

**Mechatronics for building innovative potential of higher education**

Instructors:

Yurii Romasevych

Mykola Korobko



**Course Handbook**

TREATY - Nurturing deep tech talents for clean and sustainable energy transition

Contents

[Course Information 3](#_Toc150470079)

[Course Summary 3](#_Toc150470080)

[Learning Outcomes 3](#_Toc150470081)

[Assessment 3](#_Toc150470082)

[Bibliography 4](#_Toc150470083)

[Course Timetable 6](#_Toc150470084)

[Contact Details of Instructor(s) 8](#_Toc150470085)

## Course Information

Title: Mechatronics for building innovative potential of higher education

Instructor(s): Yurii Romasevych, Mykola Korobko

ECTS: 3

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| Course structure: | 90 hours |
| Lecture classes | 15 hours |
| Laboratory classes | 15 hours |
| Personal Activities | 60 hours |

Mode of delivery: *[ hybrid]*

### Course Summary

*The aim of the course ”Mechatronics for building innovative potential of higher education” is providing by students of theoretical knowledge and practical skills in the integration of mechanical, electronic and software components to create complex and functional mechatronic systems for the development of innovative potential higher education.*

*The course delivers to the attendants the necessary knowledge and skills for the design, production and operation of complex mechatronic systems in various fields, such as automation of agro-industrial production, robotics in the agricultural sector and many others.*

### Learning Outcomes

Upon completion of the course, students will be able to know about:

1. *The basic principles and concepts of mechatronics: students get acquainted with the principles of functioning of mechatronic systems, study the basics of mechanics, electronics and control;*
2. *The development of mechatronic systems: students study methods of analysis, design and modeling of mechatronic systems, including the selection and integration of components, development of control algorithms and software;*
3. *Modern technologies and trends in mechatronics: students explore modern achievements in the field of mechatronics, such as robotics, autonomous systems, artificial intelligence, the Internet of Things and other innovative developments.*

### Assessment

In order for each participant to complete successfully the course and be awarded the corresponding ECTS credits, they must pass the course assessment. The outcome of the assessment can be either Pass or Fail.

**Assessment methods**

* Exam

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| **Learning outcomes** | **Assessment examples** |
| * *Basics of selection methodology of sensors, their features and connection schemes* | Oral presentation, quiz, laboratory research |
| * *Basics of the sensors signals processing in the mechatronic systems* | Oral presentation, quiz, laboratory research |
| * *Development of practical skills and ability to implement mechatronic systems in terms of sensors and their use.* | Oral presentation, quiz, laboratory research |

### Bibliography

1. Мехатроніка: підручник / В.С. Ловейкін, Ю.О. Ромасевич, В.В. Крушельницький. – К.: ЦП „Компрінт”, 2020. – 404 с.
2. Мехатроніка [Електронний ресурс] – Режим доступу до ресурсу: <https://uk.wikipedia.org/wiki/Мехатроніка>.
3. Основи мехатроніки: навч. посіб. / О.М. Артюх, О.В. Дударенко, В.В. Кузьмін та ін. Запоріжжя : НУ «Запорізька політехніка», 2021. – 372 с.
4. THE MECHATRONICS HANDBOOK. Editor-in-Chief Robert H. Bishop. CRC PRESS. 2002. 1229 p. <http://www.sze.hu/~szenasy/Szenzorok%20%E9s%20aktu%E1torok/Szenzakt%20jegyzetek/Mechatronics_handbook%5B1%5D.pdf>
5. Основи мехатроніки: навчальний посібник / С.М. Пересада, М.В. Пушкар. – Електронні текстові дані. – Київ : КПІ ім. Ігоря Сікорського, 2020. – 137 с.
6. Сучасні електромехатронні комплекси і системи: навч. посібник / Т.П. Павленко, В.М. Шавкун, О.С. Козлова, Н.П. Лукашова; Харків. нац. ун-т міськ. госп-ва ім. О. М. Бекетова. – Харків: ХНУМГ ім. О. М. Бекетова, 2019. – 116 с.

### Course Timetable

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| --- | --- | --- | --- |
| **Lecture** | **Date and Time** | **Instructor** | **Venue** |
| 1st | 23.04.2024,  15:10 – 16:30 | Prof. Yurii ROMASEVYCH | NUBiP, building 11,  classroom 202 |
| 2nd | 24.04.2024,  15:10 – 16:30 | Prof. Yurii ROMASEVYCH | NUBiP, building 11,  classroom 202 |
| 3rd | 30.04.2024,  15:10 – 16:30 | Prof. Yurii ROMASEVYCH | <https://us04web.zoom.us/j/4977259668?pwd=NndjcTlWWklqQ2NzaC9aSTNONGlUdz09> |
| 4th | 01.05.2024,  15:10 – 16:30 | Prof. Yurii ROMASEVYCH | <https://us04web.zoom.us/j/4977259668?pwd=NndjcTlWWklqQ2NzaC9aSTNONGlUdz09> |
| 5th | 07.05.2024,  15:10 – 16:30 | Prof. Yurii ROMASEVYCH | NUBiP, building 11,  classroom 202 |
| 6th | 08.05.2024,  15:10 – 16:30 | Prof. Yurii ROMASEVYCH | NUBiP, building 11,  classroom 202 |
| 7th | 15.05.2024,  15:10 – 16:30 | Prof. Yurii ROMASEVYCH | <https://us04web.zoom.us/j/4977259668?pwd=NndjcTlWWklqQ2NzaC9aSTNONGlUdz09> |
| 8th | 16.05.2024,  15:10 – 16:30 | Prof. Yurii ROMASEVYCH | <https://us04web.zoom.us/j/4977259668?pwd=NndjcTlWWklqQ2NzaC9aSTNONGlUdz09> |
| **Summarizing. Presentation of certificates to graduates.** | 21.06.2024  10:10 – 11:30 | Prof. Yurii ROMASEVYCH  Prof. Viacheslav BRATISHKO  Assoc. Prof. Zinovii RUZHILO | building 11,  library reading room |

**The 1-st group**

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| **Seminars** | **Date and Time** | **Instructor** | **Venue** |
| 1st | 23.04.2024,  16:50 – 18:10 | Assoc. Prof.  Mykola KOROBKO | NUBiP, building 11,  classroom 357 |
| 2nd | 24.04.2024,  16:50 – 18:10 | Assoc. Prof.  Mykola KOROBKO | NUBiP, building 11,  classroom 357 |
| 3rd | 30.04.2024,  16:50 – 18:10 | Assoc. Prof.  Mykola KOROBKO | NUBiP, building 11,  classroom 357 |
| 4th | 01.05.2024,  16:50 – 18:10 | Assoc. Prof.  Mykola KOROBKO | NUBiP, building 11,  classroom 357 |
| 5th | 07.05.2024,  16:50 – 18:10 | Assoc. Prof.  Mykola KOROBKO | NUBiP, building 11,  classroom 357 |
| 6th | 08.05.2024,  16:50 – 18:10 | Assoc. Prof.  Mykola KOROBKO | NUBiP, building 11,  classroom 357 |
| 7th | 15.05.2024,  16:50 – 18:10 | Assoc. Prof.  Mykola KOROBKO | NUBiP, building 11,  classroom 357 |
| 8th | 16.05.2024,  16:50 – 18:10 | Assoc. Prof.  Mykola KOROBKO | NUBiP, building 11,  classroom 357 |

**The 2-nd group**

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| **Seminars** | **Date and Time** | **Instructor** | **Venue** |
| 1st | 24.04.2024,  15:10 – 16:30 | Assoc. Prof.  Mykola KOROBKO | NUBiP, building 11,  classroom 357 |
| 2nd | 25.04.2024,  16:50 – 18:10 | Assoc. Prof.  Mykola KOROBKO | NUBiP, building 11,  classroom 357 |
| 3rd | 01.05.2024,  15:10 – 16:30 | Assoc. Prof.  Mykola KOROBKO | NUBiP, building 11,  classroom 357 |
| 4th | 02.05.2024,  16:50 – 18:10 | Assoc. Prof.  Mykola KOROBKO | NUBiP, building 11,  classroom 357 |
| 5th | 08.05.2024,  15:10 – 16:30 | Assoc. Prof.  Mykola KOROBKO | NUBiP, building 11,  classroom 357 |
| 6th | 09.05.2024,  16:50 – 18:10 | Assoc. Prof.  Mykola KOROBKO | NUBiP, building 11,  classroom 357 |
| 7th | 16.05.2024,  15:10 – 16:30 | Assoc. Prof.  Mykola KOROBKO | NUBiP, building 11,  classroom 357 |
| 8th | 17.05.2024,  16:50 – 18:10 | Assoc. Prof.  Mykola KOROBKO | NUBiP, building 11,  classroom 357 |

### Contact Details of Instructor(s)

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| --- | --- | --- |
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