

USC Iovine and Young Academy

*Arts, Technology and the Business
of Innovation*

IDSN 534: Fueling Business with Exponential Technologies

Units: 2

Term, Day, Time: Summer 2023, Weds 5:15-7:20 pm

Location: Zoom

Instructor: Chris Swain

Office Hours: By Appointment

Contact Info: cswain@usc.edu, 310 403 0798

IT Help:

<https://uscedu.sharepoint.com/sites/IYASStudent/SitePages/IT-Resources.aspx>

Hours of Service: 9 a.m. – 6 p.m.

Contact Info: iyahelp@usc.edu

USC Technology Support Links

[Zoom information for students](#)

[Blackboard help for students](#)

[Software available to USC Campus](#)

Technology has advanced more in the last thirty years than in the previous two thousand. The exponential increase in advancement will only continue.

- Niels Bohr

Course Description

Exponential technologies are fueling innovation in the world at an accelerating rate. Examples include: artificial intelligence, robotics, synthetic biology, decentralized finance, 3D printing, network sensors, and others. In this course we get our hands dirty breaking down the 6Ds of Exponential Technologies that enable them to intersect with other fields and scale.

Topics covered:

- Overview of Exponential Thinking
- Direction vs Intersectional Innovation
- Law of Accelerating Returns
- Network Effects
- How to map intersections so your idea is not too early and not too late
- Techniques including “How might we...” ideation methodology
- Tools for pursuing exponential projects if you are not an engineer

This course educates students on converging trends in technology and how to formulate winning venture concepts from the flashpoints. Class will include multiple guest speakers from industry.

Students will do written analyses of different verticals and develop concepts for viable near-future applications.

Key Learning Objectives

By the end of the course students will be able to...

1. Recognize exponential curves and nested s-curves. Use the 6Ds to analyze and predict disruption.
2. Project where exponential technologies could intersect in the near term and mid term
3. Ideate business opportunities at the intersection of exponential technologies in the near term (1-3 years) and mid term (4-10 years)
4. Articulate potential impacts of horizon technologies in the long term (5 years+)
5. Plan for ethical, moral, legal, and political implications of exponential technologies

Detailed Objectives and Outcomes

By the end of the course students will also be able to...

1. Identify business opportunities using first principles thinking
2. Work in multidisciplinary teams to develop tangible concepts based on opportunities identified
3. Operate with proficiency the software tools Figma and Figma to communicate concepts visually
4. Operate with proficiency Google Sheets to develop guerilla financial pro formas
5. Generate designs for Visual Value Propositions, One Page Designs, and Competitive Landscape charts with proficiency
6. Develop storytelling skill using visuals, numbers and personal charisma
7. Create work that adds to your portfolio in a meaningful way

Prerequisites:

None

Recommended Reading

Books:

- *The Future is Faster than you Think: How Converging Technologies are Transforming Business, Industries, and Our Lives*, by Peter Diamandis and Steven Kotler

- *Where Good Ideas Come From*, by Steven Johnson
- *Zero to One*, by Peter Theil
- *The Inevitable: Understanding the 12 Technological Forces that Will Shape Our Future*, Kevin Kelly
- *The Sentient Machine*, by Amir Husain

Podcasts:

- This Week in Startups
- Acquired
- The A16Z Podcast
- Bankless
- Bio Eats the World

Blogs:

- <http://trends.vc>
- <https://www.ycombinator.com/rfs/>
- <https://balajis.com/>
- <https://www.kurzweilai.net/>
- <https://su.org/>
- <https://kk.org/>

Course Notes

Lecture slides will be posted to the 2U Digital Campus for each session. Assignment specs will appear at the end of the slides and on the course Assignments page.

Technological Proficiency and Hardware/Software Required

Students must have access to the following:

- **Laptop Computer** with the following software:
 - Zoom (free with your usc.edu email address)
 - Adobe Creative Cloud (see purchasing details below)
 - Miro (free, browser-based)
 - Figma (free, browser-based)
 - Google Docs (free, browser-based)

USC Technology Rental Program

The university realizes that attending classes online and completing coursework remotely requires access to technology that not all students possess. If you need resources to successfully participate in your classes, such as a laptop or internet hotspot, you may be eligible for the university's equipment rental program. To apply, please submit an [USC Technology Rental Program Application](#) .

HOW TO PURCHASE SOFTWARE AT THE DISCOUNTED ACADEMY RATE

For classes that require them, the following software are available for purchase **online** through the USC Iovine and Young software catalog at the Academy discounted rate:

Software	IYA Short-Term License at USC Bookstore
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Adobe Creative Cloud	\$70 2022–2023 annual license
Apple Logic Pro	\$35 semester licenses
Solidworks	\$35 semester license
Apple Final Cut Pro	\$35 semester license

To purchase:

- Visit: <https://commerce.cashnet.com/IOVINE>
- Select the software license(s) you would like to purchase by clicking “View Details” or the software title, and make your purchase
- You will receive an order confirmation receipt at the email address you provided
- You will be notified by email when the software license has been activated

If you have any questions about this process, please do not hesitate to contact Academy IT Support at iyahelp@usc.edu.

Description and Assessment of Assignments

Read, Reflect, Discuss Assignments – you will read articles and white papers provided by the instructor and summarize into a) bullet points and b) a 250 word distillation of the piece. See the readings listed by week in the Course Schedule section below. These submissions will be used to lead a rigorous in-class discussion..

Personal Explorations – you will post thoughts to a Google Doc provided by the instructor on topics related to skills you seek to build personally and how you can leverage your interests and aptitudes in a world that will be in constant change for the rest of your career.

Vertical Analysis – you will conduct deep dive analysis (alone or in collaboration with a classmate) of an exponential technology vertical and concepts within those verticals. You will use web resources and assessment tools provided by the instructor to tear down verticals into component parts. You will present your analysis in a format that includes: Teardown, Competitive Landscape, Challenges, and Opportunities. Emphasis will be placed on showing tangible examples and data (as opposed to high concept materials). You will field questions from the instructor and your classmates.

Near Future Mapping Boards – you will work in small teams to generate Miro boards that map the directional path of innovation technology verticals and you will show visually how verticals could intersect in the near term and mid term. You will create competitive landscapes at the intersections using data from sites such as Crunchbase, Angellist, Republic.co, Product Hunt, Trends.vc and others. You will be challenged to create a stack ranked list of 10+ products and services that may emerge at the intersections on your map.

Term Paper and Summary Presentation – working alone or in pairs you will use what you have learned in the first 11 weeks of the semester to generate a 7-12 page written analysis of an exponential technology vertical and one or more venture opportunities in the vertical. The paper will be a scholarly research effort that includes:

- Abstract
- Overview of the State of the Vertical
- Analysis of Low Hanging Fruit for Intersectional Innovation
 - 1-3 Year Horizon

- 3-5 Year Horizon
- Venture Concept
 - Problem Statement
 - Solution Statement
 - Competitive Landscape
 - Guerilla Financial Pro Forma

Students will deliver a 7 minute verbal Summary Presentation of their Term Paper during Finals Week.

Exams

The course includes two exams:

- 1) Mid-Term – short essay and multiple choice questions about information presented in the readings and lectures from Week 1 to Week 7.
- 2) Final – same format as the Mid-Term but covering Weeks 9-15

Participation:

Students are expected to actively participate in this course. In an online forum, participation includes:

- Careful reading and viewing of assigned materials by the date due
- Regular, substantive contributions to discussions
- Active engagement with online content
- On-time attendance and full attention in synchronous sessions
- Significant collaboration with classmates and teammates

Students should notify the instructor in advance if they are unable to attend class. Those unable to attend will be required to review the online recording for the session missed and submit thoughtful feedback to the instructor.

Grading Breakdown

	Points	% of Grade
Read, Reflect, Discuss Assignments	150	15%
Personal Explorations	50	5%
Vertical Analysis	150	15%
Exams x2	200	20%
Near Future Mapping Boards x2	200	20%
Term Paper and Summary Presentation	250	25%
TOTAL	1000	100%

Grading Scale

Course final grades will be determined using the following scale

A	95-100
A-	90-94
B+	87-89
B	83-86
B-	80-82
C+	77-79
C	73-76
C-	70-72
D+	67-69
D	63-66
D-	60-62
F	59 and below

Assignment Submission Policy

All assignments are due at the date and time specified in the syllabus. Projects that are more than 24 hours late will receive a 50% deduction in points. Projects that are more than 7 days late will receive 0 points. Be sure to check Blackboard if you have to miss a class. You are responsible for any materials presented and assignments made even if you are not in class that day.

Grading Timeline

You will receive grades for classroom quizzes, check-ins, labs, projects and other assignments within one week of submission.

Academy Attendance Policy

The Academy maintains rigorous academic standards for its students and on-time attendance at all class meetings is expected. Each student will be allowed two excused absences over the course of the semester for which no explanation is required. Students are admonished to not waste excused absences on non-critical issues, and to use them carefully for illness or other issues that may arise unexpectedly. Except in the case of prolonged illness or other serious issue (see below), no additional absences will be excused. Each unexcused absence will result in the lowering of the final grade by $\frac{1}{3}$ of a grade (e.g., an A will be lowered to A-, and A- will be lowered to a B+, etc.). In addition, being tardy to class will count as one-third of an absence. Three tardies will equal a full course absence.

Students remain responsible for any missed work from excused or unexcused absences. Immediately following an absence, students should contact the instructor to obtain missed assignments or lecture notes

and to confirm new deadlines or due dates. Extensions or other accommodations are at the discretion of the instructor.

Automatically excused absences normally may not be used for quiz, exam or presentation days. Using an excused absence for a quiz, exam or presentation, such as in the case of sudden illness or other emergency, is at the discretion of the instructor.

In the case of prolonged illness, family emergencies, or other unforeseen serious issues, the student should contact the instructor to arrange for accommodation. Accommodation may also be made for essential professional or career-related events or opportunities. Additionally, students who need accommodations for religious observations should provide advanced notice to instructors and student athletes should provide Travel Request Letters. All accommodations remain at the discretion of the instructor, and appropriate documentation may be required.

Fall 2022 addendum:

- Unless students provide an accommodation letter from USC's Office of Student Accessibility Services (OSAS) or a letter from IYA Student Services detailing visa or travel restrictions, attendance and active participation is expected in the classroom. Any student with such accommodations should submit their accommodation document to the instructor as soon as possible to discuss appropriate accommodations. Either classroom recordings or live remote access to the class via Zoom will be provided.
- Students who are experiencing illness should not attend class in person. Please inform the instructor in advance of any class sessions that you can't attend for medical reasons, and accommodations will be arranged to view recorded lectures and submit alternatives to any missed class participation. Students will not be penalized for not attending class in person under these circumstances.
- In the event that you find yourself experiencing COVID-19 related symptoms, in keeping with university recommendations, you should Stay home! This is the best way to prevent spreading COVID-19 as supported by scientific evidence; Please do not come to an in-person class if you are feeling ill, particularly if you are experiencing symptoms of COVID-19.

Iovine and Young Hall Cleanout

The Academy is unable to store student projects and materials beyond the end of the semester. Students must remove all projects and personal materials from the Creators Studio, lockers/locker room, and other classrooms by the end of each semester. **All projects and materials left in Iovine and Young Hall will be discarded two days after final exams end. No exceptions.**

Classroom norms

Students are encouraged to actively engage during class zoom sessions both verbally and via chat. Students are also encouraged to post questions and thoughts via the IYA course Slack channel.

Zoom etiquette

Students are encouraged to participate in course sessions with their web camera on. Instructors will enable screenshare to allow students to share screens in the main zoom session and in breakout rooms.

Synchronous session recording notice

All class sessions will be recorded via Zoom. Zoom recordings will be available via the 2U Digital Campus.

Sharing of course materials outside of the learning environment

USC has a policy that prohibits sharing of any synchronous and asynchronous course content outside of the learning environment.

SCampus Section 11.12(B)

Distribution or use of notes or recordings based on university classes or lectures without the express permission of the instructor for purposes other than individual or group study is a violation of the USC Student Conduct Code. This includes, but is not limited to, providing materials for distribution by services publishing class notes. This restriction on unauthorized use also applies to all information, which had been distributed to students or in any way had been displayed for use in relationship to the class, whether obtained in class, via email, on the Internet or via any other media. (See Section C.1 Class Notes Policy).

Course Schedule: A Weekly Breakdown

Week	Lecture	Read, Reflect, Discuss Assignment to be Discussed	Lab	Assignment Given
1	Foundations of Exponential Thinking and the Law of Accelerating Returns	n/a	A) Personal Reflection 1 of 3: What Problem in the World Are You Uniquely Positioned to Solve B) AI Prompt Engineering 101	
2	Tools for Analysis: The 6Ds and Nested S-Curves of Exponentials	The 6Ds of Exponentials Worksheet	Nested S Curves	Vertical Analysis – All Students Write About Topics of Interest (due Week 4)
3	Global Grand Challenges: Energy, Environment, Food & Water, Health & Aging, Education, Prosperity	Y-Combinator Request for Startups	Guest Speaker (alt: Moonshot Party)	Vertical Analysis: Topics Assigned.– due Each student will present once in either Week 4, 5, or 6
4	Artificial Intelligence and Machine Learning Eat the World	The Four Waves of AI: Who Will Own the Future of Technology, Kai Fu Lee	Vertical Analysis Presentations	
5	Robots and Automation and the Connected World		Vertical Analysis Presentations	
6	Blockchain and Decentralized Finance	Satoshi Whitepaper (Bitcoin: A Peer to Peer Electronic Cash System) Complete Beginner's Guide to Decentralized Finance, Binance	Vertical Analysis Presentations	Near Future Mapping 1 of 2 (due Week 9)

7	Digital Biology and CRISPR	A Simple Guide to CRISPR, Vox	Near Future Mapping 1 of 2 Work Session	Midterm Exam
8	AR and VR		Near Future Mapping 2 of 2 Work Session	
9	Exponential Technologies, Healthcare, and Aging	Can We Live Longer but Stay Younger, New Yorker	Guest Speaker (alt:Personal Reflection 2 of 3: Term Project Soul Searching)	
10	When Humans Meet Machines		Near Future Mapping 2 of 2 Presentations	Term Project - Venture Presentation (due Week 16)
11	Will There be an Intelligence Explosion?	A) When Is the Singularity? Probably Not in Your Lifetime, New York Times B) Does the Singularity Need a Makeover?, XPrize	Venture Presentation Work Session and Rehearsal	
12	Term Papers and Summary Presentations Delivered to Class and Guests		Personal Reflection 3 of 3: Where Am I Going Next?	Final Exam

Statement on Academic Conduct and Support Systems

Academic Conduct:

Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in SCampus in Part B, Section 11, “Behavior Violating University Standards” policy.usc.edu/scampus-part-b. Other forms of academic dishonesty are equally unacceptable. See additional information in SCampus and university policies on [Research and Scholarship Misconduct](#).

Students and Disability Accommodations:

USC welcomes students with disabilities into all of the University’s educational programs. The Office of Student Accessibility Services (OSAS) is responsible for the determination of appropriate accommodations

for students who encounter disability-related barriers. Once a student has completed the OSAS process (registration, initial appointment, and submitted documentation) and accommodations are determined to be reasonable and appropriate, a Letter of Accommodation (LOA) will be available to generate for each course. The LOA must be given to each course instructor by the student and followed up with a discussion. This should be done as early in the semester as possible as accommodations are not retroactive. More information can be found at osas.usc.edu. You may contact OSAS at (213) 740-0776 or via email at osasfrontdesk@usc.edu.

Support Systems:

Counseling and Mental Health - (213) 740-9355 – 24/7 on call
studenthealth.usc.edu/counseling

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

National Suicide Prevention Lifeline - 1 (800) 273-8255 – 24/7 on call
suicidepreventionlifeline.org

Free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week.

Relationship and Sexual Violence Prevention Services (RSVP) - (213) 740-9355(WELL), press “0” after hours – 24/7 on call

Studenthealth.usc.edu/sexual-assault

Free and confidential therapy services, workshops, and training for situations related to gender-based harm.

Office for Equity, Equal Opportunity, and Title IX (EEO-TIX) - (213) 740-5086
eeotix.usc.edu

Information about how to get help or help someone affected by harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants.

Reporting Incidents of Bias or Harassment - (213) 740-5086 or (213) 821-8298
usc-advocate.symplicity.com/care_report

Avenue to report incidents of bias, hate crimes, and microaggressions to the Office for Equity, Equal Opportunity, and Title for appropriate investigation, supportive measures, and response.

The Office of Student Accessibility Services (OSAS) - (213) 740-0776
osas.usc.edu

OSAS ensures equal access for students with disabilities through providing academic accommodations and auxiliary aids in accordance with federal laws and university policy.

USC Campus Support and Intervention - (213) 821-4710
campussupport.usc.edu

Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

Diversity, Equity and Inclusion - (213) 740-2101
diversity.usc.edu

Information on events, programs and training, the Provost’s Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.

USC Emergency - UPC: (213) 740-4321, **HSC:** (323) 442-1000 – 24/7 on call

dps.usc.edu, emergency.usc.edu

Emergency assistance and avenue to report a crime. Latest updates regarding safety, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible.

USC Department of Public Safety - UPC: (213) 740-6000, **HSC:** (323) 442-120 – 24/7 on call

dps.usc.edu

Non-emergency assistance or information.

Office of the Ombuds - (213) 821-9556 (UPC) / (323-442-0382 (HSC)

ombuds.usc.edu

A safe and confidential place to share your USC-related issues with a University Ombuds who will work with you to explore options or paths to manage your concern.

Occupational Therapy Faculty Practice - (323) 442-3340 or otfp@med.usc.edu

chan.usc.edu/otfp

Confidential Lifestyle Redesign services for USC students to support health promoting habits and routines that enhance quality of life and academic performance.