

MCA (Cloud Computing) – Regulation 2018, Hindustan Inst. of Tech. & Science | Comparative Syllabus Analysis

UGC • NEP-2020 • NAAC • OBE & Bloom's Taxonomy • Industry Relevance • Digital OBE Tracking • Faculty Training • Policy Implementation • Gaps

UGC Compliance	NEP 2020 Alignment	NAAC Criteria Mapping	OBE + Bloom's Taxonomy	Bibliography Relevance
2-yr PG (4 sem), CBCS adopted – meets UGC PG norm. - Credits: 88 total (≈22/sem) — within UGC 80–96 band. - Internal:External 40:60 — matches UGC PG eval. Gap: No multi-disciplinary basket, no value-added/MOOC credit transfer, no Academic Bank of Credits (ABC) clause.	- Specialization track (Cloud) supports NEP <i>flexible programme</i>. - MOOC links (NPTEL/Coursera) shown — partial NEP digital push. Gap: No multiple entry/exit, no Indian Knowledge Systems, no internships made mandatory, no research project (NEP-PG mandates), no AI/DS exposure, no language/holistic course.	- PEOs, POs, PSOs defined → NAAC Criterion 1 (Curricular). - Industry-aligned electives → Criterion 2 (Teaching-Learning). Gap: Outcome attainment matrices, CO–PO mapping <i>weights</i>, feedback loop, course-file template, and rubric library are absent — weakens Crit. 1.2, 2.6, 5, 7.	- PEO/PO/PSO + CO statements present → OBE skeleton OK. - Verbs cluster at L1–L3 (Remember/Understand/Apply); few at L4–L6. Gap: No CO–Bloom level grid, no PI (Performance Indicator), no attainment threshold (e.g., 60% of 60%).	- Texts mostly 2010–2014 (Pressman 7e, Elmasri 7e, Sommerville 5e '11). - Few cloud titles <3 yrs old at framing date. Gap: Missing AWS/Azure/GCP whitepapers, CNCF docs, IEEE/ACM journals, and current security standards (NIST 800-53, ISO 27017/18).

Course (Sem)	Theory→Concept→Applied Utility	Direct Industry Relevance	Progressive Question Pattern & Assessment	Digital OBE Tracking Tool
Discrete Maths & Stats (S1)	Probability, hypothesis testing → A/B testing, ML feature stats, capacity planning.	Data-engineer, MLOps, BI analyst – needed for SLA & capacity models.	CIA-1 MCQ(L1-2) → CIA-2 numerical(L3) → Assignment dataset(L4) → ESE case(L5). Rubric-graded.	Moodle quiz analytics + Excel CO-attainment sheet auto-mapped to PO1/PO2.
Database Tech. (S1)	ER, normalization, SQL, NoSQL → schema design for SaaS, sharding, CAP trade-offs.	DBA, Cloud-DB engineer (RDS, Cosmos, BigQuery).	Lab rubrics + ER design viva (L3) + mini-project (L4-5) + ESE design Q (L6).	GitHub Classroom + auto-grader (pgTap) → LMS gradebook → Power BI CO dashboard.
Java Prog. (S1)	OOP, collections, JDBC → microservices in Spring Boot, Android, server-side cloud.	Backend dev, Android, AWS Lambda(Java).	Weekly lab (L3) + code-review rubric + hackathon(L5)+ESE program(L6).	HackerRank/Codility scores piped to OBE sheet via API.
Computer Networks (S1)	OSI, TCP/IP, routing → SDN, VPC design, load balancing, CDN.	NetOps, Cloud-Network engineer (AWS VPC, Azure vNet).	Packet-trace lab(L4)+Wireshark report(L5)+ESE design(L6).	Cisco Packet Tracer logs + GNS3 lab grades into LMS.
Web Design/Dev (S2)	HTML/CSS/JS/PHP → SPA, REST, JAMstack on cloud.	Full-stack dev, UI/UX.	Continuous portfolio (L3-5)+peer review+ESE.	GitHub Pages + Lighthouse CI scores → OBE.
Data Warehousing & Mining (S2)	ETL, OLAP, association → modern lakehouse, Snowflake, dbt.	Data engineer, BI consultant.	Tool lab (L4)+capstone DW(L5)+ESE.	Snowflake/Databricks lab telemetry → CO sheet.
Machine Learning (S2)	Supervised/unsup, NN → MLOps on SageMaker/Vertex.	ML engineer, AI-Ops.	Kaggle-style assignment(L4-5)+model card(L5)+ESE.	Kaggle/Colab + Weights&Biases; logged to attainment dashboard.
Software Engg. (S2)	SDLC, Agile, testing → DevSecOps pipelines.	SDE, QA, Scrum master.	Sprint demos(L4-5)+SRS doc rubric+ESE design Q.	Jira+GitHub+SonarQube → OBE via REST.
DevOps (S3)	CI/CD, IaC, containers → industry SRE/Platform Eng.	DevOps/SRE, Cloud Eng (very high demand).	Pipeline build (L4)+IaC project(L5)+ESE scenario(L6).	Jenkins/GitHub Actions + Terraform Cloud telemetry → OBE.
Cloud Architecture / Security / Storage (Electives)	IaaS/PaaS/SaaS, IAM, KMS, SAN/NAS → Well-Architected reviews.	Solutions Architect, CCSP, Storage admin (AWS/Azure/GCP).	Hands-on labs(L4)+architecture defense viva(L5)+ESE case(L6).	AWS Skill Builder/Microsoft Learn badges + lab scores into OBE LMS.
Presentation & Academic Writing (S3)	Communication, research writing → publishing, client decks.	Cross-cutting employability skill, GRE/IELTS-adjacent.	Continuous: 4 graded presentations + 1 research paper(L5-6).	Turnitin + rubric LMS scoring → PO9/PO11.

Faculty Training Required	Student Diversification & Up-to-date Knowledge	Effective Implementation of Higher-Ed Policy Changes	Major Shortcomings & Drawbacks of the 2018 Syllabus
- Annual FDPs in: AWS/Azure/GCP certifications, Kubernetes (CKA), Terraform, MLOps, Cybersecurity (CEH), Generative AI. - Pedagogy: OBE rubric design, Bloom-aligned question framing, NPTEL SWAYAM mentor course. - Research: SCI/Scopus writing, IPR, design thinking. - Industry immersion: 2-week annual internship in partner firms; train-the-trainer with NASSCOM FutureSkills.	- Mandatory MOOC credits (SWAYAM/Coursera/edX) — 1 per sem. - Industry certifications mapped to electives (AWS SAA, Azure AZ-104, GCP-ACE, CKAD, CCSP). - Open-source contribution (GSoc, Hacktoberfest) earning credit. - Mini-research papers, hackathons, idea labs, incubation cell. - Cross-disciplinary minors (Fintech, Healthtech, IoT) per NEP. - Industrial visits, internships ≥ 8 weeks, capstone with industry mentor.	- Adopt NEP framework: ABC, multiple entry-exit, 4-yr UG → 1-yr PG bridge. - Set up OBE Cell + IQAC dashboard (Power BI) per dept. - Curriculum revision every 2 yrs with BoS + industry & alumni members. - Choice-based: 30% electives from other schools. - LMS-mandated (Moodle/Canvas) with auto CO-PO attainment. - Partner with NPTEL local chapter, AICTE-ATAL, Nasscom FutureSkills Prime, Microsoft Learn for Educators. - Outcome audits aligned to NAAC SSR + NIRF data points.	Outdated texts (mostly pre-2015) — cloud field obsoletes in < 2 yrs. No mandatory internship / capstone with industry weight. No AI/DS, GenAI, Edge, Quantum, Blockchain, IoT, FinOps exposure. - Bloom levels skew low (L1-L3); analytical/creative tiers missing. No CO–PO–PSO mapping matrix nor attainment thresholds published. - Electives narrow; no inter-disciplinary basket (mgmt., design, ethics, sustainability). - No mandatory soft-skill / language / Indian Knowledge System course (NEP gap). - Assessment heavy on end-sem (60%); limited formative, peer, portfolio, viva-voce. - MOOC links unverified, not credit-bearing. - No accessibility/inclusion or gender-equity outcomes. - No explicit feedback loop (student/alumni/employer) closing CO attainment.

Single-page A4 landscape comparative analysis. Note: 15-pt body font would not fit the requested breadth on one A4 page; calibrated 6.8 pt body + 13 pt title used for legibility & complete coverage.