



COMP_SCI 5480 101
Intro to Deep Learning
2025 Spring Semester

Instructor Information



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Email: nadendla@mst.edu

Office: 314 Computer Science Building

Office Hours

Wednesdays, 3:00pm - 4:00pm

Phone: 573-341-4090

Preferred Method of Contact: CANVAS email

Course Description

Description from JoeSS - Course Catalog:

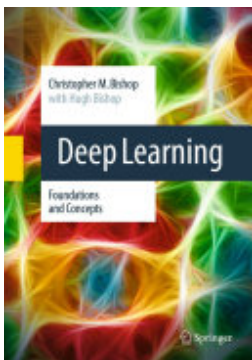
Course Goals

At the end of this course students will:

- Be proficient with fundamentals of learning using neural networks (NNs)
- Be proficient in modeling and training neural network architectures for well-known problems (e.g. classification, text analysis)

- Utilize modern computational resources (GPUs) and algorithmic techniques to train NN models on complex relationships (e.g. graphs, low-dimensional manifolds)
- Be able to implement NN models that can perform dimensionality reduction and data generation.

Course Materials



Deep Learning

ISBN: 9783031454684

Authors: Christopher M. Bishop, Hugh Bishop

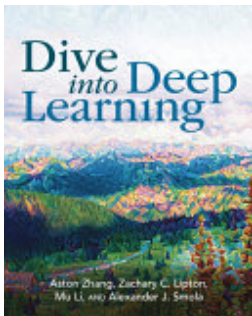
Publisher: Springer Nature

Publication Date: 2023-11-01

Auto Access:

E-textbook: <https://www.bishopbook.com/>

Required



Dive into Deep Learning

ISBN: 9781009389433

Authors: Aston Zhang, Zachary C. Lipton, Mu Li, Alexander J. Smola

Publisher: Cambridge University Press

Publication Date: 2023-12-07

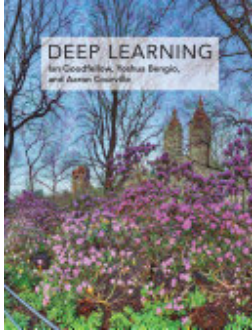
Auto Access:

E-textbook: <https://d2l.ai/>

Required

Deep Learning

ISBN: 9780262337373



Authors: Ian Goodfellow, Yoshua Bengio, Aaron Courville

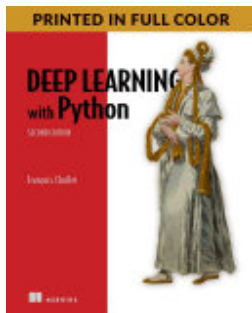
Publisher: MIT Press

Publication Date: 2016-11-10

Auto Access:

Reference book

Optional



Deep Learning with Python, Second Edition

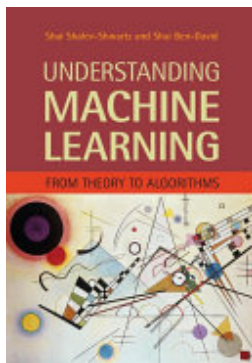
ISBN: 9781617296864

Authors: Francois Chollet, François Chollet

Publisher: Simon and Schuster

Publication Date: 2021-12-21

Optional



Understanding Machine Learning

ISBN: 9781107057135

Authors: Shai Shalev-Shwartz, Shai Ben-David

Publisher: Cambridge University Press

Publication Date: 2014-05-19

Auto Access:

A very good reference book for ML

Optional

Generative AI (GAI) usage is NOT allowed in this course



**No use of GAI is acceptable for use on any graded class activity.
Use of GAI may result in a zero for the assignment.**

Your instructor does not allow the use of GAI on assignments or projects in this class.

Please check your instructor's GAI course policies for more information.

Generative AI (GAI) Course Policies

This is a course that teaches the fundamentals of neural networks and how to analyze their performance. Your goal is to not just to acquire the skill-set to model novel NN models, but also question them using thorough analysis and fixing any concerns in the context of different problem settings.

Therefore, it is essential to learn these topics without any support from GAI models.

Course Policies

Following are the general expectations of this class:

- This class will be taught in **active learning** format. This means that students have to be physically present in the class to do in-class activities which add to 50% of their final grade. No extensions will be provided to in-class activities.
- Although students will be working in teams to solve problems during in-class activities, all homework assignments should be done individually.
- Both HW assignments and project will be submitted via **GitLab**. All students should activate their GitLab accounts in the first week of classes.
- **GPU resources** have been allocated for CS 5480 on Mill. So, students are strongly encouraged to create a Mill account during the first week of classes.
- Students are still expected to attend every class in-person. Even when the instructor is traveling, the graduate teaching assistant (GTA) will be

present to setup the Zoom call, and/or organize in-class activities.

- **Deadline extensions** to HW assignments will mostly be declined, unless the request is truly exceptional and justifiable. For example, if the student is not well, appropriate extensions will be granted as per instructor discretion, based on the doctor's letter attached with the request.

Communication Expectations

Students are strongly encourage to meet with the instructor in-person, or contact via email on CANVAS. Emails directly sent to the instructor's email inbox are sometimes lost due to an overwhelming inbox.

Instructor and GTA will try to provide feedback within 1-2 weeks of submission deadline. Any known delays will be communicated promptly to students.

Departmental Contact

First point of contact for questions, issues, and concerns is the instructor of your course. If you have a situation that you cannot resolve through discussion with the instructor, you may contact the department chair.

Name: Prof. Seung-Jong Park

Title: Kummer Endowed Chair of Computer Science

Email: seung-jong.park@mst.edu

Course Schedule

Venue: Room 115, Innovation Lab Building

Schedule: MWF 12:00pm - 12:50pm

Tentative Plan:

Label	Topics	Time Spent
T1	Learning with Neural Networks	3.5 weeks
T2	Ensembles, Regularization and CNNs	2.5 weeks
T3	Attention and Transformers	1.5 weeks
T4	Graph Neural Networks	2 weeks
T5	Deep Reinforcement Learning	1.5 weeks
T6	Generative Models	2.5 weeks

Grading Policies

- In-class assessments will be submitted on paper, but students are allowed to work in teams of 5.
- HW assessments (mostly programming-based) will be submitted via GitLab in respective private repositories assigned to each student. Feedback will be provided by the GTA in the same repository.
- Late work will be generally declined. Any exceptions will be given at the instructor's discretion based on the time and justification of the request.

Grading Scale Information

Tentative grading scale

Letter Grade	Points
A	90 -100 points
B	80 - 89 points
C	70 - 79 points
D	60 - 69 points
F	59 and below

Assessments and their Contribution to the Final
Grade

Assessment Type	% of Grade
In-class assessments (Top 10 out of 12)	50%
HW (programming) assessments (Top 4 out of 5)	20%
Midterm Exam	15%
Project	15%
	Total = 100%

STUDENT ASSISTANCE, RESOURCES & UNIVERSITY POLICIES

This section of the syllabus contains information and links to important information regarding:

- Academic Dishonesty & Integrity Policies
- Student Resources
 - Educational & Tutoring
 - Respiratory & Other Illness Policy
 - Health & Well-Being
 - Other Support Services
- Missouri S&T and UM System Policies

Use the syllabus navigation menu to migrate easily through the information.

Academic Integrity & Generative AI Policy

Student Honor Code and Academic Integrity

As a student at Missouri S&T you are responsible for maintaining your own academic integrity. Familiarize yourself with this information.

- All students are expected to follow the [Standard of Conduct](#) and [Honor Code](#).
- Your instructor is a mandated reporter in cases of Academic Integrity and Dishonesty
- [The Standard of Conduct](#) defines the behavioral expectations of all students and student organizations with clear descriptions designed to protect a specialized educational environment conducive to learning. This environment promotes learning while fostering integrity, academic success, personal and professional growth, and responsible citizenship.
- Additional resources for students regarding academic integrity can be found [online](#).

Faculty reporting of Academic Dishonesty

Your instructor is a mandated reporter in cases of Academic Integrity and Dishonesty

Communicating clear academic integrity expectations is essential to both students and faculty. Instructors are encouraged to establish and communicate specific guidelines for examination, AI systems usage, group projects, and writing assignments within their courses. When academic dishonesty violations occur (cheating, plagiarism, sabotage, unauthorized AI content), instructor should report the misconduct to the Dean of Students Office using the [online reporting form](#). The reporting process operates independently from the instructor's evaluation of the academic work.

Generative Artificial Intelligence (GAI)

Your instructor should provide information that explains what their policy is on use of Generative AI (GAI).

Your instructor may use one of these indicators to define their policy. If your instructor has tagged your course as conditional that means that GAI may be allowed on one assignment, but not another. If in doubt, check with your instructor.

It is your responsibility to know the GAI policy for your courses.

Indicators that may be used in your course:

Allowed	 GAI tools may be used to augment your learning process, not replace it. <small>When GAI is allowed you must verify and cite all claims and information appropriately. GAI are known to hallucinate. Do not blindly trust the information an AI generates. You must also not adopt generated content without reflection and revision to make it your work.</small>	
May be allowed (check each assignment)	 GAI tools may only be used under the guidance of the instructor for specific assignments and in a particular manner. <small>When GAI is allowed you must verify and cite all claims and information appropriately. GAI are known to hallucinate. Do not blindly trust the information an AI generates. You must also not adopt generated content without reflection and revision to make it your work.</small>	
Not allowed	 No use of GAI is acceptable for use on any graded class activity. Use of GAI may result in a zero for the assignment.	

For more information about the GAI policy, visit
<https://teaching.missouri.edu/blog/teaching-time-ai>

S&T Tutoring & Campus Educational Support Resources

One Canvas (<https://umsystem.instructure.com/>)

Course content may be used by your instructor to post syllabi, policies, schedule(s), and grades.

S&T Connect

S&T Connect enables students to request appointments with their instructors and advisors via the S&T Connect calendar, which syncs with the Outlook Exchange calendar. S&T Connect tracks each student's performance across all courses. S&T Connect Early Alert enables students to be provided with services as needs arise.

Student Success Center

The Student Success Center (SSC) offers peer tutoring and success coaching to help students succeed in their academic goals. Additionally, we work as a resource hub and can connect you to the campus resources necessary to help you dig deeper and finish the semester strong. Visit the SSC in Room 117 Innovation Lab and contact us at ssc@mst.edu or 573-341-7590. To learn more about the SSC, visit <https://ssc.mst.edu/>.

Writing and Communication Center

The Writing and Communication Center's mission is to assist all students in their efforts to become better writers, communicators, and critical thinkers. The Center's peer consultants and coaches provide free individualized one-on-one and small-group conversations to offer meaningful feedback and guidance to students across all disciplines. More information can be found on our website, through email: writing@mst.edu or stop by Curtis Laws Wilson Library 314–315.

University Libraries

The Curtis Laws Wilson Library provides students and faculty with physical and electronic books, journals, articles, and databases as well as recreational reading and video materials. You can also check out laptops, calculators, tool kits, and more. Study and reading rooms are available to

reserve. Talk to a library staff member one-on-one via chat, email, phone, or in person for any assistance regarding library services or finding peer-reviewed, credible research materials for study and research needs. Find out more information and connect with the library here: library.mst.edu.

S&T Tutoring Opportunities

The [Student Success Center \(SSC\)](https://ssc.mst.edu) helps you with your studies in three ways:

- **LEAD Drop-in:** Our LEAD Drop-in service provides convenient access to experienced peer learning assistants for a multitude of courses across campus. No appointments necessary. Simply check our tutoring schedule to discover when support for your specific course is available: <https://ssc.mst.edu/leaddrop-in/>
- **LEAD Group Sessions:** Our LEAD Group sessions offer after-hours group tutoring, facilitated by our dedicated peer learning assistants in partnership with faculty members. Explore the LEAD Group schedule to see if your course is featured and join us at the next session: <https://ssc.mst.edu/leadgroup/>
- **Knack Tutoring:** If your schedule clashes with our LEAD offerings, or if your course isn't covered, Knack is your solution. Request a tutor for either a virtual meeting or an in-person session on campus, ensuring you get the help you need, when you need it. To sign up for your FREE Knack account, visit: <https://ssc.mst.edu/knacktutoring/>

[Military & Veterans Resource Center \(MVSC\)](#)

The Military & Veterans Resource Center (MVRC) at Missouri S&T is dedicated to supporting those who have served, are currently serving, and those who aspire to serve in our nation's armed forces, along with their families. We are committed to fostering a welcoming and inclusive environment that empowers military-connected students to achieve their educational and personal goals. Through tailored resources, academic and

career support, and community connections, we aim to enhance the success and well-being of service members, veterans, and their loved ones as they transition into and thrive within higher education here on campus. Visit the SVRC at Harris Hall, Suite G10, and contact us at svrc@mst.edu.

Student Emergency Fund (SEF)

The SEF is administered by the Division of Student Success to help ensure Missouri S&T students have access to the support and resources they need to successfully recover from an unforeseeable financial emergency. The goal of this fund is to prevent one small emergency or unexpected expense from derailing a student's progress toward degree completion.

Respiratory & Other Illness Policy Updates

In March 2024, the Centers for Disease Control and Prevention (CDC) updated recommendations on how people can protect themselves and their communities from respiratory viruses, including COVID-19.

The new simplified recommendations follow similar guidelines for other respiratory infections.

For any respiratory illness, COVID-19 and influenza in particular, the new recommendations suggest returning to normal activities when:

- Symptoms have been improving overall for at least 24 hour, and
- If fever is present, no fever for 24 hours without the use of fever-reducing medication.

Students who are ill are advised to be seen at Student Health Services. Students can schedule appointments by calling (573) 341-4284 or online through their patient portal.

If you are ill, protect others around you by:

- Practicing good hygiene: cover your coughs and sneezes, wash or sanitize hands often, and clean frequently touched surfaces.
- Stay away from others until you are feeling better, particularly if they are immune-compromised.

Notify your instructor of any illnesses that prevent you from attending class.

Health & Well-Being Support Resources

Student Mental Health and Well-Being

Your well-being is important, and it contributes to your success in this course. At S&T, we provide resources to support your mental, physical, and social well-being. Any of us can experience challenges that make learning difficult. If you are struggling, take advantage of the following resources offered by the university:

Student Well-Being (<https://wellbeing.mst.edu/>)

Student Well-Being provides counseling services, health promotion initiatives, and prevention programs to empower the S&T community to thrive and enhance personal, academic, and professional success. Department office hours are Monday-Friday, 8 a.m. – 4:30 p.m. On the website, you can find information related to confidential individual and group counseling, wellness consultations and trainings, case management services, resources for many health and wellness topics, and help for mental health crisis situations. For the 988 Suicide and Crisis Lifeline, call or text 988, or visit missouri988.org For the National Suicide Prevention Lifeline, call or text 988, or visit missouri988.org.

Health and Well-Being Canvas Course

(<https://umsystem.instructure.com/enroll/G3LY3G>)

The Health and Well-Being Canvas Course features trainings,

presentations, and other health and well-being resources for students. The course is free for all students, is non-credit, and students can enroll at any point in the semester.

UCARE

UCARE, housed within the Division of Student Success, is the central point of contact to connect a student who may be experiencing a personal, academic, financial, well-being, and/or other concern to support and resources. An instructor, staff member, or other student may share concerns about a student with UCARE. UCARE helps connect a student with solution-focused assistance to support their holistic well-being, success, and academic progress. A referral can be submitted at <https://wellbeing.mst.edu/ucarereferrals/> or by emailing ucare@mst.edu. *For urgent matters, check out the [after-hour and urgent resources](#).*

Miner Oasis

The Miner Oasis is simply a place to relax.

We have coloring books, customizable essential oils, coffee and tea, healthy snacks, yoga mats, and a massage chair to help you de-stress and be your best self!

The Miner Oasis is open Monday - Friday, 8am - 5pm, in 201 Norwood Hall

Other free resources available for students are the Zen Den (similar to the oasis but private and for only one student at a time), light therapy, a Buddha board, and a biofeedback/HeartMath program. Stop by the front desk in 204 Norwood Hall to learn more about these resources.

Morning Cup of Joe

Using pop culture to explore mental health topics relevant to the students at S&T and the S&T community at large. Find us at: <https://wellbeing.mst.edu/>

<https://www.instagram.com/sandtwellbeing>

<https://www.facebook.com/sandtwellbeing>

Other Student Support Services & Resources

Student Emergency Fund (SEF)

The SEF is administered by the Division of Student Success to help ensure Missouri S&T students have access to the support and resources they need to successfully recover from an unforeseeable financial emergency. The goal of this fund is to prevent one small emergency or unexpected expense from derailing a student's progress toward degree completion.

Missouri S&T Fitness Center

Access to the Fitness Center and swimming pool is provided to actively enrolled students who pay an activity fee. Students who have not registered for classes will not be granted access. A valid Miner ID card must be presented for entry. For information on hours and equipment availability visit <https://studentrec.mst.edu/fitness-center/>

Commuter's Commodities (Food Pantry)

Hunger is a real problem for far too many of today's students. The pantry is to help alleviate the financial burden of obtaining good quality food and supplies.

Today's college students face serious financial challenges. Many students find it difficult to support themselves while also paying for college. Hunger is a real problem for far too many of today's students. One issue they are faced with is food insecurity - not having reliable access to sufficient, nutritious food.

Commuter's Commodities is a food and supply pantry to help alleviate the financial burden of obtaining good quality food, small household goods, cleaning supplies and hygiene products. Our hope is that this will help our

commuter students and students who may be in need.

We are a partner agency with The Food Bank for Central & Northeast Missouri.

[Closets Are For Clothes Exchange & Boutique](#)

The purpose of this service is to alleviate the often heavy financial burden of transitioning or coming out. All S&T students who have a need may use it accordingly.

A clothing exchange is a type of swap wherein participants exchange their valued but no longer used clothing for clothing they need and will use. Don't have anything to swap? No problem! This service is available to all S&T students who have a need.

[LGBTQ+ Resource Center](#)

Here you will find a wide variety of resources, information about the LGBT community at Missouri S&T, and ways to get involved as students, staff, faculty, or alumni. The LGBT Resource Center is the central hub of LGBTQ life at Missouri S&T.

[Resource Library](#)

SDI has many books and resources in our library that are available to check-out.

[MinerLink](#)

MinerLink is your connection to most student organizations on campus. MinerLink allows you to:

- Browse registered student organizations

- Contact and join a student organization
- View daily and upcoming events
- RSVP to events
- Check into university events using the event pass ... and more!

For more information visit

<https://involvement.mst.edu/involvement/minerlink/>

Missouri S&T Campus & UM System Policies

Statement about Copyright, FERPA, and Use of Video

It is vitally important that our classroom environment promote the respectful exchange of ideas. This entails being sensitive to the views and beliefs expressed during discussions, whether in class or online. Please obtain instructor permission before recording any class activity. It is a violation of University of Missouri policy to distribute such recordings without authorization and the permission of all who are recorded. More information is provided [online](#).

Accessibility and Accommodations

It is the university's goal that learning experiences be as accessible as possible. Student Accessibility and Testing provides services and accommodations that facilitate full participation in Missouri S&T's learning experience for students with disabilities. If you anticipate or experience physical, academic, and/or digital barriers due to a disability, please contact Student Accessibility and Testing at (573) 341-6655, email dss@mst.edu, or visit <https://saat.mst.edu/>; for information.

Nondiscrimination, Equity, and Title IX

Missouri S&T is committed to the safety and well-being of our campus community, and to creating an environment free from discrimination and

harassment.

The University prohibits discrimination and harassment on the basis of race, color, national origin, ancestry, religion, sex, pregnancy, sexual orientation, gender identity, gender expression, age, disability, protected veteran status, and any other status protected by applicable state or federal law. As used in this policy, the word “sex” is also inclusive of the term “gender.”

Additionally, US Federal Law Title IX states that no member of the university community shall, on the basis of sex, be excluded from participation in, or be denied benefits of, or be subjected to discrimination under any education program or activity. Sexual harassment violations of this law include quid pro quo, hostile environment, sexual assault, dating/domestic violence, and stalking. The U.S. Department of Education has stated the prohibition on discrimination on the basis of sex includes sexual orientation and gender identity.

Students who are experiencing pregnancy or pregnancy-related conditions, including the birthing parent and non-birthing parent, have rights protected under Title IX. Students should contact Student Accessibility and Testing or the Office of Equity and Title IX to learn more about their rights and pregnancy-related assistance/accommodations provided by the University to ensure equitable access to University educational programs and activities.

In accordance with the University of Missouri's Collected Rules and Regulations, all faculty and staff are required to report any information concerning discrimination disclosed through communication including, but not limited to, direct conversation, email, social media, classroom papers and homework exercises to the Equity Officer/Title IX Coordinator.

For more information regarding support for those that have been impacted

or to report an incident of discrimination or harassment as defined by [Chapter 600](#) of the University's Collected Rules and Regulations, visit the Office of Equity and Title IX or visit their website at equity.mst.edu.

Office of Equity and Title IX

Equity Officer and Title IX Coordinator: Dr. Paul Hirtz

Phone: (573) 341-7734

Location: 900 Innovation Drive, Suite 500

E-mail: equity@mst.edu

Emergency Info & Classroom Egress Maps

[Campus Police Emergency Quick Reference](#)

Classroom Egress Maps

In case of emergency both instructors and students should know where to go that is safe. These maps show where the classroom emergency exits are located. <http://designconstruction.mst.edu/floorplan/>.