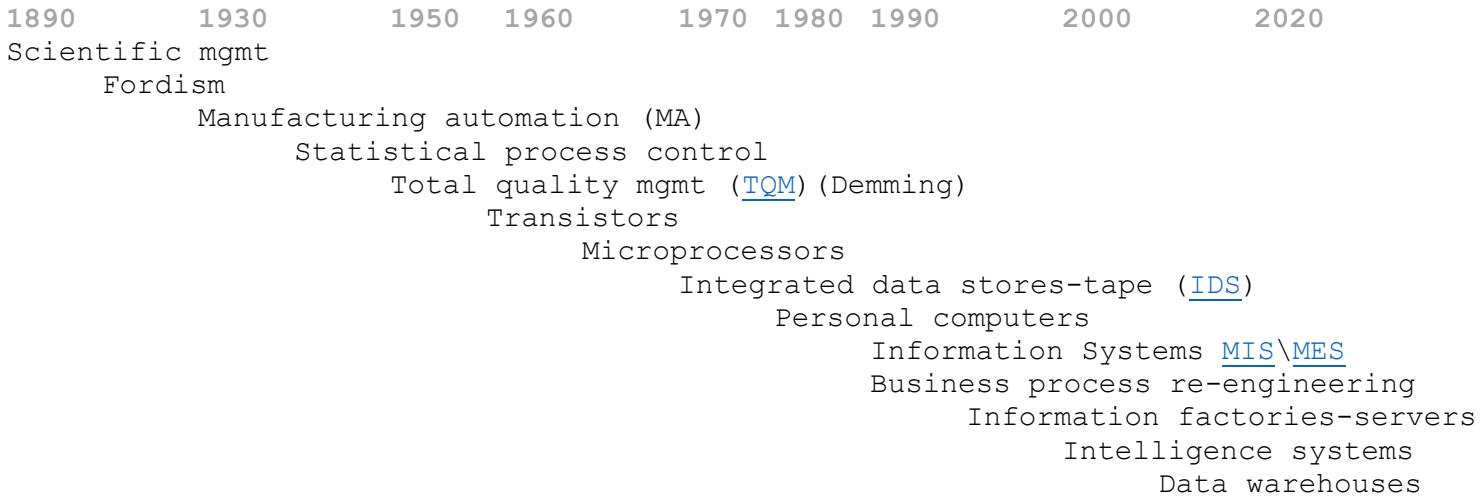
Southern New Hampshire University
Syllabus

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. The 1890s witnessed the formative pillars of speed, quality, and checklists thanks to the efforts of Frederick Taylor. His methods, and his stop-watches, are still in use^.



To perform systems analysis and design well, it helps to understand different process models alongside what operation managers need to see, what business leaders want to achieve, and what financiers insist on for sustainability. Information technology (IT) facilitates systems design efforts through codification. And now Artificial intelligence (AI) identifies gaps and untapped potential y pairing unseen connections through deep learning.

In the 1990s, MIT computer science professor Michael Hammer developed the management theory of business process re-engineering (**BPS**). Its tenets are process improvement, process re-design, and process re-engineering. **BPS** emphasizes the application of a holistic view of understanding how business objectives and processes are, or are not, actually aligned.

Question: have you stood in line in a coffee shop while the servers are busy doing lots of things but not helping you? IT online ordering has changed business operations and perhaps customer experience is not out of alignment with the new transaction processing model. Good design principals can help alleviate the potential of such unforeseen consequences.

In the 2020s, **BPS** is alive and well, as 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 its principles and focus remain profitable.
^Kanigel, R. The One Best Way. Viking.

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 viability vectors to constituents. **IT** is essential to this process. Learning how to apply BPS models will distinguish you and, more importantly, help you become a better systems designer by developing abstraction skills and looking ahead.

In BPS, an individual's skills express themselves in the selection, testing, and application of BPS models to frame situations. Abstracting systems involves applying process engineering skills to help orchestrate quality engineered improvements, new IT paradigms, and machinery to help augment and facilitate process change. Measuring change can be problematic, and this course is not focused on this topic. Suffice it to say, sometimes, only profit and stock price reflect a systemic impact.

Why does BPS impact wane? One answer is people and systems change. Life goes on, and designers and business champions retire, pulling the telltale wind out of the BPS sails. Or work was not well understood, leading to ineffective, haphazard outcomes. Developing skills in this arena will help you identify items of concern before they turn into a process nightmare.

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.

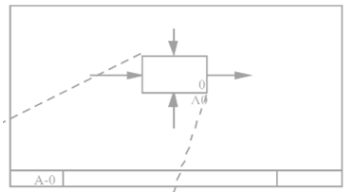
Tools and technologies to facilitate evidence formation include,
1. Document and spreadsheet software such as MS Word \ MS-Excel.
2. Microsoft Visio or similar flowcharting software.
3. Apply systems analysis and design principles by translating business and information structures into object models, systems requirement specifications, and.or implementation plans.
4. Evidence of skill evaluated in Harvard Bus. School case studies.

The coursework is challenging, accessible, and extremely useful. As such, the expectation is your work will progress naturally in an ongoing fashion driven by self-interest and self-motivation. If a topic or assignment does not strike a nerve, please reach out to discuss it with the instructor.

Students should focus effort on learnings MOST meaningful to their goals.

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 any endeavor. In this course, information is assembled from various sources to minimize purchase costs. The instructor provides online references to the extent possible and only recommends quality materials. 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 Tilley from instructor .

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
- ***Instructor has 2 textbook copies students may use and share for knowledge readings.***

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

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 attempt to submit .jpg or Adobe .pdf to help instructor consolidate work quickly.
4. Learn hands-on by applying weekly system models and theory to situations.
5. Blog, discussion chain, via slack, blackboard, or a student recommended.
6. Case studies to apply models too for assessment purposes.
7. A systems design and analysis custom model library avail. at bh.github.

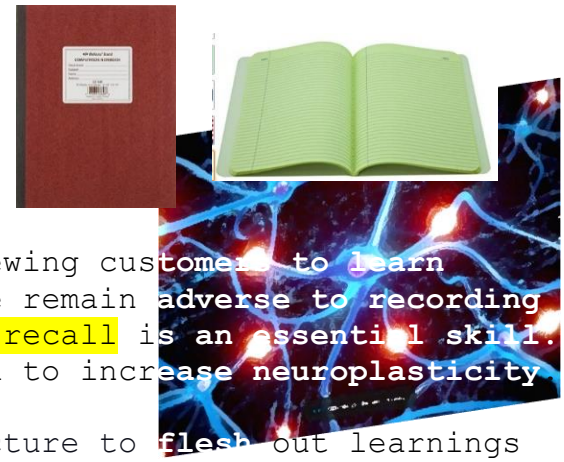
Required software

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

Instructor availability and response time

- Communications will typically occur during class for the benefit of everyone.
- 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.
- The class may use slack or blackboard for discussion blogging.
- Please communicate with your instructor via b.hogan@snhu.edu at any time!

A guide to effective analysis



This course is lecture based.

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

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 skill. Add to your class notes in another color pen to increase neuroplasticity.

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. They can be very helpful to reflect upon if you secure employment 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 flow. Word spelling/grammar matters. But, for now, focus on **IDEA** generation and design. The Victorians have 1000s of well written texts nobody reads. Herman Melville, a Victorian, wrote about a **process --** whale hunting.

iv. Maintain a top 5 model list to facilitate and focus assignment work.

v. Ask questions – right away. This course focuses on engineered ***courses of action***. Think ahead, clarify your thinking a priori vs. a posteriori.

Good writing is good thinking.

Effective analysis items to do first:

1. Write down any ideas about assignment and models 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 2x to make sure you consider what lectures, readings, and models your asked to consider. Carefully cogitate an approach. Every assignment link is curated to deepen knowledge, focus thinking, AND eliminate internet research.
   - Consider reviewing weekly assignment section and re-reading curated course content when your logic is amiss.
   - Weeks between 4-7 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 add context.

Research Websites
The internet is full of information *and* advertisements. Use your time wisely working with the research sites below. 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're 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.

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

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.
- Use Wikipedia to broadly engage a topic and topic references to get closer to source information.
- Wikipedia **is not** an academic reference nor a substitute for quality academic media.
- Some academics argue Wikipedia's its veracity p-e-r-i-o-d.
- **At any time a student may request academic approved learning media to further substantiate a topic.**

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 critically while exhibiting a growth mindset. This mindset includes the practice diversity, equity, and inclusion (DEI) to provide the most transformative experience for yourself, peers, faculty, and staff.

Collectively we are an organize learning mechanism. Through our community, collaborative interactions, and respect we can walk towards a greater good for all persons through understanding and compassion.

SNHU Handbook and University General Guidelines

- https://snhu.sharepoint.com/sites/CAMPUSACADEMICS
- Use your internal resources to access the student handbook detailing all features of attendance, academic honesty, et. al.
- Perform authentic work.
  - SNHU requires all students to adhere to high standards of integrity including avoidance of plagiarism and cheating.
- SNHU adheres to copyright provisions of the Copyright Act.
- See handbook when considering withdrawal or need information on anything else.

ADA/504 Compliance Statement

SNHU is dedicated to providing equal access to individuals with disabilities in accordance with Section 504 of the Rehabilitation Act of 1973 and with Title III of the AMericans with Disabilities Act (ADA) of 1990, as amended by the American's with Disabilities Act Amendments Act (ADAAA) of 2008.

SNHU prohibits unlawful discrimination on the basis of disability and takes action to prevent such discrimination by providing reasonable accomondations to eligible individuals with diabilities. The university has adopted this policy to provide prompt and equitable resolution of compliants regarding any action prohibited by Section 504, the ADA, and the ADAAA.

For any questions about support services, documentation guideliness, general disability issues, or pregnancy accomodations please email wellness@snhu.edu. See my.snhu.edu and select the wellness tab. And the campus accessbility center at cac@snhu.edu.

For anything regarding discrimination please contact your school professionals right away at the emails above and.or see the Disability and Accessbility Services at https:\\my.snhu.edu

Student Support Resources including Tutoring and Instructional Support

- It is really amazing to have a careteam@snhu.edu to help students with assitance of all sorts.
- For instructional support email instructionalsupport@snhu.edu.
- For in class tech support call 603.645.9615

Other Key Resources

- https://snhu.sharepoint.com/sites/thesource
- https://snhu.sharepoint.com/sites/CAMPUSACADEMICS

Grading Guides

- Weekly activities and assignments are posted in this doc Friday evening to to bh.github.
- Specific category instructions, grading rubrics, directions, and hand-it-in requirements are detailed in the assignments.
- 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	

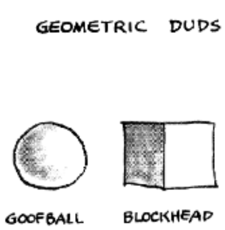
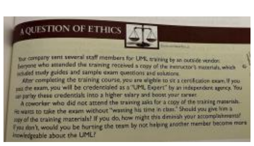
Weekly Assignment Schedule

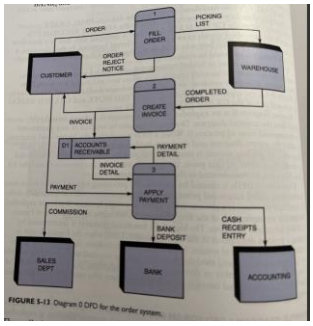
Reading assignments, activities, and tasks are distributed at the end of week except for the first week on bh.github. For students interested in doing work ahead of schedule please contact instructor. The instructor advocates for courseload strain reduction to help ensure good thinking.

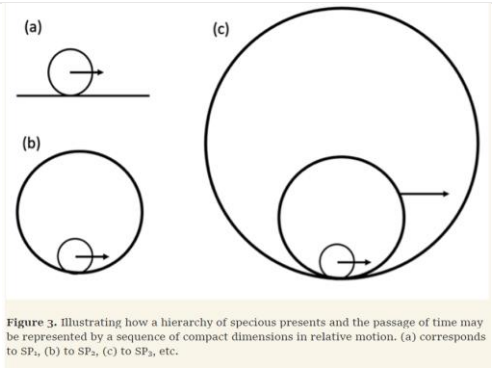
Assignments are due anytime on the day of the world clock day. If it's December 31st "somewhere" an assignment is on time.

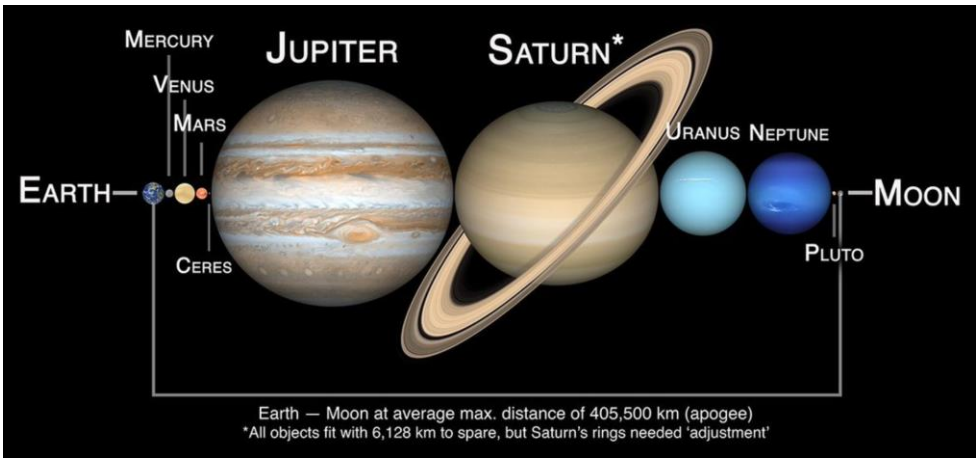
Wk	Focus & Medium	Weekly Topic & Assignment
x		

Weekly Assignments (1 or 2 pages per week as indicated on left)

Wk	Focus & Medium	Weekly Topic & Assignment
3 **9/12** **-** **9/17**	**Focus** **Overview** **Reading Tilley, Ch6 entire chapter**  **ethics discussion text tilley p196**  A QUESTION OF ETHICS	• Perform hands-on activities in Python to learn object-oriented programming(OOP) working with strings, dictionary, tuple, list, set, function, and objects. • As a team, outline system and code objects to simulate system analysis exercises. • Code is provided for you to re-type and learn. • Use cases will grow your confidence. Tilley details old and new techniques for systems modeling, like business process modeling (BPM) (ch1-2), data flow diagrams (DFD) (ch4), and data and process modeling (ch5). Exercises focus on techniques but with little substantiated in the field outcomes. Python hands-on OOP work will replicate varying Tilly processes, such as pg 155-163, with Python data objects (strings, list, etc.), building knowledge of what programmers do. It connects you closely to realistic outcomes of systems analysis and design work. And position you to learn quickly any systems anal. method. A final benefit of the Python OOP work is today's systems analysis, and design do a lot of work extracting and translating information. The result is challenging, but you will know more about it and how not to perform senseless internet searches looking for ideas.approaches to tackle it. **Tilley, Ch6: Overview** • The chapter does an excellent job detailing the components with little to no "geometric duds." • Notice by end of chapter everything you have done to this point is repeated here. Curious! **Python Training:** • By Wed you will be provided with customized training to support this work. It will have all that you need. • Python crash course link below is good to reference and see examples for lists, loops, and similar. Feel free to dig into. • Real world python is super fun training exercises. **Other reference materials** • Matthes, E. (2019), Python Crash Course • Real world Python – FUN training examples • Matthes, Alien Invasion, Ch12. o Note: custom materials being provided replace Matthes chapters 1-11. Good to skim by priority: Ch:9,1,3,6 **Nothing due / Reading Only!** Class will start off discussing pg 196 ethics case study so please simply have your thoughts organized on that.

WK	Focus & Medium	Weekly Topic & Assignment
2.2 **9/9**	Focus / Goal lecture notes  **Assignment** **A. Reading** ○ **Tilley,Ch5** **B. Install Python** **Good luck w install!**	**Goal:** wrap-up historical influence of business process reengineering • **lecture notes:** BPS's evolution with invention of machine learning and data warehousing. The institutionalized game changer of Amazon's kiva robotics **Ch5: data and process modeling** • data flow diagramming uses mostly an agreed upon set of symbols to represent processes, data flows, data stories and entities like transactions or physical items like a deposit ticket and goods. • the goal is to represent the information to be encoded by database programmers and develop apps that negotiate the transactions. • this class is less concerned on formality of box symbols but use circles to start and end a process, diamonds for decisions and rectangles for activities. • pg 153, agreed! try not to cross lines when building. • pg 155-159 does a nice job representing an actual system we could easilly and realistic code for on hands-on pyton activities. • Unlike the book are goal is not to "write" about doing this work but actually code it using standard python data objects of lists, strings, dictionaries, tuples, and sets. a) **Reading:** Tilley, ch5, pgs 144-163 b) **Install Python** • **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.** **i.** 1.3M views on YouTube: Install Anaconda Python, Jupyter Notebook And Spyder on Windows 10 - YouTube **ii.** good start place = jupyter notebook classic home **iii.** Jupyter :: Anaconda.org **Python cloud** • **online\cloud Jupyter Notebook:** • online alternative – works great ! • https://jupyter.org/try-jupyter/lab/ • JupyterLite — JupyterLite 0.1.0-beta.12 documentation

Wk	Focus & Medium	Weekly Topic & Assignment
2.1	Overview Podcast / Video **Run videos at speed 1.25** Focus / Goal **Model.2:SWOT** **Model.2:SWOT. Decision.Book** **perception... cartoon**  	**Ch2: Overview** 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. o Section 2.9, "Preliminary Investigation" (p.26), outlines your revolving course focus building skills and techniques in o **Abstraction:** Which tool-kit model will help me quickly assess the situation asked of me? ▪ 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. ▪ *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. o **Data:** What data collection strategy will help me access inputs, outputs, resources, and constraints? o **Situational awareness:** After presenting initial response to business owner, what kind of model support, time, and resources do I have? Do I need? ✓ info.Tech resources usually can help get process metrics, source metric data, and any other information to meet your analysis goals. ✓ Data not what you need? Initiate estimation work. ✓ Today, operations often have project planning documents associated with the system workflow you should inspect while applying your abstraction work. ✓ **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). **Perception & time <philosophy>:**  **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. link physical space, perceptual space, and memory 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. 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 IT Order Harmonization Example model.3.swimlane <bh.github> <how.to.doc> <wikipedia> sorry! in github you have to download to get link to work or use them here Artemis I Space Launch System unmanned Moon mission  Swimlane Assignment request by 9/6 @6ish PM	**Model.3.Swimlane** **Purpose:** use horizontal or vertical gradating color bars to demarcate business lines illustrating system inputs, activities, and decisions connected with arrows. **Assignment: Tilley Ch2 + Roughcut Swimlane diagram** ➢ 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. ➢ 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. ➢ **"""You're the only resource, but you can have and do anything you want to do. Please include,"""** ➢ You're the only resource but can have, and do, anything you want to do. Please include, ✓ Square(ish) boxes to represent activities ✓ Lines to connect between activities ✓ Line arrowheads to show directionality between shapes ✓ Diamond(ish) boxes to represent decisions ✓ Text in squares + diamonds + on lines to detail happenings ✓ Optional: add a numeric index for each box & feel free to annotate "anyway" you like.  **Example:** **Earth:Launch ↓** **Mars: Fuel up -> Open solar flares 3 yrs ↓** **Neptune: Turn into nano-space particulates** ❖ **Please email a .jpg, pdf however you build it.** ○ **File\SaveAs\often allows you select type .pdf** **-->'The goal is to be more thoughtful of your logic'<--**

Week	Focus & Medium	Weekly Topic & Assignment
1.1	Reading Podcast / Video What is business process re-engineering? **Run videos at speed 1.25** What is a system? **inputs** **outputs resources** **constraints** IDEF0 Handout **Assignment Request for 9/1** Assignment Example page Assignment example **Model.1:IDEF0**	**Tilley, Ch 1.** Intro to Systems Analysis (free link) • 1st chapter is FREE !, use above link • Awareness & Design – Michael Hammer o https://www.youtube.com/watch?v=9oxM5JV7H50 • Business Process Re-engineering explained - o https://www.youtube.com/watch?v=v-jAf7L2Uak ▪ (10.5min/1.25=8.4min) • IBM Business process Analysis (6.5min/1.25=5.2min) o https://www.youtube.com/watch?v=1E6II2U1shY Utilize your abstraction instinct while reading because the name "EMS" isn't important, but the concepts are. https://www.niu.edu/ems/introduction/definition.html 1) definition is page 1 + 8 more pages using <next topic> 2) The EMS model 3) Benefits of EMS 4) Examples of EMS 5) Systems approach 6) Concept diagram <focus and perform abstraction here> 7) Processes, inputs, outputs a. Example of: inputs, outputs, resources, constraints 8) Summary • IDEFØ – Function Modeling Method – IDEF - website o 2nd example of input, output, res., constraint 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. https://www.niu.edu/ems/introduction/constraints.html