UGARC Report

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Introduction

- Links to previous decades: [history], [ugarc-2000] and [ugarc-2010].

- Early feedback from Departments and Students [link1, link2].

- Interim Report-I feedback from Senate, Departments, Student Senate, and Alumni [link1, link2].

- Our comments on the community feedback received [Response], [Interim Report]
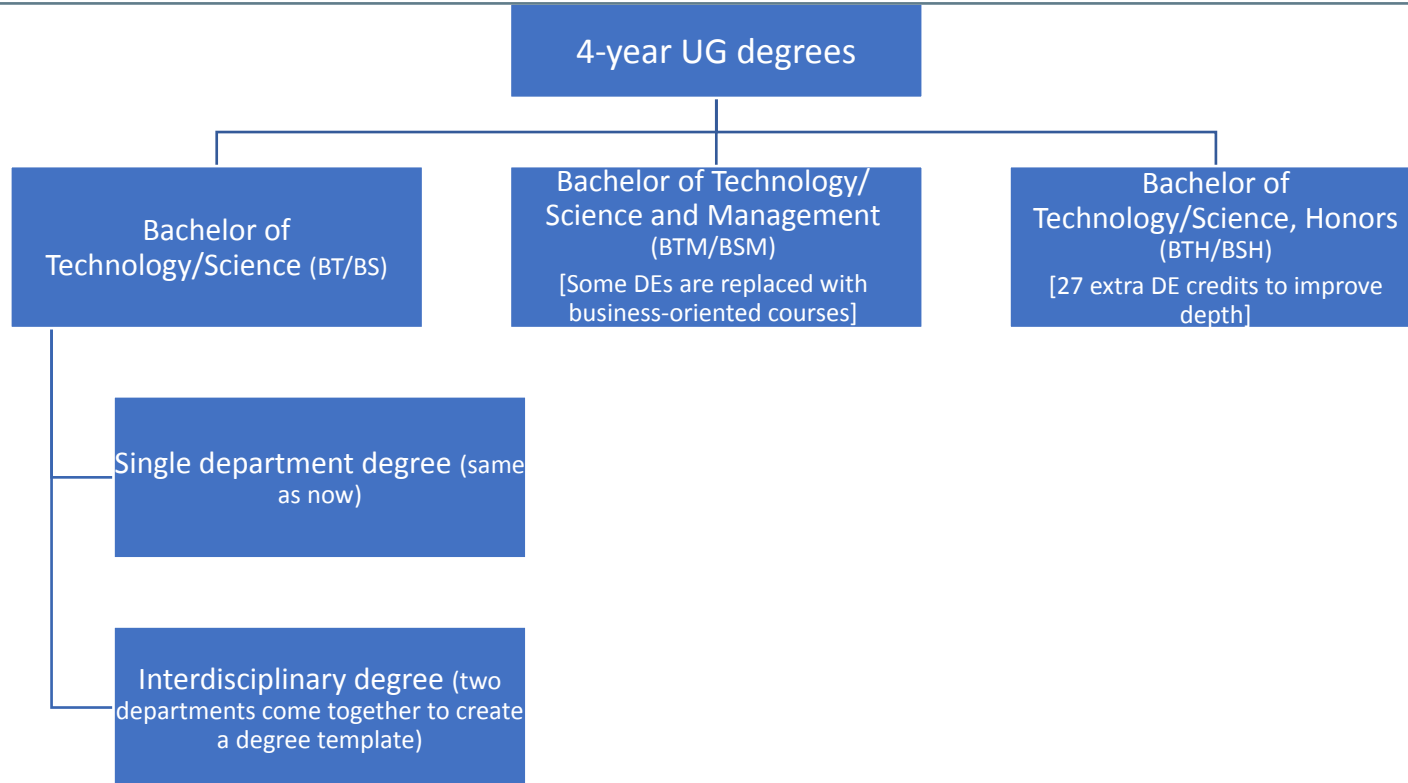 - [OpenHouse], [FinalRemarks], [FinalReport].

Vision

We envision a student-centric undergraduate education system that

- imparts broad-based knowledge at par with the best in the world
- imparts technical, scientific, computational and soft skills that are in tune with the changing times
- enables interdisciplinary learning and kindles research-based entrepreneurship
- addresses the wide diversity of student abilities in large class sizes
- makes greater use of technology to improve learning experience; is ready and trained to teach online whenever the need arises
- encourages student exchange across Indian Institutes and across the globe
- imparts ethical values to create socially and environmentally aware scientists, engineers and job-creators of the future.

Diversity:-- New Degree Options

Huge diversity in the skills and aptitude of the students: some students want more rigour and depth while many students are unable to cope up with the coursework or lose interest in engineering altogether. A one-size-fits-all approach to BT/BS curriculum is not ideal.

4-year UG degrees

Bachelor of Technology/Science (BT/BS)

Bachelor of Technology/ Science and Management (BTM/BSM)
[Some DEs are replaced with business-oriented courses]

Bachelor of Technology/Science, Honors (BTH/BSH)
[27 extra DE credits to improve depth]

Single department degree (same as now)

Interdisciplinary degree (two departments come together to create a degree template)

Diversity:-- Grade granularity

The current grading scheme has a relatively large jump of 2 grade points between adjacent grades. Students with very slight difference in marks may end up with significant difference in grade points.

Current grading scheme

Grade	Grade Points	Description
A*	10	Outstanding
A	10	Excellent
B	8	Good
C	6	Fair
D	4	Pass
E	2	Exposure
F	0	Fail

Proposed grading scheme

Grade	Grade Points	Description
A*	10	Outstanding
A	10	Excellent
B+	9	Very Good
B	8	Good
C+	7	Fair
C	6	Satisfactory
D+	5	Marginal
D	4	Pass
E	0	Exposure
F	0	Fail
I	0	Incomplete

The highest grade is called A* instead of A+, as it has the same number of points as A, while grades with "+" have higher number of points.

Flexibility:-- Courses & learning

Salient Points

1. *Credits for External Activities* : Allows students to avail semester leave for academic as well as industrial work subject to certain conditions.
   a. Up to 27 UGP credits in lieu of this external work. Grade awarded by Faculty supervisor at IIT Kanpur
   b. ex-ante approval required from Supervisor, DUGC and SUGC
2. *Use of Technology in Courses*:
   a. allow students to do online MOOC courses and claim OE credits
   b. make lecture videos available to students (unless Instructor opts out)
   c. use flipped and mixed classroom model. Archive courses in LMS.
3. *Interdepartmental Major*:
   a. 2 departments could come together to offer a joint major with a specific name and specific template.
   b. a 4-year program, and is not envisaged to replace the double major program
4. *Interdepartmental Electives [IDEs]*: may be offered in two ways
   a. Multiple departments may come together to propose a joint course.
   b. One department may co-opt a course offered by another department as an interdepartmental DE
5. *Recommendation for Major and Minors*. Ways to avoid course overlap.
6. Seminar courses and with Student presentations. Allow Sub-modular courses.

Balanced options:-- Institute core courses

Salient Points:

1. *Focus on computational skills: A computing course should be offered by the department. To accommodate this, it is recommended to move TA201 and TA202 to ESO/SO basket, called E/SO. A Department can make these courses compulsory for their students, if needed.*

2. *Changes to deal with large class sizes:*

    a. For MTH101/102*: MTH 101 should be split into two modular courses: MTH101M1 and MTH101M2. Similarly, MTH 102 will also be offered in two modular courses as MTH 102M1 and MTH102M2. Both the modular courses MTH 101M1 and 101M2 may be offered in the first semester and MTH 102M1 and 102M2 may be offered in the second semester. More flexibility in selecting the modules to ensure smaller class size.*

    b. For CHM102*: CHM102 will be split in two modules to be run both semesters and both modules offered in both halves.*

    c. For PHY102/PHY103*: Physics department will offer 4 full semester courses every semester of which departments will choose 2 courses for their students.*

    d. CSE *Department proposes to modularize* ESc101 into ESc(101-103)*. The first two will be offered every semester by CSE. Students have to do ESc101 & choose another from 102-103.*

Balanced options:-- Institute core courses

Salient Points:

3. *Focus on Inter-Departmental*: DE basket should also consist of courses from other departments which the parent department feels is relevant to promote interdisciplinarity. To allow students to take advantage of this, the departmental requirement could be increased by 2 courses (18 credits) with the E/SO requirement being reduced from 40 to **18** (~reduction from four courses to two courses).

4. Provision can be added to the UG Manual which allows a student to *substitute at most one IC course* with another course at the recommendation of the DUGC. Students can be allowed to avail this provision only if he/she has received E/F grades in an IC course 3 times.

5. All existing ESO/SO/CSO/MSO/PSO/HSO courses are proposed to be *subdivided into only ESO and SO* courses. Departments will select certain courses from each basket of E/SO.

6. *Earth Science* Department can design some E/SO courses which can be taken by their students as well as any interested student of the Institute.

7. *Continuation* of the existing courses ESC101A, ESC201A, CHM101A, PHY101A; LIF101 (with major revision), PE 101A, PE 102A. And for TA101,
   a. *Sketching* should be retained
   b. *Use* of software like AUTOCAD or similar ones should be increased along with the hand drawing using drawing board and drafters.

SCHEME:-- HSS, COM and OE

Salient Points:

1. *Drop COM200*
2. *Formation of **ELC** (English Language Cell)*

   a. **External Help:** Trained professionals for providing communication education.

   b. **Courses**: Offers a basket of courses addressing various aspects of English, such as Basic English Communication (in lieu of the current ENG112), writing, communication etc.

   c. **Writing Center**: Such a center should help students at all levels to improve their writing skills, providing year-long support to students on a need basis.

3. *No Change in OE Courses*

4. *HSS-EME Courses:* Courses especially in HSS and related areas like Economics, Management and Environment are kept in one basket named here as **HSS-EME** (or SCHEME).

   a. **One HSS Level-I Course:** One introductory HSS course

   b. **English Course:** Each student must take a mandatory English course offered **by ELC,** based on their prior exposure to English (tested via a Diagnostic Test).

   c. **Three HSS Level-II Courses:** Students will do 3 advanced HSS Level-II courses.

   d. **Economics/Management/Environment (EME) Course:** Each student must take a mandatory course from a basket of Economics/Management/Environment (EME) Courses. Economics Science, IME and Civil Engineering departments will offer full-semester courses to this basket.

Suggested Overall Credits

	IC (minus COM)	ESO/SO (E/SO)	Departmental	OE	HSS+COM+EME (=SCHEME)	Total
Current	119	40-55	133 - 149	54-72	54	400-428
Proposed	**107**	18-45	144 - 179	54	53-58	386-415

where, **E/SO** = **E**ngineering **S**cience & **S**cience **O**ptions

SCHEME = **S**ocial-Sciences, **C**ommunication, **H**umanities, **E**conomics, **M**anagement, **E**nvironment Options

[Suggestive Templates given in the Report.]

Research & Exchange:-- MSc, BT-MT, BS-MS

Salient Points:

1. *Thesis Criteria* : *Uniformize Grading in Thesis and Projects in Masters level degrees and Letter grades ensure that students get the credit they deserve.*
   a. *All UGPs should have letter grades, irrespective of whether they are counted as credits. Non-credited but letter graded UGPs should find mention in the transcript.*
   b. *No S/X system in UGPs*
   c. *MT thesis and M.Sc project evaluation may remain unchanged.*
   d. *MS part of BS-MS and 2 Yr M.Sc may be handled by PG section.*
2. *In principle recommendation of the possibility of admitting students via Olympiads: may help attract deserving students who don't sit for the JEE.*
   a. *At present will be applicable to Science departments, BSBE and CSE.*
   b. *Departments might decide on listing specific olympiads, normalising ranks, and other criteria such as the maximum number of students to be admitted via this format, and the need for any separate evaluation for admission.*
3. *External Students in BT-MT/ BS-MS: In principle, good BT/BS students from other IITs, IISERs & other institutes with JEE-based admission, could apply to the DUGC of a department in IITK to continue in our BT-MT/BS-MS program.*

M.Sc two year programs

Formulate necessary changes in M.Sc two year programs in Sciences, while retaining their brand values built up over five decades.

1. *Change to credit based system, similar to BS part of BS-MS program.*
2. *Introduce compulsory English writing/communication course for 2-yr M.Sc.*
3. *Decrease DC component.*
    a. *Avoid significant overlap with BS/B.Sc.*
    b. *Allow interested students to substitute DCs with more advanced DE/OEs.*
    c. *Departments to identify students for such waivers.*
4. *Finer grading system (10, 9,...) similar to BS students.*
5. *Uniformize termination criteria, to bring it at par with BT/BS.*
6. *Introduction of M.Sc-Ph.D dual degree programs in Mathematics-Statistics, similar to the one in Physics.*
7. *M.Sc Chemistry project recommended for two semesters. Departments can work out the details.*

Two-way feedback-- Course feedback forms

Vision:
- Teaching methods and modes of interactions are rapidly evolving with the aid of technology.
- Proper feedback mechanism together with the maintenance of the database and other concerns of the instructors and students.
- This will help in improving (or completely revamping) the course in the next offering by a different faculty.
- Continuous evaluation and improvement of the overall teaching-learning process.

Proposed (*revised*) Student's Feedback Form: Report

Proposed (*new*) Instructor's Feedback Form: Report

Awareness:-- Ethics & Counsel

Salient Points:

1. *Ethics Issues:*
   a. *A mandatory (modular, S/X) course on ethics for all undergraduate students*
   b. *Creation, and advertisement, of guidelines for ethical code of conduct inside IIT related to: academics / ragging / gender and minorities inclusivity / honesty and ethics in communication*
2. *Academic Counselling & Guidance (ACG) Center:*
   a. *One faculty member with 4 UG students to be part of departmental ACG, to work with DUGC*
3. *Festivals:*
   a. *Student and faculty feedback indicated that festivals were found to be a necessary mechanism for reducing stress, and enabling extracurricular interests, in students*
   b. *Issue of forced participation of younger UG students is a matter that has been discussed in the student feedback committee, and necessary mechanisms for this has been proposed.*

Respectable Exit:-- Termination reforms

Premise

1. *50 students are terminated each semester and 105 students are placed on AP every semester*
2. *After going through the trauma of termination, many of the students are reinstated, but only after tedious processes during which the student's life remains uncertain*
3. *Majority of the departments favored removing termination, as per survey*

Proposal

1. *Maximum Residency: Maximum residency will be 1.5 times the normal duration of BT/BS program (6 yrs)*

2. *Continuous monitoring of students: Early identification and continuous monitoring of students performance*

3. *Academic Counselling and Guidance (ACG) Center: DUGC/CS will be assisted by ACG which will be under purview of DOAA office*

4. *Exit Option Degree (EOD): Bachelors degree (equiv.3 yrs)-- involves regular IC + E/SO + HSS + DC + DE/ OE courses. (see report/table in the next slide)*

5. *EOD will only be initiated by the student and not by the ACG or any other body.*

Respectable Exit:-- Termination reforms

Course Group	Credits
IC	Min 60 credits (with at least one each in Math, Phy, Chem and 2 labs)
E/SO	Min 18 credits
HSS + COM	Min 36 (at least one course in Eng)
DC	Min 60 credits (suggested to complete all labs)
DE + OE	Balance
Total	**300 Credits**

Exit Option Degree:
EOD
(regular courses, but reduced)

Students would have completed ~75% of the requirements of their original template. This degree can be equated with *B.Sc in Engineering*.

Suggestion: Any particular department need not be associated with this degree and the degree can be simply called BE (pass).

Envision a student-centric undergraduate education system that

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III. enables interdisciplinary learning and kindles research-based entrepreneurship
IV. addresses the wide diversity of student abilities in large class sizes
V. makes greater use of technology to improve learning experience; is ready and trained to teach online whenever the need arises
VI. encourages student exchange across Indian Institutes and across the globe
VII. imparts ethical values to create socially and environmentally aware scientists, engineers and job-creators of the future.

[Full UGARC18-21 Report]

Thank You!