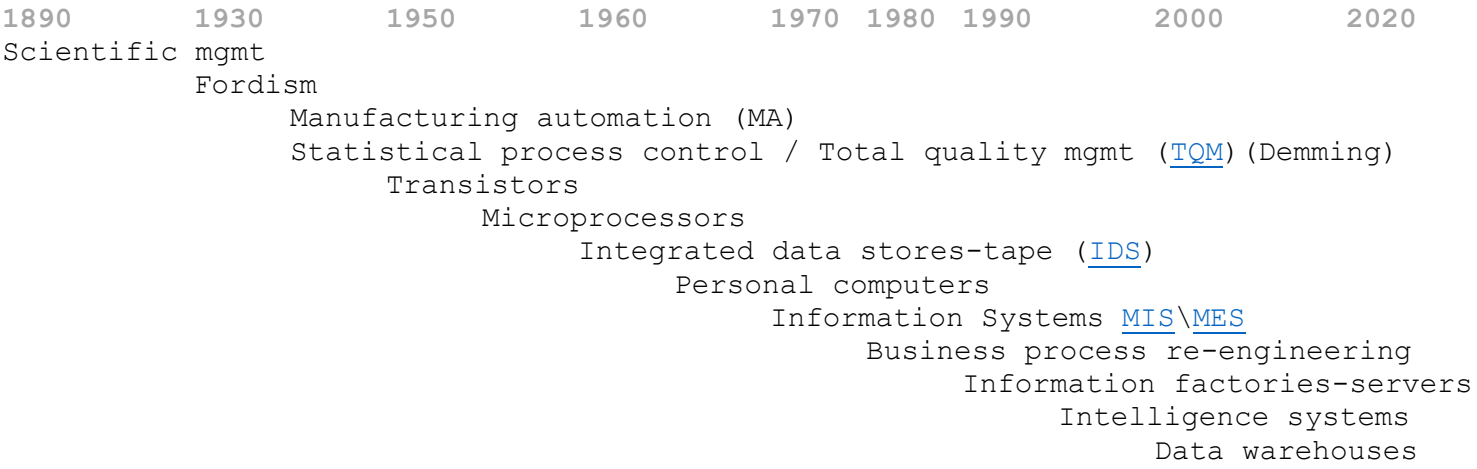
**Southern New Hampshire University**
**Syllabus**

**IT.304: Systems requirements and implementation planning**
**Course Prerequisites:** IT.200, QSO.340
**Location: on-ground, SETA, 209, Wednesday and Friday at 11:00 – 12:15**
**<weekly syllabus activities posted Friday 6PM of prior week>**

**Instructor: brian hogan**, b.hogan@snhu.edu, https://github.com/bbe2/IT.304.Fall.2022

**Course Description**
Systems analysis and design is an art form, discipline, and science, and it has a deep history dating back to the 1890s, forming the salient pillars of speed, quality, and control.




To perform systems analysis and design, it helps to understand different models, what operation managers *need* to see, what business leaders *want* to achieve, and what financiers *insist* for sustainability. Information technology (**IT**) databases facilitate systems analysis by codifying everything. And today, artificial intelligence (**AI**) identifies untapped and unrealized potential Fordism, IDS,and TQM system solutions could not achieve.

In the 1990s, MIT computer science professor Michael Hammer developed the management theory of business process re-engineering (**BPS**) focused on process improvement, process re-design, and process re-engineering. Tenets of BPS emphasized applying a holistic point of view toward business objectives and how, in reality, the business process does or does not align with them. The theoretical work is today witnessed by consultancies like IBM's Business Process Reengineering <IBM-BPRS> and Bain & Company's Business Process Redesign <Bain>. **BPS** names change, such as Accenture's Human + machine intelligence, but BPS analysis of systems principles is constant.

Business requirements, business rules, system specifications, environmental factors, technology (personal and corporate), people, skills, and methods change. Change provides opportunities to tear things apart, reorganize, recodify, and demonstrate new or improved viability to constituents. **IT** is critical to this process, and learning how to apply BPS models will distinguish you from your peers and, more importantly, help you become a better systems designer through abstraction and looking ahead skilling.

Skill achievement in this arena derives from selecting models to frame systems with BPS models and using process engineering competencies to abstract systems and institute quality engineered solutions. It can also be difficult to measure overall competency, other than the stock price, because people are the systems change so if two designers leave, work can be shelved or implemented haphazardly.

Students are encouraged to focus learning on what is MOST meaningful to their future goals.

This course will develop skills to perform systems analysis and design as evidenced by:
1. Written examination and diagnostics of systems thinking.
2. Use of information modeling to draft system requirements.
3. Use of data and object model programming to codify information systems.

Tools and technologies to facilitate evidence formation include,
1. Document and spreadsheet software such as MS Word \ MS-Excel.
2. Microsoft Visio (required).
3. Apply systems analysis and design principles by translating business and information structures into object models, systems requirement specifications, and.or implementation plans.
4. Case studies.

**Course competencies:**

- IT-20358: Make ethically informed decisions based on awareness of legal and organization parameters
- IT-20359: Develop a systems requirements specification
- IT-30360: Develop an implementation plan

**Required textbooks for knowledge reading assignments:**
Resources are critical to success in this course. Information is gathered from various sources to minimize personal learning costs. The instructor provides online references to the extent possible and only recommends materials with quality learning value. When applicable, consider acquiring materials from the SNHU Online Bookstore.

The following textbook is well suited for class purposes. Class.1 and Class.2 will guide a course of action for purchase, rental, or borrowing of Scott Tilley book.

A) Tilley, Scott (2022). **Systems analysis and design, 12th Edition**. Shelley Cashman Series. Cengage. Published 2022. ISBN 978-0-357-11781-1.
- https://www.amazon.com/s?k=systems+analysis+and+design+12th+edition+scott+tilley&crid=3MA5XRRHG2KMB&sprefix=systems+analysis+%2Caps%2C82&ref=nb_sb_ss_ts-doa-p_2_17

Models come in all forms, and ideas from The Decision Book will broaden your capabilities through short weekly exercises. Students are encouraged to purchase.

B) Krogerus, M., Tschappeler, R., and Pienning, J. (2018). **The decision book: fifty models for strategic thinking**. ISBN-10: 0393652378, ISBM-13, 978-0393652376.
- Amazon.com: The Decision Book: Fifty Models for Strategic Thinking: 9780393652376: Krogerus, Mikael, Tschäppeler, Roman, Piening, Jenny: Books

- these models will also be posted in the class bh.github

***Note: instructor has 2 textbook copies students may use and share for knowledge readings.***

**Tools and technologies to facilitate evidence:**

1. <provided> Paper, pencil, digital/in-hand Imperial rulers, index cards.
2. Document and spreadsheet software such as MS Word \ MS-Excel.
3. Microsoft Visio or another process design software like EdrawMax.
   ✓ Please submit work as a .jpg or Adobe .pdf to help instructor consolidate work quickly.
4. Weekly system models are provided to learn and apply theory to situations.
5. Blog, discussion chain, via slack, blackboard, or a student recommended.
6. Case studies to apply models too for assessment purposes.

**Required software:**

- Document and spreadsheet processing software.
- Microsoft VISIO (available through university here)
- Python; jupyter notebook classic home
  - Jupyter :: Anaconda.org

**Instructor availability and response time**

- Interaction with the instructor and classmates will occur regularly on Wednesdays and Fridays at 11:00 in room 209 SETA building.
- The instructor can be available before and after class from 8 AM till approximately 3 PM for in person discussion. Please request a day ahead.
- Communications will typically occur during class for the benefit of everyone.
- The class will use either slack or blackboard for discussion blogging.
- Please communicate with your instructor via b.hogan@snhu.edu at any time!

**Weekly Assignment Schedule**

Reading assignments, activities, and tasks are distributed at the start of week except for the first week on bh.github. Please reach out to the instructor for students interested in doing work ahead of schedule.

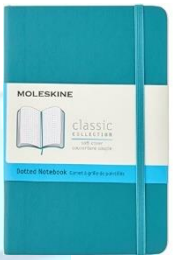
The coursework is challenging, accessible, and extremely useful. As such, the expectation is that work progresses naturally in an ongoing fashion driven by self-interest and self-motivation to guide your participation and creativity.

Assignments are due anytime on the day of the world clock day. If it's December 31st "somewhere" an assignment is on time.

**Use of Wikipedia for course referencing and information sharing:**

Any links to dictionary wikipedia is to help quickly build topic background and.or augment class lectures. Wikipedia **is not** an academic reference nor a substitute for quality textbook, et.al. learning media. **At any time a student may request academic approved learning media to further substantiate a topic.** A systems design and analysis custom model analysis library is on bh.github.

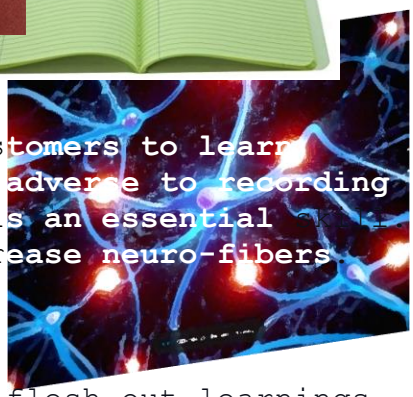
**A guide to effective analysis**




Taking notes is critical to success in business and scholastic pursuits.

**This course is lecture based.**

i. In systems analysis and design your interviewing customers to learn information and process details. Many people remain adverse to recording conversations in any medium so conversation recall is an essential [illegible]. Add to your class notes in another color pen to increase neuro-fibers.



**Good writing is good thinking.**

ii. Augment your class notes shortly after a lecture to flesh out learnings, context, and details. When something is not understood reach out to your instructor promptly to help your analysis skills advance organically. Some students opt to keep an experience journal and they can be very effective to reflect upon if you take a position in this field.

iii. Consider typing your notes or ideas with the computer screen blocked or blacked out. Doing so can stimulate your abstraction engine and flow. Word spelling/grammer matters but for now **IDEAs** generation is encouraged.

iv. Maintain a top 5 model list faciliate turn-it-in assignments.

v. Ask questions sooner than later! This course focuses on training on models, method, and ***course of action*** decision criteria for performing systems analyis and design. Clarify thinking a priori vs. a posteriori.

**Effective analysis items to do first:**

1. Write down any ideas about the assignment that come into your head when they arrive. Carry index cards, text yourself, keep a moleskin notebook and pencil. Don't put it off even for five minutes else "whooosh-vapor."

2. Carefully read every word of the assignment over^2 to make sure you consider what lectures, reading assignments, and models the assignment wants you to cogitate. Every assignment link is carefully curated to deepen your knowledge, eliminate internet research, and focus thinking.
   - Consider reviewing weekly assignment section and re-reading curated course content when your logic is amiss.
   - Week 5 will review research websites

3. If you assignment wants you to use class lectures, then study your lecture notes. Hopefully you have augmented your lecture notes shortly after the lectures to flesh them out and add context.

**Research Websites**

The internet is full of information *and* advertisements. Use your time wisely working with the following research sites. This list should be longer, but ResearchGate and Routledge cover the fantastic territory.

If you like what you find, I suggest setting up an account as each provides:

- Unscheduled ad-hoc resource emails of things you have queried.
- Building quality information you are more likely interested in.
- Coming to your inbox.

Once acquainted with quality information sources, it is challenging to remember the data.Trash you used to wade through, and you may never listen to commercials again.

Wikipedia offer value on many levels. From their random page to having Google translate a Chinese page that has exactly what you couldn't find on English pages. How extraordinary is that? Wikipedia helps to build quickly build content and context. Often it outperforms information quality from regular internet searches. Academics do not consider Wikipedia an academic website. Some academics may even argue its veracity p-e-r-i-o-d. Use Wikipedia to broadly engage a topic and topic references to get closer to source information.

Below are a few quality research website.

- Shapiro Library - Research Guides at Southern New Hampshire University (snhu.edu)
- Home Feed | ResearchGate, https://www.researchgate.net/
- Routledge - Publisher of Professional & Academic Books, https://www.routledge.com/
- Syracuse University Libraries - Research guides by subject
  - https://researchguides.library.syr.edu/
  - Syracuse also has outstanding librarians like MS. Brenna Helmstutler
    - https://researchguides.library.syr.edu/prf.php?account_id=152875
- Wikipedia - information for building context. Not considered an academic reference.

**Grading Guides**

Specific category instructions, grading rubrics, directions, and hand-it-in requirements are detailed in the assignment, the syllabus 2-3 weeks before due, and the up-to-date syllabus is posted every Monday to bh.github. Grades and feedback are within seven days. This course also contains non-graded activities to assist you in mastering the learning outcomes.

**Grade distribution***

| Category | # items | Points | Total points |
|---|---|---|---|
| Activities | 10 | 50 | 500 |
| Assessments | 5 | 20 | 100 |
| Quiz | 5 | 20 | 100 |
| Project 1 | 1 | 150 | 150 |
| Project 2 | 1 | 150 | 150 |
| | | Total | 1000 |

*based on class experience and expectations may be revised by 2nd Wednesday of week 2

**updated: 09.05.22, grading categories were finalized.

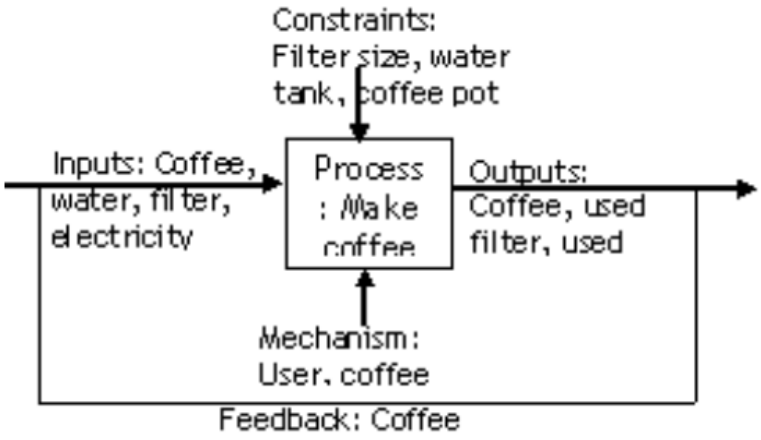
**University grading system**

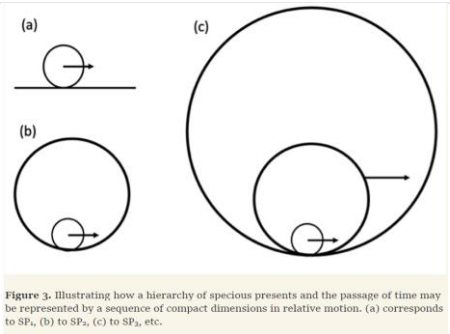
| Grade | Numerical Equivalent | Points |
|---|---|---|
| A | 93-100 | 4 |
| A- | 90-92 | 3.67 |
| B+ | 87-89 | 3.33 |
| B | 83-86 | 3 |
| B- | 80-82 | 2.67 |
| C+ | 77-79 | 2.33 |
| C | 73-76 | 2 |
| C- | 70-72 | 1.67 |
| D+ | 67-69 | 1.33 |
| D | 60-66 | 1 |
| F | 0-59 | 0 |
| I | Incomplete | |
| IF | Incomplete/Failure | |
| IP | In progress | |
| W | Withdrawn | |

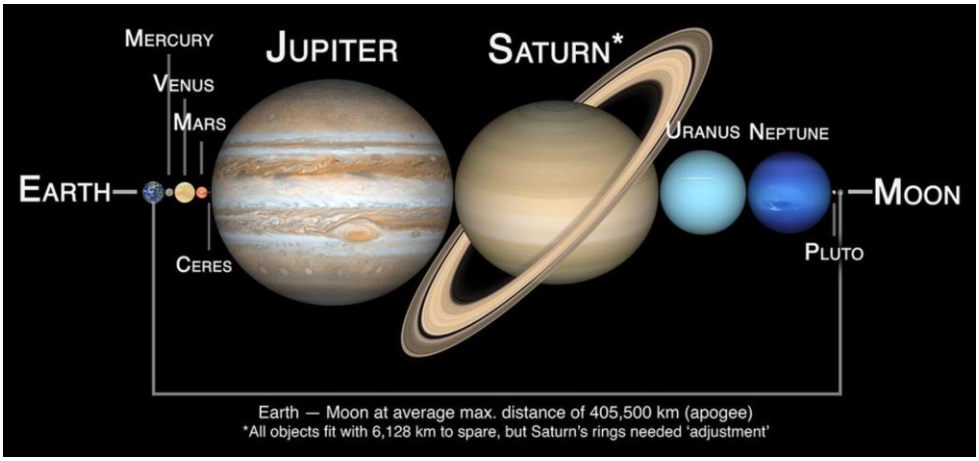
**Diversity, Equity, and Inclusion**

As indicated in SNHU's core value, the university is committed to "embrace diversity where we encourage and respect diverse identities, ideas, and perspectives by honoring difference, amplifying belonging, engaging civilly, and breaking down barriers to bring our mission to life."

In higher education, you're expected to think and engage critically while exhibiting a growth mindset. This mindset also encludes the practice diversity, equity, and inclusion (DEI) to provide the most transformative expereince for our students, faculty, and staff. Through our community, collaborative interactions, and respect we can walk towards a greater good for all persons through understanding and compassion.

| Week | Focus & Medium | Weekly Topic & Assignment |
|---|---|---|
| 1.1<br><br>X.x<br>X=1<br>.x=<br>2<br><br>1.1<br>---<br>---<br>-<br>1.1<br>=<br>Wk1<br>Day<br>1 | Reading<br><br>Podcast / Video<br>What is business process re-engineering?<br><br>**Run videos at speed 1.25**<br><br>What is a system?<br><br>**inputs outputs resources constraints**<br><br>IDEF0 Handout<br><br>**Assignment Request for 9/1**<br><br>Assignment Example page<br><br>Assignment example<br><br>**Model.1:IDEF0** | **Tilley, Ch 1.** Intro to Systems Analysis (free link)<br>• 1st chapter is FREE !, use above link<br>• Awareness & Design – Michael Hammer<br>o https://www.youtube.com/watch?v=9oxM5JV7H50<br>• Business Process Re-engineering explained -<br>o https://www.youtube.com/watch?v=v-jAf7L2Uak<br>▪ (10.5min/1.25=8.4min)<br>• IBM Business process Analysis (6.5min/1.25=5.2min)<br>o https://www.youtube.com/watch?v=1E6II2U1shY<br><br>Utilize your abstraction instinct while reading because the name "EMS" isn't important, but the concepts are.<br>https://www.niu.edu/ems/introduction/definition.html<br>1) definition is page 1 + 8 more pages using <next topic><br>2) The EMS model<br>3) Benefits of EMS<br>4) Examples of EMS<br>5) Systems approach<br>6) Concept diagram <focus and perform abstraction here><br>7) Processes, inputs, outputs<br>a. Example of: inputs, outputs, resources, constraints<br>8) Summary<br><br>• IDEFØ – Function Modeling Method – IDEF - website<br>o 2nd example of input, output, res., constraint<br><br>Select a process you love or dislike. Define its input, outputs, resources, and constraints (IORC). Logically what goes into the system is either consumed or comes out. Notate ALL you think of. Then, list 5 to 10 high-level activities performed by the IORC. Use paper and pencil and send me a picture **anytime** end of the day tomorrow. I am only asking for a max of 15 min to whip up. Please spend more if having fun. Thank you for considering this fast turnaround, as I will use all work submitted to start Friday's lecture. Perform work as a team as desired or convenient.<br>https://www.niu.edu/ems/introduction/constraints.html<br>  <br> |

| Week | Focus & Medium | Weekly Topic & Assignment |
|---|---|---|
| 1.2<br>X.x<br>X=1<br>.x=<br>2<br><br>1.2<br>---<br>---<br>--<br><br>Wk1<br>Day<br>2 | Overview<br><br>Podcast / Video<br>Run videos at speed 1.25<br><br>Focus / Goal<br><br>**Model.2:SWOT**<br><br>**Model.2:SWOT. Decision.Book**<br><br>**perception... cartoon**<br><br>  <br> | **Ch2: Overview**<br><br>o ch2 directs focus to business cases and how to identify a system for analysis. It augments learnings with factors contributing to project success/failure, purpose+ how.to a perform feasibility study, align priorities, and perform an preliminary investigation.<br><br>o Section 2.9, "Preliminary Investigation" (p.26), outlines your revolving course focus building skills and techniques in<br><br>o **Abstraction:** Which tool-kit model will help me quickly assess the situation asked of me?<br>▪ Quick assessments illustrate your ability to another party to grok salient factors, exercise skill by presenting a visual or data dashboard, and communicate back to manager or stakeholder.<br>▪ *Why should person X trust you*? Your responsible for building trust b/c it gets you access to more resources and what you need most, time.<br><br>o **Data:** What data collection strategy will help me access inputs, outputs, resources, and constraints?<br><br>o **Situational awareness:** After presenting initial response to business owner, what kind of model support, time, and resources do I have? Do I need?<br>✓ info.Tech resources usually can help get process metrics, source metric data, and any other information to meet your analysis goals.<br>✓ Data not what you need? Initiate estimation work.<br>✓ Today, operations often have project planning documents associated with the system workflow you should inspect while applying your abstraction work.<br>✓ **SWOT.** When in doubt fall back to basics to help assess a situation's status with strengths, weaknesses, opportunities, and threats(tilley.45, krogerus.tschappelerp.12).<br><br>**Perception & time <philosophy>:**<br>  <br><br>**Figure 3.** Illustrating how a hierarchy of specious presents and the passage of time may be represented by a sequence of compact dimensions in relative motion. (a) corresponds to $SP_1$, (b) to $SP_2$, (c) to $SP_3$, etc.<br>link physical space, perceptual space, and memory<br><br>o the course is not designed to dive deep into perception, time, and points of view. For systems modeling, learn to hone your logic representation skills ***and*** figure what you missed.<br>o Do individuals experience time similarly? Does time affect perception? Quality of shared information? |

| Week | Focus & Medium | Weekly Topic & Assignment |
|---|---|---|
| 1.2 | **Model.3: Swimlane**<br><br>note: additional resources are now on the model link page<br><br>**model.3.swimlane**<br><bh.github><br><how.to.doc><br><wikipedia><br><br>sorry! in github you have to download to get link to work or use them here<br><br>**Artemis I Space Launch System unmanned Moon mission**<br><br>  <br><br><br>**Swimlane Assignment request by 9/6 @6ish PM** | **Model.3.Swimlane**<br>**Purpose:** use horizontal or vertical gradating color bars to demarcate business lines illustrating system inputs, activities, and decisions connected with arrows.<br><br>**Assignment: Tilley Ch2 + Roughcut Swimlane diagram**<br>➢ Swimlanes no longer have notoriety as in 1993, and some IT professionals view them as a hindrance to what they need, that is, codified information.<br>➢ However, swimlanes are super at helping a senior manager or new employees quickly grasp what an organization is doing and how they are doing it.<br>➢<br>**"""You're the only resource, but you can have and do anything you want to do. Please include,"""**<br><br>➢ You're the only resource but can have, and do, anything you want to do. Please include,<br>✓ Square(ish) boxes to represent activities<br>✓ Lines to connect between activities<br>✓ Line arrowheads to show directionality between shapes<br>✓ Diamond(ish) boxes to represent decisions<br>✓ Text in squares + diamonds + on lines to detail happenings<br>✓ Optional: add a numeric index for each box & feel free to annotate "anyway" you like.<br><br>  <br><br><br>**Example:**<br>---<br>**Earth:Launch ↓**<br>---<br>**Mars: Fuel up -> Open solar flares 3 yrs ↓**<br>---<br>**Neptune: Turn into nano-space particulates**<br>---<br>❖ **Please email a .jpg, pdf however you build it.**<br>○ **File\SaveAs\often allows you select type .pdf**<br><br>**-->'The goal is to be more thoughtful of your logic'<--** |

| Week | Focus & Medium | Weekly Topic & Assignment |
|---|---|---|
| Wk2 Day 1 + Day 2<br><br>**2.1 + 2.2**<br><br>Wk2 Day 1 | Focus / Goal<br><br>**Assignment request to perform by EOD Thursday 9/8.**<br><br>Book Matthes, E. (2019), Python Crash Course, 2nd<br><br>Good luck! | **Ch5: Overview,**<br>Develop an understanding of object-oriented programming (OOP) by performing hands-on activities to learn the basics of Python strings, dictionaries, tuples, lists, sets, and functions supporting object-oriented programming methodologies.<br><br>Understanding the mechanics of info.TECH components can help quickly establish peer credibility. Taking apart hard drives and reading and writing code builds credibility with your future peers. It has also become somewhat necessary for systems design work because file sizes are large, and often regular spreadsheet apps can't open them.<br><br>Performing hands-on work in OOP will help ensure you can read dot.notation code format shared across many modern programming languages. It will help you write better search criteria in Google to find the information you need. It will also give you modern tools to extract, translate, and load (ETL) data you need for systems design exercises.<br><br>a) Reading: Tilley, Ch5.<br>b) Reading: Matthes, Alien Invasion, Ch12.<br>• Note: custom materials being provided replace Matthes chapters 1-11. Good to skim by priority: Ch:9,1,3,6<br>c) Install Python<br>**Please watch video (i). The best course of action is installation via anaconda b.c it is engineered to auto-fix MANY challenges. However, if done wrong, the 1st time may take => 2-3x more work/time to fix. You "do not" have to figure this out yourself so please reach out with any questions.**<br><br>**i.** 1.3M views on YouTube: Install Anaconda Python, Jupyter Notebook And Spyder on Windows 10 - YouTube<br>**ii.** good start place = jupyter notebook classic home<br>**iii.** Jupyter :: Anaconda.org<br><br>**Optional: online\cloud Jupyter Notebook:**<br>**I am 97% sure everything 'could' run in the new cloud JupyterLite Python.**<br>• https://jupyter.org/try-jupyter/lab/<br>• JupyterLite — JupyterLite 0.1.0-beta.12 documentation |
| | | |
| **Week** | **Focus & Medium** | **Weekly Topic & Assignment** |