Name of university, Name of faculty: Trnava University
Faculty of Education

INFORMATION SHEET OF THE SUBJECT

Code: YPEM321	**Name:** Fundamentals of graph theory	
Cover: Department of School Education		
Type of educational activity: Seminar **Scope of educational activity (in hours):** **Weekly:** 2 **For term of study:** ZS 46 **Method of educational activity:** Combined	**Number of credits:** 3	**Recommended semester:** WT **Study grade:** Master

Recommended semester	Study programme
2.year WT	Primary Education Teaching (DUPV_E2) Primary Education Teaching (YUpPV-D2) Primary Education Teaching (YUpPV-E2)

Underlie subjects:

Conditions for passing the course:
Method of evaluation: Completion by taking an examination

Continuous evaluation: None.
Final evaluation: The final evaluation consists of a written test for which a maximum of 100 points can be obtained. The content of the test follows the items in the schedule of the course.
Finished: The course is completed on the basis of a final assessment. A minimum of 91 points is required for getting an A grade, a minimum of 81 points for a B grade, a minimum of 71 points for a C grade, a minimum of 61 points for a D grade and a minimum of 51 points for an E grade. Completion of the non-contact part of the course is also a prerequisite for passing the course. This part is realized mainly by regular study of the material covered in the last lecture, regular preparation for the next seminar, study of recommended study literature, and study of video recordings in Teams, preparation for the final test.

Learning outcomes:
LO1 The student acquires knowledge from selected parts of graph theory
LO2 The student is able to apply the acquired knowledge to solve problems with mathematical and non-mathematical context
LO3 The student is able to use the acquired knowledge in the work of a teacher in primary education

Schedule of subject:
Graph, concept of graph, definition of graph, graph diagram, multigraph, pseudograph.
Some properties of finite graphs, vertex degree, degree theorem, regular graph, complete graph, subgraph.
Sequence, line, way, Eulerian graph, drawing a picture in one line.
Distances in graphs.
Hamiltonian circle, Hamiltonian graphs.
Trees and their use in solving combinatorics problems in primary education.
Rated graphs.
Oriented graphs.
Labyrinths, solving labyrinths.
Planar and non-planar graphs, their characterisation, examples of non-planar graphs, their applications.
Graph colouring, chromatic number of a graph, four-colour problem. Use in colouring maps.

Recommended reading:
POKORNÝ, M.: Diskrétna matematika. On-line kurz, 2012, Trnava.
HÍC, P. – POKORNÝ, M.: Grafové algoritmy v školskej praxi. On-line kurz, 2004, Trnava.
HÍC, P. – POKORNÝ, M.: Vybrané state z teórie grafov, Bratislava: MC, 2003.
ŽIDEK, O.: Teória grafov a ich aplikácie v školskej praxi, Bratislava: Edičné stredisko PdF UK, 1997, 98,99, 2000.
SEDLÁČEK, J.: Úvod do teórie grafov, Praha: Akadémia, 1981.
ABAS, M. – HÍC, P.: Diskrétna matematika, MtF STU Trnava, 2005.

Language requirements: Slovak, English

Notes:

Course evaluation:
Assessed students in total: 463

A	B	C	D	E	FX
26%	27%	18%	14%	11%	3%

Lecturers:
doc. PaedDr. Milan Pokorný, PhD., lecturer, examiner, instructor, seminary supervisor

Date of last change: 01.09.2026
Approved by: prof. PhDr. Oľga Zápotočná, CSc.