# Overview & Responsibilities

**Software Testing & Maintenance**

SWE 437

http://go.gmu.edu/swe437

**Dr. Brittany Johnson-Matthews**

(Dr. B for short)

# Welcome!

**SWE 437 – Software Testing & Maintenance**
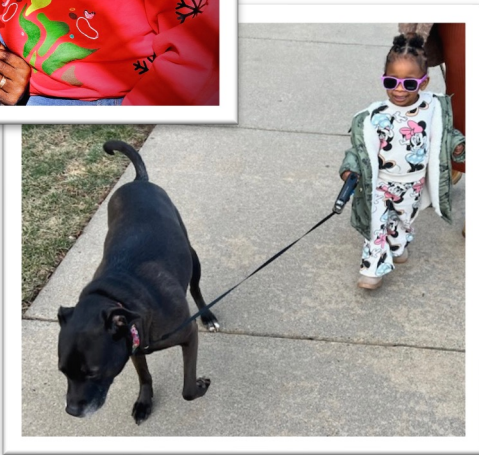
Roughly...

**25%** lectures,

**25%** reading,

**50%** application

**Learn about:**

--> history and state of practice in software testing

--> practical approaches to testing software systems

--> foundations and theoretical knowledge of software testing
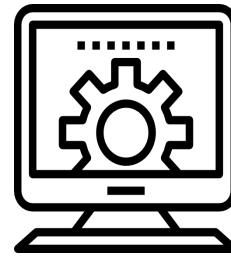
# About me
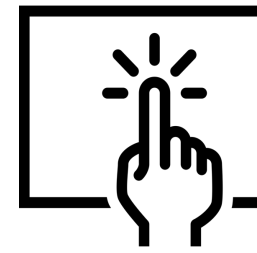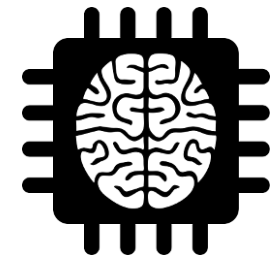
# About my lab

Software Engineering    Human-Computer Interaction    Artificial Intelligence

**Understanding Software Practice**
Developer tool use
Developer expertise
Work environments

**Improving Software Practice**
Testing & debugging
Tool adoption & communication
Sustainable OS communities

**Developing Equitable Software**
Software and model fairness
Ethics in open source
Technology for Black Lives
Equitable healthcare access

INSPIRED Lab
(INterdisciplinary Software Practice Improvement REsearch and Development)

http://inspired.cs.gmu.edu

# Course Materials

**Introduction to Software Testing, 2nd edition**

by Ammann and Offutt

(strongly recommended)

https://cs.gmu.edu/~offutt/softwaretest/
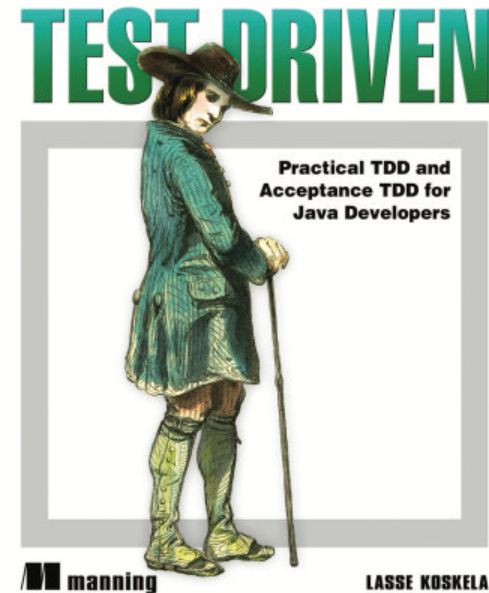
**Test Driven: Practical TDD and Acceptance TDD for Java Developers**

by Koskela

# Online Resources

All information, announcements, and discussions will be on **Piazza**.

- Key course information and links (e.g., syllabus and scheduled) are in a pinned post

Assignments and grades will be posted on **Blackboard**.

# Schedule

AO-Chapter *x* means chapter *x* in the Ammann and Offutt textbook.

K-Chapter *x* means chapter *x* in the Koskela textbook.

| Date | Topic | Readings & Handouts | Quizzes & Assignments | In-Class |
|---|---|---|---|---|
| Meet 1 Monday, Aug 21 | **Responsibilities & introductions** | Responsibilities Intro maintenance (pptx) | Assign 0: Introduce yourself on Piazza! | |
| Meet 2 Wed 8/23 | **Introduction & why test?** | AO-Chapter 1 | | |
| Meet 3 Mon 8/28 | **Overview** | Maintenance overview (pptx) | | |
| Meet 4 Wed 8/30 | **Evolution** | Evolutionary design (pptx) | Quiz 1 Assign 1 due | |
| Mon 9/4 | *No class (University Holiday)* | | | |
| Meet 5 Wed 9/6 | **Coding for change** | Code for change (pptx) | Quiz 2 | |
| Meet 6 Mon 9/11 | **Design for change** | Design for change (pptx) | Assign 2 due | |
| Meet 7 Wed 9/13 | **Model-Driven Test Development** | AO-Chapter 2 | Quiz 3 | |
| Meet 8 Mon 9/18 | **Test automation** | AO-Chapter 3 | Assign 3 due | Min.java |
| Meet 9 Wed 9/20 | **Test Driven Development (TDD) overview** | AO-Chapter 4 & K-Chapter 1 (pptx) | Quiz 4 | |
| Meet 10 Mon 9/25 | **Beginning TDD** | | Assign 4 due | > |
| Meet 11 Wed 9/28 | **More TDD** | K-Chapter 2 (pptx) *(have IDE, such as Eclipse, installed on laptop)* | Quiz 5 | |
| Meet 12 Mon 10/2 | **Spikes & Refactoring** | K-Chapter 3 (pptx) *(have IDE, such as Eclipse, installed on laptop)* | | |
| Meet 13 Wed 10/4 | **Still more TDD** | K-Chapter 9 (pptx) | Quiz 6 | |

| | | | | |
|---|---|---|---|---|
| Meet 14 **Tue 10/10** | **RIPR model** | AO-Chapter 1 & 2 | Assign 5 due | OddsOrPos.java |
| Meet 15 Wed 10/11 | **Test criteria** | AO-Chapter 5 | Quiz 7 | |
| Meet 16 Mon 10/16 | **Input Space Partition (ISP) Testing** | AO-Chapter 6.1 | | |
| Meet 17 Wed 10/18 | **More ISP Testing** | AO-Chapter 6.2 | Quiz 8 | |
| Meet 18 Mon 10/23 | **More ISP Testing** | AO-Chapter 6.2 | Assign 6 due | |
| Meet 19 Wed 10/25 | **Graph coverage criteria** | AO-Chapter 7.1 | Quiz 9 | |
| Meet 20 Mon 10/30 | **Graph coverage criteria** | AO-Chapter 7.2 | Assign 7 due | |
| Meet 21 Wed 11/1 | **Graphs of source code** | AO-Chapter 7.3 Graph web app | Quiz 10 | |
| Meet 22 Mon 11/6 | **Graphs of source code** | AO-Chapter 7.3 | Assign 8 due | |
| Meet 23 Wed 11/8 | **Logic Testing** | AO-Chapter 8.1.1 | Quiz 11 | |
| Meet 24 Mon 11/13 | **Logic Testing** | AO-Chapter 8.1.2 | Assign 9 due | |
| Meet 25 Wed 11/15 | **Logic--determination** | AO-Chapter 8.1.4 & 8.1.5 | Quiz 12 | |
| Meet 26 Mon 11/20 | **Logic--source** | AO-Chapter 8.3 | Assign 10 due | |
| Wed 11/22 | *No class (Thanksgiving Recess)* | | | |
| Meet 27 Mon 11/27 | **Review Graph and Logic Homeworks** | Review + Q&A | Quiz 13 | |
| Meet 28 Wed 11/29 | **Final discussion & review** | Final Exam Preview Practice Problems | Assign 11 due | |
| **Mon 12/11 10:30 am - 1:15 pm** | FINAL EXAM Mason's final exam schedule | | | |

Subject to change, but generally final

# Office Hours

Virtual and in-person options (all posted on Piazza)

Also available by appointment (contact TA or myself via Piazza)

TA office hours in-person (also posted on Piazza)

# Class structure

**Typically:**

- 30-45 minutes of lecture
- remainder of class for in-class exercises

If there's a quiz, class will start with that.

**Questions are always welcome!**

# Grading

All details on grading are in the syllabus.

Participation (discussion board & in-class) = 15%

Homework (11 assignments total) = 20%

Quizzes (13 total) = 20%

Final exam (theory and practice) = 35%

# Homework Assignments (20% of final grade)

Practice with concepts from class & reading (*precision*)

**Keep in mind:**

- Homework is due *before the start of class* on the due date

- Collaboration is encouraged (and rewarded!)

- Late homework gets a 30% deduction for each week it is late

If you work on a team, make sure to include *collaboration summary*.

**All homework must be submitted before the last day of class to be graded.**

# Quizzes (20% of final grade)

More practice with concepts from class & reading (*recall*)

**Keep in mind:**

- Quizzes <u>are not </u>collaborative

- You will only have 10-15 minutes to complete them (at the start of class, so *be on time*)

- Any content covered in class or the reading in lectures prior to each quiz are fair game.

I will drop the lowest quiz grade at the end of the semester.

**There are no quiz make-ups or retakes.**

# Class Participation (15% of final grade)

**Earn points by:**

- Attending class regularly

- Completing in-class exercises

- Engaging in in-class discussions

- Engaging meaningfully on Piazza

# Final Exam (35% of final grade)

Assessment of cumulative course knowledge

**Keep in mind:**

- The final is <u>closed book</u> and <u>closed notes</u>.

- It will be timed (per University policies).

- The final must be taken on exam day (with few exceptions).

As per GMU policy, an unexcused absence from the final will result in an automatic F – **there are no final exam make-ups or retakes** – talk to me first!

# Extra Credit Opportunities

Collaboration extra credit (applied to homework)

Other potential extra credit examples:

- Themed t-shirt day

- Extra practice problems (most common)

- Various class interactions

Extra credit (not collab credit) will be applied at the end of the semester such that it provides the largest impact to final grade.

# Attendance

Not required, but **strongly encouraged**

All due dates are final (with few exceptions)

**Don't forget participation grade!**

# Responsibilities of Professor

Curate **useful and interesting information** for you

Come to class

Offer **challenging but reasonable** exercises and assignments

Grade fairly **without bias**

Return graded work **promptly with helpful comments**

**Goals**:
- *Support discussion and knowledge sharing of important concepts*
- *Make the class fun and engaging for everyone*

# Responsibilities of Student

Come to class **on time**

If you miss class, **catch up on your own** (but don't hesitate to ask for help if needed)

**Listen** to all instructions

Turn in **assignments on time**

**Read** the material

If you disagree with me, **disagree politely**

**Goals**:

- *Read before class*

- *Actively participate in your academic growth*

# Fostering an inclusive, safe space

A classroom consists of a **instructors** and **students**.

We all play a role in creating a **safe learning space**.

Everyone should feel comfortable and supported
- by instructors
- by their fellow classmates

There is **ZERO TOLERANCE** for:

- *racism or sexism*

- *bullying or harassment*

- *inappropriate comments of any kind*

INCLUSIVE
EQUITABLE
DIVERSE
ACCEPTING
WELCOMING
SAFE SPACE
FOR EVERYONE