

**Science and Technology**

Computer Science

 Developing Artificial Intelligence

 CST 3170

Module Leader: Chris Huyck

Term AY 2021

Duration of the module 24 weeks

Document Version 2 Removed Dangling Template Notes

Start with version 1 for the start of the academic year and If you need to revise the handbook mid run then on the file name use the word 'updated', state the 'date' of update, use version 'number' and make sure that a small summary of the updates is included on the file description on MyLearning.

**Online location of handbook**

This handbook can also be accessed via My Learning.

**Other formats available**

This handbook is available in a large print format. If you would like a large print copy or have other requirements for the handbook, please contact the Disability Support Service disability@mdx.ac.uk

**Disclaimer**

The material in this handbook is as accurate as possible at the date of production. You will be notified of any minor changes promptly. If there are any major changes to the module you will be consulted prior to the changes being confirmed. Please check the version number on the front page of this handbook to ensure that you are using the most accurate information.

**Other documents**

Your module handbook should be read and used alongside your programme handbook and the information available to all students on My Learning and UniHub, including the Academic Regulations. Your programme handbook can be found on the My Learning programme page on the My Learning programme page.

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# Welcome – Module Introduction

This module is an introduction to Artificial Intelligence (AI), focusing on developing AI systems. It is focused around the three pillars of search, machine learning, and knowledge representation, though there is also an attempt to explore some AI subdomains such as vision, robotics and natural language processing.

*Students are expected to attend lectures and labs, do both course works, and take an exam. Labs will provide experience in programming and in AI techniques, so working on the lab before or after the session is encouraged.*

# The Module Team

Please see below details of the teaching team for this module.

|  |
| --- |
| Insert Name |
| Please insert the staff member photo | Role:  | Chris Huyck |
| Room number: | T127 |
| Email: | c.huyck@mdx.ac.uk |
| Telephone number: | 208-411-5412 |
| Office hours: | Tuesday 11-12Tuesday 10-11 on Kaltura |

# Communication with the teaching team

*Students may contact staff via e-mail, phone, by dropping into staff office hours, and by making an appointment to see them outside office hours.*

*Staff will contact students by e-mail, phone, the My Learning module page and via lectures and seminars.*

*The team may send urgent group or individual messages about the module to you by email, so it is important that you read your University email regularly.*

*All staff have office hours, it is not necessary to book an appointment during these hours, you just need to drop-in.*

*In the first instance problems should be dealt with by talking to a member of the module team. You can give feedback on this module to the module leader, your Student Voice Leader, to your personal tutor, and through the end of module evaluation survey.*

Overall module and course feedback can also be given to the student voice leader for their programme which will be included in programme feedback sessions and they can also provide feedback through relevant surveys .

Our most important consideration is your health, wellbeing and safety as well as our staff and people related to the University. Remember that you – as part of #TeamMDX – can stay up-to-date with the guidance on Coronavirus at

<https://unihub.mdx.ac.uk/coronavirus-covid19>

# Module overview

|  |  |
| --- | --- |
| **Module Code** | CST3170  |
| **Module Title** | Artificial Intelligence  |
| **Credit** | 30  |
| **Other Restrictions and Requirements** | None  |

**Aims**
The aim of the module is to introduce students to a range of AI theories and techniques, including the most commonly used. This will extend to the ability to implement these techniques, and the students will extend their own development skills.

**Learning Outcomes**

**Knowledge**

On completion of this module, the successful student will be able to:

1. Critically analyse common knowledge representation mechanisms.
2. Critically evaluate common machine learning mechanisms

**Skills**

This module will call for the successful student to demonstrate a sophisticated application of information searching:

1. Ability to implement knowledge bases in common knowledge representation formats.
2. Ability to implement machine learning algorithms for particular applications.
3. Ability to use common AI development techniques and languages.

**Syllabus**

* First Order Predicate Logic
* Semantic Nets
* XML
* Statistical techniques including linear approximation.
* Multi-layer perceptrons
* Self-organising maps
* Genetic algorithms
* Rule based systems
* Case base reasoning
* Search mechanisms
* Algorithms for large data sets
* AI areas including language, vision and robotics

**Learning and Teaching Strategy:**

In-depth theoretical overview of machine learning concepts will be delivered in the form of lectures. Students will gain significant hands-on interaction with particular algorithms and representation techniques. Hands-on labs and case studies will help students apply what they learn and to develop critical thinking and complex problem-solving skills.

**Assessment Scheme**

**(a) Formative assessment scheme**

The workshops will be used as platforms to discuss various aspects of machine learning and algorithms and representation techniques. Feedback will be given by workshop tutors.

**(b) Summative assessment scheme**

The module is assessed by coursework and examination.

50% coursework will be based on hands-on lab exercises. (Learning outcome 1 to 3). A Lab book will be submitted with completed labs and a coursework that is based on “Skills-Based Assessments”. (Learning outcome 4 to 5)

**Assessment Weighting**
The module is assessed by 50% coursework and 50% examination. - Coursework will be based on hands-on lab exercises.

**Exam Duration**
Examination, 24 hour take home exam.

**Learning Materials**

**Core:**

Russell, S and Norvig, P. (2016) Artificial Intelligence: a Modern Approach, Prentice Hall. 3rd Edition ISBN: 978-1292153964

**Essential:**

Russell, S and Norvig, P. (2016) Artificial Intelligence: a Modern Approach, Prentice Hall. 3rd Edition ISBN: 978-1292153964

**Recommended:**

Brachman, R. and Levesque, H. (2004) Knowledge Representation and Reasoning. ISBN: 978-1-55860-932-7

Poole, D. and Mackworth, A. (2018) Artificial Intelligence: Foundations of Computational Reasoning. 978-1107195394

**Total Notional Learning Hours**
300

***Research Ethics –***

***The teaching, learning, assessment and research activities undertaken in this module have been considered and are not likely to require ethical approval****.*

* *However, please seek advice if undertaking the module entails carrying out any research activities involving* ***human participants, human data, animals/animal products, precious artefacts, materials or data systems.*** *If you submit work that includes data gathered from or about people, this may be treated as academic misconduct and could lead to fail grade being awarded.*
* *Research ethics approval seeks to ensure all research is designed and undertaken according to certain principles of ethical research. These include:*

*1. Primary concern must be given to the* ***safety, welfare and dignity*** *of participants, researchers, colleagues, the environment and the wider community*

*2. Consideration of* ***risks*** *should be undertaken before research commences with the aim of minimising risks to those involved – i.e. human participants or animal subjects, colleagues, the environment and the wider community, as well as actual or potential risks to those directly or indirectly affected by the research.*

*3.* ***Informed consent*** *should be freely given by participants, and by a trained person when collecting or analysing human tissue (details on accessing and completing online training for gaining informed consent for HTA purposes can be found below in Section 8).*

*4. Respect for the* ***privacy, confidentiality and anonymity*** *of participants*

*5. Consideration of the rights of* ***people who may be vulnerable*** *(by virtue of perceived or actual differences in their social status, ethnic origin, gender, mental capacities, or other such characteristics) who may be less competent or able to refuse to give consent to participate*

*6. Researchers have a responsibility to the general public and to their profession; as such they should balance the anticipated benefits of their research against* ***potential harm, misuse or abuse*** *which must be avoided*

*7. Researchers must demonstrate the highest standards of* ***ethical conduct and research integrity****. They must work within the limits of their skills, training and experience, and refrain from exploitation, dishonesty, plagiarism, infringement of intellectual property rights and the fabrication of research results. They should declare any actual or potential conflicts of interest, and where necessary take steps to resolve them.*

*8. When using human tissues for research, Human Tissue Act and Human Tissue Authority (HTA) requirements must be met. Please contact the relevant designated person (DP) in your department or the HTA Designated Individual (DI) (Dr Lucy Ghali - L.Ghali@mdx.ac.uk). Further information is provided below in the section: "Human Tissue Authority Information", see 'Governance Structure" document and SOPs etc.*

*9. Research should* ***not involve any illegal activity****, and researchers must comply with all relevant laws.*

* *For more information about ethics go to the Middlesex Online Research Ethics (MORE) system which has information and guidance to help you meet the highest standards of ethical research using this link: https://MOREform.mdx.ac.uk*
* *Information and further guidance on how to complete a research ethics application form (e.g., video guides and templates) can be found on the MORE MyLearning site\*: http://mdx.mrooms.net/enrol/index.php?id=12277 (Log in required)*

*\*Middlesex University Definition of Research document can be located on this site.*

# Learning resources

This module has a variety of learning resources available for you to use to support your learning. These include lecture notes and lab descriptions on https://www.cwa.mdx.ac.uk/cst3170/cst3170.html and past exams. These can be accessed online via the module page. Please visit the module page regularly to make use of these.

# Making the most of your module.

This module is designed as a combination of contact sessions, directed study and independent study. This means you must participate in all the allocated sessions and you must complete all set prework and activities outside them. Students are expected to take an active part in all learning sessions whether these are online or on campus; lectures, lab sessions, practical classes, seminars and workshops.

To make the most of this module please complete the following every week

* Complete all prework in preparation for learning sessions. This may be watching videos, reading through set material or chapters and completing activities. Please make notes of points you need to clarify and discuss these in learning sessions with module tutors.
* Read through the notes making a note of any points you need to discuss with your tutor.
* Complete the set activities before the next session, making a note of any points you need to discuss with your tutor.
* Go to the module My Learning page, attempt the quizzes, make use of extra material, view the podcasts, and access the activity solutions. Make a note of anything you wish to discuss with your tutor.
* Complete further reading from the core text online.

The module team is committed to support you and your fellow students whilst you undertake this module. In order for you to get the most out of sessions you need to come prepared and ready to contribute. Please ensure that any work set by the team has been completed before workshops. After each class please review what has been covered and make a note of anything you would like clarification on.

Engaging with online and on-campus in-person learning and activities is integral to your success.  Middlesex University supports students, enabling them to achieve their full potential.

We provide this support through a number of strategies, all of which provide our students with a supportive learning environment online, remotely, face-to-face, or blended.

Further information on engaging with your programme will be available at your Induction and updates online at UniHub

<https://unihub.mdx.ac.uk/study/assessment/attendance>

## Professional behaviour and online conduct

The programme of study you are undertaking is underpinned by developing professional behaviour and attitude.

It is important that you are respectful and supportive to your fellow students and tutors. Adopting this approach will create a positive atmosphere within sessions and is something you can use in your professional life.

You must come to sessions prepared and ready to contribute where appropriate.

To access some of the rooms and specialist space used for this module you will need your University ID card. Please remember that your University ID should be carried with you always.

Please conduct your email communication with fellow students, tutors and all relevant staff in a courteous manner. It is helpful to provide your student number and if you have a query relating to a module include the module number as well.

In the same way that we help you understand how to effectively participate in learning on campus, we also want to make sure that you can make the most of online learning. Our principles of online learning class conduct are available at: <https://unihub.mdx.ac.uk/covid-19-updates-faq/online-classroom-conduct>

## Academic Integrity and Misconduct

You should be aware of the University’s academic integrity and misconduct policies and procedures. Taking unfair advantage over other students in assessment is considered a serious offence by the University. Action will be taken against any student who contravenes the regulations through negligence, foolishness or deliberate intent. . Academic misconduct takes several forms, in particular:

* **Plagiarism** – using extensive unacknowledged quotations from, or direct copying of, another person’s work and presenting it for assessment as if it were your own effort. This includes the use of third party essay writing services.
* **Collusion** – working together with other students (without the tutor’s permission), and presenting similar or identical work for assessment.
* **Infringement of Exam Room Rules** – Communication with another candidate, taking notes to your table in the exam room and/or referring to notes during the examination.
* **Self-Plagiarism** – including any material which is identical or substantially similar to material that has already been submitted by you for another assessment in the University or elsewhere.

Students who attempt to gain unfair advantage over others through academic misconduct will be penalised by sanctions, according to the severity of the offence, which can include exclusion from the University. Links to the relevant University regulations and additional support resources can be found here:

Full details on academic integrity and misconduct and the support available can be found at  [Academic Integrity | UniHub (mdx.ac.uk)](https://unihub.mdx.ac.uk/study/academic-integrity)

**Becoming a successful student** Course which includes Academic Integrity

[**Access to course**](https://mdx.mrooms.net/mod/lesson/view.php?id=877307). -You will have to log into to MyUniHub and then MyLearning to access the course.

The Academic Integrity and Misconduct policy is available in our Public Policy Statements (under Academic Quality) at: [Our policies | Middlesex University London (mdx.ac.uk)](https://www.mdx.ac.uk/about-us/policies)

Referencing & Plagiarism: Suspected of plagiarism?:

<http://libguides.mdx.ac.uk/c.php?g=322119&p=2155601>

Referencing and avoiding plagiarism:

 <https://unihub.mdx.ac.uk/study/writing-numeracy/awl-resources/writing>

The Middlesex University Students’ Union (MDXSU) Advice Service offers free and independent support in making an appeal, complaint or responding to any allegations of academic or non-academic misconduct.

<https://www.mdxsu.com/advice>

## Extenuating circumstances:

There may be difficult circumstances in your life that affect your ability to meet an assessment deadline or affect your performance in an assessment. These are known as extenuating circumstances or ‘ECs’. Extenuating circumstances are exceptional, seriously adverse and outside of your control. Please see link for further information and guidelines:

<https://unihub.mdx.ac.uk/your-study/assessment-and-regulations/extenuating-circumstances>

# Assessment

Formative assessment**:** Formative assessment is completed during your year of study and provides the opportunity to evaluate your progress with your learning. Classroom assessment is one of the most common formative assessment techniques although other activities and tasks may be used. Formative assessments help show you and us that you are learning and understanding the material covered in this course and allow us to monitor your progress towards achieving the learning outcomes for module. Although formative assessments do not directly contribute to the overall module mark they do provide an important opportunity to receive feedback on your learning.

|  |  |
| --- | --- |
| Formative assessment | Deadline |
|  *Weekly laboratory sessions* |  |

Summative assessment**:** Summative assessment is used to check the level of learning at the end of the course. It is summative because it is based on accumulated learning during the course. The point is to ensure that students have met the learning outcomes for the course and are at the appropriate level. It is the summative assessment that determines the grade that you are awarded for the module.

There are three (3) assessment components in this module:

## The Travelling Salesman Problem

## Due Date: End of Week 11 (Dec 9 and 10 2021)

## 20% of Overall Course Mark

The coursework is to build a system in Java that solves travelling salesman problems. The travelling salesman problem is to go to each city exactly once and return to the start. Solving the problem should give a path and the length of the path. There are optimal solutions, that is solutions with the shortest path.

Sample files are provided below. They have n lines for n cities. The first integer in the line is the city number (starting with 1 and ending with n) and the second and third integers are the X and Y coordinates of the city. Distance is standard Euclidean distance.

The code should be written entirely by the student. You are entirely welcome to discuss the project with others, but you need to write every single character. If you use an algorithm described elsewhere, please include a reference to that in the report.

The system should be run on the training TSPs, and submitted by 5 pm on 9th. At 5 pm, the test TSPs will be released. The student should run their unmodified system on the tests, gather the results and submit the final project. This should be submitted by 5:00 pm on December 10th to myunihub.

The system should solve the three training sets ( [train problem 1](https://www.cwa.mdx.ac.uk/cst3170/coursework/test1tsp.txt), [train problem 2](https://www.cwa.mdx.ac.uk/cst3170/coursework/test2atsp.txt), and [train problem 3](https://www.cwa.mdx.ac.uk/cst3170/coursework/test3atsp.txt).
The test sets for Dec 2018 are [old final test 1, 2018](https://www.cwa.mdx.ac.uk/cst3170/coursework/TSP1-18.txt), [old final test 2, 2018](https://www.cwa.mdx.ac.uk/cst3170/coursework/TSP2-18.txt), [old final test 3, 2018](https://www.cwa.mdx.ac.uk/cst3170/coursework/TSP3-18.txt), and [old final test 4, 2018](https://www.cwa.mdx.ac.uk/cst3170/coursework/TSP4-18.txt).
The old test sets and other test sets are [old final test 1](https://www.cwa.mdx.ac.uk/cst3170/coursework/finalTest1.txt), [old final test 2](https://www.cwa.mdx.ac.uk/cst3170/coursework/finalTest2.txt), [old final test 3](https://www.cwa.mdx.ac.uk/cst3170/coursework/finalTest3.txt), and [old final test 4](https://www.cwa.mdx.ac.uk/cst3170/coursework/finalTest4.txt). [old train problem 2 (not marked)](https://www.cwa.mdx.ac.uk/cst3170/coursework/test2tsp.txt), [old train problem 3 (not marked)](https://www.cwa.mdx.ac.uk/cst3170/coursework/test3tsp.txt)), [old final test 1 2019](https://www.cwa.mdx.ac.uk/cst3170/coursework/test1-19.txt), [old final test 2 2019](https://www.cwa.mdx.ac.uk/cst3170/coursework/test2-19.txt), [old final test 3 2019](https://www.cwa.mdx.ac.uk/cst3170/coursework/test3-19.txt), and [old final test 4 2019](https://www.cwa.mdx.ac.uk/cst3170/coursework/test4-19.txt).

The final tests are: sets will appear here. [test 1 2020](https://www.cwa.mdx.ac.uk/cst3170/coursework/test1-20.txt), [test 2 2020](https://www.cwa.mdx.ac.uk/cst3170/coursework/test2-20.txt), [test 3 2020](https://www.cwa.mdx.ac.uk/cst3170/coursework/test3-20.txt), [test 4 2020](https://www.cwa.mdx.ac.uk/cst3170/coursework/test4-20.txt),
Note that you need to make a complete circuit.

**Marking scheme**:

|  |  |
| --- | --- |
| **Points** | **Area** |
| 10 | Self Marking Sheet |
| 10 | Solve First Training Problem |
| 10 | Get Optimal Result for All Three Training Problems. |
| 10 | Describe Algorithm(s) Used |
| 10 | Quality of Code |
| 20 | Get Optimal Results for the First Three Tests |
| 20 | Get Optimal Results for First Three Tests in under a minute. |
| 10 | Best system on Fourth Test (Path length times time.) |

The student should provide a self marking sheet with their opinion of their own score. You can not get this wrong if you submit it. Additionally, the student should describe the algorithm or algorithms used. This need not be a long description; typically a paragraph will do, but for simple algorithms less is fine.

The quality of the code will be marked. This includes comments, variable, function and class names, and class structure.

Times: the final 10 points involve time. The student needs to use the system clock to time the algorithm. Use System.nanoTime(); Report times for all solutions and the first solution. The best combination of result multiplied by time on the fourth test will get 10 points. Others may also get points on this criterion.

Submission notes: you should email the system to the tutor on the 10th. The code should not change after 5 on the 10th. The only thing that should change is the reported results of the test problems. It should run from Eclipse. Instructions for running are welcome.

Please submit the code, the mark sheet, and analysis to the coursework 1 folder of CST 3170 on myunihub. You are also welcome to email a copy to the tutor. You must email a copy of the system to the tutor before the test data is released if you want any of the 50 points available for the test data.

# CST 3170 Course Work 2

## Machine Learning

## Due Date: Week 20 (Thursday, March 3, 2022)

## 30% of Overall Course Mark

This work is to build a machine learning system to categorise one of the UCI digit tasks. You should develop the system on your own from scratch. You should then run a two-fold test, and report your results.

The data is from the University of California at Irvine's Machine Learning Repository. It's the [Optical Recognition of Handwritten Digits Data Set](http://archive.ics.uci.edu/ml/datasets/Optical%2BRecognition%2Bof_Handwritten%2BDigits). This gives you two data sets, training set and a test set. I've converted them to two data sets [data set 1](https://www.cwa.mdx.ac.uk/cst3170/coursework/cw2DataSet1.csv), and [data set 2](https://www.cwa.mdx.ac.uk/cst3170/coursework/cw2DataSet2.csv)that should be used by your system.

You should write all of your code. If you use an existing algorithm, you should reference that algorithm in your code and in your report. The code should be written in Java, and should run in the lab from eclipse.

**Marking scheme**:

|  |  |
| --- | --- |
| **Points** | **Area** |
| 20 | Report |
| 20 | Running Code |
| 20 | Quality of Code |
| 20 | Quality of Algorithm |
| 20 | Quality of Results |

You should write a brief (1-2 page) report on your system. This should describe the algorithm you used, and why you chose this algorithm. It should also show the results of a two fold test using the provided data; a brief discussion of data usage would be useful.

Quality of code and algorithm are important for good marks. The code should be well commented and structured. Selection of a good algorithm is also important. Simple algorithms may be effective, but a relatively complex algorithm may get you more points just for effort.

Finally, the quality of the results do matter. To get reasonable marks you need to surpass the baseline reported on the UCI website. This is not a competition between students, but discussing performance with your colleagues will be useful.

Note for scraping by: the base line reported on UCI website is nearest neighbor using Euclidean distance. You should be able to implement this quite easily (and might want to start with this). This should be enough to pass (10 report, 20 running, 10 code, and 5 results).

Please submit the code, the mark sheet, and analysis to the coursework 2 folder of CST 3170 on myunihub. You are also welcome to email a copy to the tutor.

Assessment 3 Exam (scheduled in the spring). Hopefully this will be a 3 hour proctored exam. The exam will be scheduled by the exams office. There will be four questions, and you should answer all questions. There may be parts to the questions, and you should answer each part. Sample and old exams can be found on https://www.cwa.mdx.ac.uk/cst3170/Exam.html

The table below specifies the associated deadlines:

|  |  |  |  |
| --- | --- | --- | --- |
| Summative assessment | Weighting | Deadline | Feedback |
|  *Travelling Salesman* | *%20* | *Dec. 9 and 10, 5 pm* | *By Jan 20* |
|  *Digit Categorisation* | *%30* | *March 3, 5 pm* | *By March 24* |
|  *Exam* | *%50* | *TBD* |  |

Overall module grade

Each component of assessment will be marked as a percentage. To produce the overall module grade a weighted average percentage will be calculated and then converted to the 20-point grade using the University scale in the appendix.

Before you submit your work for final grading, please ensure that you have accurately referenced the work. It is your responsibility to check the spelling and grammar. If you have submitted a formative or draft assessment, you will receive feedback but no grade. The comments should inform you about how well you have done or tell you about the areas for improvement. All assignments should be submitted online unless specified in assessment briefs.

Reassessment for this module normally takes place in the following way:

Resit course works are the same as the originals due on the University coursework deadline. Resit exams are scheduled for the week of July 11th. Chris Huyck is available for consultation throughout the year.

Further information is available at <https://unihub.mdx.ac.uk/study/assessment/regulations>

Middlesex University is committed to being fair in its approach to assessing student learning following the [UK Quality Code for Higher Education (Quality Code) (2018](https://www.qaa.ac.uk/quality-code)) and the [UK Quality Code - Advice and Guidance: Assessment (2018)](https://www.qaa.ac.uk/quality-code/advice-and-guidance/assessment) and [External Expertise (2018).](https://www.qaa.ac.uk/quality-code/advice-and-guidance/external-expertise)

The Assessment Fairness guidance, policies and procedures put in place by Middlesex University in our commitment to ensure fairness for all in assessment, include our [Academic Policy Statement APS18: Curriculum Design Policy (2018)](https://www.mdx.ac.uk/__data/assets/pdf_file/0029/452909/APS18-Curriculum-Design-Policyweb.pdf), [Middlesex University Regulatory Framework Code of Assessment Practice: Section M](https://www.mdx.ac.uk/__data/assets/pdf_file/0040/577687/Regulations-2020-21.pdf), [Academic Policy Statement APS29: Anonymous Marking Assessment Policy (2020)](https://www.mdx.ac.uk/__data/assets/pdf_file/0037/563599/anonymous-marking-assessment-policy.pdf), [Equality and Diversity Policy and Codes of Practice (HRPS8)](https://www.intra.mdx.ac.uk/tools-policies/policies-and-guidance?start_rank=71), specifically [code of practice 7: Curriculum, Pedagogy and Assessment](https://eur02.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.intra.mdx.ac.uk%2F_media%2F_intranet%2Fdocument-library%2Fh%2FHRPS8-Equality-and-diversity-policy-revised-May-2019.docx&data=02%7C01%7CD.Gallacher%40mdx.ac.uk%7C36c3c6b1f3c045c90fae08d82f0ab462%7C38e37b88a3a148cf9f056537427fed24%7C0%7C0%7C637311070469181655&sdata=6Datk7wrCMKbzye9Pwg9u5FKcCRJrMzxK%2BT54IwdguA%3D&reserved=0) and Key Principles of Assessment.

If you have any queries or would like to know more on how this approach has been applied to modules you are studying please contact your Programme Leader.

## 7.2 Feedback on your assignments

You will be provided with feedback on all coursework that is helpful and informative, consistent with aiding the learning and development process. The nature of the feedback shall be determined at programme level but may take a variety of forms including: written comments; individual and group tutorial feedback; peer feedback; or other forms of effective and efficient feedback.

Feedback will normally be provided within 15 WORKING DAYS of the published coursework component submission date.

## 7.3 How is your assignment mark agreed?

The following diagram provides an overview of the marking process for your module assessment. Further information on the role of external examiners can be found at. <https://www.mdx.ac.uk/about-us/policies/academic-quality/handbook> (section 4)

## Anonymous Marking Assessment Policy

We have worked with the Middlesex University Students’ Union (MDXSU) to create an anonymous marking policy, in response to student feedback.  Anonymous marking ensures that your identity (your name, student number and other personal/identifiable information) is not made available to academics when they are marking your work.  This means that you can have confidence that your assessments will be marked fairly and consistently.  However, there are some forms of assessment for which anonymity cannot be guaranteed and these are recognised in the policy.  We believe that it is important to provide you with the support and guidance needed to help you develop and prepare for your final assessments (those which count towards your final grades i.e. summative assessments).  Therefore, anonymous marking will not apply to learning activities and assessments that do not contribute to your final grades (i.e. formative assessments).  If you require further information and support to understand how anonymous marking works in your programme modules please contact the Module Leader for more information.

The Anonymous Marking Assessment Policy is available at: <https://www.mdx.ac.uk/__data/assets/pdf_file/0037/563599/anonymous-marking-assessment-policy.pdf>

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| We now look at each component of assessment for this module in detail. Each of the following tables provides an overview of the requirements for each component. The support provided for each component along with the feedback arrangements, is also detailed below.**Assessment marking criteria rubric (presentation)** *As part of the assessment and fairness policy and guidance the university has approved a set of rubrics for use with all assignments. These are available for download and subject customisation from MyLearning and in Turnitin, for use with a structured general comment, see policy and guidance for more details* <https://www.intra.mdx.ac.uk/about-us/services/centre-for-academic-practice-enhancement/policy-bank/FV-Assessment-Fairness.pdf> |
| **Criteria** | **1-4 First** | **5-8 Upper Second** | **9-12 Lower Second** | **13-16 Third** | **17-20 Refer** |
| **Content:**Topic chosen relevant and informative, with a depth of knowledge and understanding. | Excellent and well-informed understanding of theories and concepts involved with topic. | Good understanding of theories and concepts involved with topic. | Demonstrate satisfactory knowledge and understanding of topics theories and concepts. | Adequate content, and limited depth of knowledge and understanding. | Inadequate content and limited depth of knowledge and understanding. |
| **Communication:**Interesting, relevant language, explanation of terminology. | Very well expressed and very good understanding of content. | Very well expressed; good understanding of content. | Well expressed; understanding of content. | Unclear expression of information; little understanding of content. | Unclear and confusing; lack of understanding of content. |
| **References:** Reference to sources including directions for further study. | Broad and relevant readings examined and used selectively in presentation. | Good range of appropriate references used during the presentation. | Conventional references and readings used within presentation. | Adequate but limited use of references during presentation. | Critique relies on no or one reference; evidence of unexamined personal opinion. |
| **Technology:**Use of video, PowerPoint, tools etc. to present the chosen topic. | Very good selection, use and integration of technology. | Good use of appropriate AV. | Technology used but poor integration. | Technology used but poorly. | Absence of any technology use. |
| **Workload:**Balance between students. | All students share presentation role equally with good transition. | Presentation shared but with poor transition. | Presentation shared unequally. | Presentation shows little sharing. | No sharing, one student presents. |

# Learning Planner

*The module leader will lead all lectures and laboratory sessions. Coursework support will be done in the lab, with particular sessions before the deadline reserved for coursework support.*

# University 20- point Scale

Coursework and exams will be marked out of 100. A final overall mark out of 100 will be calculated and converted to the 20 point scale using the University general scale.

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| **20-point scale** | General scale | General scale (full ranges) | Percentage used for aggregation purposes only **(for areas marking directly to the 20 point scale on modules with multiple assessment components)** |
| **1** | 80% - 100% | 79.50% - 100% | 90% |
| **2** | 76% - 79% | 75.50% - 79.49% | 77.5% |
| **3** | 73% - 75%  | 72.50% - 75.49% | 74% |
| **4** | 70% - 72%  | 69.50% - 72.49% | 71% |
| **5** | 67% - 69%  | 66.50% - 69.49% | 68% |
| **6** | 65% - 66%  | 64.50% - 66.49% | 65.5% |
| **7** | 62% - 64%  | 61.50% - 64.49% | 63% |
| **8** | 60% - 61%  | 59.50% - 61.49% | 60.5% |
| **9** | 57% - 59% | 56.50% - 59.49% | 58% |
| **10** | 55% - 56%  | 54.50% - 56.49% | 55.5% |
| **11** | 52% - 54%  | 51.50% - 54.49% | 53% |
| **12** | 50% - 51%  | 49.50% - 51.49% | 50.5% |
| **13** | 47% - 49%  | 46.50% - 49.49% | 48% |
| **14** | 45% - 46% | 44.50% - 46.49% | 45.5% |
| **15** | 42% - 44%  | 41.50% - 44.49% | 43% |
| **16** | 40% - 41%  | 39.50% - 41.49% | 40.5% |
| **17** | 35% - 39%  | 34.50% - 39.49% | 37% |
| **18** | 30% - 34% | 29.50% - 34.49% | 32% |
| **19** | 0% - 29%  | 0.01% - 29.49% | 15% |
| **20** | Non-participation | 0% | 0% (non-submission of a component) |