



L-Università ta' Malta
Faculty for the
Built Environment

B.Sc.(Hons) in Built Environment Studies
BEN3101 – Design Workshop
OCC_A – Pedestrian Footbridge Project

Unit Co-Ordinator:

Professor Marc Bonello

Design Mentors:

On a weekly basis:

Dr Nathan Vella, Perit Carmelo Barbara, Dr Konrad Xuereb & Perit David Xuereb.

On an ad hoc basis:

Prof. Ing. Simon P. Borg may be consulted for any building engineering services requirements of the design project.

Programme:

This Design Workshop will have a 6-week duration, starting on Wednesday 30th September 2026. The Design Project Deliverables for this Design Workshop are to be submitted by Tuesday 10th November 2026. The date of the Oral Presentation and Final Design Review for this Design Workshop will be communicated in due course.

Objective:

The Design Workshop will focus on the design of an elevated pedestrian walkway across Xlendi Creek in Gozo as shown in the attached Site Plan (obtained from the Planning Authority Map Server). The existing access from the urban area of Xlendi to Xlendi Tower, situated on the promontory at Ras il-Bajda, is via an existing old stone pedestrian footbridge across the valley leading to Xlendi Creek and a rather dangerous narrow stepped footpath located by the hillside leading to the tower. Given that Xlendi Tower is a popular tourist destination, it is desired to provide a more convenient, safe pedestrian access for all from Triq il-Kantra in Xlendi to Xlendi Tower. The objective of this Design Workshop, therefore, is to propose a design for a pedestrian footbridge linking the urban area in Xlendi to Xlendi Tower. The design proposal is also to consider the optimum structural system, the suitable structural and finishing materials, the location (placed within or nearby the ellipse shaded in red on the attached Site Plan) and the span of the pedestrian footbridge.

The act of crossing the bridge is, therefore, also an opportunity to cross this ecological area close to one of the most scenic locations around the Gozo coastline. Bridges can become places, where the pedestrian interacts with the surroundings, or which one can exploit a vantage point over particular

views. Bridges can help pedestrians cross from one point to the other, but they can also encourage them to linger and to stop in the middle of the space between departure and arrival points. Pedestrian bridges must also address the issue of safe and comfortable access, and safe and comfortable passage across, at all times of the day. Protection from the elements, railings, and artificial lighting issues must, therefore, also be carefully studied during the design stage.

Footbridges have developed into an exciting genre in the field of bridges. Pedestrian footbridges are primarily functional structures, but they must also engage with both the pedestrian user– at close proximity – and with the site. In this case, the Site is a protected valley leading to Xlendi Creek, with particular ecological importance. The issues of construction methodology, including appropriate foundations must, therefore, be taken into account.

Therefore, it is necessary to conduct a site analysis in order to determine the existing site constraints on both sides of the creek valley as well as the topography of the terrain. In this way, it would be possible to determine the ideal position of the pedestrian footbridge, since its location and elevation above the existing terrain will also determine its overall span.

For this purpose, different structural materials may be considered in order to achieve a sustainable design with the lowest possible carbon footprint and environmental impact, taking into consideration the important fundamental structural design principles of sustainability, resilience, durability, structural efficiency, accessibility and amenability.

Pedestrian footbridges provide an opportunity to use different building and finishing materials. Since the pedestrian experiences such materials from a much closer distance than when crossing major highway bridges, the choice of these materials, both structural and finishes, as well as the details of the junctions between these materials, become much more important design decisions. Pedestrian footbridges are, therefore, an excellent opportunity for inter-disciplinary design collaboration.





Design Methodology:

It is intended that this Design Workshop would be an opportunity to study the holistic DESIGN PROCESS, starting from an understanding of the Site, an understanding of the functional requirements, and a survey of case studies— examples of existing pedestrian footbridges from which to learn.

The first two weeks will be devoted to this part of the design process, which will be undertaken on the basis of group work, and which will be concluded by the First Intermediate Presentation/ Seminar to be held on Wednesday 14th October 2026. At the same time, each one of you will individually develop two alternative design concepts, which will be explored and assessed. The aspects of structural stability are obviously important, and the opportunity should be taken to integrate principles of structural behaviour at the conceptual design stage.

The **emphasis of this Project** will not be on numerical analysis work, but **on the understanding of the basic principles of structural stability and resilience**, mostly using physical and/or digital 3-D models, and approximate simple methods of analysing structural behaviour.

Basic structural concepts of one of the two proposed alternative design concepts will be presented at the end of the fourth week, in a Second Intermediate Presentation/ Seminar to be held on Wednesday 28th October 2026.

The Design Project Deliverables are to be submitted in PDF Format on BEN3101 OCC_A UM VLE online facility at the end of the sixth week on Tuesday 10th November 2026.

Finally, the Assessment of this Design Workshop will be carried out in a Final Oral Presentation at a date to be communicated in due course.

Your Design Workshop presentation should include as a minimum:

- (a) At least, 1 in No. working 3-D physical and/or digital model of your final structural design concept.
- (b) Not more than 2 in No. A0 sheets. The submission of drawings should include an architectural plan, an architectural elevation and large-scale detailed sections of your proposed pedestrian footbridge, namely one longitudinal section and two transverse sections (one transverse section at mid span of your pedestrian footbridge and another transverse section at a footbridge support).
- (c) An A4 Design Report (not exceeding 30 in No. pages), that has the following content:
 - (i) Introduction and scope.
 - (ii) Case studies (with references) and discussion on structural design concepts.
 - (iii) Two alternative design proposals and considerations influencing your choice of design.
 - (iv) Final proposed design of the pedestrian footbridge, including structural justifications for your proposal.
 - (v) Additional structural details, which may not have fitted within the 2 in No. A0 sheets.
- (d) An MS Power Point Presentation (not exceeding 20 in No. slides) to be used during the Oral Presentation of the Design Project.

The emphasis of this Design Workshop will be focused upon:

- (a) **The quality of your critical analysis of the design problem.**
- (b) **Your alternative structural design proposals, and your assessment of such design alternatives.**
- (c) **Design quality aspects, which should deal with:**
 - (i) **The clarity of the pedestrian access (beginning and end of the footbridge).**

- (ii) The soundness of your proposed structural system, and the construction and erection methodology.
- (iii) The quality of the proposed materials, and the way that they are detailed and implemented within your proposed structural design.
- (iv) The artificial lighting scheme.
- (v) The way your design proposal integrates within the context of the Site.



Learning Outcomes:

This design project workshop envisages the following learning outcomes for the pedestrian bridge design project:

- An ability to **identify, formulate and solve engineering problems**, to select and apply relevant methods from established analytical, computational and experimental methods, to recognise the importance of non-technical – societal, health and safety, environmental and industrial – constraints.
- An ability to develop and **design engineering structures and systems in detail** to meet established requirements, that can include an awareness of non-technical considerations, and to select and apply relevant design methodologies.
- An ability to conduct searches of literature, to consult and to critically use scientific databases and other appropriate sources of information, to **carry out structural simulation and critical analysis** in order to pursue detailed investigations and research of technical issues.
- An ability to consult and **apply design codes of practice and safety regulations**.
- An **understanding of applicable materials, equipment and tools, engineering technologies**, and their limitation.
- An ability to **communicate effectively** information, ideas, problems and solutions.
- An ability to **function as a member of a design team** and to cooperate effectively with peers.

Assessment Criteria:

Assessment of the individual student design projects will be carried out by means of an oral examination following a MS Power-Point presentation by the students of their individual design project deliverables submitted on the BEN3101 OCC_A UM VLE online facility by the deadline for submissions. Every student will be allocated a maximum of 15 minutes for the oral presentation, following which there will be a 5-minute Q & A (Question and Answer) session with the BEN3101 OCC_A Board of Examiners. The assessment marks, which will be assigned by the examiners, will be based upon the following assessment criteria:

<i>Learning Outcome</i>	<i>Mark</i>
Identify, formulate and solve engineering problems	10
Design engineering structures and systems in detail	50
Carry out structural simulation and critical analysis	10
Apply design codes of practice and safety regulations	5
Understanding of applicable materials, equipment and tools, engineering technologies	10
Communicate effectively	10
Function as a member of a design team	5

Suggested Further Reading:

Keil, Andreas, *Pedestrian Bridges - Detail Practice*, Edition Detail, Munich 2013.

Schlaich Bergermann und Partner, ed. C.Hellstern et al., *Detail Engineering 1*, Edition Detail, Munich 2011.

Plagiarism:

When writing the Technical Design Report, students should be mindful of the regulations on plagiarism and collusion of the University of Malta, which may be consulted online at:

[Student Conduct - Office of the Registrar - L-Università ta' Malta \(um.edu.mt\)](http://um.edu.mt)

AERIAL SITE PHOTOGRAPH

