# GRADUATE STUDY: ITS AND LOGISTICS

## SEMESTER (II)

### Syllabus

Academic year 2023/2024

| Course: | **Reverse Logistics** | | | | |
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| Head of course: Asst. Prof. **Ivona Bajor**, Ph.D. | | | | | |
| Co-lecturers: **Margareta Živičnjak**, MSc Traff. Eng. | | | | | |
| Semester: **II** | Course code: **172544** | Lectures: **30** | Auditory exercises: **10** | Laboratory exercises: **5** | ECTS credits: **4** |
| Group for lectures: **40 - 50 students** | | | Group for auditory and laboratory exercises: **5 - 10 students** | | |

**Objective of the course:**

- Course provides knowledge of reverse logistics from the aspect of supply chain.
  It consist of these topics: Reverse Logistics Activities, Reverse Logistics Barriers, Green Logistics, Managing Returns, Gatekeeping in Reverse Logistics, The Concept of Disposition of Returned Goods in Reverse Logistics Channels, Consumer as a Part of Reverse Logistics Chain, Centralised Return Centres, Reverse Logistics Operations as Element of Warehouse Management, Reverse Logistics Information Systems, Human Resources in Reverse Logistics, Secondary Market, Landfills, Importance of Transport Packaging in Reverse Logistics, Returnable Packaging and Product Considerations.

**Learning outcomes:**

After the completion of the course the students will be able to:
1. Distinguish the basic terms of reverse and green logistics
2. Evaluate delivery intervals for returns
3. Explain the advantages and disadvantages of existing reverse logistics systems
4. Apply methods for optimizing individual feedback processes
5. To anticipate the possibility of introducing new reverse logistics activities to optimize logistic processes
6. Systematize data for monitoring the efficiency of the reverse logistics system
7. Innovative thinking to adapt systems to market needs and capabilities
8. Apply a simulation tool with the aim of selecting the best solutions for reverse logistics system

## LECTURES and EXERCISES

| Week | Syllabus | Form of classes | Performed by | Lessons | Remark |
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| 1. | ▪ First lecture with introduction note will inform the students about the importance of reverse logistics, providing knowledge about the thematic, basic terminology used, and definition of the subject. Also, the lecture informs students about the functioning of the reverse supply chain, as the opposite or the following activities of supply chain. | L | Ivona Bajor | 2 | |
| | ▪ As following to the introduction lectures, students will see specific issues regarding reverse logistics when researching the field. Researches are based on interviews, questionnaires, and measuring activities of performance. Student will know the difference and the right way to examine the field of reverse logistics. | AE | Ivona Bajor | 1 | |
| 2. | ▪ The lecture will provide basic knowledge about barriers for reverse logistics. Students will recognize the difference between business difficulties when implementing reverse logistics activities and cultural difficulties. Also, there will be presented barriers at different levels of reverse logistics implementation. | L | Ivona Bajor | 2 | |
| | ▪ As following to the lectures, students will learn to develop research material and make analysed field of reverse logistics activities regarding to identification of barriers. They will learn to make steps during the identification, and statistical calculations of important segments that will affect the sustainability of reverse logistics. Ability to recognize potential barriers will provide a ground for future development. | AE | Ivona Bajor | 1 | |

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| 3. | ▪ Lecture regarding green logistics will present the importance of this part of logistics, the state of it on the international level and also the benefits that follow implementation of the activities. There will be presented definition, terminology and fields of green logistics. | L | Ivona Bajor | 2 | |
| | ▪ As following to the green logistics lectures, students will learn to calculate the environmental impact of logistics activities in the field of transport, storage, manipulation and production. After the calculation of impact, they will learn to identify the amount of environmental impact that is not necessary, by using more environmentally friendly equipment. | AE | Ivona Bajor | 1 | |
| 4. | ▪ The lecture will provide knowledge about specifics of managing returns as opposite of distribution logistics when generally there is more products involved when organising the chain. The lecture will present the channels and possible activities of products in return. | L | Ivona Bajor | 2 | |
| | ▪ As following to the lectures, students will learn to develop channels for different reverse logistics systems, providing the best option for company's needs. Also, they will calculate the impact of wrong implemented activity. | AE | Ivona Bajor | 1 | |
| 5. | ▪ Lecture that will implicate the importance of entering spot into reverse logistics channel. The lecture will define the ways of organisation of this process to have benefits for the reverse logistics system and to reduce the amount of products directed to landfills and directed into wrong channels, resulting with lost profit and unsatisfied consumer. | L | Ivona Bajor | 2 | |
| | ▪ Students will learn to create the gatekeeping spot for company and upgrade the quality of it by strategical implementation of reverse logistics activities and knowledge | AE | Ivona Bajor | 1 | TEST 1 |

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| 6. | ▪ Lecture will provide knowledge regarding the disposition cycling time, the time that the product spends in reverse logistics channel. Also, the significance of calculating disposition cycling time, effect that leaves on the consumer and the ways to reduce it on the minimum. | L | Ivona Bajor | 2 | |
| | ▪ Students will perform the measuring of disposition cycling time and will learn to recognize the needless time that product spends in the channel and the way to reduce it. | AE | Margareta Živičnjak | 1 | |
| 7. | ▪ When observing from developed logistics systems, to have a satisfied consumer is one of the most important strategies. To have a satisfied consumer, company must develop well organised reverse logistics system and create a locked consumer. Also, the satisfaction level can depend on liberalization level of return. Except being only a consumer, research implicated that also consumer can participate in product return with environmentally friendly influence on it. | L | Ivona Bajor | 2 | |
| | ▪ Students will learn to create the questionnaire based on reverse logistics activities that can involve consumer in it and provide savings, in the aspect of profit savings and the amount sent to landfills. Also, there will be presented conducted research regarding this thematic. | AE | Margareta Živičnjak | 1 | |
| 8. | ▪ Centralised return centres are facilities that include activities involved with reverse logistics processes. Students will be informed about the activities, employees, benefits and possibility of creation a CRC in reverse logistics chains. | L | Ivona Bajor | 2 | |
| | ▪ Presentation of a research conducted among companies in Croatia regarding facilities that involve reverse logistics activities. Creating processes in facility based on needs of a company. | AE | Margareta Živičnjak | 1 | |

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| 9. | ▪ Mainly all the activities involving reverse logistics (products and packaging) are processes that are conducted in warehouses. Every warehouse (that accepts returned subjects) has to provide certain activities that will ensure services for every possible returned item. Lecture will describe processes and activities in warehouses regarding returns. | L | Ivona Bajor | 2 | |
| | ▪ Creating processes in warehouses, regarding products in return, based on the needs and possibilities of a company. | AE | Ivona Bajor | 1 | |
| 10. | ▪ There is lack of information systems in the field of reverse logistics. The lecture will implicate the significance of applying information systems in the companies regarding reverse logistics issues. Besides information systems, students will learn about developed technology in logistics that can provide amount of information about the product in return. | L | Ivona Bajor | 2 | |
| | ● There will be presented an information system that company uses for their analysis and a 2D bar code reader and their upgrading possibilities. | AE | Ivona Bajor | 1 | |
| 11. | ▪ As in many other fields, human resources are important part of managing returns. Specifically, for reverse logistics, the creation of return processes depends on a knowledge of an employee. | L | Ivona Bajor | 2 | |
| | ▪ Simulation modelling | LE | Ivona Bajor | 1 | |
| 12. | ▪ Secondary market is lecture that will provide definition and processes in this part of reverse logistics. Also, there will be presented development and reasons for development some secondary markets based on the value and condition of the product. | L | Ivona Bajor | 2 | |

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| | • Simulation modelling | LE | Ivona Bajor | 1 | |
| 13. | ▪ Lecture will implicate the importance of landfills and the possibility of reducing the amount of waste sent to the landfills. Also, there will be presented history of landfills, development and new technologies used for waste. The lecture will include presentation of activities on the landfills and also ways to close them. | L | Margareta Živičnjak | 2 | |
| | • Simulation modelling | LE | Ivona Bajor | 1 | TEST 2 |
| 14. | ▪ The lecture will include the definitions and specific issues regarding transport packaging, providing knowledge about use, choice and return channels for transport packaging users. | L | Ivona Bajor | 2 | |
| | • Simulation modelling | LE | Ivona Bajor | 1 | |
| 15. | ▪ As a new field, especially in developing logistics system, there are certain issues regarding law obligations. Students will develop knowledge about basic law obligation regarding returns from the aspect of consumers, transport packaging, products, landfills, disposal of different waste etc. Law obligation will be presented also with comparing analysis at the international level from developed logistics systems. | L | Ivona Bajor | 2 | |
| | ▪ Simulation modelling | LE | Ivona Bajor | 1 | |

**L** = Lectures; **AE** = Auditory Exercises; **LE** = Laboratory Exercises; **S** = Seminars

# STUDENT OBLIGATIONS AND EXAMS

**Conditions for obtaining signatures:**

During the semester students have the option of taking two tests. Each test consists of numerical and theoretical questions (or their combination) in which it is possible to achieve a maximum of 80 points. Students that achieve a total of 20 points or more have an option of taking the second test. Students that achieve a total of 20 points or more on the second test are exempted from a written exam. Students that do not achieve minimum of 20 points have to take a written exam.

The written and oral exam is provided for all students, regardless. To pass the written exam it is necessary to answer 51% of questions correctly, and the grading system is shown in "scoring system". Verbal evaluation of the cognitive skills of applying empirical facts and theoretical knowledge is organized after finishing written exam and getting positive evaluation.

Students are required to attend lectures and exercises. Students that at the end of semester have minimum of 70% of attendance get 10 points (5 points for lectures and 5 points for exercises attendance). Students that do not achieve those points have to take course once again. In the case of justified absences (for more than 3 times during lectures and more than 3 times for exercises), students have to submit medical records or other official records (which are subject of verification). After successful verification process and seminar paper acceptance students get 20 points.

# LITERATURE

**a) Obligatory literature:**

1. Rogers D.S, Tibben Lembke R.S.: Going Backwards: Reverse Logistics Trends and Practices; Reverse Logistics Executive Council, Pittsburgh, USA, 1998. ISBN 0-9674619-0-1
2. Pochampally K.K., Nukala S., Gupta S.M.: Strategic Planning Models for Reverse and Closed Loop Supply Chains, CRC Press, Gladwyne, Pennsylvania, USA, 2011. ISBN: 1420054783

**b) Recommended literature:**

1. Blumberg, D. F.: Introduction to Management of Reverse Logistics and Closed Loop Supply Chain Processes, CRC Press, pp. 65-87, Gladwyne, Pennsylvania, USA, 2005. ISBN 0-203-59298-0
2. McKinnon, A., Cullinae S., Browne, M., Whiteing, A.: Green Logistics: Improving the environmental sustainability of logistics, The Chartered Institute of Logistics and Transport, Kogan Page, pp 3-68, London, UK, 2010. ISBN 978 0 749 5678
3. Thierry, C.; Thomas, A.; Bel, G. :Simulation for Supply Chain Management, ISTE Ltd. London, UK, 2008.
4. Emmet, S.; Sood, V.: Green Supply Chains: An Action Manifesto, Wiley Ltd., West Sussex, UK, 2010.
5. Rodrigue, J. P.; Slack, B.; Comtois, C.: Green Logistics (The Paradoxes of), Handbook of Logistics and Supply-Chain Management, Pergamon, Elsevier, London, UK, 2010.

# METHODOLOGY OF THE IMPLEMENTATION OF THE COURSE PLAN

## 1.  LECTURES

Lectures follow specific topics from compulsory literature and are performed using Power Point presentation (in English). The use of a textbook and recommended literature allows students to prepare the lecture topics in advance. Lectures are published on students portal on the Faculty internet site (e-student). The students are encouraged to read the topic of the forthcoming lecture in advance and to take part in the pro-active discussion.

## 2.  AUDITORIAL EXERCISES

Students solve problems using applied methods. During exercises students learn to conduct research regarding reverse logistics processes and evaluating them.  Students are calculating the benefits and channels of reverse logistics to direct used product and transport packaging.

## 3.  LABORATORY EXERCISES

Laboratory exercises are performed in a way to include students into research and/or project drafts and measurements in real and/or laboratory conditions, as respondents and/or students researchers, using devices of the Laboratory for simulations in logistics or other laboratories of FPZ.

## Note: Individual and/or group viewing negative written test

Individual at the time of consultation or a designated period after each colloquium and / or written exam. If necessary and at the request of a group of students in the form post exam exercises in order to explain the most common mistakes typical, after discussion with the team responses to individual student issues.

## 4. DOCUMENTATION

The student's attendance record is kept during the semester. Achievements of goals are recorded by continues monitoring on information system ISVU. All tests are kept in lecturer's file for one year.

## 5. SCORING SYSTEM

Each test consists of numerical and theoretical questions (or their combination) in which it is possible to achieve a maximum of 80 points. Students that achieve a total of 20 points or more have an option of taking the second test. Students that achieve a total of 20 points or more on the second test are exempted from a written exam. Students that do not achieve minimum of 20 points have to take a written exam.

The written and oral exam is provided for all students, regardless. To pass the written exam it is necessary to answer 51% of questions correctly, and the grading system is shown in paragraph 4 (Course gradation).

Students are required to attend lectures and exercises. Students that at the end of semester have minimum of 80% of attendance get 20 points (10 points for lectures and 10 points for exercises attendance). Students that do not achieve those points have to take course once again. In the case of justified absences (for more than 3 times during lectures and more than 3 times for exercises), students have to submit medical records or other official records (which are subject of verification). After successful verification process students get 20 points.

**Table 1** The scoring system for the monitoring of students and explained credit values in ECTS credits

| no | Segment: | Required credits to be achieved: Min. | Required credits to be achieved: Max. | Remark: | ECTS credits |
|---|---|---|---|---|---|
| 1. | I test | 20 | 40 | 50% minimum | **1** |
| 2. | II test | 20 | 40 | 50% minimum | **1** |
| 3. | Seminar paper | 10 | 10 | Accepted paper | **1** |
| 4. | Presence | 10 | 10 | Presence ≥ 70% | **1** |
| Σ | Overall points: | Σ **60** | Σ **100** | Overall ETCS points: | Σ **4** |

**Table 2** - Explanation of the credit values in evaluations

| CREDITS: | Estimate based on attendance, seminar paper and two colloquies (or written exam) - [4 ECTS]: | The final score [5 ECTS]: |
|---|---|---|
| 60 - 70 | Sufficient (2) | Exemption from the written part of the exam, the final score after oral exam |
| 71 - 80 | Good (3) | |
| 81 - 90 | Very good (4) | |
| 91 - 100 | Excellent (5) | Exemption from verbal parts of exam |

**Information for students** (scoring system, implementation plan, learning outcomes, syllabus, literature, consulting teachers, announcement of results of examinations or colloquium, and all other information):
- **https://moodle.srce.hr/2022-2023/**
- **http://www.fpz.unizg.hr**

**Student assistants:**
Additional individual work with the students through individual consultations for assignments from auditory exercises and / or research designs from laboratory exercises.