IIT Mandi
Proposal for New Course

Course Name:	Selected Topics in Algorithms
Course code:	CS592
Credits:	0-0-4-2
Prerequisites:	Some exposure to various programming paradigms. Permission of the instructor is required before enrollment.
Intended for:	BTech
Elective/Core:	Discipline elective for BTech CSE, free elective for others
Semester:	Even

Objective:

Develop competency in implementing advanced algorithms through projects.

Course Outline:

Students can work individually or in small groups. Assignment of project topics will be based on interests and discussion and interview with the instructor.

Themes for each project will be one of the following:

a) Algorithms in Linear programming, Graph Theory, Linear Algebra etc.
b) Parallelization based on OpenMP, MPI
c) e-content creation for Algorithms.
d) Source to source language translation

As a by-product, students can learn Python or Fortran or Latex

Resouces:

Some of the key resources:

1. U*sing MPI: Portable Parallel Programming with the Message-Passing Interface*, William Gropp, Ewing Lusk, Anthony Skjellum, MIT Press, 2014
2. *Using Advanced MPI: Modern Features of the Message-Passing Interface*, William Gropp, Torsten Hoefler, Rajeev Thakur, Ewing Lusk, MIT Press, 2014.
3. *Guide to Fortran 2008 Programming*, Walter S. Brainerd, 2nd ed. Springer, 2015
4. *Modern Fortran in Practice*, Arjen Markus, Cambridge University Press, 2012
5. *LaTeX: A Document Preparation System*, Leslie Lamport, Addison-Wesley Series on Tools and Techniques for Computer T, 1994
6. *LaTeX Beginner's Guide*, Stefan Kottwitz, Packt Publishing Ltd, 2011
7. *Doing Math with Python: Use Programming to Explore Algebra, Statistics, Calculus, and More!*, Amit Saha, No Starch Press, 2015
8. *Programming Python*, Mark Lutz, 4th Edition - O'Reilly Media, 2006