Key points from IUCEE Algorithms workshop

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Discrete Mathematics

- Correlate Computer science applications to the Maths topics
- Proof of Contradiction with Tiling Example
- Importance of sequencing the topics by their complexity level.(Understanding level, not algorithm complexity)

Data Structures

- Best and worst case analysis preferred over average case analysis
- Examples for the students to think more(memory hierarchy)
- Build a library for Hash tables for their future use
- Summary of sorting techniques for better comparison
- Union find, Fibonacci heaps and Binomial Queues are identified as light weight topics.
- Better understanding of theoretical run time and complex data structures.

Algorithms

- Begin the course with Stable Marriage problem
- Knowledge of Mapping between different NP problems
- Clear distinction between NP-Hard, NP, NPC, P with suitable examples.
- Introduction of other spaces.
- Mathematical proof not to be dealt in depth
- Stress Dynamic Programming technique

General Points

- Preparation for the Course:
  - Identify the goals and challenges in each unit(purpose is normally done in lecture plan.)
  - Identify the topics to be dealt in detail (those that are practically applicable) and those to be done on surface level
- Course Delivery:
  - Establish Correlation between staff
    - Bring in a discussion between the CS and Maths staff, to relate the CS applications to the Maths topic
    - Identify suitable Practical examples/ analogies to the topic being dealt
  - Motivate Students
    - Educate the students about the applications where the topics can not/ difficult to be used apart from applications where it can be used.

General Points

- Quality Improvement:
  - **Students**
    - Concentrate on formative assessments also rather than summative assessments alone.
    - Design suitable classroom activity for the course (i.e) problems which can stimulate the thinking process.
    - Design suitable strategy at frequent intervals to regain the students attention.
  - **Instructor**
    - Get a short feedback at the end of each hour rather than getting it thrice during a course.
- Research:
  - Select a project that is applicable to the Society
  - Divide it in to subparts, and involve the students.

Actions Planned

- Presentation of the Algorithm course to colleagues
- Discuss classroom activities to the teachers of respective subjects
- Suggest classroom activities to be included in lesson plan
- Highlighting the projects of UW to our students