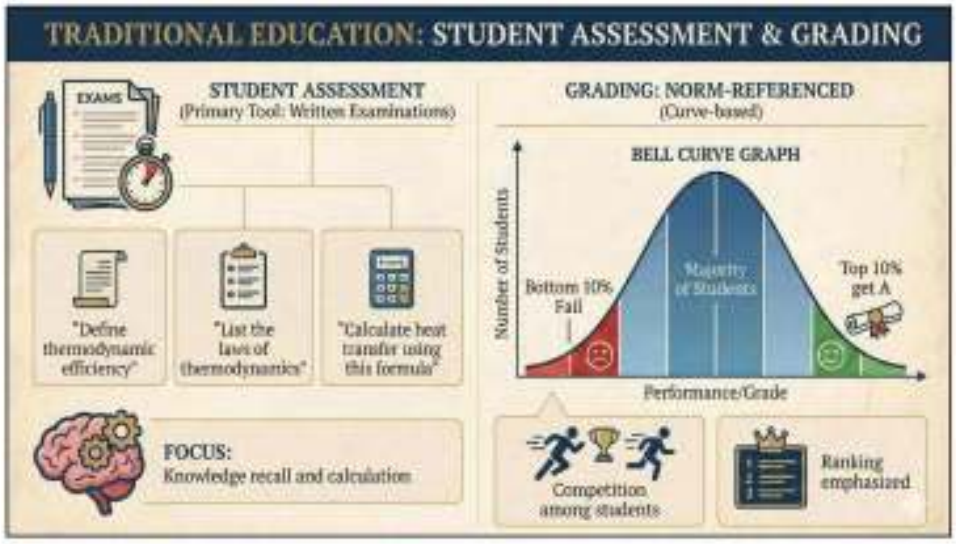
8

Methods of Assessment and Evaluation - Closing the Loop for Continuous Evaluation

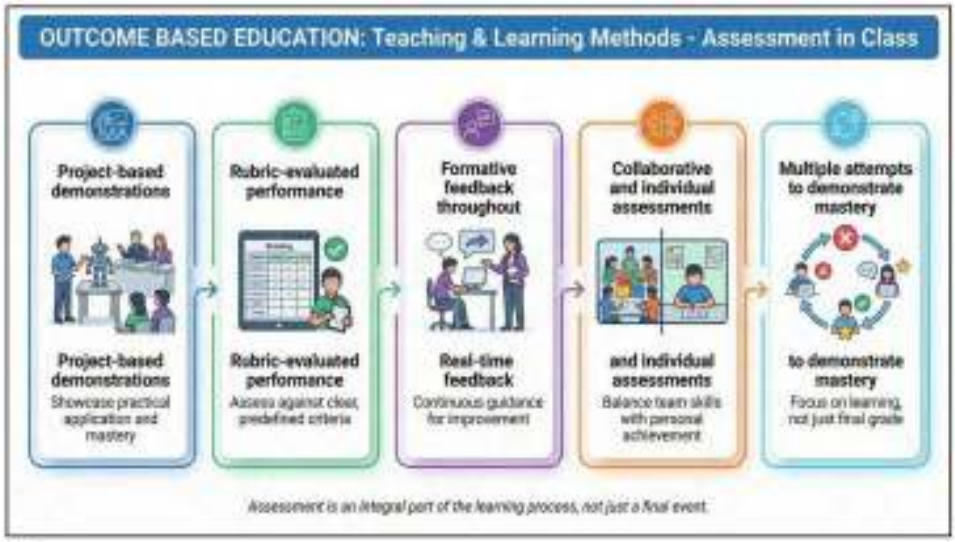
4

NBA Awareness Workshop at J.C. Bose University Faridabad. by Dr. Sanjay Agrawal

13-05-2026



9



10

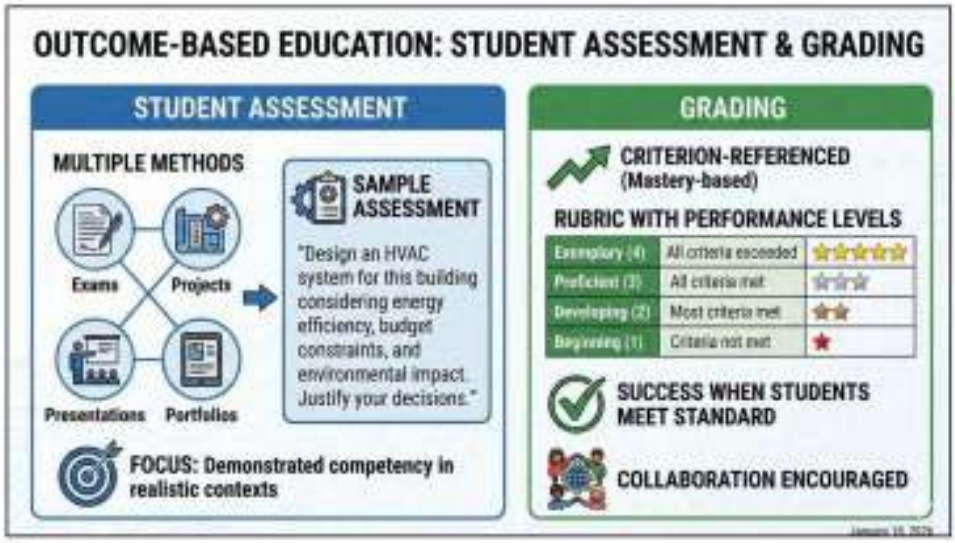
Methods of Assessment and Evaluation - Closing the Loop for Continuous Evaluation

5

NBA Awareness Workshop at J.C. Bose University Faridabad. by Dr. Sanjay Agrawal 13-05-2026



11



12

Methods of Assessment and Evaluation - Closing the Loop for Continuous Evaluation 6



13

POs (Outcome)	PSOs (Outcome)	PEOs (Objective)
• As per New SAR: 11 • Defined by NBA • The Graduates to attain during duration of 4 years • Attributes of students to imbibe/inculcate during the programme • Defined for Programme i.e. UG/PG/MBA/MCA etc., • Assessed using curriculum, teaching-learning, assessment and evaluation records etc. (09 criteria)	• 2 to 3 to be defined for each programme • Fill up the gaps to contribute towards POs • Attainment before getting the Degree • Support specialization or beyond curriculum • Defined for a particular programme of a discipline such as UG: Civil or PG: Electrical etc., • Assessed using teaching-learning ,assessment records etc.	• 4 to 5 to be listed for each programme • Expected to achieve after 3 to 4 years or beyond after degree • It is like the dream the stakeholders see while establishing the institute/ Launching a programme • POs and PSOs are feeder to PEOs • Assessed using Alumni data and interacting with employers

14

Methods of Assessment and Evaluation - Closing the Loop for Continuous Evaluation 7

NBA Awareness Workshop at J.C. Bose University Faridabad. by Dr. Sanjay Agrawal 13-05-2026

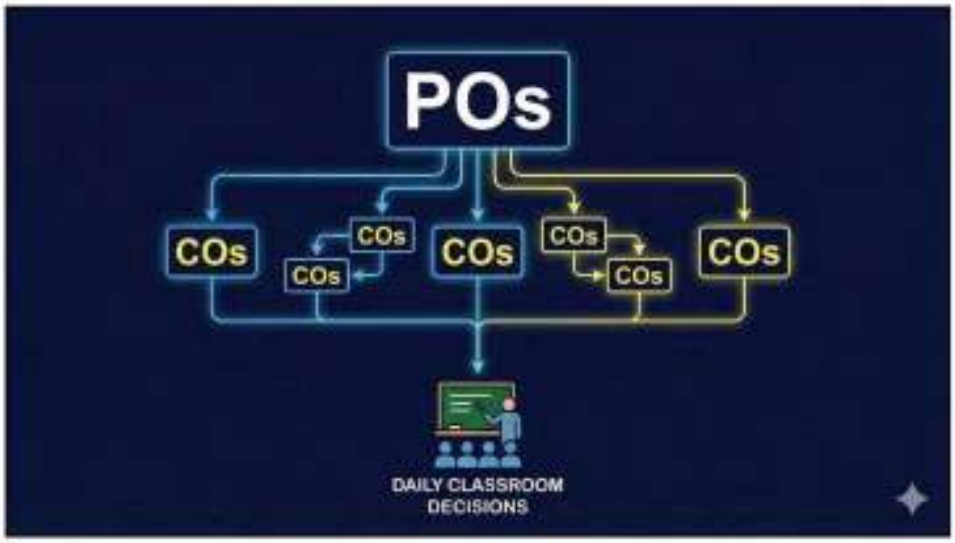


15



16

Methods of Assessment and Evaluation - Closing the Loop for Continuous Evaluation 8


POs
COs
COs
COs
COs
COs
COs
COs
DAILY CLASSROOM DECISIONS

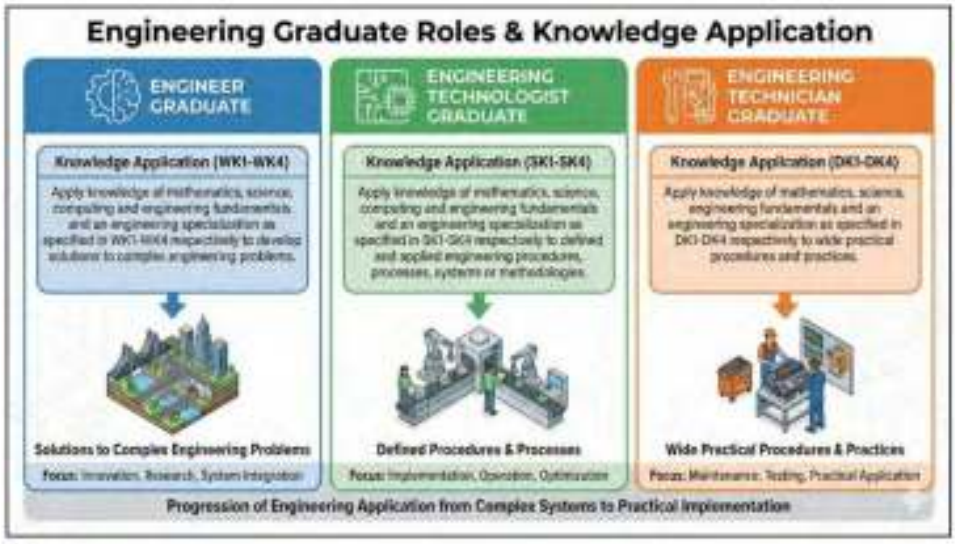
17


GRADUATE ATTRIBUTES AND PROFESSIONAL COMPETENCES
Approved Version 4: 21 June 2021
Document is available through the IEA website:
http://www.ieagreements.org

18

NBA Awareness Workshop at J.C. Bose University Faridabad. by Dr. Sanjay Agrawal

13-05-2026



19



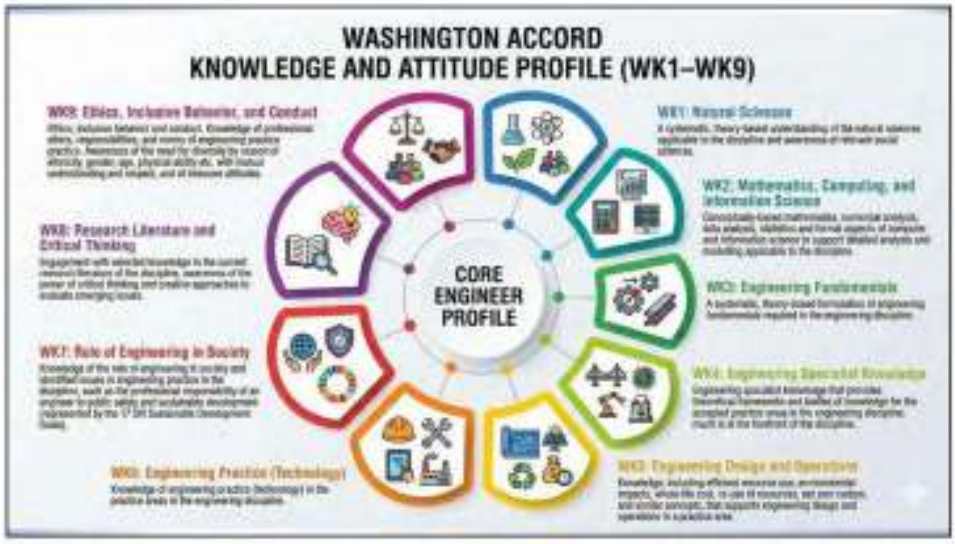
20

Methods of Assessment and Evaluation - Closing the Loop for Continuous Evaluation

10

NBA Awareness Workshop at J.C. Bose University Faridabad. by Dr. Sanjay Agrawal

13-05-2026



21



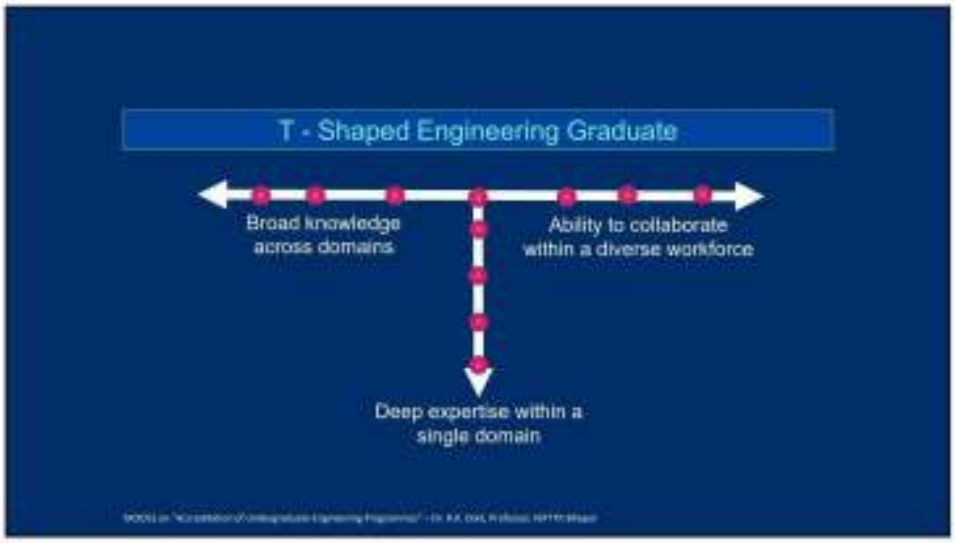
22

Methods of Assessment and Evaluation - Closing the Loop for Continuous Evaluation

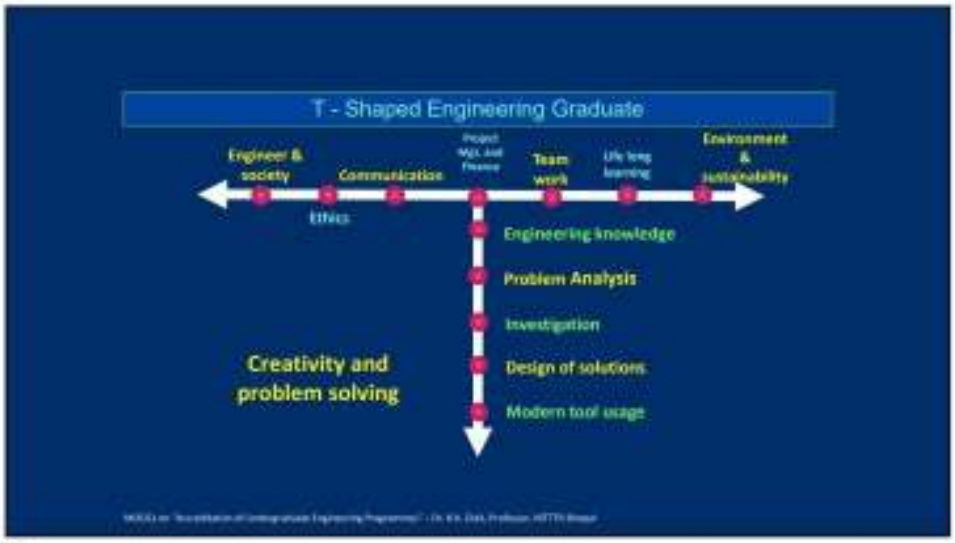
11

NBA Awareness Workshop at J.C. Bose University Faridabad. by Dr. Sanjay Agrawal

13-05-2026



23

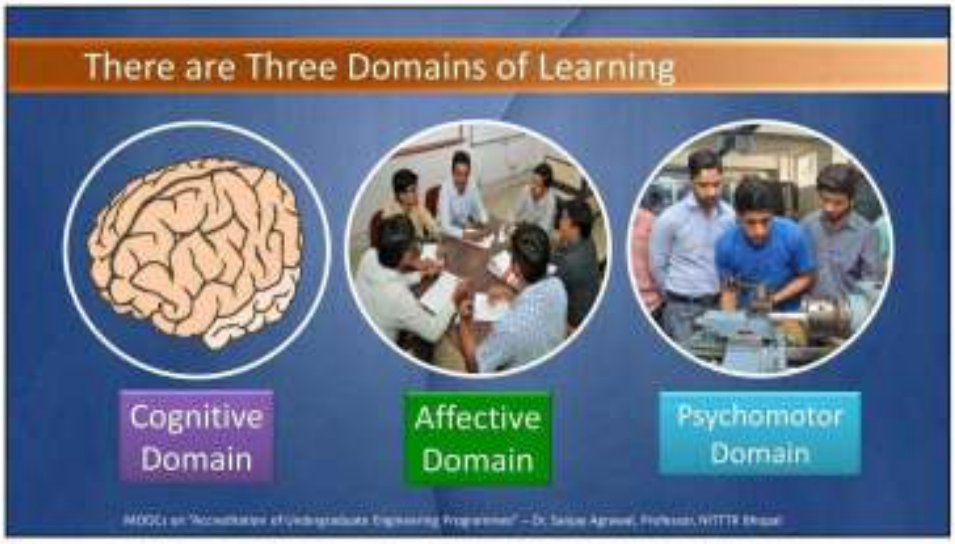


24

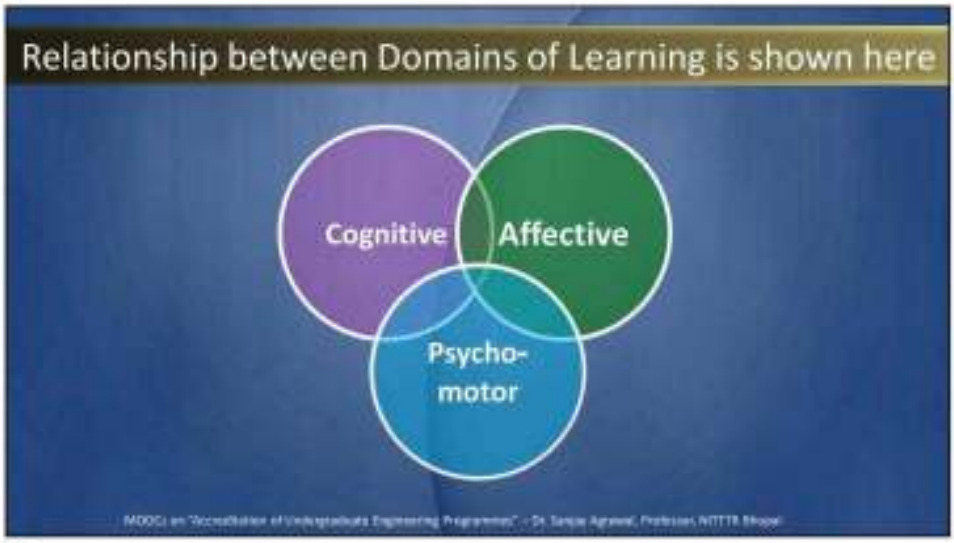
Methods of Assessment and Evaluation - Closing the Loop for Continuous Evaluation

12

NBA Awareness Workshop at J.C. Bose University Faridabad. by Dr. Sanjay Agrawal 13-05-2026



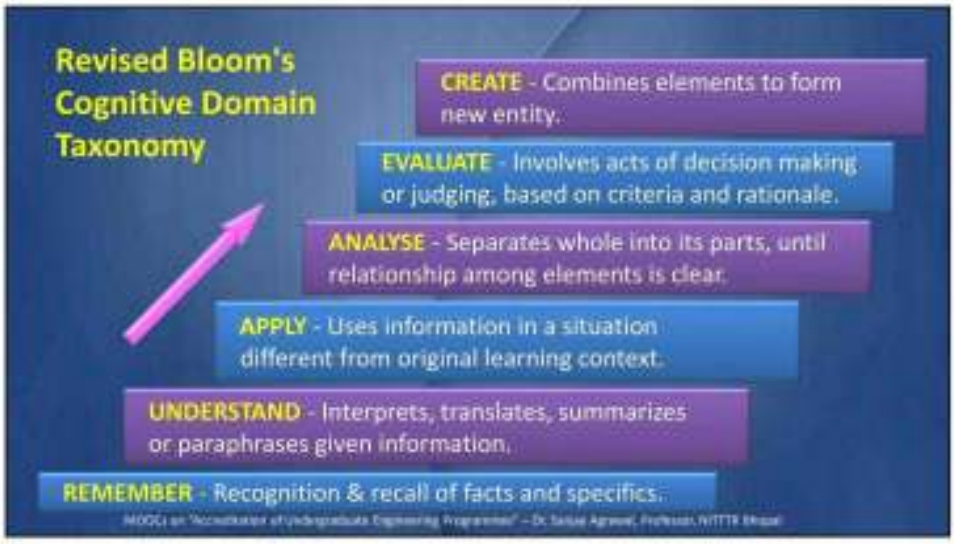
25



26

Methods of Assessment and Evaluation - Closing the Loop for Continuous Evaluation 13

NBA Awareness Workshop at J.C. Bose University Faridabad. by Dr. Sanjay Agrawal 13-05-2026



27



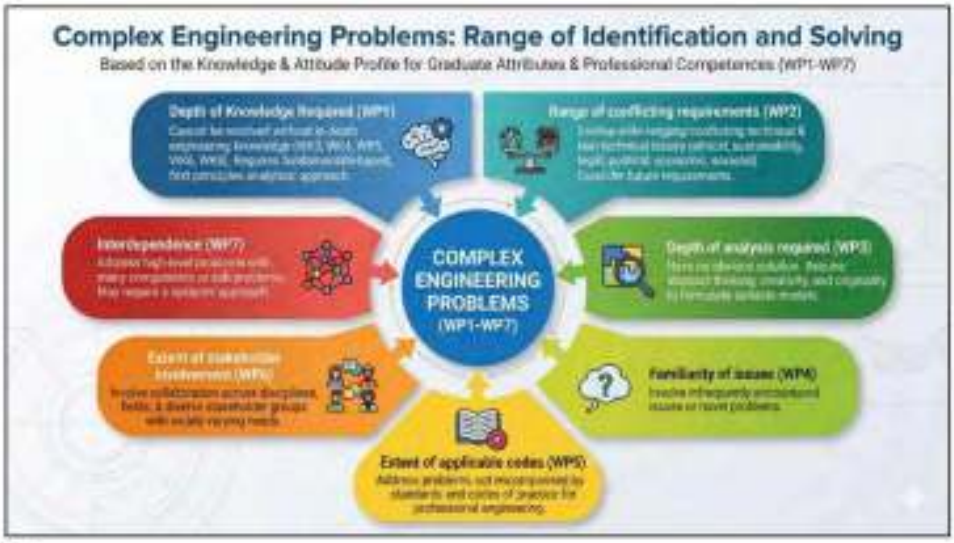
28

Methods of Assessment and Evaluation - Closing the Loop for Continuous Evaluation 14

NBA Awareness Workshop at J.C. Bose University Faridabad. by Dr. Sanjay Agrawal 13-05-2026



29

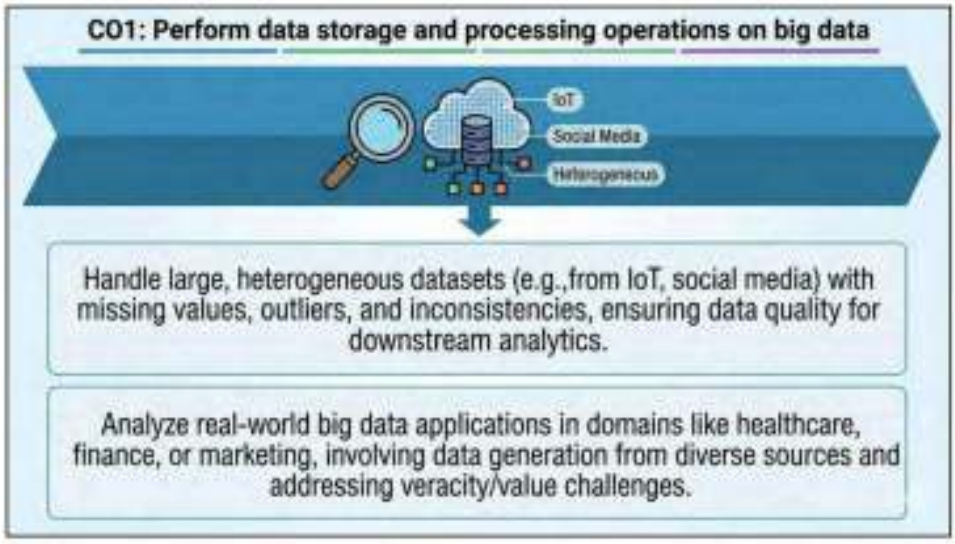


30

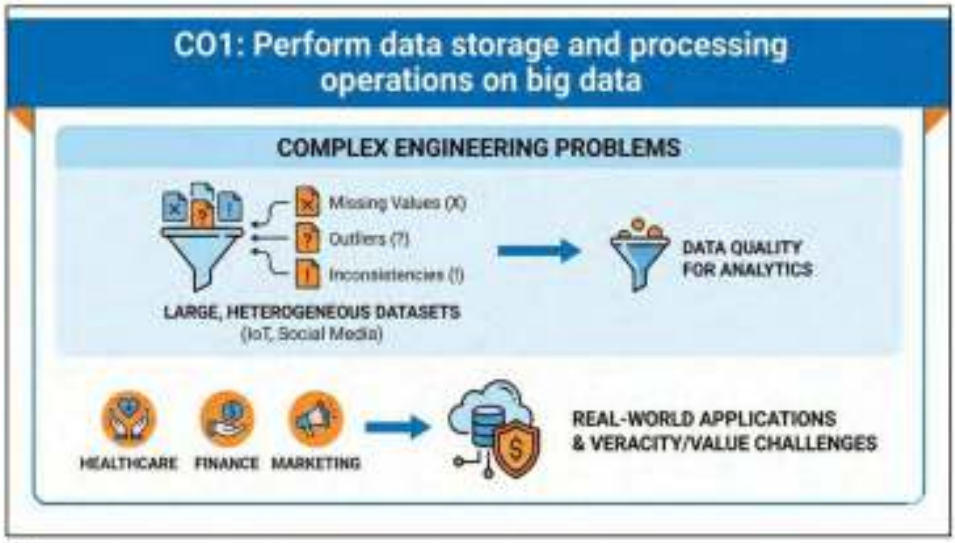
Methods of Assessment and Evaluation - Closing the Loop for Continuous Evaluation 15

NBA Awareness Workshop at J.C. Bose University Faridabad. by Dr. Sanjay Agrawal

13-05-2026



31

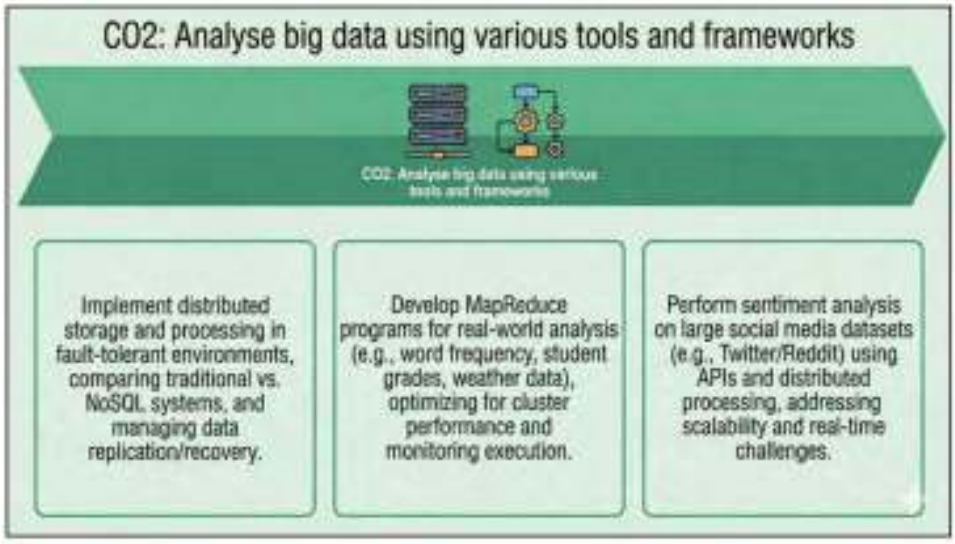


32

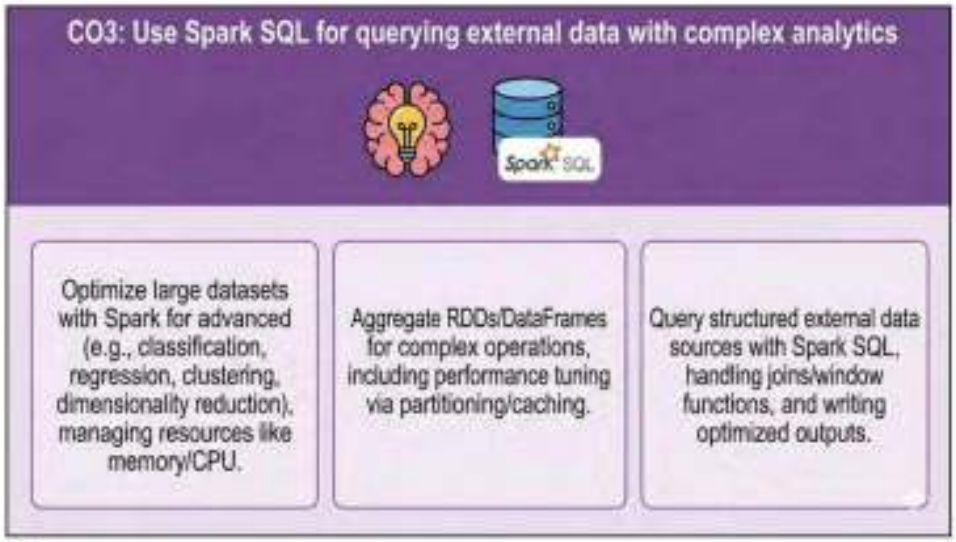
Methods of Assessment and Evaluation - Closing the Loop for Continuous Evaluation

16

NBA Awareness Workshop at J.C. Bose University Faridabad. by Dr. Sanjay Agrawal 13-05-2026



33

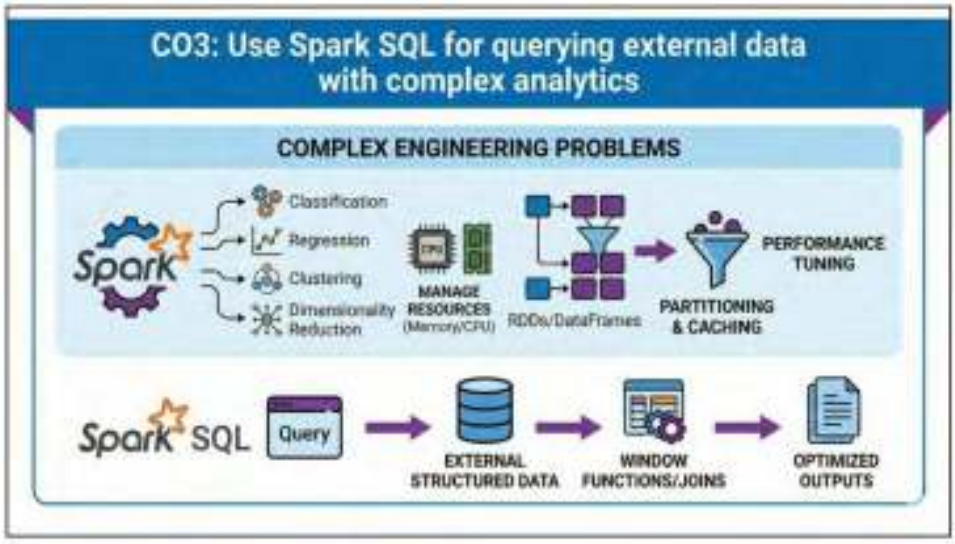


34

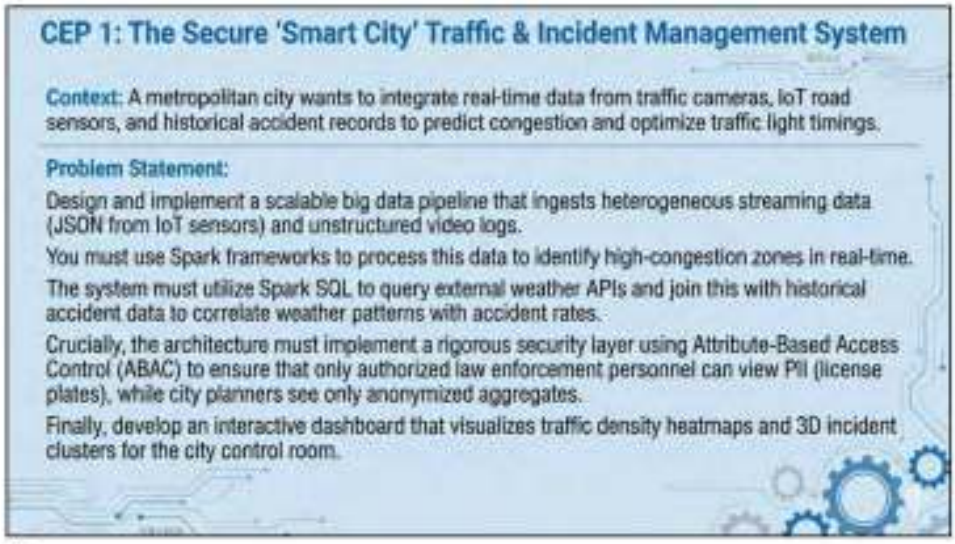
Methods of Assessment and Evaluation - Closing the Loop for Continuous Evaluation 17

NBA Awareness Workshop at J.C. Bose University Faridabad. by Dr. Sanjay Agrawal

13-05-2026



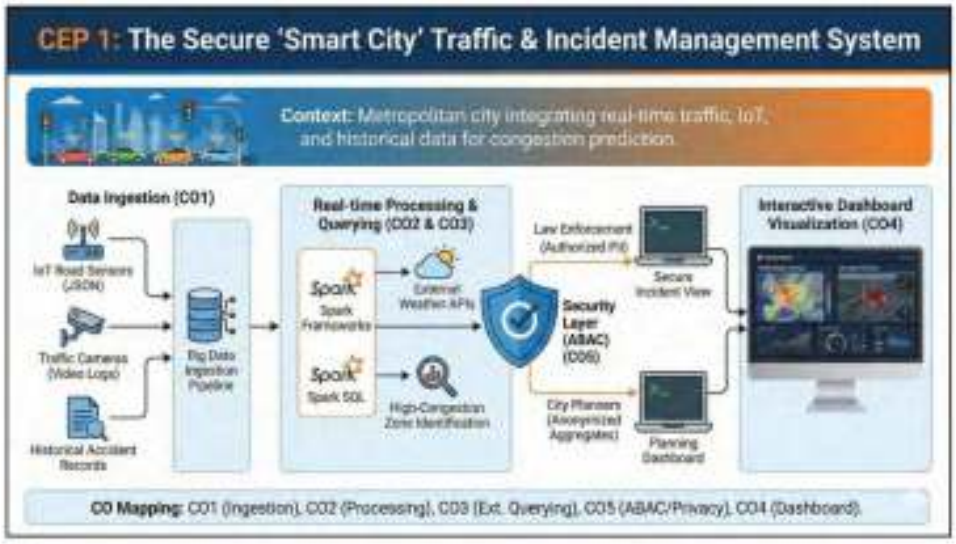
35



36

Methods of Assessment and Evaluation - Closing the Loop for Continuous Evaluation

18



37

CEP 2: Healthcare Analytics Platform for Epidemic Tracking

Context:

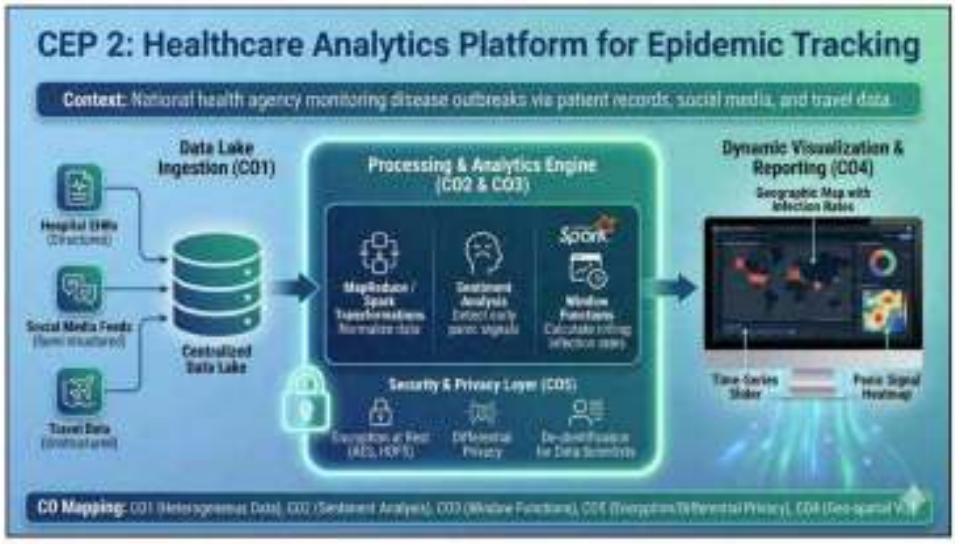
- A national health agency needs a centralized data lake to monitor disease outbreaks.
- This involves analyzing patient records from hospitals, social media sentiment, and travel data.

Problem Statement:

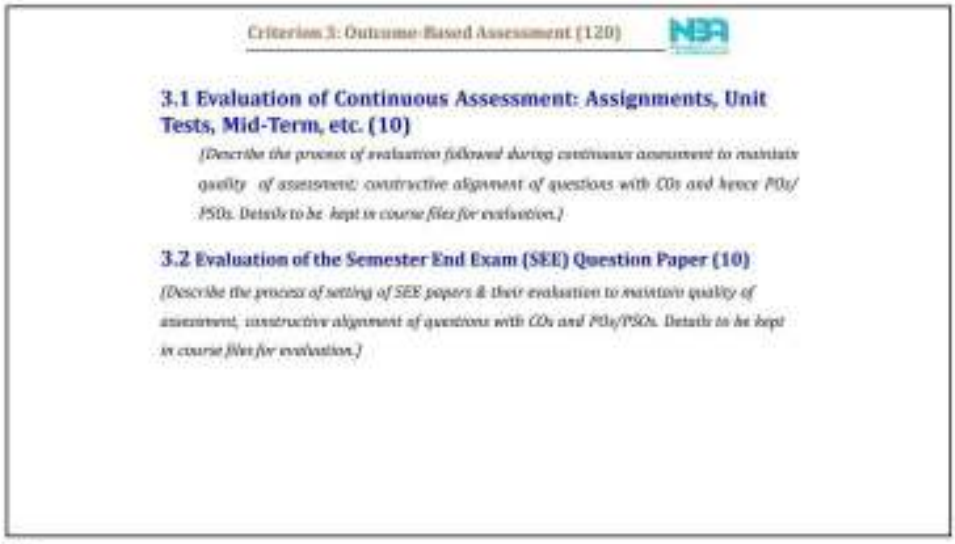
- Architect a big data solution that stores and processes massive volumes of electronic health records (structured) and social media feeds (semi-structured/unstructured).
- Use MapReduce or Spark transformations to normalize this data and perform sentiment analysis on social media posts to detect early panic signals in specific regions.
- Use Spark SQL to execute complex window functions that calculate rolling averages of infection rates over time (CO3).
- Due to the sensitivity of medical data, you must implement encryption at rest (e.g., AES) for the HDFS storage zones and apply differential privacy techniques so that data scientists can run statistical queries without re-identifying specific patients.
- Present the findings using a dynamic visualization tool that overlays infection rates onto geographic maps with time-series sliders.

38

NBA Awareness Workshop at J.C. Bose University Faridabad. by Dr. Sanjay Agrawal 13-05-2026



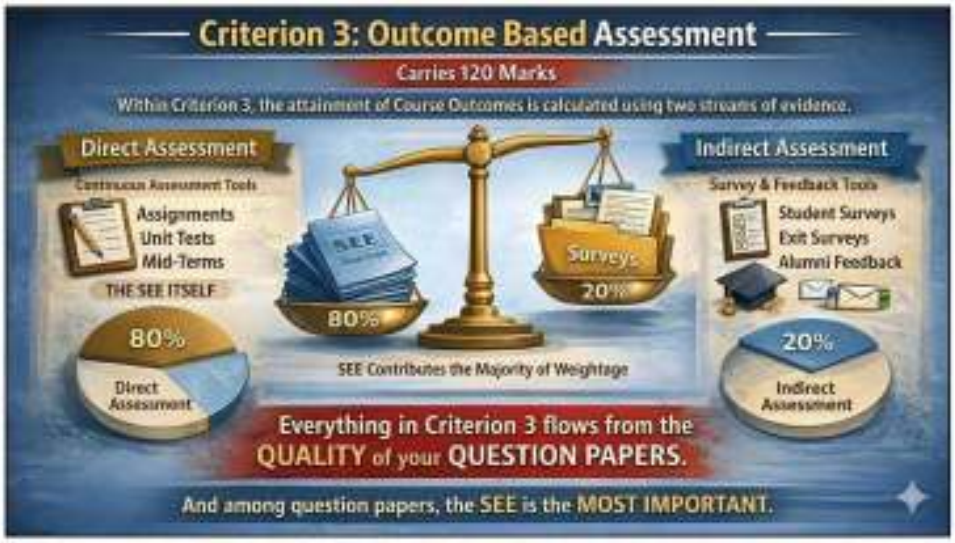
39



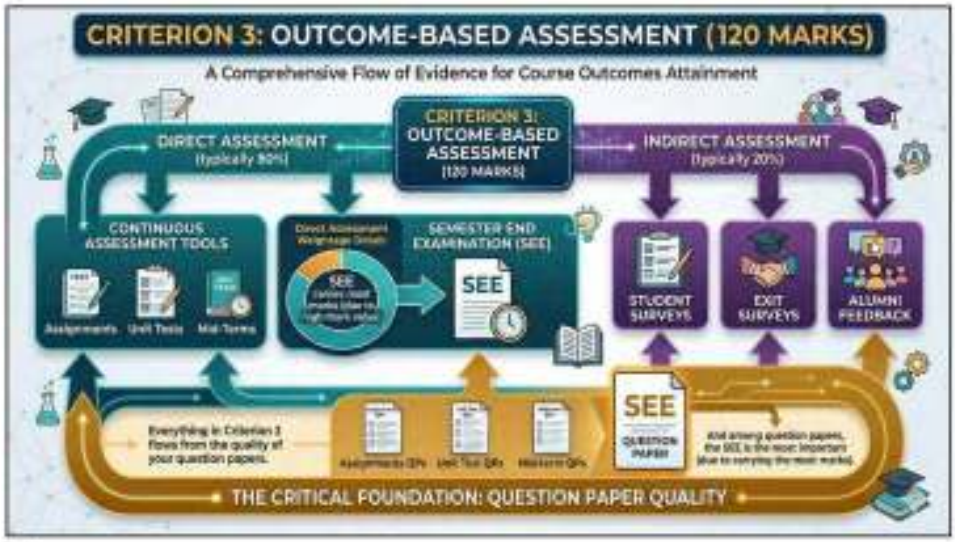
40

Methods of Assessment and Evaluation - Closing the Loop for Continuous Evaluation 20

NBA Awareness Workshop at J.C. Bose University Faridabad. by Dr. Sanjay Agrawal 13-05-2026



41

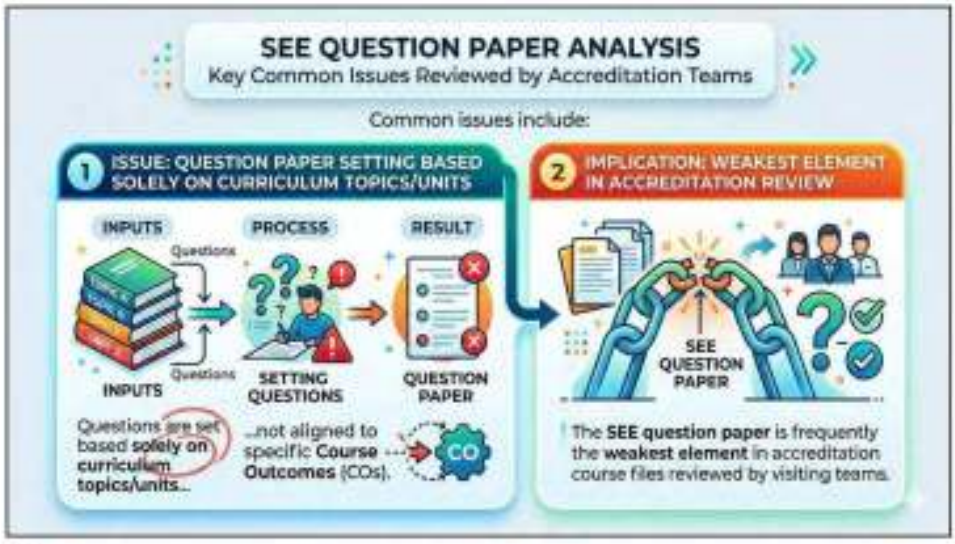


42

Methods of Assessment and Evaluation - Closing the Loop for Continuous Evaluation 21

NBA Awareness Workshop at J.C. Bose University Faridabad. by Dr. Sanjay Agrawal

13-05-2026



43



44

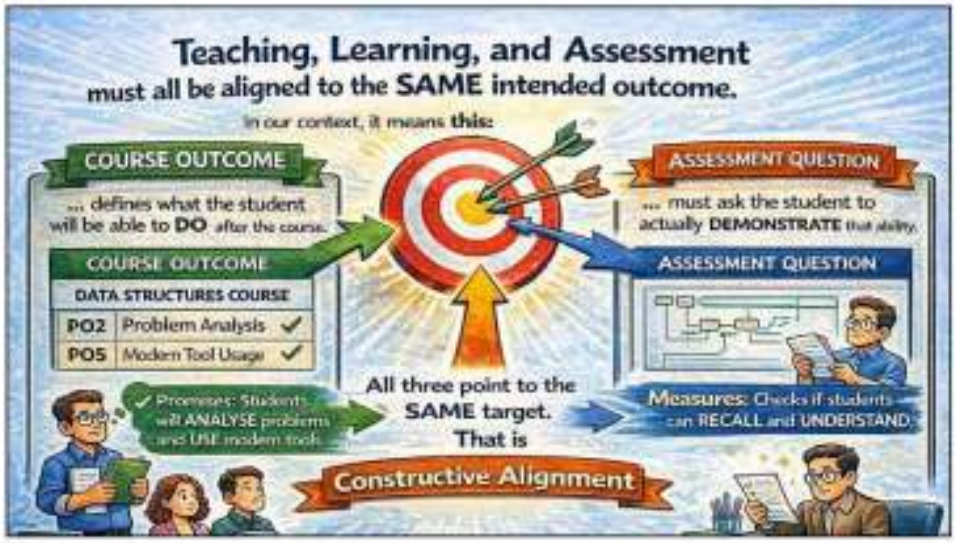
Methods of Assessment and Evaluation - Closing the Loop for Continuous Evaluation

22

NBA Awareness Workshop at J.C. Bose University Faridabad. by Dr. Sanjay Agrawal 13-05-2026



45



46

Methods of Assessment and Evaluation - Closing the Loop for Continuous Evaluation 23

NBA Awareness Workshop at J.C. Bose University Faridabad. by Dr. Sanjay Agrawal

13-05-2026



47

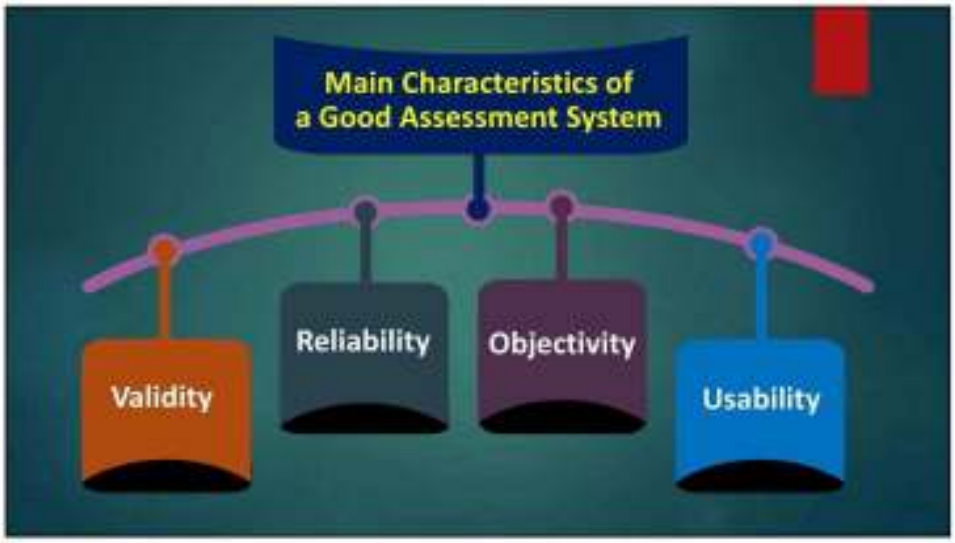


48

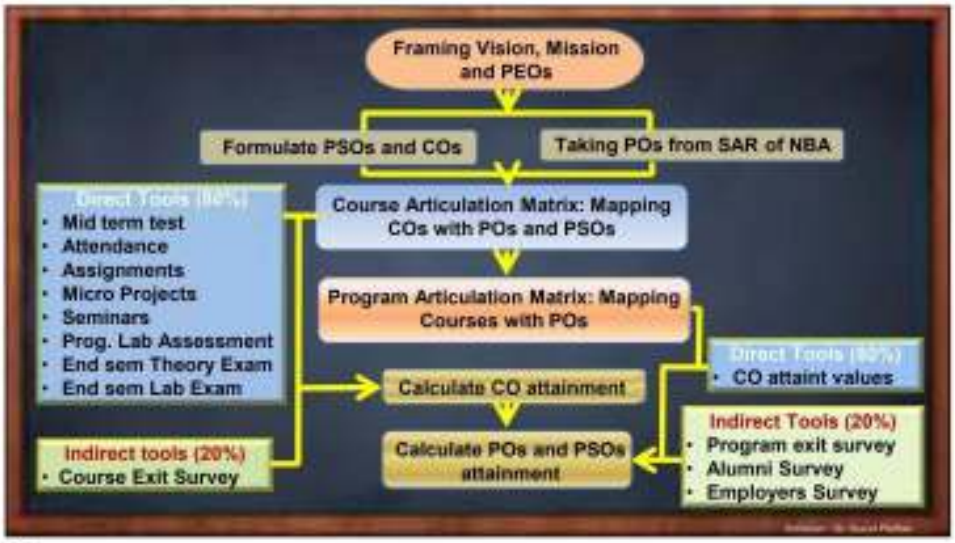
Methods of Assessment and Evaluation - Closing the Loop for Continuous Evaluation

24

NBA Awareness Workshop at J.C. Bose University Faridabad. by Dr. Sanjay Agrawal 13-05-2026



49



50

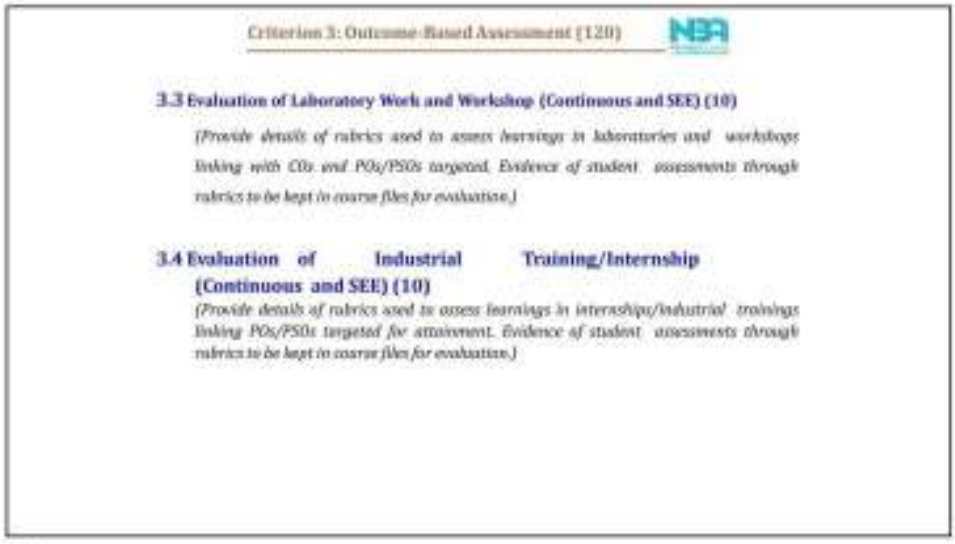
Methods of Assessment and Evaluation - Closing the Loop for Continuous Evaluation 25

NBA Awareness Workshop at J.C. Bose University Faridabad. by Dr. Sanjay Agrawal

13-05-2026



51


Criterion 3: Outcome-Based Assessment (120)

3.3 Evaluation of Laboratory Work and Workshop (Continuous and SEE) (10)

(Provide details of rubrics used to assess learnings in laboratories and workshops linking with COs and POs/PSOs targeted. Evidence of student assessments through rubrics to be kept in course files for evaluation.)

3.4 Evaluation of Industrial Training/Internship (Continuous and SEE) (10)

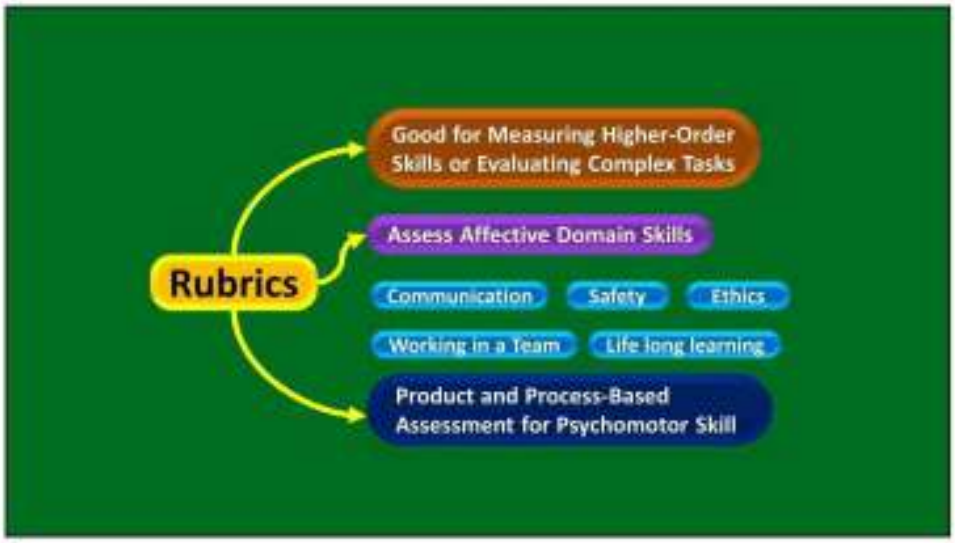
(Provide details of rubrics used to assess learnings in internship/industrial trainings linking POs/PSOs targeted for attainment. Evidence of student assessments through rubrics to be kept in course files for evaluation.)

52

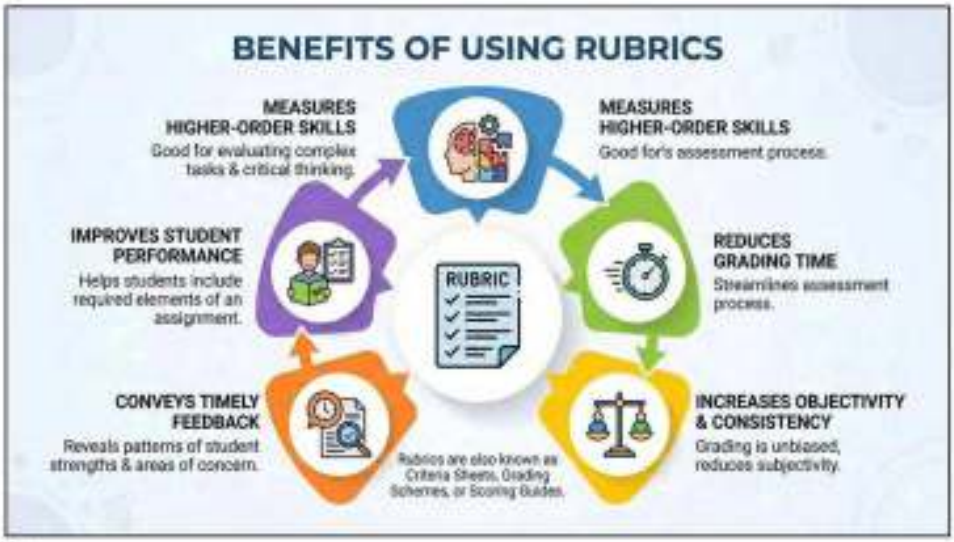
Methods of Assessment and Evaluation - Closing the Loop for Continuous Evaluation

26

NBA Awareness Workshop at J.C. Bose University Faridabad. by Dr. Sanjay Agrawal 13-05-2026



53

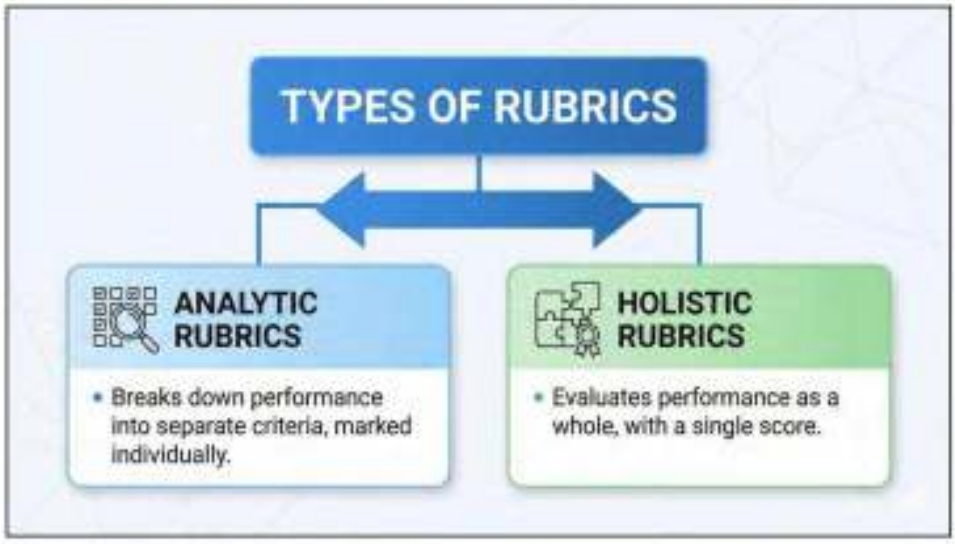


54

Methods of Assessment and Evaluation - Closing the Loop for Continuous Evaluation 27

NBA Awareness Workshop at J.C. Bose University Faridabad. by Dr. Sanjay Agrawal

13-05-2026



55



56

Methods of Assessment and Evaluation - Closing the Loop for Continuous Evaluation

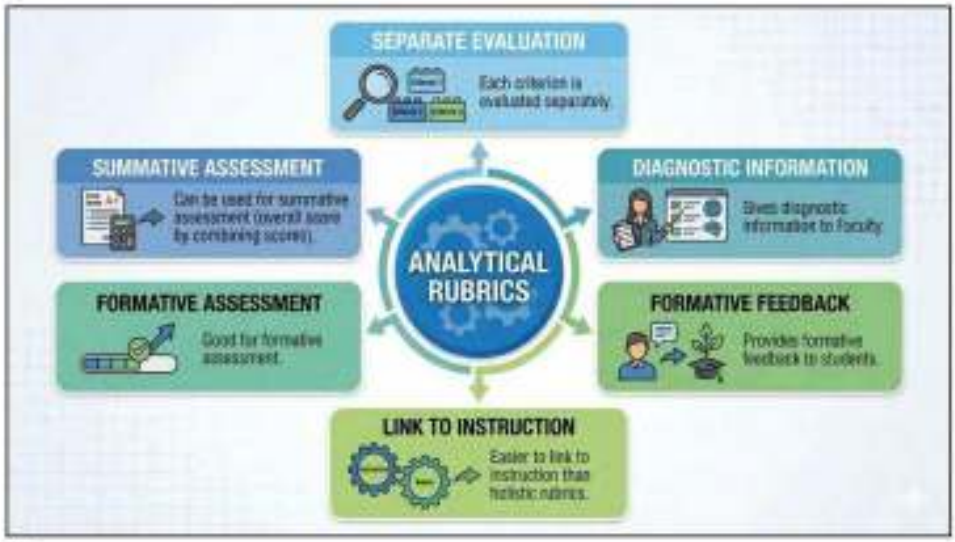
28

NBA Awareness Workshop at J.C. Bose University Faridabad. by Dr. Sanjay Agrawal

13-05-2026



57



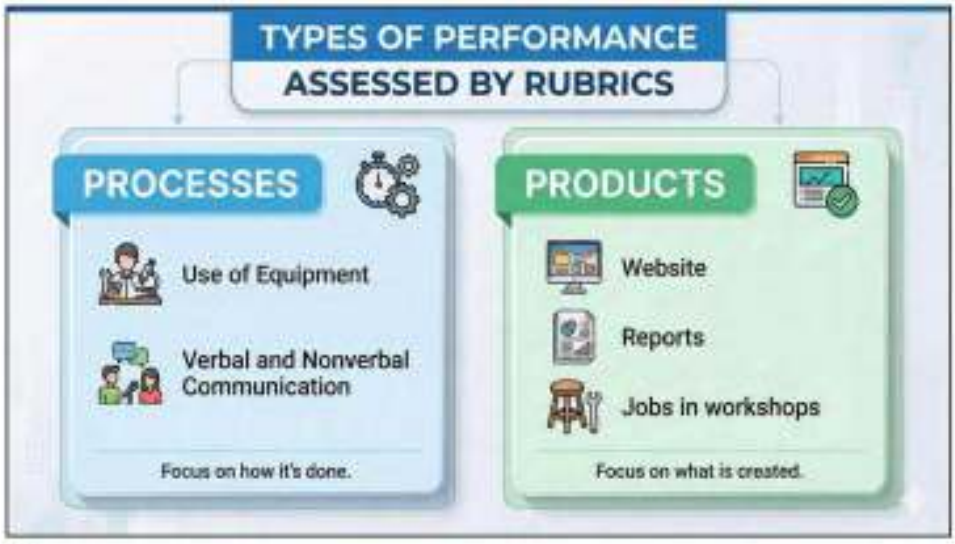
58

Methods of Assessment and Evaluation - Closing the Loop for Continuous Evaluation

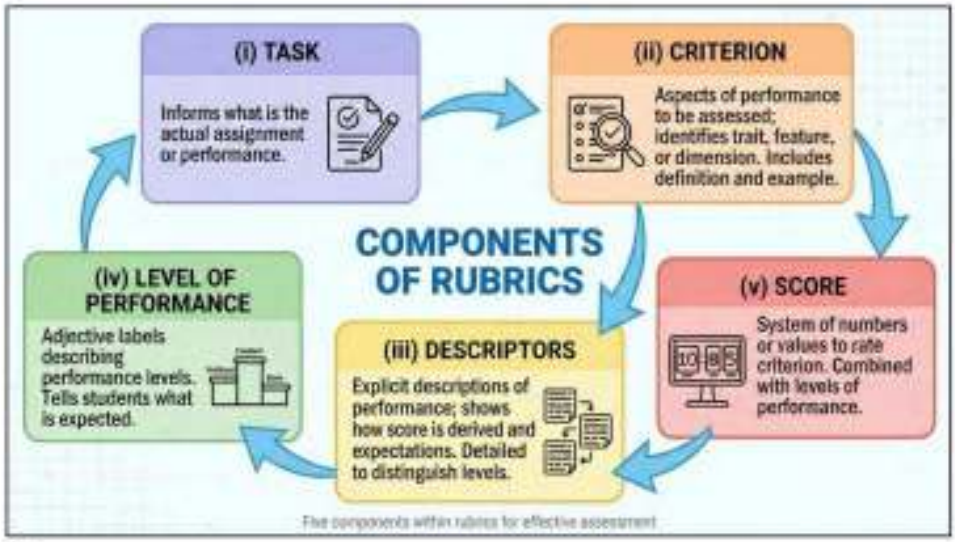
29

NBA Awareness Workshop at J.C. Bose University Faridabad. by Dr. Sanjay Agrawal

13-05-2026



59



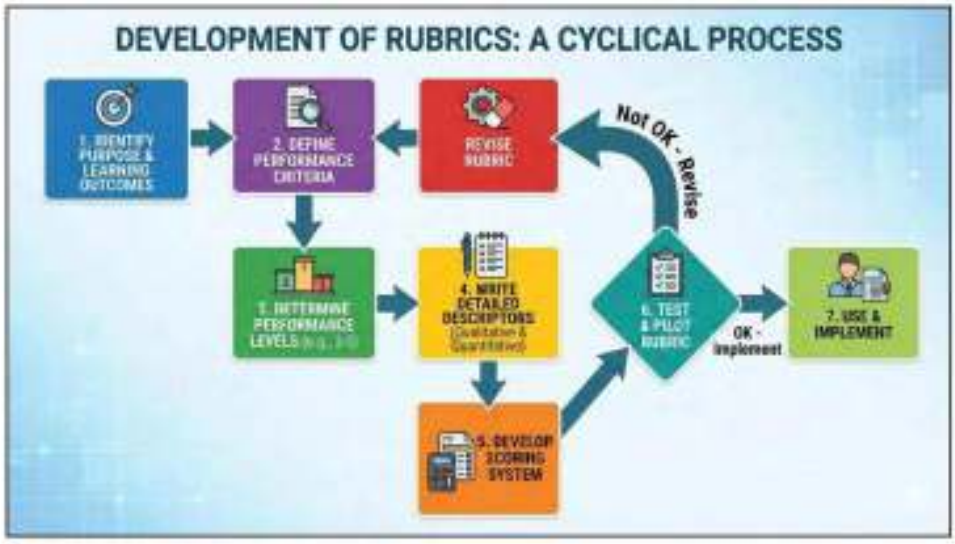
60

Methods of Assessment and Evaluation - Closing the Loop for Continuous Evaluation

30

NBA Awareness Workshop at J.C. Bose University Faridabad. by Dr. Sanjay Agrawal

13-05-2026



61



CARPENTRY WORKSHOP RUBRIC: MAKE A FOUR LEG STOOL

CRITERIA	INADEQUATE (1 mark)	FAIR (2 Marks)	GOOD (3 marks)	SCORE
Measurement	No attention to measurements. The plan followed with little accuracy.	Minor measurement errors. Plans followed but some steps skipped or done incorrectly.	Measurements are accurate. Plans completely followed.	
Assembly	Little care taken in assembly of parts. Some pieces do not fit correctly. Visible evidence of glue.	Minor errors in assembly. Overall assembly is accurate. Minor evidence of glue.	No visible errors in assembly. No visible glue.	
Sanding	Prominent scratches in wood surface. Sanding across grain looks obvious. Not sanded to the proper sand paper.	Some scratches are visible. Some cross grain sanding is visible.	Smooth finish with no visible scratches.	
Finish	Paint/polish is applied in incomplete. Finish does not cover all of the wood or has visible brush marks and bubbles.	Paint/polish is not consistent throughout the job. Finish has minor imperfections.	Paint/polish is even. Finish is smooth with only a slight imperfection noticeable.	
Safety	Student neglects to follow safety precautions properly, and is careless in the work. Does not keep area neat and organized.	With prompting, student follow safety precautions. Student is somewhat careless about work and does not keep area neat.	Student follow safety precautions, works carefully and keeps work area neat and clutter free.	
Craftsmanship	The complete job has many errors. Student did not apply given instructions.	The complete job has few minor errors and close to satisfactory standards. Student applied given instructions with little ignorance.	The job built to standard. Gives a decent look.	
TOTAL SCORE				

62

Methods of Assessment and Evaluation - Closing the Loop for Continuous Evaluation

31

NBA Awareness Workshop at J.C. Bose University Faridabad. by Dr. Sanjay Agrawal

13-05-2026

Mathematics Assignment Rubric

CATEGORY	WEIGHT	VERY GOOD (Level 4)	GOOD (Level 3)	FAIR (Level 2)	POOR (Level 1)	SCORE (Level * Weight)
Mathematical Errors	25%	95-100% of the steps and solutions have no mathematical errors	Almost all (80-85%) of the steps and solutions have no mathematical errors	Most (70-79%) of the steps and solutions have no mathematical errors	More than 70% of the steps and solutions have mathematical errors	
Explanation	25%	Explanation is detailed and clear	Explanation is clear	Explanation is a little difficult to understand, but includes critical components	Explanation is difficult to understand and is missing several components OR was not included	
Neatness and Organization	20%	The work is presented in a neat, clear, organized fashion that is easy to read	The work is presented in a neat and organized fashion that is usually easy to read	The work is presented in sloppy and may be hard to read at times	The work appears Sloppy and disorganized. It is hard to know what information goes together	
Diagrams and Sketches	15%	Diagrams and/or sketches are clear and greatly add to the readers understanding of the procedure(s)	Diagrams and/or sketches are clear and easy to understand	Diagrams and sketches are somewhat difficult to understand	Diagrams and/or sketches are difficult to understand or are not used	
Completion	15%	All problems are completed	All but one of the problems are completed	All but two of the problems are completed	Several of the Problems are not completed	
TOTAL SCORE						Sum of Above /100

63

RUBRIC FOR SEMINAR PRESENTATION SKILLS (DELIVERY)

CRITERIA	INADEQUATE (1 Mark)	AVERAGE (2 Marks)	ADMIRABLE (3 Marks)	OUTSTANDING (4 Marks)	SCORE
Slide presentation	Presentation has more than 8 misspellings and/or grammatical errors	Presentation has no more than 4 misspellings and/or grammatical errors	Presentation has no more than 3 misspellings and/or grammatical errors	Presentation has no misspellings or grammatical errors	
Approach to presentation	Reads most slides	Refers to slides to make Point	Refers to slides to make points	Refers to slides to make points	
Eye Contact	Not able to hold the attention of audience and not able to maintain eye contact. On occasion eye Contact	Able to hold the attention of only a few audiences, only for 30-40% of time with less eye to eye contact	Able to hold the attention of some audience, with direct eye to eye contact for 60-70% of time.	Holds attention of entire audience with direct eye to eye contact with proficient content delivery for entire duration	
Ability to speak Communication Skill	Not able to communicate the content properly.	Satisfactory oral communication skills with errors in pronunciation, grammar and sentence formation	Fairly good oral communication skills with better pronunciation with a few grammatical mistakes and sentence formation	Effective oral communication skills with good pronunciation, with no grammatical mistakes, correct sentence formation	
Voice and its Modulation	Voice is low; difficult to hear. No modulation	Satisfactory Voice audibility with poor voice modulation	Fairly Good voice audibility with less voice modulation	Excellent voice audibility and modulation as per need	
Pace during Presentation	Rushed OR dragging throughout	Rushed OR dragging in parts	Most of the seminar well paced	Well paced throughout	
Non-Verbal communication	Poor demonstration of mannerism and body language with the audience	Satisfactory mannerism and body language with the audience	Reasonably good mannerism and body language with the audience	Pleasing, mannerism and body language with the audience	
Total Score					

64

Methods of Assessment and Evaluation - Closing the Loop for Continuous Evaluation

32

Lab work Rubric (Process)

Criteria	<50%	Level 1: 50 - 59% (Marks - 1)	Level 2: 60 - 69% (Marks - 2)	Level 3: 70 - 79% (Marks - 3)	Level 4: 80 - 100% (Marks - 4)	Score
Procedural Knowledge	Selects inappropriate skills and/or strategies required by the task and makes critical errors in applying them	Selects and applies appropriate skills and/or strategies required by the task, but makes a number of non-critical errors in doing so		Selects and applies the appropriate strategies and/or skills specific to the task without significant errors	Selects and applies appropriate strategies and/or skills specific to the task without error, and applies some in innovative ways also	
Use of Equipment	Uses tools, equipment and materials with limited competence	Uses tools, equipment and materials with some competence		Uses tools, equipment and materials with considerable competence	Uses tools, equipment and materials with a high degree of competence	
Safety	Requires constant reminders to follow safety procedures	Requires some reminders to follow safety procedures		Follows safety procedures with only minimal reminders	Routinely follows safety procedures	
Work Area	Requires constant reminders to clean work area	Requires some reminders to clean work area		Cleans work area with only minimal reminders	Routinely keeps work area clean without reminders	
Interpersonal Skills in Group Work	Rarely to interacts positively within a group, even with prompting, and shows frequent lack of sensitivity to others' feelings and abilities in opinions expressed	Interacts with other group members if prompted, but sometimes expresses opinions which are insensitive to the abilities and feelings of others		Interacts with all group members spontaneously and contributes in a way that is sensitive to the abilities and feelings of others	Interacts positively with all group members, encourages such interaction in others, and is always sensitive to the abilities and feelings of others' contributions	
Participation to Achieve Group Goals	Shows little commitment to group goals and fails to perform assigned roles	Demonstrates commitment to group goals, but has difficulty performing assigned roles		Demonstrates commitment to group goals and carries out assigned roles effectively	Actively helps to identify group goals and works effectively to meet them in all roles assumed	

65

RUBRICS FOR STUDENT SEMINAR PRESENTATION ASSESSMENT

Task: Content Evaluation at the time of Seminar presentation by the student

CRITERIA	INADEQUATE (1 Mark)	AVERAGE (2 Marks)	ADMIRABLE (3 Marks)	OUTSTANDING (4 Marks)	SCORE
Organization of presentation	Hard to follow; sequence of information jumps	Most of information presented in sequence	Information presented in logical sequence; easy to follow	Information presented in interesting story in logical, easy to follow sequence	
Background content	Content not clearly related to topic; OR background dominated seminar	Content sufficient for clear understanding but not clearly presented	Content sufficient for clear understanding AND effectively presented	Content sufficient for clear understanding AND exceptionally presented	
Methods	Methods not listed or insufficient for adequate understanding OR too detailed	Sufficient for understanding but not clearly presented	Sufficient for understanding AND effectively presented	Sufficient for understanding AND exceptionally presented	
Figures	Some figures hard to read	Majority of figures clear	Most figures clear	All figures clear	
Tables	Some in inappropriate format	Majority appropriately formatted	Most appropriately formatted	All appropriately formatted	
Graphs	Some explanatory lacking	Reasonably explained	Well explained	Exceptionally explained	
Contribution of work	Significance not mentioned or just formed	Significance mentioned	Significance explained	Significance exceptionally well explained	
Knowledge of subject	Does not have grasp of information; answered only rudimentary questions	At ease with information; answered most questions	At ease; answered all questions but failed to elaborate	Demonstrated full knowledge; answered all questions with elaboration	
Total Score					

66

Methods of Assessment and Evaluation - Closing the Loop for Continuous Evaluation

33

NBA Awareness Workshop at J.C. Bose University Faridabad. by Dr. Sanjay Agrawal

13-05-2026

EFFECTIVE TEAMWORK RUBRIC: COLLABORATING WITH INTEGRITY

CRITERIA	UNSATISFACTORY (1 Mark)	DEVELOPING (2 Marks)	SATISFACTORY (3 Marks)	EXEMPLARY (4 Marks)	SCORE
Research & gather information	Does not collect any information relating to the topic	Collects very limited information; some relate to the topic	Collects some basic information; most refer to the topic	Collects a great deal of information; all refer to the topic	
Achieves team's roles & duties	Does not perform any duties assigned to the team role	Performs very little duties	Performs nearly all duties	Performs all duties of assigned team roles	
Shares work equally with members	Always relies on others to do the work	Rarely does the assigned work; often needs reminding	Usually does the assigned work; rarely needs reminding	Always does the assigned work without having to be reminded	
Listen to other Team members	Is always talking; never allows anyone else to speak	Usually does most of the talking; rarely allows others to speak	Listens, but sometimes talk too much	Listens and speaks a fair amount	
Team morale and cohesiveness	Did not collaborate well. Work independently without regard to objectives or priorities. No of respect and regards	Did collaborate some times. Work independently, without regard to objectives or priorities. Lack of respect and regard was frequently noted	Worked well with other members most of the time, with only a few occurrences of communication breakdown or failure to collaborate when appropriate. Mostly respectful of each other	Worked well with other members to achieve objectives. As a team member enjoyed interacting with other and learned from other exhibit high level of mutual respect and collaboration	
				TOTAL SCORE	

67

Criterion 3: Outcome-Based Assessment (120)

3.5 Evaluation of Projects (20)

(Provide details of rubrics used to assess learnings in projects linking POs/PSOs targeted for attainment. Evidence of student assessments through rubrics to be kept in course files for evaluation.)

3.6 Evidence of Addressing Sustainable Development Goals (SDG) (10)

(Provide details of student work carried out to meet sustainable development goals such as research work, project work, student activities etc. Evidence in the form of a portfolio to be made available during the visit.)

68

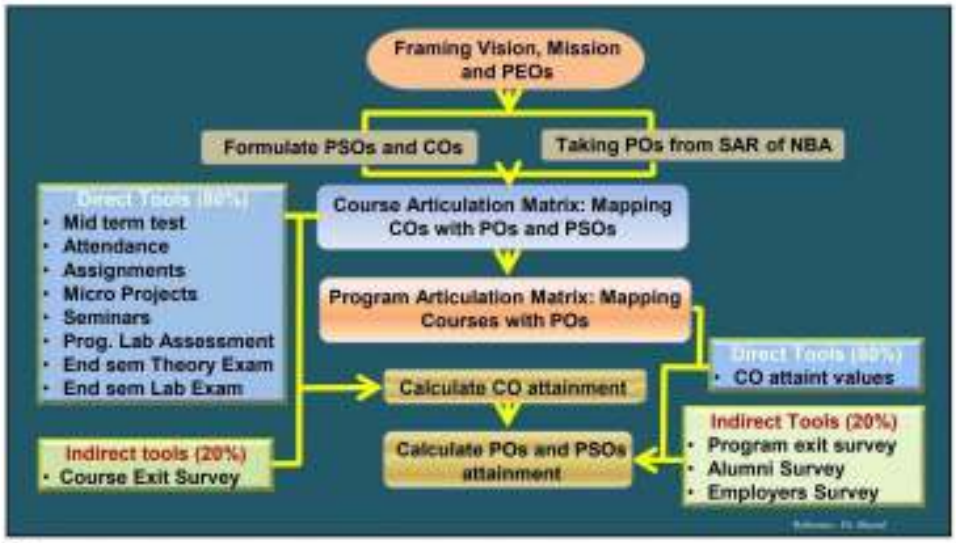
Methods of Assessment and Evaluation - Closing the Loop for Continuous Evaluation

34

NBA Awareness Workshop at J.C. Bose University Faridabad. by Dr. Sanjay Agrawal 13-05-2026



69



70

Methods of Assessment and Evaluation - Closing the Loop for Continuous Evaluation 35

NBA Awareness Workshop on OBE & Accreditation for Engineering Colleges in Haryana.

Venue: Vivekananda Auditorium, J.C. Bose University of Science & Technology, YMCA, Faridabad
13th May, 2026

Prof. R.V. Ranganath,
Provost (Engineering and Allied Sciences)
M.S. Ramaiah University of Applied Sciences, Bangalore

Self Assessment Report (SAR) - 2024

Undergraduate Engineering Programs
(GAPC V 4.0)
(TIER-I/II – Institutions)

SAR Context

- Provides preparedness status at I/P level for the NBA visit,
- Provides the first impression about the I/P to the evaluation team,
- Presents crisp program status to the evaluation team and addresses process and the extent to which, a program meets each criterion,
- Provides documented evidences, which the evaluation team maps/matches with the visual /oral evidences during the visit.

PART A: Institutional Information

1. **Name and Address of the Institution:**
2. **Type of the Institution: (Tick the applicable choice)**

Institute of National Importance ☐
Deemed to be University ☐
University ☐
Autonomous ☐
Non-Autonomous (Affiliated) ☐
Any Other (Please specify*) ☐

*Provide Details: _____

Note:
- In case of Autonomous Institute/Deemed University, mention the year of grant of status by the authority. In case of autonomous institution, mention also the duration of status.
- In case of University Constituent Institution, please indicate the academic autonomy status of the institution as defined in 12th Plan guidelines of UGC. Institute should apply for Tier 1 only when fully academically autonomous.

3. **Year of Establishment of the Institution:**
4. **Ownership Status: (Tick the applicable choice)**

Central Government ☐
State Government ☐
Grant-in-Aid ☐
Self-financing Trust ☐
Any Other (Please specify*) ☐

*Provide Details: _____

5. **Name and Address of the Affiliating University (if any):**
6. **Other Academic Institutions Run by Trust/Society/etc., if any:**

Table No. A6: List of all institutions running under the same trust/society.

S. N.	Name of the Institution(s)	Year of Establishment	Programs of Study	Location
1	..	..	..	..
...				

8. **Programs to be Considered for Accreditation vide this Application:**

Table No. A8.1: List of programs to be considered for accreditation.

S. N.	Name of the Department	Name of the Program
1.		
...		

Note:
- Keep a list of programs applying for NBA accreditation through this application.

Table No. A8.2: Allied Department(s) to the Department of the programs considered for accreditation as above.

S. N.	Name of the Department (in table no. A8.1)	Name of allied Departments/Cluster (for table no. A8.1)
1.		
...		

Note:
- Keep a list of all allied departments/cluster programs with respect to Table No. A8.1.
- See the Allied Departments/Cluster programs information in Annexure-III.

Example for **Table No. A8.1**: List of programs to be considered for accreditation.

Table No. A8.1: List of programs to be considered for accreditation.

S. N.	Name of the Department	Name of the Program
1.	Computer Science and Engineering	BE (Computer Science and Engineering)
2	Electronics and Communication Engineering	BE (Electronics and Communication Engineering)
3	Mechanical Engineering	BE (Mechanical Engineering)
4	Electrical Engineering	BE (Electrical Engineering)
5	Chemical Engineering	BE (Chemical Engineering)

Example for **Table No. A8.2**: Allied Department(s) to the Department of the programs considered for accreditation as above.

Table No. A8.2: Allied Department(s) to the Department of the programs considered for accreditation as above.

S. N.	Name of the Department (in table no. A8.1)	Name of allied Departments/Cluster (for table no. A8.1)
1.	Computer Science and Engineering	Information Technology
2	Computer Science and Engineering	Computer Science and Engineering & Business Systems
3	Computer Science and Engineering	Artificial Intelligence and Machine learning
4	Electronics and Communication Engineering	Electronics & Telecommunication Engineering
5	Electronics and Communication Engineering	Communication Engineering
6	Mechanical Engineering	Industrial and Production Engineering
7	Electrical Engineering	Electrical Engineering Industrial Control

10. Total Number of Engineering Students in Various Departments:

Table No. A.10: No. of engineering students in various departments.

S. N.	Name of the Department	Number of students in the Department (UG and PG)		
		CAY	CAYm1	CAYm2
1				

Note:

In case the institution is running programs other than engineering programs (UG and PG), a separate table giving similar details is to be included.

11. Vision of the Institution:

12. Mission of the Institution:

13. Contact Information of the Head of the Institution and NBA Coordinator:

A. Head of the Institution

- Name:
- Designation:
- Mobile Number:
- Email id:

B. NBA Coordinator:

- Name:
- Designation:
- Mobile Number:
- Email id:

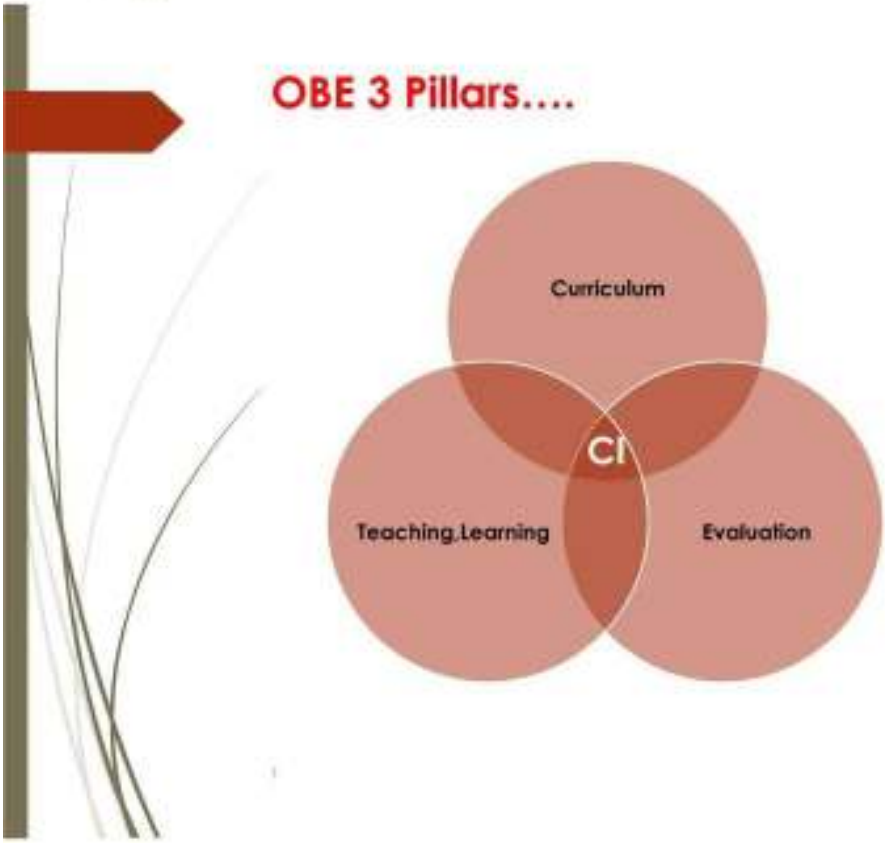
Comparison of Marks/Weightage between Tier-I & Tier-II

Program Level Criteria			
Criterion's		**Tier-I**	**Tier-II**
Criterion 1	Outcome-Based Curriculum	120	120
Criterion 2	Outcome-Based Teaching Learning	120	120
Criterion 3	Outcome-Based Assessment	120	120
Criterion 4	Students' Performance	120	120
Criterion 5	Faculty Information	100	100
Criterion 6	Faculty Contributions	120	120
Criterion 7	Facilities and Technical Support	100	100
Criterion 8	Continuous Improvement	80	80
Institution Level Criteria			
Criterion 9	Student Support and Governance	120	120
		1000	1000

Comparison of Marks/Weightage between Tier-I & Tier-II

Criterion's		Tier-I	Tier-II	
Criterion 1	**Outcome-Based Curriculum**	**120**	**120**	**Outcome-Based Curriculum**
1.1	**Vision, Mission and Program Educational Objectives (PEOs)**	**35**	**40**	**Vision, Mission and Program Educational Objectives (PEOs)**
1.1.1.	State the Vision and Mission of the Institute and the Department	05	05	State the Vision and Mission of the Institute and the Department
1.1.2.	State PEOs of the Program	05	05	State PEOs of the Program
1.1.3.	Process of Defining Vision, Mission and PEOs	10	15	Process of Defining Vision, Mission and PEOs
1.1.4.	Dissemination of Vision, Mission and PEOs	05	05	Dissemination of Vision, Mission and PEOs
1.1.5.	Mapping of PEOs with Mission	10	10	Mapping of PEOs with Mission


Continuous Quality Improvement
SAY
What you want to
DO
What you Say
Prove it
What you Do
Improve it
What you Proved
Continuous Quality Improvement


OBE 3 Pillars....
Curriculum
Teaching.Learning
Evaluation

PART B: *Program Level Criteria*

Criterion 1: Outcome-based Curriculum (120)

1.1. Vision, Mission and Program Educational Objectives (PEOs) (35) *(Provide details of vision and mission and program education objectives.)*

1.1.1. State the Vision and Mission of the Institute and the Department (05)

(Vision statement typically indicates aspirations and Mission statement states the broad approach to achieve aspirations.)

1.1.2. State PEOs of the Program (05)

(State the PEOs (3 to 5) of program seeking accreditation.)

Vision and Mission Statements

(as per NBA document)

Vision is a futuristic statement that the institution would like to achieve over a long period of time, and Mission is the means by which it proposes to move toward the stated Vision

Example..

Action verb ??

Vision:

To emerge as one of the nation's finest Institutions in the field of Technical Education and Research through focused, effective and sustained monitoring of its programmes and resources.

Mission:

To develop high quality professionals ingrained in ethics, wisdom and creativity for the betterment of the society.

Corrected Vision and Mission Statements

Vision:.

To emerge as one of the nation's finest Institutions of higher learning in the field of Technical Education to develop professionals who are technically competent, ethical, environment friendly for betterment of society.

Mission:

Accomplish stimulating learning environment for students through quality teaching, research and outreach activity by providing state of the art facilities, industry exposure and guidance of dedicated faculty

Department Vision and Mission Statements
(Sample)

Vision:

To be an excellent centre for imparting quality higher education in Civil Engineering for a constantly changing societal needs with credibility, integrity and ethical standards.

Mission:

Accomplish excellence in curricular, co-curricular activities with a committed faculty through teaching and research which creates technically competent and dedicated civil engineers to serve their surroundings with pride.

Program Educational Objective-PEO

- The educational objectives of an engineering degree program are the statements that describe the expected achievements of graduates in their career, and also in particular, **what the graduates are expected to perform and achieve during the first few years after graduation.**
- The PEOs, may be guided by global and local needs, vision of the Institution, long term goals etc.
- For defining the PEOs the faculty members of the program must continuously work with all Stakeholders: Local Employers, Industry, Students and the Alumni

PEOs (Samples)

PEO1:

Graduate will compete on a global platform to pursue their professional career in Electrical Engineering and allied disciplines.

PEO2:

Graduates will pursue higher education and/or engage in continuous up gradation of their professional skills.

PEO3:

Graduate will communicate effectively and will demonstrate professional behaviour while working in diverse team.

PEO4:

Graduates will demonstrate concern for society and environment.

Criterion 1: Outcome-based Curriculum (120)

1.1.3. Process of Defining Vision, Mission and PEOs (10)

(Articulate the process involved in defining the Vision and Mission of the department and PEOs of the program.)

1.1.4. Dissemination of Vision, Mission and PEOs (05)

(Describe where (websites, curricula, posters etc.) the Vision, Mission and PEOs are published and detail the process which ensures awareness among internal and external stakeholders with effective process implementation.



Criterion 1: Outcome-based Curriculum (120)

1.1.5. Mapping of PEOs with Mission (10)

(Generate a Mission of the Department–PEOs matrix with justification and rationale of the mapping.)

Table No.1.1.5.1: Mapping of PEOs with mission

PEO Statements	M_1	M_2	....	M_n
PEO1:				
PEO2:				
PEON:				

Note:

- $M_1, M_2 \ldots M_n$ are distinct elements of mission statement. Enter correlation levels as Low (1), Medium (2) and High (3). If there is no correlation, put "-"

Mission of the Department:

- M1: Make competent Civil Engineers with high level of professional, moral and ethical values
- M2:Impart highest standards in theoretical as well as practical knowledge and skill set
- M3:Establish Center of Excellence in major areas of Civil Engineering to respond to the current and future needs of the industry

- PEO1: Graduates will have successful career in the field of Civil Engineering
- PEO2: Graduates will respond to growing demands of society through professional and ethical practices
- PEO3: Graduates will pursue lifelong learning including higher studies in the field of Civil Engineering

What is Expected here ?

Establish consistency of PEOs with Mission of the Department (15)

Generate a "Mission of the Department – PEOs matrix" with justification and rationale of the mapping

PEO Statements	M1	M2	.....	Mn
PEO 1	3/2/1 ?	3/2/1 ?		
PEO 2				
PEO 3	3/2/1 ?			

Criterion 1: Outcome-based Curriculum (120)

1.2. Curriculum Structure and Features (30)

1.2.1. State the Process for Developing/Revising the Program Curriculum (10)

Describe the process that periodically documents and demonstrates how the program curriculum has evolved, considering the Washington Accord Knowledge and Attitude Profile (WKs) and the Program Outcomes (POs) defined by the NBA, as listed in Annexure-II.

(Describe the process involving both internal and external stakeholders in framing the curriculum.)

Criterion 1: Outcome-based Curriculum (120)

1.2.2. Curriculum Structure (10)

(Provide details of courses in terms of teaching and learning scheme and number of credits in the Program curriculum.)

Table No.1.2.2.1: Details of various courses presented in terms of teaching and learning scheme.

Course Code	Course Title	Teaching & Learning Scheme					
		Class room Instruction (CI) (in hours per semester		Lab Instruction (LI) (in hours per semester	Team Work (TW) Self Learning (SL) (TW+SL)(in hours per semester)	Total no. of Hours per semester	Total Credits (C)* (Total Hours/30)
		L(2)	T(1)	P(1)	SL		
101	C++	30	15	30	120-75= 45	120	120/30=4
102	Chemistry Lab			30	30	60	60/30=2
...							

This is as per the new National Credit Framework, which accounts for 30 hrs. of learning as equivalent to 1 credit. Those universities which are still following the LTP will transform them into no. of hours and fill in the above table.

Criterion 1: Outcome-based Curriculum (120)

1.2.3. Components of Curriculum (05)

(Provide details of Curriculum components for all relevant Years.)

Table No.1.3.3.1: Program curriculum grouping based on curriculum components.

Curriculum Component	Curriculum Content (% of total number of credits of the program)	Total number of contact hours	Total number of credits
Basic Sciences			
Basic Engineering			
Humanities and Social Sciences			
Program Core			
Program Electives			
Open Electives			
Project(s)			
Internships/Seminars			
Any other (Please specify)			
		Total number of Credits:	

Add more rows, if required

Tier 2

1.2.3. State the Process Used to Identify Extent of Compliance of the University Curriculum for Attaining the Program Outcomes and Program Specific Outcomes as mentioned in Annexure II. Also Mention the Identified Curricular Gaps, if any (10)

(Describe the process that periodically documents and demonstrates how the program curriculum is evolved, or provide the process of gap analysis, whichever is applicable, considering the Program Outcomes (POs) as mentioned in Annexure-II.)

Note: In case all POs are being demonstrably met through University curriculum then 1.2.4 will not be applicable and the weightage of 1.2.3 will be 20.

1.2.4. State the Delivery Details of the Content beyond the Syllabus for the Attainment of Program Outcomes and Program Specific Outcomes (10)

(Provide details of the value-added courses, workshops, seminars, hands-on experiences, etc., organized to address the gaps identified in 1.2.2 in the following format.).

Table No.1.2.4.1: Details of events organized to cover content beyond the syllabus

S. N.	PO/PSO as gap Identified	Name of the event	Date of event	Resource person, organization	Relevance to POs, PSOs
			CAYm1		
1					

Criterion 1: Outcome-based Curriculum (120)

1.2.4. Strategies for Education Reforms (05)

(A brief explanation of the plans to implement and map activities in curriculum design with multidisciplinary and interdisciplinary programs, the establishment of an academic bank of credits system, APAAR etc.)

1.3. PO, PSO and their Mapping with Courses (20)

1.3.1. POs and PSOs (05)

(Program Specific Outcomes (PSOs) are defined by the program, with up to 3 PSOs specified.)

List of POs as Defined by NBA in Annexure II.

List of PSOs (up to 3)

(Provide details of the PSOs for the program currently seeking accreditation.)

POs (Defined by NBA)

- **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 analyze 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)**
- **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).**

POs (Defined by NBA)

- **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 reports and design documentation, make effective presentations considering cultural, 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)**

- **Program Specific Outcomes (PSOs) up to 2-3.**

Programme Specific Outcomes

- **There should not be any repetition of POs already defined by NBA.**
- **Specific to the particular program**
- **2 to 3 in number**
- **Must have a process for arriving at them**

Key Points in GAPC 4:

- **Knowledge Profiles needs to be ascertained.**
- **Complex Engineering Problems /activities to be met as per definition**
- **Sustainability issues to be addressed while solving CEP**

NATIONAL BOARD OF ACCREDITATION

Annexure I: Knowledge and Attitude Profile (WK)

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.

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.

Range of Problem Identification and Solving

References included are to the Knowledge and Attitude Profile i

In the context of both Graduate Attributes and Professional Comp	
Attribute	***Complex Engineering Problems*** have characteristic WP1 and some or all of WP2 to WP7:
Depth of Knowledge Required	**WP1:** Cannot be resolved without in-depth engineering knowledge at the level of one or more of WK3, WK4, WK5, WK6 or WK8 which allows a fundamentals-based, first principles analytical approach
Range of conflicting requirements	**WP2:** Involve wide-ranging and/or conflicting technical, non-technical issues (such as ethical, sustainability, legal, political, economic, societal) and consideration of future requirements
Depth of analysis required	**WP3:** Have no obvious solution and require abstract thinking, creativity and originality in analysis to formulate suitable models
Familiarity of issues	**WP4:** Involve infrequently encountered issues or novel problems



**Each Programme can target any 2 or 3 GOALS appropriate to their discipline and ascertain their compliance while solving CEP.

Criterion 1: Outcome-based Curriculum (120)

1.3.2. Mapping between the Courses and POs/PSOs (15)

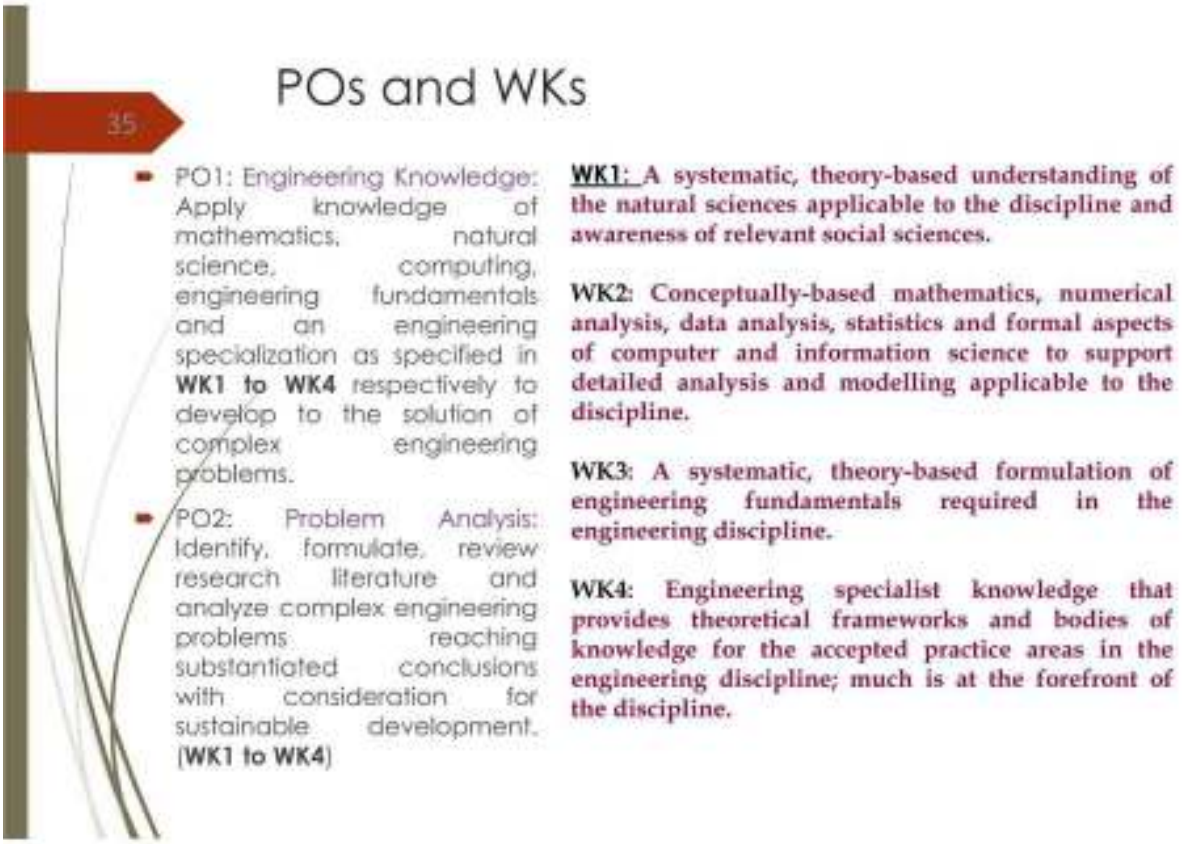
(Mention the courses relevant to the POs/PSOs.)

Table No.1.3.1: Connection of courses with POs/PSOs.

PO Number	List of Courses
PO1:	
PO2:	
PON:	

Add more rows for PSOs

PO	List of Courses
PO1:	Core Science Courses, CE307 Fluid Mechanics, Engineering geology, biology for engineers.,
PO2:	CE321 Structural Analysis, CE310 Hydraulic Engineering, CE490 Civil Engineering Design Project.
PO3	CE328 Foundation Engineering, CE342 Fundamentals of Reinforced Concrete, CE310 Hydraulic Engineering, CE 572 Steel design, CE490 Civil Engineering Design Project
PO6	Environmental engineering, Transoration Engineering, Hydrology and Water Resources, RCC structures, RS & GIS,
PON:	


35
POs and WKs
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 analyze complex engineering problems reaching substantiated conclusions with consideration for sustainable development. (WK1 to WK4)
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.


36
POs and WKs
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).
WK5: Knowledge, including efficient resource use, environmental impacts, whole-life cost, reuse of resources, net zero carbon, and similar concepts, that supports engineering design and operations in a practice area
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

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***

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.

Courses:	Justification w.r.t WKs
1. Applied Chemistry	WK1 – Theory based learning of alternative fuels, reactions….
2. Data structure	Wk2- Conceptually based analysis for computer and Information sc to support modeling..
3. Fluid Mechanics	WK3- A systematic theory-based formulation of engg fundamentals
4. Surveying	Wk4 – Engg specialist knowledge with accepted practice area in civil engg

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)**

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.

Courses/ Projects/Activities:

1. Steel Design (PBL) – (WK 2, 4, 5 and 6)
2. Minor Project
3. Integrated Design Project…
3.