



Content

Academic integrity

Use of Laptops in Classroom

Grading Policies

Student Recording of Class

Attendance Policy

Statement about Units

Textbooks and Other Required Materials

Blackboard



1. Academic integrity

Here are the things you need to know to ensure that you are working within the constraints of both the university's policy, and my expectations for this course:

- Cheating, plagiarism, and all forms of academic dishonesty are expressly forbidden in this class. Any form of cheating will immediately earn you a failing grade for the entire course.
- Unacceptable Collaboration:
 - Copying (program or assignment) files from another person or source, including retyping their files, changing variable names, copying code without explicit citation from previously published works (except the textbook), etc.
 - Copying on quizzes or exams.
 - Allowing someone else to copy your code or written assignment, either in draft or final form.
 - Inappropriately obtaining course information from instructors and TAs.



2. Use of Laptops and Mobile Devices in Class

As research on learning shows, unexpected noises and movement automatically divert and capture people's attention, which means you are affecting everyone's learning experience if your cell phone, pager, laptop, etc. makes noise or is visually distracting during class.

For this reason,

- You can take notes on your laptop or your mobile, but you must turn the sound off so that you do not disrupt other students' learning.
- If you are doing anything other than taking notes on your laptop, please sit in the back row so that other students are not distracted by your screen.



3. Grading Policies

Students are expected to participate in class, complete assignments on time, and take the examinations.

There will be one midterm examination and one final examination for each semester course.

All scores on exams and assignments will be based on 100 points.

The final grade of the course will be determined by the following constraints.

•Quiz	10%
Lab. Assignments	20%
•Midterm Exam	30%
•Final Exam	40%

Total Percentage Must Be 100



4. Student Recording of Class

Classroom activities may be recorded by a student for the personal, educational use of that student or for all students presently enrolled in the class only, and may not be further copied, distributed, published or otherwise used for any other purposes.

All students are advised that classroom activities may be taped by students for this purpose.



5. Attendance and Participation Policy

I can expect you:

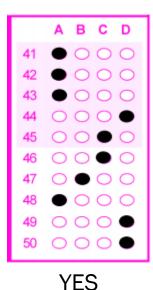
- •To come to class on time.
- •To be attentive and engaged in class.
- •To refrain from using laptops, cell phones and other electronic devices during class.
- •To spend an adequate amount of time on the assignments, making an effort to solve and understand each problem.
- •To engage with both the abstract and computational sides of the material.
- •To seek help when appropriate.

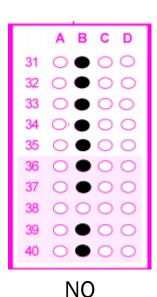


6. Feedback about the course

During your studies, you will do some surveys (school surveys and my own surveys).

In performing the survey of school, if you only use only one choice for all questions, the questionnaire will invalid (i.e. it will not be statistics, excluded). In order for the school to listen to your opinion, please take the survey carefully and seriously.







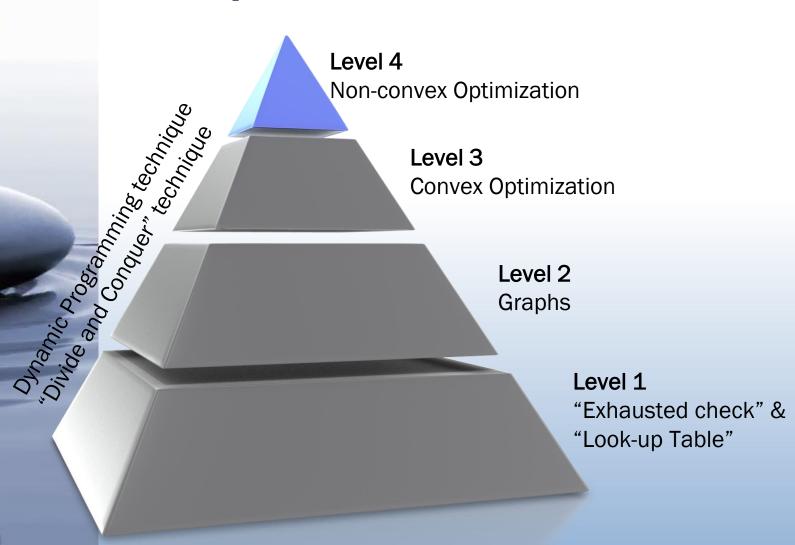
7. Statement about the course

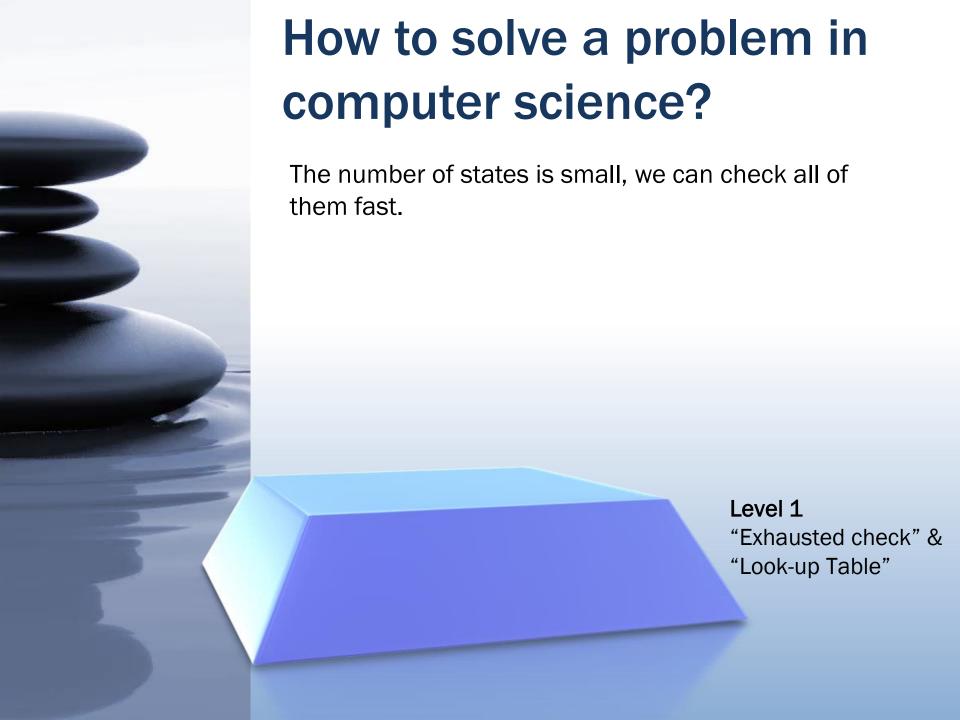
This course is oriented to those undergraduate students who require a working knowledge of numerical methods.

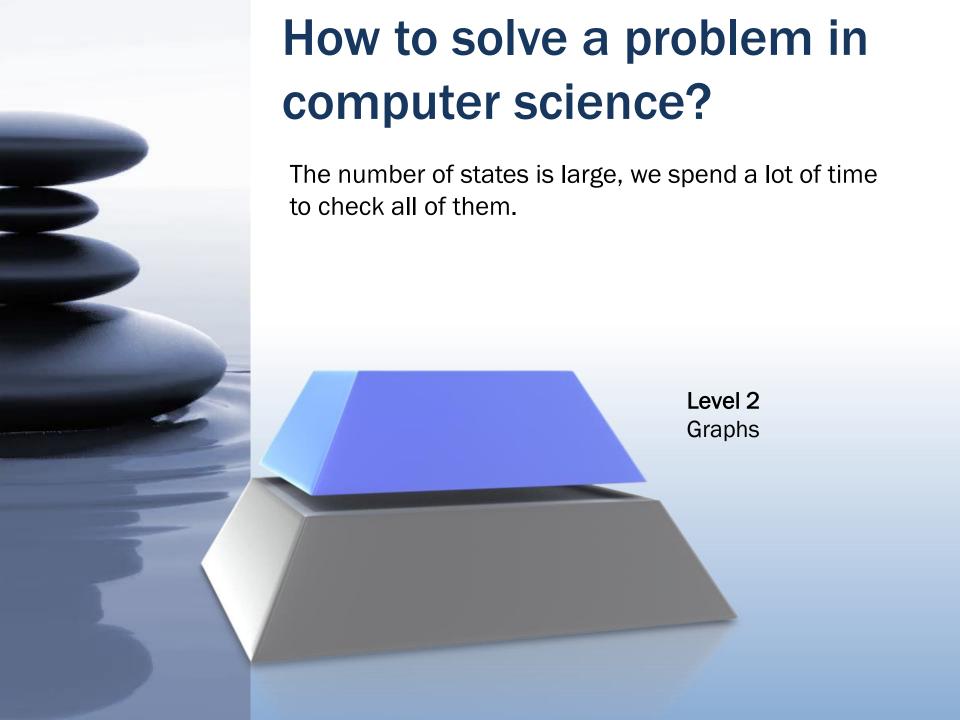
Upon the successful completion of this course students will be able to:

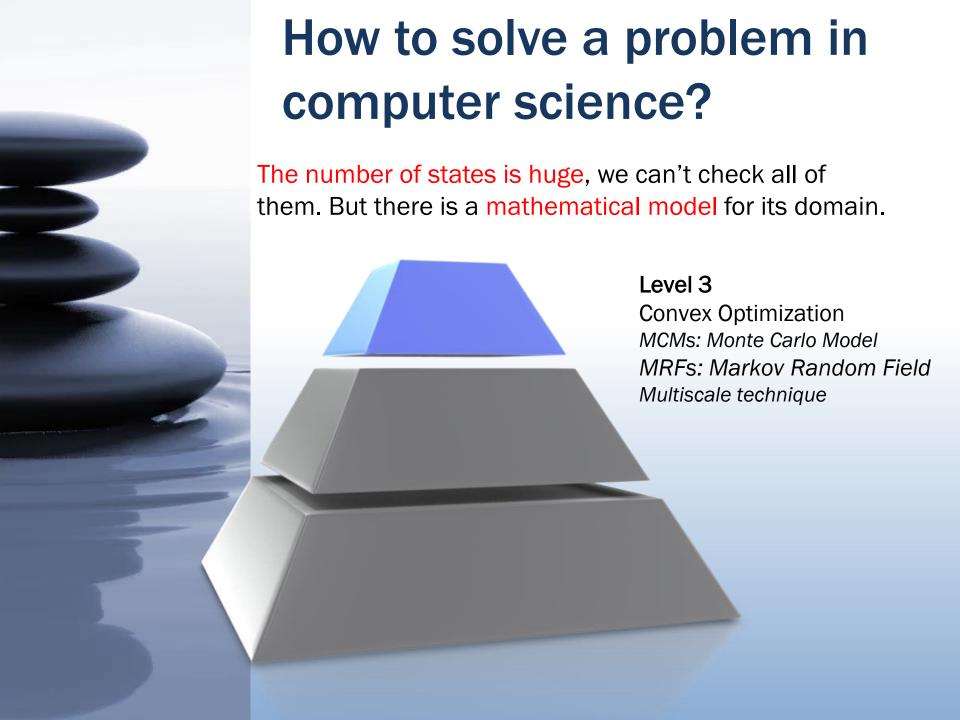
- 1. Solve numerically nonlinear equation by bisection, iterative and Newton methods.
- 2. Solve big linear systems by exact and iterative methods.
- 3. Fit data by interpolation polynomials, Spline polynomials and least square methods.
- 4. Solve numerically Boundary value problems by Euler, Euler improved and Finite Difference methods
- 5. Evaluate numerically derivatives and integrals.

How to solve a problem in computer science?



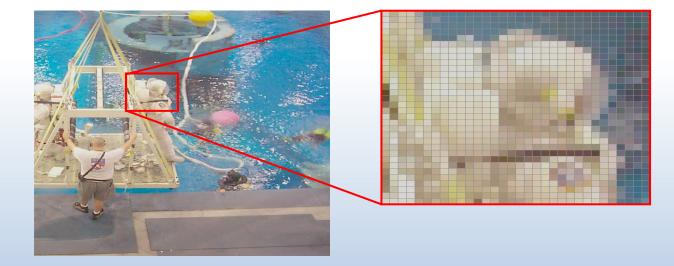


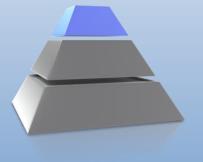


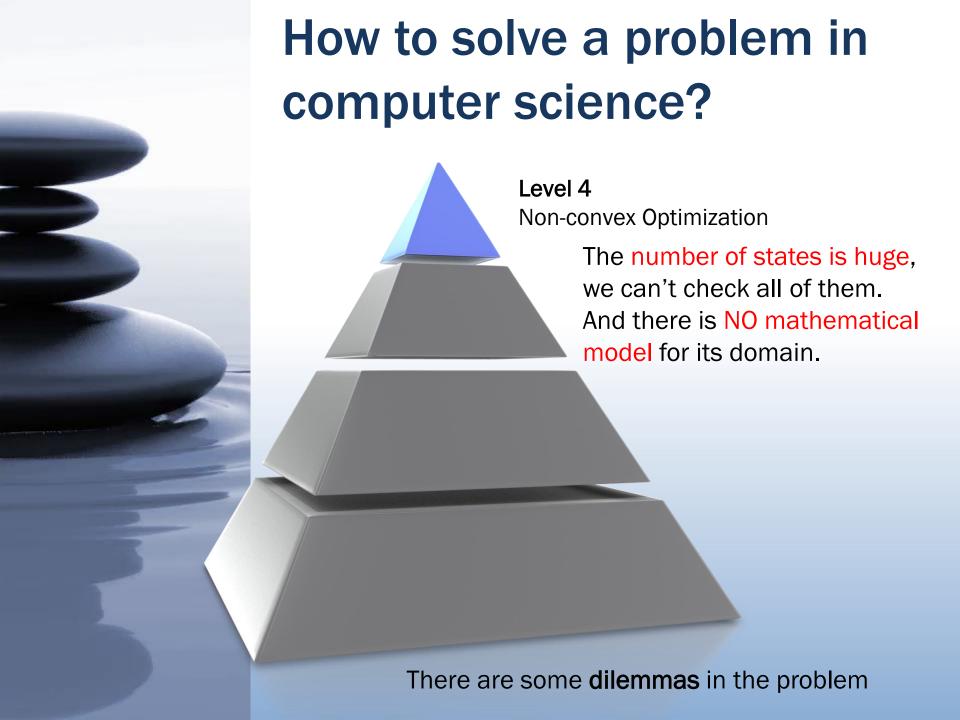




Discrete Prob. Vs Relational Prob.





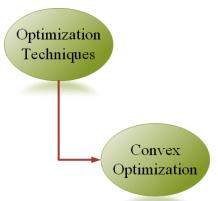




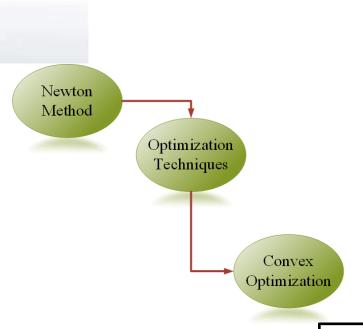


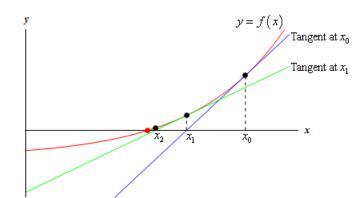


$$y = f(x, y', y'')$$



$$sinc(\pi x) = \frac{sin(\pi x)}{\pi x} = 0$$
 when $x = \pm 1, \pm 2, \pm 3, ...$





Newton's Method

THE GOAL: We want to find c such that f(c) = 0

THE STEPS:

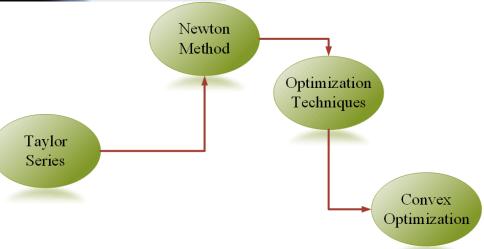
Step 1 Make a guess that should be close to $c = x_0$

Step 2 Repeat this iterative formula until 2 consecutive steps have the same values for the desired number of decimal places.

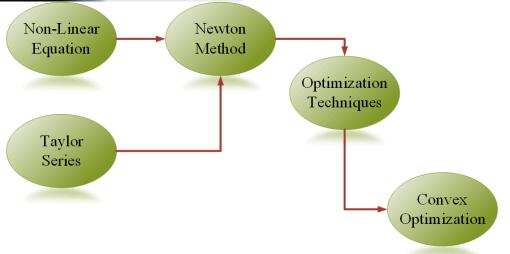
$$x_{n+1} = x_n - \frac{f(x_n)}{f'(x_n)}$$

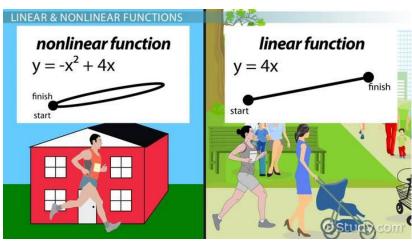
Step 3 Your answer is the values with the desired number of decimal places. You are now done.

Newton Method



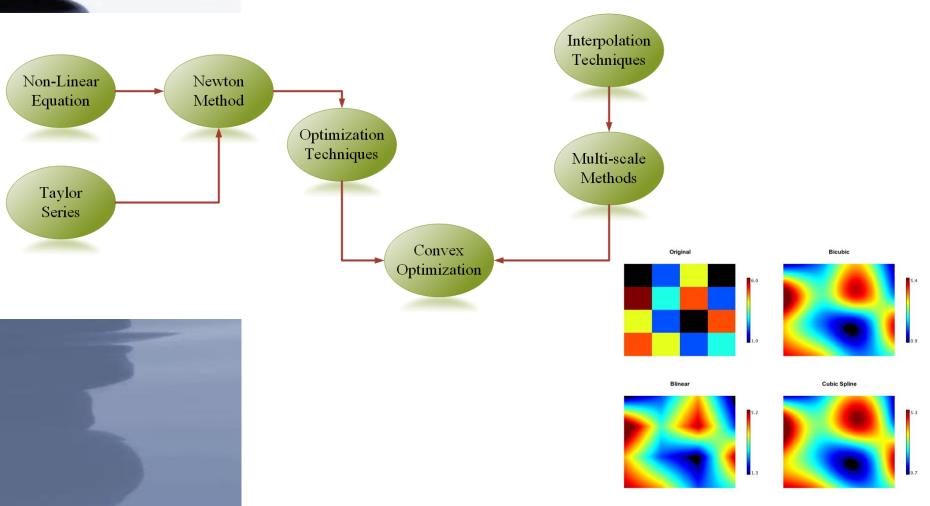
$$f(x) = f(x_0) + f'(x_0)(x - x_0) + \frac{f''(x_0)}{2!}(x - x_0)^2 + \frac{f'''(x_0)}{3!}(x - x_0)^2 + \frac{f''''(x_0)}{4!}(x - x_0)^4 + \cdots = \sum_{n=0}^{\infty} \frac{f^{(n)}(x_0)}{n!}(x - x_0)^n.$$

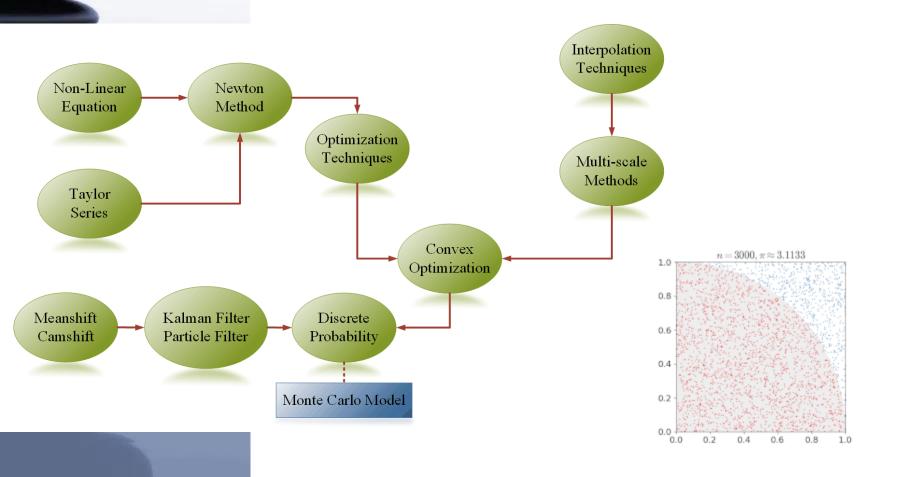


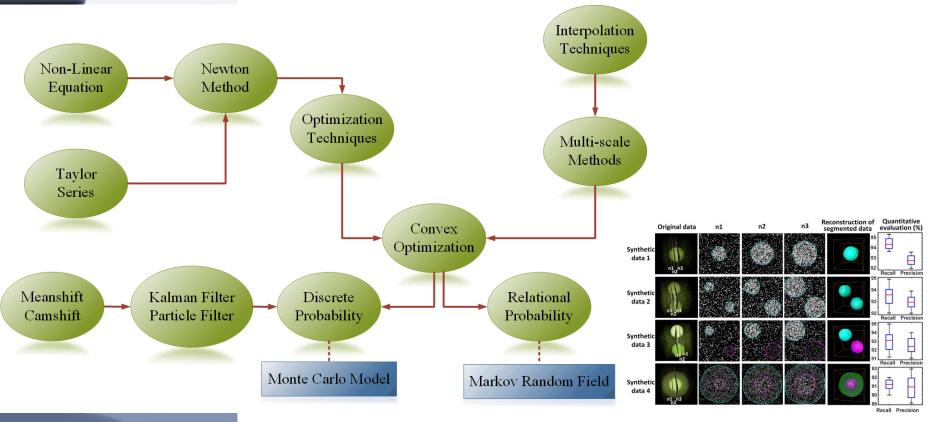


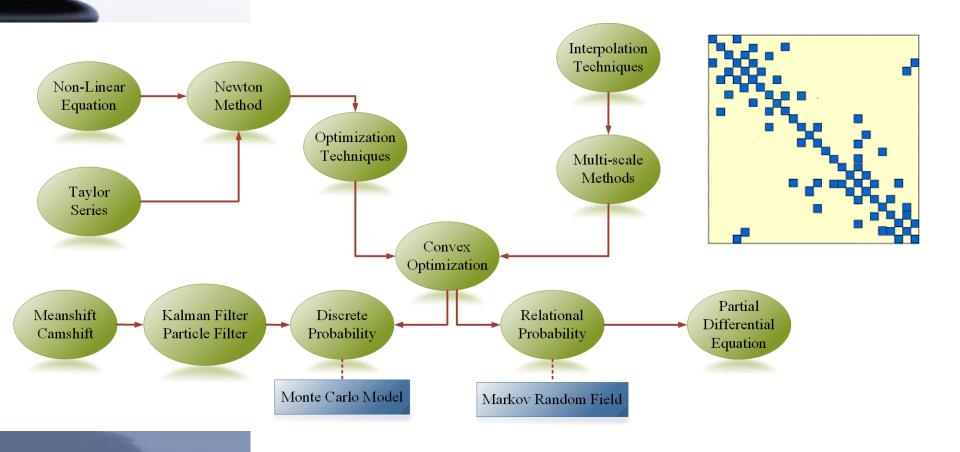


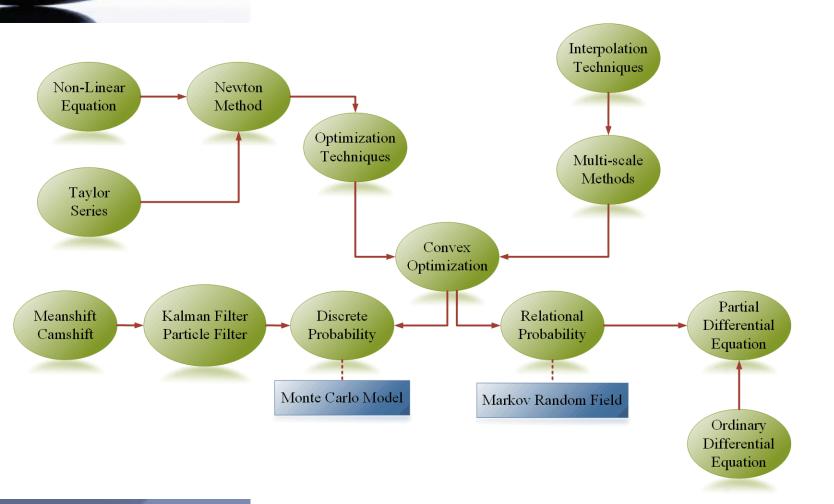
The Mind map of Engineering Mathematics Non-Linear Newton Equation Method Optimization Techniques Multi-scale Methods Taylor Series Convex Optimization

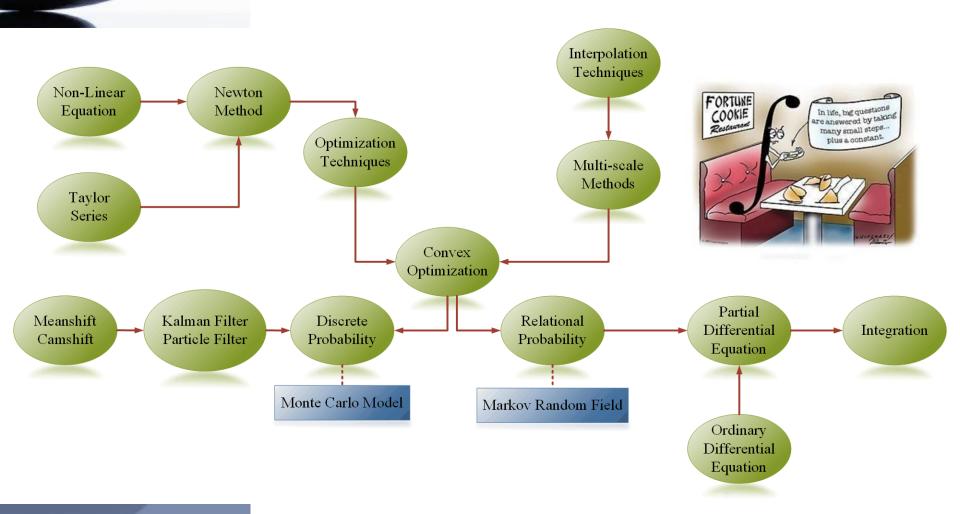


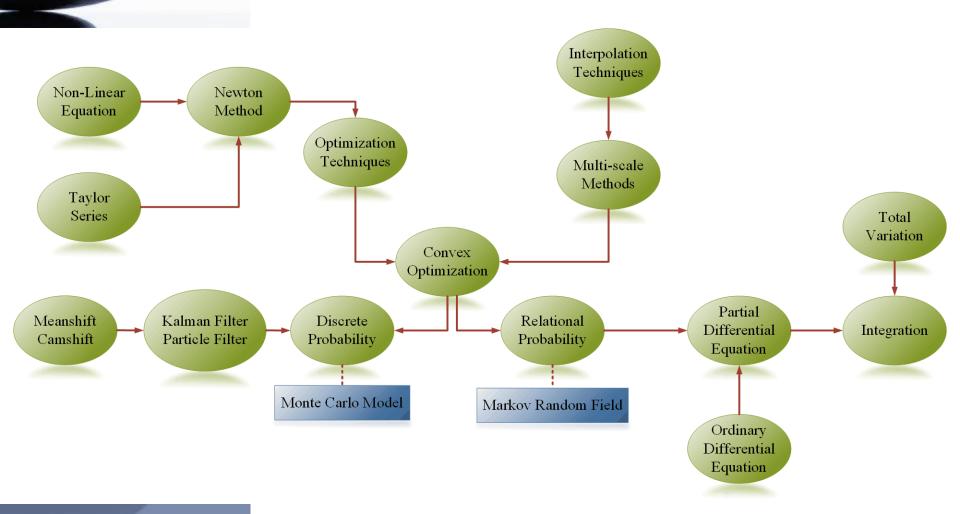


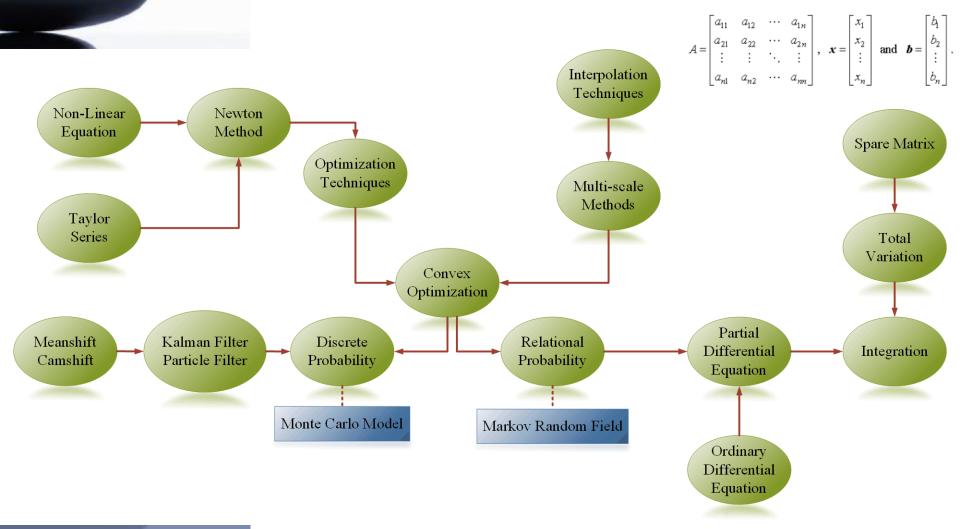


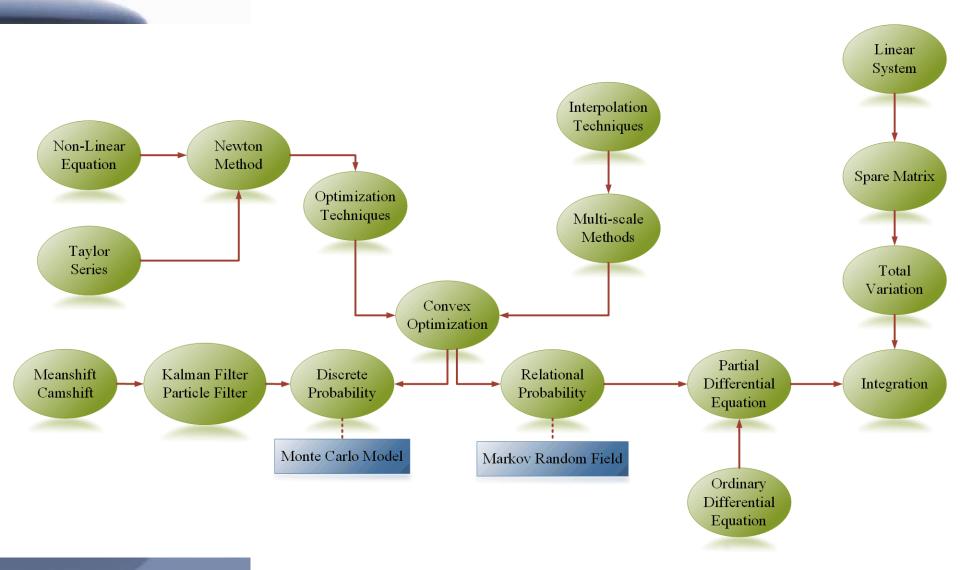


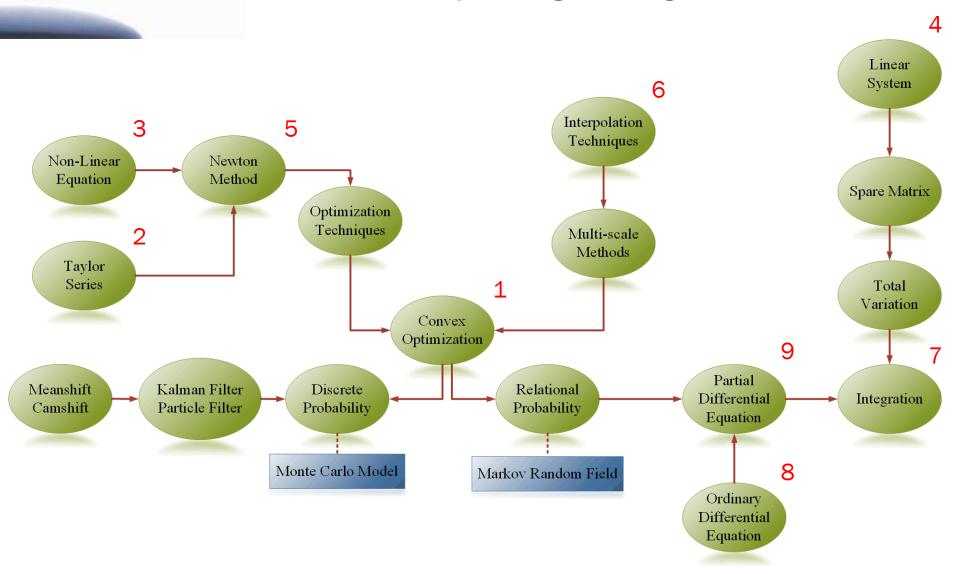






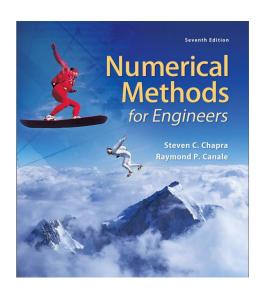


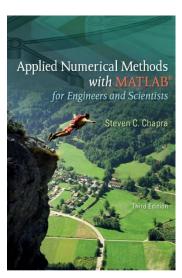


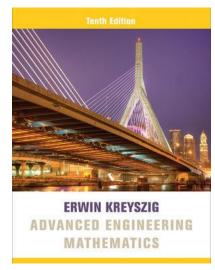


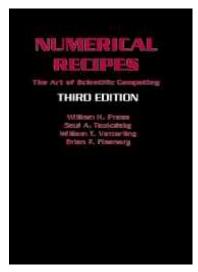


8. Textbooks and Other Required Materials







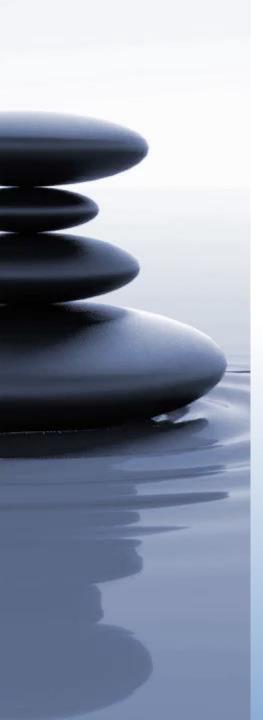




9. Blackboard Learning Management Systems

- Blackboard Docs for Students _ By CIS@IU
 (https://drive.google.com/file/d/1vzBTMhtGrAITIdDQgbh6mF0YIU4
 TdFex/view)
- Students can receive announcements, lectures from BB
- Students must complete assignments, exams and submit them through BB.
- https://cis.hcmiu.edu.vn/cis-elearning-guidelines





Questions? More Information?

