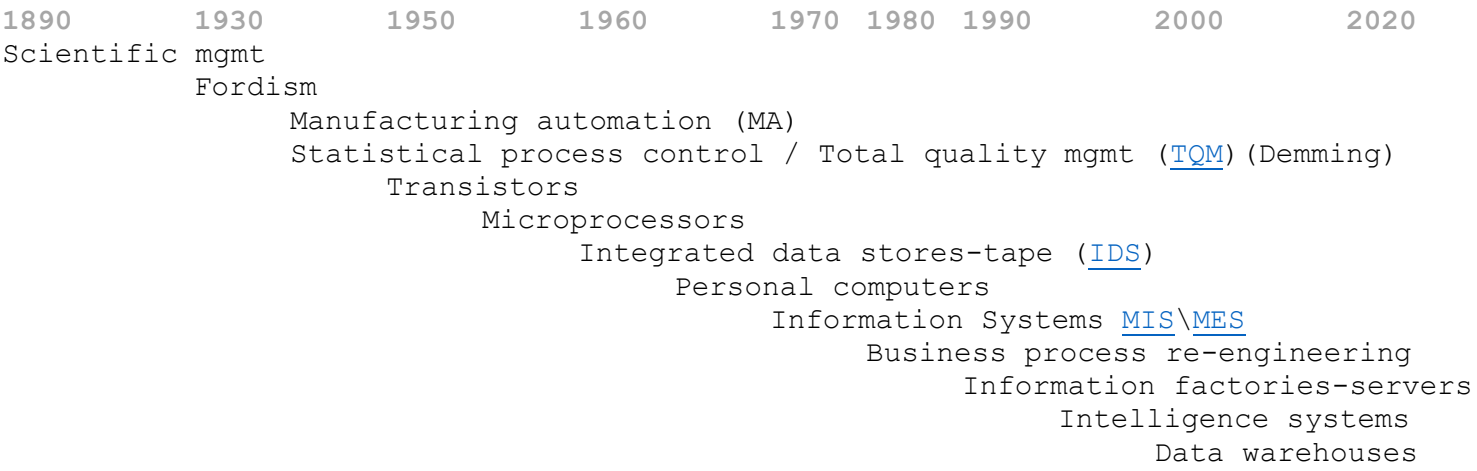
IT.304: Systems requirements and implementation planning
Course Prerequisites: IT.200, QSO.340
Location: on-ground, SETA, 209, Wednesday and Friday at 11:00 – 12:15

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* on for sustainability. Information technology (**IT**) databases are the facilitators of systems analysis codifying everything, and artificial intelligence (**AI**) helps realize unknown potentiality never achieved by Fordism, IDS, and TQM.

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

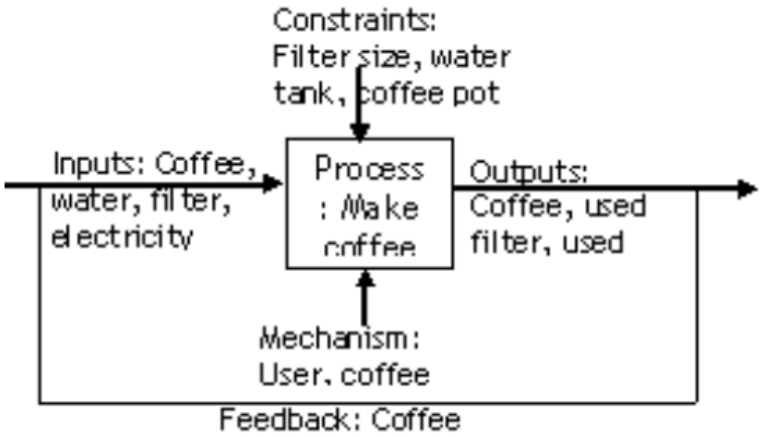
Reading assignments, activities, and tasks are distributed at the start of week except for the first week on bh.github. Please reach out to the instructor for students interested in doing work ahead of schedule.

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.

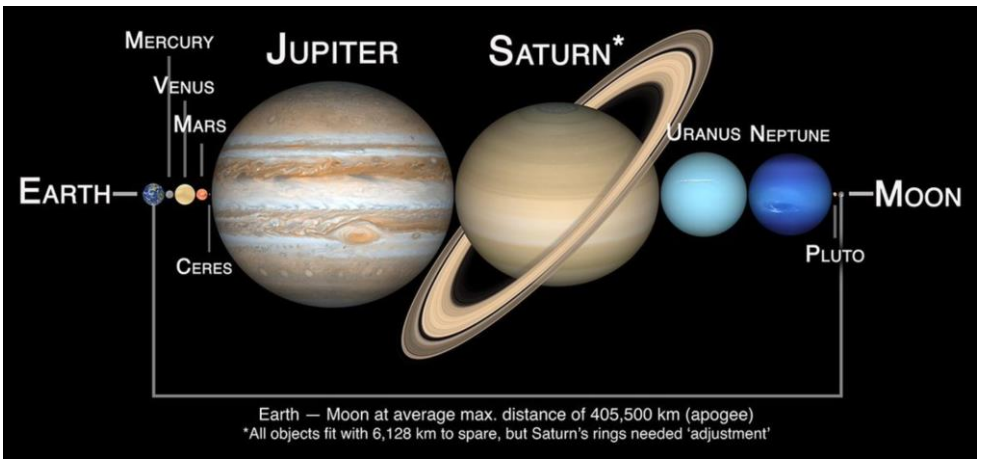
Assignments are due anytime on the day of the world clock day. Hence, if it is December 31st "somewhere" an assignment isn't late.

Wikipedia course referencing

A systems design and analysis custom model library is provided on bh.github. 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 subsitute for quality textbook, et.al. learning media. **At any time a student may request academic approved learning media to further substantiate a topic.**

Week	Media Type/Focus	Topics & Assignments
1.1 X.x X=1 .x=2 1.1 ---- --- 1.1= Wk1 Day1	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 <link **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 

Week X.x X=wk .x=day	• **Media Type** • **Focus/Goal** • **Assignment**	**Topics & Assignments**
1.2 X.x X=1 .x=2 1.2 ---- ---- Wk1 Day2	Overivew Podcast / Video Run videos at speed 1.25 Focus / Goal **Model.2:SWOT** **Model.2:SWOT.Decision.Book** **Model.3: Swimlane**	**Ch2: Overview** o ch2 directs focus to busines 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 **Siutational 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 model**@bh.github. When in doubt fall back to basics to help assess a situation's status with strengths, weaknesses, opportunities, and threats. (tilley.p.45, krogerus.tschappelerp.p12). **Model.3.Swimlane** **Purpose:** use horizontal or vertical gradating color bars to demarcate business lines illustrating system inputs, activities, and decisions connected with arrows.

Week X.x X=wk .x=day	• Media Type • Focus/Goal • Assignment	Topics & Assignments
1.2	Model.3: Swimlane note: additional resources are now on the model link page 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 Swimlane Assignment request by 9/6 @6ish PM	**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 activites ✓ 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.  For example: --- Earth:Launch ↓ --- Mars: Fuel up -> Open solar flares 3 yrs ↓ --- Neptune: Turn into nano-space particulates --- ❖ **Please email a picture however you build it.** ❖ **The goal is to be more thoughtful of your logic.**

Week X.x X=wk .x=day	• **Media Type** • **Focus/Goal** • **Assignment**	**Topics & Assignments**
Wk2 **Day1** **+** **Day** **2** **2.1** **+** **2.2** **Wk2** **Day1**	Focus / Goal **Assignment request to perform by EOD Thursday 9/8.** Book Matthes, E. (2019), Python Crash Course, 2nd Good luck!	**Ch5: Overiew,** 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. 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. 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. a) Reading: Tilley, Ch5. b) Reading: Matthes, Alien Invasion, Ch12. • Note: custom materials being provided replace Matthes chapters 1-11. Good to skim by priority: Ch:9,1,3,6 c) 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 **Optional: online\cloud Jupyter Notebook:** **I am not 97% sure everything 'coud' run in the new cloud JupyterLite Python.** • https://jupyter.org/try-jupyter/lab/ • JupyterLite — JupyterLite 0.1.0-beta.12 documentation

Week	• Media Type • Focus/Goal • Assignment	Topics & Assignments
3.1	model.4. Object.Model <bh.github> <how.to.doc> <wikipedia>	

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.

I love Wikipedia on many levels. From their random page to finding things you want to be written in Chinese and using google to translate the Chinese Wikipedia page. Indeed extraordinary time to live in. Keep in mind that it helps build content and context, but academics consider it only information and not an academic reference. You can use Wikipedia references to get closer to the source and go from there.

- 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/
  - this is an incredible link to find high-quality location by subject
- Wikipedia - information for building context. Not considered an academic reference.

Assignment Links

Week 1
Week 2
Week 3

Grading Guides

Specific activity directions, grading guides, posting requirements, and additional deadlines are provided in syllabus, assignment, and bh.github. Grades and feedback are within seven days of a submitted assignment.

Grade distribution*

Assignment category	# items	Points	Total points
Discussions	5	30	150
Quiz	8	25	200
Activities	5	50	250
Project 1	1	250	250
Project 2	1	150	150

Total	1000

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

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	