



JOHN WESLEY THEOLOGICAL COLLEGE
COURSE TEMATICS

Course: Risk Analysis for Environmental Security	Course type: lecture+practice contact	Credits: 4	Course ID: KTAK148
Course responsible: Istvan Kun Dr.	Programme type: full time/part time/correspondence/individual/...	Hours/Se mester: 56	Assessment: <u>practical mark</u>

Course objectives:

To acquire knowledge for the exact description and evaluation of environmental risks

Competencies to be improved:

Knowledge: F1, F2

Ability: K5, K6, K7

Attitude: A2, A5, A6

Autonomy and responsibility: F2, F4

Compulsory literature:

Elliott Mendelson: Introduction to mathematical logic. Chapman & Hall, London, 1997.

<https://www.karlin.mff.cuni.cz/~krajicek/mendelson.pdf> William Vesely: Fault tree handbook with aerospace applications.
https://elibrary.gsfc.nasa.gov/_assets/doclibBidder/tech_docs/25.%20NASA_Fault_Tree_Handbook_with_Aerosp
[df](https://elibrary.gsfc.nasa.gov/_assets/doclibBidder/tech_docs/25.%20NASA_Fault_Tree_Handbook_with_Aerosp)

William Vesely: Fault tree handbook with aerospace applications. NASA, Washington, 2002

https://elibrary.gsfc.nasa.gov/_assets/doclibBidder/tech_docs/25.%20NASA_Fault_Tree_Handbook_with_Aerosp
[df](https://elibrary.gsfc.nasa.gov/_assets/doclibBidder/tech_docs/25.%20NASA_Fault_Tree_Handbook_with_Aerosp)

Recommended literature:

Weiqing Huang, Hongbo Fana, Yongfu Qiu, Zhiyu Cheng, Yu Qian: Application of fault tree approach for the causat
Beijing—Considering the risk events related with exhausts of coal combustion. Science of the Total Environme

<http://tarjomefa.com/wp-content/uploads/2017/07/7234-English-TarjomeFa.pdf> kötelező irodalom

Recomm

Course content:

Propositional logic.

Truth tables.

The most important logical operations: negation, conjunction, disjunction, implication, equivalence.

De Morgan's laws.

Conjunctive and disjunctive normal form of a logical expression.

Predicate logic.

Logical quantification.

Universal and existential quantifier.

Negation of quantifiers.

De Morgan's laws for quantifiers.

Different ways of logical inference: implication, logical consequence, propositional and predicate syllogisms.

Fault tree

Top event, basic event

Conjunctive and disjunctive gates

Fault tree construction rules

Inducing and preventing the top event

Cut sets

Path sets

Qualitative and quantitative analysis of the fault tree

Top event probability



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Structural and statistical importance of basic events
Environmental risk considerations
Ranking the criticality of hazards

Fault tree payoffs, constraints and shortcomings

Course requirements:

Regular attendance of classes, acceptable level of written homeworks

Grading scale:

>88 %: excellent, 87-76 %: good, 75-64 %:satisfactory, 63-52 %:pass

Course Programme:

WJLF ENVIRONMENTAL SCIENCE

Semester:

2022_2023_I1

Lecturers:

Dr. István