

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	Geomorfologija v študijah geološko pogojenih nevarnosti
Course title:	Geomorphology in Geohazard Studies

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Okoljske in regionalne študije, doktorski študij 3. stopnje	4D Zemlja	/	/
Environmental and Regional Studies, doctoral study 3 rd cycle	4D Earth	/	/

Vrsta predmeta / Course type Izbirni/Elective

Univerzitetna koda predmeta / University course code: DIZ06

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje work	Druge oblike študija	Samost. delo Individ. work	ECTS
15	5	10			150	6

Nosilec predmeta / Lecturer: doc. dr. Petra Jamšek Rupnik
(ostali izvajalci: dr. Eva Mencin Gale)

Jeziki / Languages: **Predavanja / Lectures:** slovenščina, angleščina / Slovene, English
Vaje / Tutorial: slovenščina, angleščina / Slovene, English

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:

Končana druga bolonjska stopnja ustrezne smeri ali univerzitetni študij VII stopnje

Prerequisites:

Second-cycle Bologna degree in the relevant track or a university (level VII) degree.

Vsebina:

- Geomorfološki procesi
- Pregled področij in metod v preučevanju geološko pogojenih nevarnosti
- Tektonska geomorfologija
- Fluvialna geomorfologija
- Geomorfologija pobočnih procesov
- Sedimentacijska okolja in tipične pokrajinske oblike
- Opis sedimentov
- Datiranje pokrajinskih oblik in sedimentov
- Daljinsko zaznavanje in GIS okolje
- Pregled prostodostopnih podatkov za geomorfološke analize
- Priprava podatkov za analizo

Content (Syllabus outline):

- Geomorphological processes
- Overview of subfields and methods in studying geologically induced hazards
- Tectonic geomorphology
- Fluvial geomorphology
- Geomorphology of slope processes
- Sedimentary environments and typical landscape forms
- Description of sediments
- Dating of landforms and sediments
- Remote sensing and GIS environment
- Overview of publicly available data for geomorphological analyses
- Data preparation for analysis

- Uporaba digitalnih modelov reliefa za analizo površine s poudarkom na uporabi lidar podatkov in zajemu podatkov z dronom
- Primerjava različnih vizualizacij modelov površja
- Geomorfološko kartiranje
- Morfometrija
- Digitalni zajem terenskih podatkov
- Praktične izkušnje

- Use of digital elevation models for surface analysis with an emphasis on the use of LiDAR data and drone data collection
- Comparison of different surface model visualizations
- Geomorphological mapping
- Morphometry
- Digital field data collection
- Practical experience

Temeljni literatura in viri / Readings:

Izbrana poglavja iz knjig ter članki/Selected chapters from books and papers:

- Burbank, D. W. & Anderson, R. S. 2011. Tectonic geomorphology. - Malden (MA)[etc.] : Blackwell Science, 274 str.
- Bull, W. B. 2007. Tectonic geomorphology of mountains : a new approach to paleoseismology. - Malden, MA ; Oxford : Blackwell Pub., 316 str.
- Charlton, R., 2008. Fundamentals of fluvial geomorphology. [na spletu] London; New York: Routledge.str.XXIII, 234. Dostopno na: <http://www.loc.gov/catdir/toc/ecip0714/2007014030.html>.
- Goudie, A. S. 2004. Encyclopedia of geomorphology. London; New York: Routledge; International Association of Geomorphologists. 2 zv.
- Hengl, T. & Ruter, H. I. 2008. Geomorphometry : Concepts, Software, Applications. - Amsterdam [etc.] : Elsevier, 765 str.
- Highland, L.M. & Bobrowsky, P., 2008. The landslide handbook—A guide to understanding landslides: Reston, Virginia, U.S. Geological Survey Circular 1325, 129 str.
- Hugget, R. J. 2017. Fundamentals of geomorphology. 4th ed. - London ; New York : Routledge, 458 str.
- Miall, A.D., 2014. Fluvial depositional systems. Cham: Springer.str.IX, 316.
- Pavlopoulos, K., 2009. Mapping Geomorphological Environments. Springer Berlin Heidelberg, 236 str.
- Tarolli, P. & Mudd, S. M, 2020. Remote Sensing of Geomorphology. Amsterdam [etc.] : Elsevier, 380 str.

Cilji in kompetence:

Študenti in študentke pridobijo sposobnosti in znanja za celovito razumevanje in analizo različnih geomorfoloških procesov. Razumejo obliko površja v kontekstu geoloških procesov, sestave in strukture pod površjem. Pridobijo znanje o uporabi geomorfoloških metod pri raziskavah različnih geološko pogojenih nevarnosti. Spoznajo najbolj tipične podatke za geomorfološko analizo in orodja za izvedbo analiz. Razvijajo 3D prostorsko predstavo in sposobnost orientacije na terenu z uporabo sodobnih orodij. Naučijo se geomorfološke

Objectives and competences:

Students acquire the skills and knowledge for a comprehensive understanding and analysis of various geomorphological processes. They understand the surface morphology as result of geological processes, composition and structure beneath the surface. They gain knowledge about the application of geomorphological methods in researching various geologically induced hazards. They become familiar with the most typical data and tools for geomorphological analyses. They develop 3D spatial visualization skills and the ability to orient themselves in the field using modern tools. They learn to combine

metode kombinirati s sedimentološko analizo in spoznajo najbolj uporabne metode datacij geomorfoloških oblik in sedimentov. Seznanijo se s primeri geomorfoloških analiz v praksi.

geomorphological methods with sedimentological analysis and become acquainted with the most useful methods for dating geomorphological features and sediments. They are introduced to examples of practical geomorphological analyses.

Predvideni študijski rezultati:

- Razumevanje geomorfoloških metod in njihove uporabe v raziskavah geološko pogojenih nevarnosti
- Sposobnost razumevanja razvoja reliefa oz. pokrajine
- Osvojena strokovna terminologija
- Samostojna priprava podatkov za geomorfološko analizo izbranega območja
- Aplikativna geomorfološka karta izbranega območja
- Seminarska naloga iz izbranega področja/območja

Intended learning outcomes:

- Understanding of geomorphological methods and their application in researching geologically induced hazards
- Ability to understand the development of landforms and landscapes
- Mastery of professional terminology
- Independent preparation of data for geomorphological analysis of a selected area
- Application of geomorphological mapping to a selected area
- Seminar paper on a selected topic/area

Metode poučevanja in učenja:

- Predavanja
- Laboratorijske vaje
- Terensko delo
- Seminar
- Individualne naloge
- Konzultacije
- e-izobraževanje

Learning and teaching methods:

- Lectures
- Lab work/tutorials
- Field work
- Seminar
- Independent work assignments
- Consultations
- e-Learning

Načini ocenjevanja:

Seminarska naloga z zagovorom

Delež (v %) /
Weight (in %)

100

Assessment:

Written seminar paper and defence

Reference nosilca / Lecturer's references:

1. **Jamšek Rupnik, Petra**, Atanackov, Jure, Horn, Barbara, Mušič, Branko, Zajc, Marjana, Grützner, Christoph, Ustaszewski, Kamil, Tsukamoto, Sumiko, Novak, Matevž, Milanič, Blaž, Markelj, Anže, Ivančič, Kristina, Novak, Ana, Jež, Jernej, Žebre, Manja, Bavec, Miloš, Vrabec, Marko. Revealing subtle active tectonic deformation: integrating lidar, photogrammetry, field mapping, and geophysical surveys to assess the Late Quaternary activity of the Sava Fault (Southern Alps, Slovenia). Remote sensing. 2024, vol. 16, no. 9, 33 str. DOI: 10.3390/rs16091490.
2. Baize, Stéphane, Amoroso, Sara, Belić, Nikola, Benedetti, Lucilla, Boncio, Paolo, Budić, Marko, Cinti, Francesca Romana, Henriquet, Maxime, **Jamšek Rupnik, Petra**, Kordić, Branko, Markušić, S., Minarelli, Lua, Pantosti, Daniela, Pucci, Stefano, Špelić, Marko, Testa, Alessio, Valkaniotis, Sotiris, Vukovski, Matija, Atanackov, Jure, Barbača, Josip, Bavec, Miloš, Brajkovič, Rok, Brčić, Vlatko, Caciagli, Marco, Celarc, Bogomir, Civico, Riccardo, De Martini, Paolo Marco, Filjak, Radovan, Iezzi, Francesco, Moulin, Adrien, Kurečić, Tomislav, Métois, M., Nappi, Rosa, Novak, Ana, Novak, Matevž, Pace, Bruno, Palenik, Damir, Ricci, Tullio. Environmental effects and seismogenic source characterization of the December 2020 earthquake sequence near Petrinja,

Croatia. Geophysical journal international. August 2022, vol. 230, no. 2, str. 1394–1418. DOI: 10.1093/gji/ggac123.

3. **Jamšek Rupnik, Petra**, Žebre, Manja, Monegato, Giovanni. Late Quaternary evolution of the sedimentary environment in Modrejce near Most na Soči (Soča Valley, Julian Alps) = Poznokvartarni razvoj sedimentacijskega okolja v Modrejcah pri Mostu na Soči (Posočje, Julijske Alpe). Geologija. 2020, vol. 63, no. 2, str. 295-309. DOI: 10.5474/geologija.2020.022.
4. **Mencin Gale, Eva, Jamšek Rupnik, Petra**, Trajanova, Mirka, Bavec, Miloš, Anselmetti, Flavio S., Šmuc, Andrej. Morphostratigraphy and provenance of Plio-Pleistocene terraces in the south-eastern Alpine foreland : the Mislinja and Upper Savinja valleys, northern Slovenia. Journal of quaternary science. November 2019, vol. 34, no. 8, str. 633-649. DOI: 10.1002/jqs.3156.
5. **Mencin Gale, Eva, Jamšek Rupnik, Petra**, Akçar, Naki, Christl, Marcus, Vockenhuber, Christof, Anselmetti, Flavio S., Šmuc, Andrej. The onset of Pliocene–Early Pleistocene fluvial aggradation in the Southeastern Alpine Foreland (Velenje Basin, Slovenia) and its paleoenvironmental implications. Journal of quaternary science. May 2024, ISSN 0267-8179. str. 1-19. DOI: 10.1002/jqs.3623.