

# TLM Level 3 Diploma in Applied Numeracy and Analytical Thinking

The Level 3 Diploma in Applied Numeracy and Analytical Thinking qualifications builds on key principles of inclusive, accessible education, providing a structured pathway for learners seeking to develop advanced skills in mathematical reasoning, applied problem-solving, and logical thinking. Designed to support progression from Level 2 study, this qualification offers meaningful opportunities for learners to deepen their understanding of core concepts in number, data, shape, and systems.

Each unit within the suite focuses on real-world application of mathematical and analytical thinking, supporting both academic development and practical competence. From interpreting data and understanding risk, to modelling change and solving problems using logic and algorithms, the qualifications are built around a flexible structure that meets a wide range of learner needs and institutional contexts.

This qualification is suitable for post-16 learners, adult returners, and those preparing for further or higher study in fields such as STEM, finance, business, or digital technologies. They support varied learning styles and assessment approaches, incorporating coursework and applied tasks that enable learners to demonstrate both subject understanding and transferable skills in critical thinking, communication, and decision-making.

The Regulated Qualifications Framework (RQF) was designed by the UK government's Qualifications and Curriculum Development Agency now replaced by Ofqual. The RQF is referenced to the European Qualifications Framework devised by the European Union

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# 1. For those in a hurry!

- 1.1 TLM's assessment model is common to most of its qualifications. It is based on competence-based assessment of coursework using a portfolio of evidence and supported by a free optional cloud-based evidence management system.
- 1.2 Learners must demonstrate competence against the assessment criteria from their day-to-day work and the tutor assessor must verify that they are competent in relation to the general level descriptor using indicative assessment criteria. TLM's external moderator will check the judgements and the quality of the evidence and provide feedback. This process is not graded; the intention is that it is a flexible way of checking basic practical competence in the subject at the qualification's framework level.

#### **Procedures**

- 1.3 The first thing to do is to arrange assessor training with TLM. TLM trains at least one assessor as Principal Assessor who must accept responsibility for standards within the Centre. The Principal Assessor can train and appoint assessors within the Centre as long as they are competent to take on the work and are willing to sign an agreement on the web site to uphold standards.
- 1.4 TLM will provide initial training in the pedagogical model, and using the supporting technologies to provide the evidence needed. The purpose is to get you started and then we provide on-going support to ensure you are confident and we can work as a professional partnership. We advise new Centres to do some coursework assessment early so that they can receive feedback and quickly become confident in doing routine coursework assessment. Our aim is to make this no more onerous than normal routine assessment that anyone would do as a normal part of the teaching job. This gives more time to focus on teaching and therefore to support raising attainment.

# 2. Introduction

The TLM Level 3 Diploma in Applied Numeracy and Analytical Thinking offers a progression pathway from prior study by developing advanced skills in quantitative reasoning, logical analysis, and problem-solving across a range of real-world contexts. Covering themes such as number, data, shape, systems, and decision-making, the qualifications support learners in building both subject-specific competence and broader transferable skills

The Level 3 Diploma in Applied Numeracy and Analytical Thinking in will give learners the opportunity to:

- Engage in applied learning that is relevant to real-world contexts, developing a range of mathematical, analytical, and problem-solving techniques essential for academic and professional progression
- Achieve a nationally recognised Level 3 qualification
- Strengthen personal growth and confidence through structured, meaningful tasks that encourage deeper engagement with learning.
- 2.1 TLM Level 3 Diploma in Applied Numeracy and Analytical Thinking

The objective of the qualification is to equip learners with the knowledge, confidence, and transferable skills needed to support their continued personal and professional development.

#### **Mandatory Units**

- Unit 1 Developing Numerical Literacy (6 Credits)
- Unit 2 Exploring Shape, Space and Structure (6 Credits)
- Unit 3 Working with Data and Quantitative Uncertainty (6 Credits)
- Unit 4 Proportional Reasoning and Value (6 Credits)
- Unit 5 Exploring Patterns and Relationships (6 Credits)
- Unit 6 Solving Geometric Problems with Rules and Ratios (6 Credits)
- Unit 7 Visual Thinking and Spatial Problem Solving (6 Credits)

#### **Optional Units**

- Unit 8 Modelling Change Over Time (4 Credits)
- Unit 9 Structured Thinking and Optimisation (4 Credits)

# 3. Summary of Qualification Specification

#### 3.1 Level 3 Diploma in Applied Numeracy and Analytical Thinking (Annexe A)

The Level 3 Diploma in Applied Numeracy and Analytical Thinking supports progression from a Level 2 study by developing advanced skills in numerical reasoning, logical thinking, and applied problem-solving. Through engagement with real-world contexts across topics such as number, data, spatial relationships, and systems, learners build both subject expertise and transferable skills. Designed for post-16 learners, adult returners, and those preparing for further or higher education, the Diploma offers a flexible assessment model that promotes critical thinking and confident application through structured, purposeful learning experiences

Qualification Title: TLM Level 3 Diploma in Applied Numeracy and Analytical Thinking

Qualification Number: XXXXXXX Qualification Level: Level 3

Total Credits: 42

Guided Learning Hours: 322 Total Qualification Time: 460

Assessment Methods: Coursework, E-assessment, Portfolio of Evidence

#### Assessment

Learners must demonstrate competence against the assessment criteria from their communication and involvement with the training materials and the trainer assessor must verify that they are competent in relation to the general level descriptor using indicative assessment criteria. TLM's external moderator will check the judgements and the quality of the evidence and provide feedback. This process is not graded; the intention is that it is a flexible way of checking basic practical competence in the subject at the qualification's framework level.

#### 3.5 Assessment

The internally assessed, externally moderated coursework for all qualifications is pass/fail but by submitting the evidence for external moderation, feedback can be given to the tutor on areas to improve for resubmission.

Evidence must be provided against the unit assessment criteria from practical tasks related to the learners' everyday work supported by tutor observations, portfolio completed, and or activities in line with the learning materials

The way evidence is gathered is up to the assessor, the only requirement is that it clearly supports the judgements against the assessment criteria and the relevant learning outcomes.

If on formative assessment the account manager finds gaps in evidence relating to a particular candidate, they will request more evidence before approving the award or the unit certificate. Assessors must then adjust their work to ensure all their learners are providing the appropriate level and breadth of evidence.

We encourage early submission of at least some evidence so that assessors are confident from the feedback that what they are providing is sufficient. In this way we can maintain standards while supporting improved efficiency.

Centres will be subject to the TLM Centre Assessment Standards Scrutiny (CASS) and further details of this, including our centre guidance, is freely available on the TLM website in our Policy Download Centre. <a href="https://tlm.org.uk/policy-download-centre/">https://tlm.org.uk/policy-download-centre/</a>

# 4. Qualification Content

| Mandatory   | Optional Unit Bank   |
|---|--|
| None  |  |
| <ul> <li>Unit 1 - Developing Numerical Literacy</li> <li>Unit 2 - Exploring Shape, Space and Structure</li> <li>Unit 3 - Working with Data and Quantitative Uncertainty</li> <li>Unit 4 - Proportional Reasoning and Value</li> <li>Unit 5 - Exploring Patterns and Relationships</li> <li>Unit 6 - Solving Geometric Problems with Rules and Ratios</li> <li>Unit 7 - Visual Thinking and Spatial Problem Solving</li> </ul> | <ul> <li>Unit 8 – Modelling Change Over Time</li> <li>Unit 9 - Structured Thinking and Optimisation</li> </ul> |

# 5. Support

#### **Guidance and Assistance**

- 5.1 There is further guidance for coursework assessment on the TLM web site. All centres have an assigned Account Manager who will be pleased to help at any time. Our aim is to give professional assessors, most of whom are qualified tutors, the confidence to make judgements with a minimum of bureaucracy so that they can focus their time on maintaining their professional knowledge, skills and supporting learning through effective teaching rather than "chasing paper". There is often a confusion between bureaucracy and rigour, since unnecessarily complex bureaucracy can actually detract from rigour by obscuring the importance of the outcomes.
- **5.2 Web sites** TLM provides support through cloud-based systems. Providing assessment grades and the management of certification through the Centre Management Site is mandatory and all assessors are provided with training in its use. It is simply a matter of recording learner competence against the unit criteria as the evidence is collected and claiming a certificate on behalf of the learner when a unit has been fully assessed.
- 5.3 The community learning site provides free optional facilities for learners to submit their evidence online, linking it to the assessment criteria across single or multiple units. The assessor can accept or reject this evidence and comment on it providing a full audit trail for evidence. Moderator/verifiers can get immediate access to this evidence and so it is potentially a lot more efficient than alternative methods. No paper, no e-mails with file attachments necessary. There are facilities for progress tracking that can be based on criteria and/or units. The system can be linked as an extension to any standards compliant VLE/e-portfolio system for centres that are already committed to a specific VLE product. Training can be provided, and free support is available from your Account Manager. The aim is to eliminate all paper-based bureaucracy, all screen-shots and referencing that draws time away from teaching.
- **5.4 Telephone** and e-mail support are available to all Centres. There is a general convention of firstname.secondname@tlm.org.uk for e-mail addresses. It is usually best to e-mail your account manager in the first instance. Google hangouts can be arranged for video conferencing support.

# 6. Registration & Procedures

#### Registration

**6.1** TLM's registration model allows centres to enter learners at times convenient to them. There are no late entry fees and no additional fees should a learner fail to produce evidence at a level but can meet the criteria at a lower level. This can reduce costs to the centres when compared to other qualifications

There are no fees for replacement certificates or verification of certificates because all certificates can be directly authenticated against TLM's secure database. For details of current subscription costs please contact us or refer to the web site.

#### **Internal standardisation**

6.2 The Principal Assessor has the ultimate responsibility for consistency in assessment standards within a centre. All assessors have signed a contract agreeing to uphold standards and should therefore cooperate with the Principal Assessor and Account Manager at TLM to ensure that standards across the centre are consistent.

It is advisable to send work samples to TLM early to check that evidence is at the right standard so that there is time to make any adjustments necessary to the course and learner expectations.

TLM will generally check a higher quantity of work from new assessors and feedback to ensure that they are confident to make appropriate judgements over time. This reduces risk and improves efficiency in the longer term.

#### Authentication

- 6.3 All assessors must take reasonable steps to ensure that any coursework evidence submitted by candidates is a true reflection of the candidates' competence. This is in keeping with the assessor undertaking to uphold and maintain standards in the contract with TLM.
- **6.4** Certificates can be authenticated directly on-line using the certificate number or by scanning the QR code on the certificate. There is no charge and it makes it more likely that certificates will be checked and that in turn improves security. Certificate forgeries are a significant problem when authentication is not simple and straightforward because convincing forgeries are easy to achieve with recent technologies and will get easier as time goes on.

# 7. Other Considerations

#### Access arrangements and special requirements

**7.1** All TLM's qualifications are intended to be accessible, as widely as possible.

Please refer to the Annex for further information.

Centres should contact TLM if they have any questions related to accessibility issues

#### Language

7.2 The language for provision of this qualification is English only. This will only change if we have a significant demand in another language that is sufficient to cover the additional costs involved.

#### Malpractice

7.3 TLM has comprehensive policies and procedures for dealing with malpractice. These are documented with links on the web site at https://tlm.org.uk/policy-download-centre/ Assessors should be familiar with these policies and make them clear to candidates. Assessors should inform their account manager if they suspect any instance of malpractice that could have a material effect on the outcome of any assessments, either for themselves or colleagues. This is part of the upholding of standards that is part of the contract with TLM.

#### **Equality of opportunity**

7.4 TLM promotes equality of opportunity through policies and procedures. These are again documented in detail on the web site at https://tlm.org.uk/policy-download-centre/

#### **Resources, Support and Training**

- **7.5** A clear goal is to enable learners to support all their IT user needs using resources freely and legally available from the internet. This is related directly to national policies for inclusion and equality of opportunity. The reality is that there is so much user dependence on proprietary applications that we can only support the transition to free and open resources through education and common sense.
- 7.6 TLM does not require centres to use Free and Open-Source applications but it certainly encourages them to do so. Most of the key software applications needed to support any of the assessed units are available freely from the web including office suites, graphics and sound editing. As a nation we could save hundreds of millions if not billions of pounds in software licensing fees by providing users with the skills, knowledge and confidence to migrate to free and open-source applications. You Tube, OpenClipart.org, Wikipedia and many other sites provide free content that supports learning and the number and range of such sites is increasing.

#### Annexe A

#### Level 3 Diploma in Applied Numeracy and Analytical Thinking - Unit assessment - coursework guidance

The **Level 3 learner** has knowledge and understanding of facts, procedures and ideas in an area of study or field of work to complete well-defined tasks and address straightforward problems. Holder can interpret relevant information and ideas. Holder is aware of a range of information that is relevant to the area of study or work.

#### AND/OR

Holder can select and use relevant cognitive and practical skills to complete well-defined, generally routine tasks and address straightforward problems. Holder can identify how effective actions have been. Holder can identify, gather and use relevant information to inform actions.

Moderation/verification: The assessor should keep a record of assessment judgements made for each candidate and make notes of any significant issues for any candidate. They must be prepared to enter into dialogue with their Account Manager and provide their assessment records to the Account Manager through the on-line mark book. They should be prepared to provide evidence as a basis for their judgements should it be required by the Principal Assessor or their Account Manager/external moderator. Before authorising certification, the Account Manager must be satisfied that the assessor's judgements are sound.

#### **General Information**

The Level 3 qualification has the following characteristics for learners:

- Achievement at RQF level 3 (EQF Level 4) reflects the ability to select and use relevant knowledge, ideas, skills and procedures to complete well-defined tasks and address straightforward problems. It includes taking responsibility for completing tasks and procedures and exercising autonomy and judgement subject to overall direction or guidance.
- Use understanding of facts, procedures and ideas to complete well-defined tasks and address straightforward problems. Interpret relevant information and ideas. Be aware of the types of information that are relevant to the area of study or work.
- Complete well-defined, generally routine tasks and address straightforward problems. Select and use relevant skills and procedures. Identify, gather and use relevant information to inform actions. Identify how effective actions have been.
- Take responsibility for completing tasks and procedures subject to direction or guidance as needed.
- The specification for the Level 3 award provides an outcome framework for assessment and is not intended to dictate any particular context for learning and so can be used with any age range of adults.

#### Requirements

- Standards must be confirmed by a trained Level 4 Assessor
- Assessors must as a minimum record assessment judgement as entries in the on-line mark book on the TLM certification site.
- It is expected that there will be routine evidence of work used for judging assessment outcomes in the candidates' records of their day-to-day work. Samples, including related plans and schemes of work should be available at the annual visit and/or by video conference.
- Different approaches to learning will be required in order to match differing needs, for example, the needs of learners will be different from the needs of those with learning disabilities.
- When the candidate demonstrates secure capability against each of the criteria in the unit, they are entitled to a certificate for passing the unit and the overall award.

### Unit 1 – Developing Numerical Literacy 6 Credits

| 1 Explore prime factors and powers.                   | <ul><li>1.1 Identify prime numbers and prime factors, and express numbers using exponents</li><li>1.2 Calculate the least common multiple and greatest common divisor</li></ul>  |
|---|--|
| 2 Understand roots and powers.                        | <ul> <li>2.1 Compare and apply square numbers, cube numbers, square roots, and cube roots.</li> <li>2.2 Estimate square roots of non-perfect squares and use the long division method to approximate square roots.</li> <li>2.3 Construct and label a number line to illustrate square and cube roots</li> </ul> |
| 3 Work with positive, negative, and rational numbers. | <ul> <li>3.1 Perform arithmetic with positive and negative numbers.</li> <li>3.2 Identify and apply operations with whole numbers.</li> <li>3.3 Recognise rational numbers and perform calculations with fractions and decimals.</li> <li>3.4 Convert between fractions and decimals.</li> </ul>                 |
| 4 Understand number representation.                   | 4.1 Illustrate whole numbers and their operations using number line models 4.2 Describe how to use standard form to express very large and very small numbers.   |
| 5 Explore number properties and set theory.           | <ul><li>5.1 Apply properties of real numbers, including commutativity and associativity.</li><li>5.2 Apply the laws of exponents and identify fractional exponents.</li><li>5.3 Understand and apply basic set theory concepts.</li></ul>  |

## Unit 2 – Exploring Shape, Space and Structure 6 Credits

| 1 Recognise and describe 2D shapes and their properties | <ul><li>1.1 Analyse the comparison between the properties of triangles and quadrilaterals.</li><li>1.2 Describe the relationships between parallel lines and angles.</li><li>1.3 Describe how to apply parallel lines and angle rules to geometric problems.</li></ul> |
|---|--|
| 2 Calculate measures in 2D shapes                       | 2.1 Calculate area and perimeter of squares, rectangles, parallelograms, and trapeziums.   |
| 3 Explore 3D shapes and volume                          | 3.1 Identify 3D shapes and their properties. 3.2 Calculate surface area and volume of pyramids, cones, cylinders, and spheres.   |
| 4 Understand triangle properties and relationships      | <ul><li>4.1 Describe the properties of isosceles and right-angle triangles.</li><li>4.2 Apply the Pythagorean theorem to solve for unknown side lengths.</li><li>4.3 Identify and describe the criteria for similar triangles.</li></ul>                               |

## Unit 3 – Working with Data and Quantitative Uncertainty 6 Credits

| 1 Understand types and sources of data    | <ul><li>1.1 Identify different types of data, including qualitative and quantitative.</li><li>1.2 Describe differences between populations and samples in data collection.</li><li>1.3 Identify variables and raw data in statistical contexts.</li></ul> |
|---|---|
| 2 Organise and present data effectively   | <ul><li>2.1 Organise raw data into frequency tables and grouped data classes.</li><li>2.2 Present data visually using bar charts, line graphs, pie charts, and histograms.</li></ul>  |
| 3 Summarise and interpret data            | 3.1 Calculate measures of central tendency: mean, median, and mode. 3.2 Interpret and calculate measures of spread, including range and standard deviation.   |
| 4 Explore relationships within data       | <ul><li>4.1 Identify how to interpret scatter graphs and describe correlations.</li><li>4.2 Use correlation coefficients to evaluate strength and direction of relationships between variables.</li></ul>   |
| 5 Understand probability in context       | <ul><li>5.1 Describe experimental and theoretical probability.</li><li>5.2 Calculate probabilities for single and combined events.</li><li>5.3 Analyse probability using fractions, decimals, and percentages.</li></ul>                                  |
| 6 Apply probability to real-life problems | <ul><li>6.1 Apply the addition and multiplication rules of probability.</li><li>6.2 Interpret and calculate conditional probability in everyday scenarios.</li><li>6.3 Explore mutually exclusive and independent events.</li></ul>                       |

## Unit 4 – Proportional Reasoning and Value 6 Credits

| 1 Use ratios and proportions in everyday contexts         | <ul><li>1.1 Explain and apply ratios in real-life situations.</li><li>1.2 Solve problems using direct and inverse proportion.</li><li>1.3 Apply compound proportion to multi-step scenarios.</li></ul>   |
|---|--|
| 2 Understand and use percentages                          | <ul><li>2.1 Convert between percentages, decimals, and fractions.</li><li>2.2 Calculate percentage increases, decreases, and comparisons.</li><li>2.3 Apply percentage calculations in real-world contexts, such as growth and decay.</li></ul>                        |
| 3 Apply basic financial arithmetic                        | <ul><li>3.1 Calculate profit, loss, and changes in value.</li><li>3.2 Use simple and compound interest formulas in practical problems.</li><li>3.3 Apply discount and rebate calculations in commercial settings.</li></ul>  |
| 4 Explore value, inflation, and purchasing power          | <ul><li>4.1 Explain the concept of inflation and its impact on money.</li><li>4.2 Adjust prices, salaries, or values to reflect inflation over time.</li><li>4.3 Describe how to distinguish between nominal and real values.</li></ul>                                |
| 5 Understand financial protection and resource allocation | <ul><li>5.1 Describe the concept of risk and how insurance provides financial protection.</li><li>5.2 Divide amounts into proportional parts in different practical scenarios.</li><li>5.3 Explain simple investment concepts and how returns are generated.</li></ul> |

## Unit 5 – Exploring Patterns and Relationships 6 Credits

| 1 Understand algebraic expressions and operations  | <ul><li>1.1 Describe variables, terms, and algebraic expressions.</li><li>1.2 Perform operations with polynomials, fractional expressions, and root expressions.</li><li>1.3 Apply the rules of algebra to simplify and manipulate expressions.</li></ul>   |
|--|---|
| 2 Work with equalities and inequalities            | <ul> <li>2.1 Identify and solve equations involving one variable</li> <li>2.2 Solve simultaneous equations using substitution, elimination, or graphical methods.</li> <li>2.3 Interpret and solve inequalities involving one or two variables.</li> <li>2.4 Describe solutions to equations and inequalities graphically.</li> </ul>               |
| 3 Explore relationships using functions and graphs | <ul> <li>3.1 Describe functions, domains, and ranges.</li> <li>3.2 Describe how to distinguish between types of functions.</li> <li>3.3 Construct and interpret graphs of common functions.</li> <li>3.4 Apply function notation, composite functions, and inverse functions.</li> </ul>  |
| 4 Apply exponentials, logarithms, and sequences    | <ul> <li>4.1 Identify and use exponential and logarithmic functions.</li> <li>4.2 Apply the laws of logarithms to simplify and solve problems.</li> <li>4.3 Identify arithmetic and geometric sequences and calculate their terms and sums.</li> <li>4.4 Recognise finite and infinite series and understand convergence and divergence.</li> </ul> |
| 5 Understand vectors, matrices, and linear systems | <ul> <li>5.1 Represent vectors in two and three dimensions and apply vector operations.</li> <li>5.2 Identify and perform basic matrix operations.</li> <li>5.3 Use matrices and determinants to solve systems of equations.</li> <li>5.4 Apply transformations using matrices.</li> </ul>  |
| 6 Explore complex numbers                          | 6.1 Identify and perform operations with complex numbers. 6.2 Use powers, roots, and polar forms of complex numbers.  |

## Unit 6 – Solving Geometric Problems with Rules and Ratios 6 Credits

| 1 Understand angles and side relationships in triangles       | <ul> <li>1.1 Identify angle and side properties in right-angled and non-right-angled triangles.</li> <li>1.2 Define and use trigonometric ratios: sine, cosine, and tangent.</li> <li>1.3 Calculate missing sides or angles using trigonometric ratios.</li> </ul> |
|---|--|
| 2 Apply trigonometry to special cases and real-world problems | <ul><li>2.1 Use trigonometric values for special angles.</li><li>2.2 Apply trigonometric functions to solve contextual and geometric problems.</li></ul>   |
| 3 Work with arcs, radians, and circular measure               | <ul><li>3.1 Understand and use radians as a unit of angular measure.</li><li>3.2 Calculate arc lengths and areas of sectors using radians.</li></ul>   |
| 4 Explore and graph trigonometric functions                   | <ul><li>4.1 Describe the graphs of sine, cosine, and tangent functions.</li><li>4.2 Apply knowledge of trigonometric graphs to solve equations and model periodic behaviour.</li></ul>   |
| 5 Use trigonometric rules and theorems                        | <ul><li>5.1 Apply the sine rule and cosine rule to solve triangles.</li><li>5.2 Solve non-right-angled triangle problems using appropriate trigonometric methods.</li></ul>  |

# Unit 7 – Visual Thinking and Spatial Problem Solving 6 Credits

| 1 Use coordinate systems to explore position and distance | <ul> <li>1.1 Identify points using Cartesian coordinates.</li> <li>1.2 Calculate the distance and midpoint between two points.</li> <li>1.3 Determine the slope of a line and interpret relationships between parallel and perpendicular lines.</li> </ul> |
|---|--|
| 2 Apply transformations and symmetry                      | <ul><li>2.1 Perform reflections, rotations, and translations on 2D shapes.</li><li>2.2 Describe the concept of symmetry in different contexts.</li></ul>   |
| 3 Explore circle geometry                                 | 3.1 Identify and describe the parts of a circle. 3.2 Apply geometric theorems and rules involving circles to solve problems.   |
| 4 Work with equations in coordinate geometry              | 4.1 Write and apply equations of straight lines. 4.2 Write and interpret the equation of a circle in Cartesian form.   |
| 5 Understand and apply vector geometry                    | 5.1 Identify and manipulate vectors using coordinates. 5.2 Use vector methods to solve geometric problems in 2D and 3D space.  |
| 6 Explore curved shapes and conic sections                | 6.1 Identify and describe parabolas, hyperbolas, and ellipses. 6.2 Solve geometric problems involving the loci of conic sections.  |

## **Unit 8 – Modelling Change Over Time 4 Credits**

| 1 Explore the concept of limits and continuity | <ul><li>1.1 Describe the concept of a limit and its role in understanding change.</li><li>1.2 Explain what it means for a function to be continuous.</li><li>1.3 Identify the relationship between limits, continuity, and derivatives.</li></ul>                                   |
|--|---|
| 2 Understand and apply differentiation         | <ul> <li>2.1 Interpret the derivative as a measure of change or rate.</li> <li>2.2 Differentiate basic algebraic functions.</li> <li>2.3 Identify and analyse critical points on a curve.</li> <li>2.4 Use differentiation to sketch and interpret the shape of a graph.</li> </ul> |
| 3 Understand and apply integration             | <ul><li>3.1 Describe the relationship between differentiation and integration.</li><li>3.2 Integrate basic functions to calculate area under a curve.</li><li>3.3 Apply integration to practical problems such as distance, area, and accumulation.</li></ul>                       |
| 4 Use numerical methods to solve problems      | <ul><li>4.1 Approximate solutions to equations using iterative methods.</li><li>4.2 Apply the Newton-Raphson method to find roots.</li><li>4.3 Estimate the value of definite integrals using the trapezoidal rule.</li></ul>   |

# Unit 9 – Structured Thinking and Optimisation 4 Credits

| 1 Explore logic and structured reasoning       | <ul><li>1.1 Define simple and compound propositions.</li><li>1.2 Construct truth tables and apply logical connectives (and, or, if-then, if and only if).</li><li>1.3 Apply logic rules to evaluate statements and build compound arguments.</li></ul>   |
|--|--|
| 2 Understand networks and graph-based models   | <ul><li>2.1 Describe graphs using vertices and edges.</li><li>2.2 Distinguish between simple graphs and directed graphs.</li><li>2.3 Identify regions and routes using maps and planar graphs.</li><li>2.4 Identify and describe trees and spanning trees.</li></ul>   |
| 3 Apply algorithms to decision-making          | <ul><li>3.1 Use sorting algorithms (e.g., binary search, bubble sort, quick sort).</li><li>3.2 Apply Prim's and Kruskal's algorithms to find minimum spanning trees.</li><li>3.3 Model critical paths in project planning using precedence tables.</li></ul>   |
| 4 Solve problems using optimisation techniques | <ul> <li>4.1 Represent constraints and objectives using linear programming models.</li> <li>4.2 Use graphical methods to identify optimal solutions.</li> <li>4.3 Understand and apply the simplex method to standard linear problems.</li> <li>4.4 Explore the big-M and two-phase methods for non-standard linear problems.</li> </ul> |

#### **Accessibility Policies**

TLM firmly believes that every learner should have an equal chance to excel in their studies and assessments, regardless of any disabilities they may have. To achieve this goal, TLM has developed a comprehensive and well-structured reasonable adjustment policy that is specifically tailored to cater to the needs of learners with disabilities. This policy is not only an essential aspect of TLM's commitment to inclusivity but also an integral part of creating a diverse and accessible learning environment.

The reasonable adjustment policy is designed to support learners with disabilities in various ways. It encompasses a range of accommodations, such as providing additional time for examinations, offering alternative formats for study materials, permitting the use of assistive technology, arranging for sign language interpreters, and ensuring accessible physical facilities. The implementation of these reasonable adjustments is meticulously carried out to ensure that they meet the individual needs of each learner, acknowledging the unique challenges they may face.

TLM is dedicated to making the reasonable adjustment process transparent and easily accessible for all stakeholders. Thus, the details of the policy are made readily available to all, including learners, educators, and TLM Centres. These details can be found on TLM's official website, ensuring that everyone is well-informed about the support and accommodations available to learners with disabilities.

Additionally, TLM Centres play a crucial role in facilitating this process. They are empowered to submit requests for other reasonable adjustments on behalf of learners, based on their specific requirements and circumstances.

TLM firmly believes that promoting a culture of inclusivity and understanding is fundamental to fostering an environment where learners can thrive, irrespective of their abilities or disabilities. By continuously evaluating and refining its reasonable adjustment policy, TLM ensures that it remains up to date with the best practices in the field of inclusive education.

TLM Qualifications is deeply committed to its duty as an awarding organisation to provide reasonable adjustments for learners with disabilities in accordance with the Equality Act 2010. By adhering to its comprehensive reasonable adjustment policy and collaborating closely with TLM Centres, TLM strives to create a learning landscape that supports and empowers all learners, ensuring they can reach their full potential and achieve academic success

TLM Accessibility Policy: https://tlm.org.uk/policies/general-requirements-for-regulated-qualifications/#3

TLM reasonable adjustment policy: <a href="https://tlm.org.uk/reasonable-adjustments-and-special-considerations-policy-2/">https://tlm.org.uk/reasonable-adjustments-and-special-considerations-policy-2/</a>

TLM reasonable adjustments request form: <a href="https://tlm.org.uk/wp-content/uploads/2022/03/TLM-RASC-form-1.docx">https://tlm.org.uk/wp-content/uploads/2022/03/TLM-RASC-form-1.docx</a>

TLM reasonable adjustments request form: https://tlm.org.uk/wp-content/uploads/2022/03/TLM-RASC-form-1.docx