

SIT307-SIT720 – MACHINE LEARNING

UNIT INTRODUCTION

Team

- Unit Chair
 - Dr Ming Liu (m.liu@deakin.edu.au)
- Lecturer
 - Dr Ming Liu (m.liu@deakin.edu.au)
- Tutors
 - Chandan Karmakar (karmakar@deakin.edu.au)
 - Thommen George
(thommen.karimpanalgeorge@deakin.edu.au)
 - Ella Zarandi (ella.zarandi@deakin.edu.au)
 - Xinzhe Li (lixinzhe@deakin.edu.au)
 - Oscar Wu(Oscar.w@deakin.edu.au)
 - Xungang Gu(x.gu@deakin.edu.au)
 - Khondaker Tasrif Noor(k.noor@deakin.edu.au)

About the Unit

- ✓ This unit is an **Introduction to Machine Learning**.
- ✓ You will learn about various **elements of machine learning**.
- ✓ You will learn techniques for **unsupervised learning** e.g. **clustering**, **dimensionality reduction** and **prediction**.
- ✓ You will learn techniques for **supervised learning** e.g. **regression** and **classification** for both **linear** and **non-linear** problems.
- ✓ At the end of this course, you would be able to **apply Machine Learning to real-world problems**.

Unit structure:

- ✓ Introduction to Machine Learning + Python
- ✓ Basic concepts of Probability Distribution and Matrices
- ✓ Data Wrangling
- ✓ Unsupervised learning: Similarity measures and clustering
- ✓ Unsupervised learning: Dimensionality reduction
- ✓ Fundamentals of Supervised learning
- ✓ Model Selection and Evaluation in Supervised Learning
- ✓ Supervised learning:
 - ✓ Regression/Classification, Regularization
 - ✓ KNN and Support Vector Machines
 - ✓ Decision Trees and Random Forest
 - ✓ Neural Networks (→ Deep Learning)

SIT307/SIT720 Delivery

- Platforms used:
 - CloudDeakin
 - Content (resources)
 - Announcements
 - Class recordings
 - Microsoft Teams
 - Class
 - Online workshop
 - QA/Discussions
 - On Track
 - Assessments
- Modes of delivery:
 - Online
 - Class
 - Workshop
 - QA
 - HelpHub
 - On-campus
 - Workshop
 - Offline
 - Discussion

SIT307-SIT720 Unit Site

The screenshot shows the homepage of the SIT307_SIT720 - Machine Learning unit site. At the top, there is a navigation bar with icons for Home, Content, Discussions, Assessment, Tools, Setup, and 2025 T2. To the right of the navigation bar are icons for a grid, envelope, message, bell, and user profile (ML Ming Liu). Below the navigation bar is a banner with the text "SIT307_SIT720 - Machine Learning".

Below the banner, there are four main links: "Unit Information", "Assessment Resources", "Online Classroom and Recordings", and a calendar block showing "Week 0 Thursday, July 3rd 2025 Trimester 2".

The "Announcements" section contains a welcome message from Dr. Ming Liu:

Welcome to SIT307/SIT720
Posted an hour ago - (03 July, 2025 9:00 am)

Dear all,
Welcome you to SIT307/SIT720 Machine Learning! It is great that you take this unit, I am your unit chair Dr. Ming Liu. Our teaching team for this unit is very experienced, including Dr. Xinzhe Li, Oscar Wu, Dr Ella Zarandi, Xungang ...[more](#)

[See all announcements >](#)

To the right of the announcements is a sidebar with links to various SEBE services:

- Learning Innovation (SEBE) >
- SEBE Staff Hub
- Module Description Builder
- Amendment to Results
- Get Started (for Students)
- Learning Analytics for Teachers (L4T) >

Accessing online Classrooms from MS Teams/Unit Site

The image shows a split-screen view. On the left is a screenshot of a Microsoft Teams interface. At the top is a purple header bar with the letters 'SM'. Below it is a sidebar with a purple square icon containing 'SM' and a list of team-related links: Home page, Class Notebook, Classwork, Grades, Reflect, and Insights. Under 'Main Channels', there is a list of channels: General, Online_workshop_SIT307, Online_workshop_SIT720, SIT307_SIT720_online_lecture (which is highlighted), TeachingTeam (with a small info icon), and UnitChair_QA. On the right is a screenshot of a unit site's 'Posts' tab for the channel 'SIT307_SIT720_online_lecture'. The post is by 'Ming Liu' at 11:41 am, titled 'SIT307/SIT720 Lecture' with a video icon. It says 'Occurs every Tuesday 11:00'. Below the post are icons for 'Weekly lecture' and 'Reply'.

- Join the scheduled meeting in the corresponding channel
- Do not create your own meeting
- Attend your allocated workshops (cloud or on-campus)

DISCUSSIONS AND QA

- ❖ Any messages or comments posted on this unit site that are not respectful of teaching staff or students will be removed.
- ❖ **Student General Discussion in MS Teams**
 - This Student Forum allows you to get to know fellow students and to discuss unit content and support each other in your learning.
- ❖ **Questions for the unit chair**
 - Please use this topic to post questions related to all matters regarding the admin and teaching of this unit to the Unit Chair.
- ❖ **QA Online in Microsoft Teams**
 - Any discussion about weekly materials.

Have questions ?

1. Firstly ask your tutor first **in a face-to-face manner**
2. If not solved, send your question to your tutor.
3. If still not solved, post your question to MS Teams Unit Chair QA.
4. In very urgent scenario, send an email to the unit chair with title “SIT307/SIT720 question”, I will try to response within 24 hours.

SIT307-SIT720 Evaluation

- Portfolio based assessment (submission through OnTrack)
 - Pass Tasks – weekly quizzes and problem solving(Week 1-10)
 - Credit Task – Problem solving task (Wrangling and Clustering, Classification)
 - Distinction Task – Regression Task
 - High Distinction (HD) Task – Reproduce a research paper

Two OnTrack site for SIT307 SIT720 students separately. Tasks may be different!

SIT307-SIT720 Where can I find the task description

- Task descriptions are uploaded to OnTrack.
- 5 pass tasks, 1 C task, 1 D task, 1 HD task.

PASS TASK (Task 2.1)

About this task

At the completion of week 2 modules, you are required to complete a lesson review to indicate what you have learnt and how you learnt it by submitting evidence requested at the end of this file.

Step-1

Step-2

Your tutor will then review your submission and will give you feedback. If your submission is incomplete the tutor will ask you to include missing parts. Tutor can also ask follow-up questions, either to clarify something that you have submitted or to assess your understanding of certain topics.

Feedback and submission deadlines

Feedback deadline: Friday 25 July (No submission before this date means no feedback!)

Submission deadline: Before creating and submitting portfolio.

Evidence of Learning

1. Submit a summary report (pdf format) in Ontrack (<https://ontrack.deakin.edu.au>)
 - 1.1. Summarise the main points that is covered in week 1 and 2.
 - 1.2. Provide summary of your reading list – external resources, websites, book chapters, code libraries, etc.
 - 1.3. Reflect on the knowledge that you have gained by reading contents of this week with respect to machine learning.
 - 1.4. Attempt the quiz given in weekly content (1.28 and 2.14) and add screenshot of your score (>85% is considered completion of this task) in this report.
2. Complete the problem solving task given below and submit your code file (.ipynb) separately to OnTrack (<https://ontrack.deakin.edu.au>).

SIT307-SIT720 How to know which one is my task?

- Pass tasks are defined in the unit site.
- In the weekly content there is one module that lists all pass activities.

WEEK 1: INTRODUCTION TO MACHINE LEARNING



Image source: Getty - © Getty Images

Week 1
pass
activities

Getting started (1.1-1.3): Discover what you will be learning this week as well as throughout this unit.
Introducing machine learning (1.4-1.10): Some examples of ML and an overview of the process.
Data representation overview (1.11-1.15): Learn how data is represented in machine learning algorithms.
Types of machine learning (1.10-1.12): Explore different machine learning algorithms and understand their variances.
Introduction to Python programming (1.16-1.28): Install and get started with Python programming.
Wrap up (1.29): Reflect on what you have learnt in this week and start to think about what you could do next.
Pass activity (1.28): Complete this activity and submit in OnTrack as an evidence of learning.



SIT307-SIT720 How to know which one is my task?

QUIZ

The image shows two separate boxes, each containing a green header bar with the course code and a white body with a link to a quiz. The first box is for SIT307 and the second for SIT720.

SIT307

We can find the quiz link by clicking on this [SIT307-Week 1-Quiz](#)

SIT720

We can find the quiz link by clicking on this [SIT720-Week 1-Quiz](#)

- Pass tasks are defined in the unit site.
- In the weekly content there is one module that lists all pass activities.

SIT307-SIT720

Evaluation

- Credit, Distinction and HD tasks description
- Will be released on OnTrack
- Tasks are given in the same document

CREDIT TASK

[About this task](#)

Step-1

This task is designed to assess the Credit level expectations. There are some coding based questions in this task, please **get familiar with the data set first** and then answer the questions with your code and necessary explanation.

Step-2

Your tutor will then review your submission and will give you feedback. If your submission is incomplete the tutor will ask you to include missing parts. Tutor can also ask follow-up questions, either to clarify something that you have submitted or to assess your understanding of certain topics.

Feedback and submission deadlines

Feedback deadline: Friday 12 April (No submission before this date means no feedback!)

Submission deadline: Before creating and submitting portfolio.

Background
The Victorian Government is committed to improving the oral health of Victorians. A person's oral health is key to their overall general health and wellbeing. Extending community water fluoridation is important for public health. Melbourne has had fluoridated water since 1977. Other parts of Australia have had fluoridated drinking water for more than 50 years. Community water fluoridation is the most effective population-wide intervention to prevent tooth decay.

Dataset
Dataset file name: FluoridationData.csv

Dataset description: The dataset contains different features along with the fluoridation status of different water companies. It contains total 7 features. It contains different types of data including boolean, float and string. Feature names, data type and values are described in the following link. Each observation is a datapoint along the row of the dataset. The data set can be found in :
<https://discover.data.vic.gov.au/dataset/victorian-water-fluoridation-status-by-postcode> .

SIT307-SIT720

Deadlines (Feedback)

- Two deadlines
 - Feedback
 - No feedback on submission after this date.
 - Does not provide details for how to solve the problem. More about what you must re-attempt for successful completion of the task.
 - Submission
 - You must have to submit all tasks before creating your portfolio and then submit the portfolio for final evaluation.

CREDIT TASK

The slide is titled 'CREDIT TASK'. It contains two main sections: 'About this task' and 'Feedback and submission deadlines'. The 'About this task' section has two green arrows pointing right labeled 'Step-1' and 'Step-2'. Step-1 leads to a box containing text about assessing credit level expectations and getting familiar with the dataset. Step-2 leads to a box containing text about tutor review and feedback. The 'Feedback and submission deadlines' section contains two items: 'Feedback deadline: Friday 12 April (No submission before this date means no feedback!)' and 'Submission deadline: Before creating and submitting portfolio.' A red oval highlights these two items. Below this section is a 'Background' paragraph about Victorian water fluoridation. At the bottom is a 'Dataset' section with a file name and a detailed description.

About this task

This task is designed to assess the Credit level expectations. There are some coding based questions in this task, please **get familiar with the data set first and then answer the questions with your code and necessary explanation.**

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RUBRIC IN A NUTSHELL

| Grade (marks) | Expectation |
|-------------------|---|
| ❖ HD (80 or more) | <ul style="list-style-type: none">• Has the ability to explore and learn independently i.e., can solve problem by learning contents that is not covered in this unit.• Have knowledge of D level |
| ❖ D (70-79) | <ul style="list-style-type: none">• Can explain the result, compare different methods and select the optimal solution with acceptable explanation.• Have knowledge of C level |
| ❖ C (60-69) | <ul style="list-style-type: none">• Independently can design and solve a problem using machine learning methods with an acceptable performance.• Have knowledge of P level |
| ❖ P (50-59) | <ul style="list-style-type: none">• Understand the basics of machine learning algorithms and can apply the learned methods on a given dataset and present the results. |

SIT307-SIT720 TEACHING SCHEDULE

Science, Engineering and Built Environment (SEBE) Peer Mentor Program

About the program

- Meet people in your Faculty and make lifelong friends
- Learn about 'university hacks' and what everyone wishes they'd known in their first year
- Increase your employability in and beyond university

What's involved?

- One 50 min meeting a week for 5 weeks

Important

- Check your Deakin email for instructions to join your Peer Mentor group meetings
- Download Microsoft Teams (Instructions in the email)

deakin.edu.au/sebe/peer-support



Ask a Mentor

Science Engineering & Built Environment (SEBE)

Available to all students in the Faculty.

- Got a question and don't know where to start?
- Need support (academic/ financial/ health/ access) and don't know what services the University offers?
- Looking to connect with your peers at social and academic events?

The Faculty Peer Mentors can help you!
deakin.edu.au/sebe/peer-support

You will receive a response within 2 business days and can choose if you would like to be answered by email, phone or video call.



School of IT HelpHub

- The SIT HelpHub supports students enrolled in SIT units by:
 - ✓ Answering your questions
 - ✓ Showing you where to find information
 - ✓ Demonstrating how to solve problems and understand concepts that will help you with your assessments and the unit in general
- The HelpHub is supported by tutors and volunteers, who are selected by your unit chairs and are experts in your unit topics.
- Regardless of your enrolment, you can join any helphub session.
- Details of Help Sessions are available on our [helphub site](#)

The screenshot shows the homepage of the School of IT HelpHub. At the top, there is a navigation bar with links to CloudDeakin, Home, Content, Discussions, FAQ, Assessment, Tools, Setup, and Ongoing. On the right side of the header, there are icons for a user profile (Guillermo Pineda Villavicencio), notifications, and settings. Below the header is a large blue banner with the text "IT HelpHub". Underneath the banner, there is a section titled "IT HelpHub Announcements" which contains a message about sessions starting in Week 1. To the right of the announcements is a sidebar with links to "Need Help?", "SEBE Cloud Support", "SEBE Staff Hub", "Module Description Builder", "Get Started (for Students)", and "Unit Staff". At the bottom of the page, there is a section titled "SEBE IT HelpHub Sessions" with a message stating that no sessions are currently available. There are three small images below this section: one showing hands reaching towards a green plant, another showing a person using a tablet, and a third showing a purple and pink graphic. To the right of these images is a contact card for Dr Guillermo Pineda Villavicencio, listing his name, campus (Geelong Waurn Ponds Campus), email (guillermo.pineda@deakin.edu.au), and phone number (+61 3 522 73711).

School of IT HelpHub

- All students in SIT units can access the [helphub site](#), where they can find access to the helphub sessions
- The online sessions are run on the [helphub MS teams channels](#), which can be joined using Deakin credentials and the code **fszp1fl**
- The helphub site will be linked to your SIT unit pages
- The room for the sessions at Burwood is B1.34
- The rooms for sessions at Waurn Ponds can be found on the [helphub site](#)
- Check our [helphub site](#) for the details of session days/times and the expertise covered in each session

The screenshot shows the homepage of the School of IT HelpHub. At the top, there is a navigation bar with links for CloudDeakin, Home, Content, Discussions, FAQ, Assessment, Tools, Setup, and Ongoing. On the far right of the header, there is a user profile for 'Guillermo Pineda Villavicencio' with a gear icon for settings. Below the header is a large blue banner with the text 'IT HelpHub'. Underneath the banner, there is a section titled 'IT HelpHub Announcements' containing a message about the start of sessions in Trimester 3. To the right of this section is a sidebar with links for 'Need Help?', 'SEBE Cloud Support', 'SEBE Staff Hub', 'Module Description Builder', 'Get Started (for Students)', and 'Unit Staff'. At the bottom of the page, there is a section titled 'SEBE IT HelpHub Sessions' with a message stating that no sessions are currently available due to a break. There are three small images below this section: one showing hands reaching towards a green plant, another showing a person using a tablet, and a third showing a purple and pink graphic.

SIT HelpHub sessions for SIT307/SIT720



Be aware of plagiarism

Please follow this link for further information

<http://www.deakin.edu.au/students/studying/academic-integrity>

Group Project



question

