



**DISCIPLINE ACADEMIC SHEET**  
**ACADEMIC YEAR 2025 – 2026**

**1. PROGRAMME DATA**

|                                               |                                       |
|-----------------------------------------------|---------------------------------------|
| 1.1. Higher Education Institution             | UNIVERSITY OF CRAIOVA                 |
| 1.2. Faculty                                  | Automation, Computers and Electronics |
| 1.3. Department                               | Computers and Information Technology  |
| 1.4. Field of Study                           | Computers and Information Technology  |
| 1.5. Study level                              | L(License / Undergraduate)            |
| 1.6. Organizational form                      | IF                                    |
| 1.7. Study Program (name/code) /Qualification | Computers / L2060101010               |

**2. DISCIPLINE DATA**

|                                  |                         |               |   |                      |   |                        |     |
|----------------------------------|-------------------------|---------------|---|----------------------|---|------------------------|-----|
| 2.1 Discipline Name              | Machine Learning        |               |   |                      |   |                        |     |
| 2.2 Course Activities Holder     | Udriștoiu Anca Loredana |               |   |                      |   |                        |     |
| 2.3. Practical Activities Holder | Udriștoiu Anca Loredana |               |   |                      |   |                        |     |
| 2.4. Study Year                  | 4                       | 2.5. Semester | 1 | 2.6. Evaluation type | V | 2.7. Discipline regime | DOP |

**3. ESTIMATED TOTAL TIME** (hours per semester of teaching activities)

|                                                                                    |    |                      |    |                    |       |
|------------------------------------------------------------------------------------|----|----------------------|----|--------------------|-------|
| 3.1. Number of hours per week                                                      | 4  | in which: 3.2 course | 2  | 3.3. sem./lab./pr. | 2     |
| 3.4. Total hours of curriculum                                                     | 56 | in which: 3.5 course | 28 | 3.6. sem./lab./pr. | 28    |
| 3.7. Time distribution - hours/week                                                |    |                      |    |                    | hours |
| Study after manual, course support, bibliography and notes                         |    |                      |    |                    | 10    |
| Additional documentation in library, on specialized electronic platforms and field |    |                      |    |                    | 10    |
| Training seminars / labs, homework, portfolios and essays                          |    |                      |    |                    | -     |
| Tutorial                                                                           |    |                      |    |                    | 2     |
| Examinations                                                                       |    |                      |    |                    | 2     |
| Other activities.....                                                              |    |                      |    |                    | 20    |
| Total hours per individual activities                                              |    |                      |    |                    | 44    |
| 3.8. Total hours per semester                                                      |    |                      |    |                    | 100   |
| 3.9. Number of credits                                                             |    |                      |    |                    | 4     |

**4. PRECONDITIONS** (where appropriate)

|                    |                                                                                                                        |
|--------------------|------------------------------------------------------------------------------------------------------------------------|
| 4.1. of curriculum | The prerequisites for this discipline are: Data structures and algorithms, Databases, Artificial intelligence.         |
| 4.2. of competence | The student is required to have fundamental knowledge about programming, databases and data structures and algorithms. |

**5. CONDITIONS** (where appropriate)

|                    |  |
|--------------------|--|
| 5.1. of the course |  |
|--------------------|--|

## 6. COURSE OBJECTIVES – expected learning outcomes that are supported by completing and passing the course

|                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Knowledge</b>                   | <p>Student/Graduate:</p> <p>Studentul/absolventul descrie, identifică, sumarizează concepte și metode elementare privitoare la limbaje de programare, medii de programare, tehnici de programare, baze de date. inteligență artificială și inginerie software și modul lor de aplicare în probleme concrete.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Skills (Abilities)</b>          | <p>Student/Graduate</p> <p>Studentul/absolventul alege și explică concepte proprii specifice proiectării algoritmilor, programării orientate pe obiecte, programării logice și funcționale. Studentul/absolventul specifică cerințe, analizează, elaborează, dezvoltă și testează sisteme software în limbaje de programare de uz general (C, etc.) și /sau obiectorientate (C++, Java, etc.), aplicând elementele specifice ingineriei software. Studentul/absolventul proiectează, implementează, dezvoltă și /sau gestionează aplicații ce includ diverse tipuri de baze de date. Studentul înțelege conceptele principale care stau la baza sistemelor de translatore și compilarea codului sursă. Contribuie la dezvoltarea și îmbunătățirea uneltelor specifice limbajelor de programare.</p> |
| <b>Responsibility and autonomy</b> | <p>Student/Graduate:</p> <p>Studentul/absolventul are o comportare onorabilă, responsabilă, etică, în spiritul legii pentru a asigura reputația profesiei.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

## 7. CONTENT

| 7. CONTENT                                                                              |                              |                                                                                         |                        |
|-----------------------------------------------------------------------------------------|------------------------------|-----------------------------------------------------------------------------------------|------------------------|
| 7.1. Course                                                                             | The method of implementation | Teaching methods                                                                        | Allocated time (hours) |
| 1. Introductory elements                                                                | face to face                 | Explaining, Demonstrating, Collaborating using traditional methods and Google Classroom | 2                      |
| 2. Linear regresion                                                                     | face to face                 |                                                                                         | 2                      |
| 3. Logistic regression                                                                  | face to face                 |                                                                                         | 2                      |
| 4. k-nearest Neighbors                                                                  | face to face                 |                                                                                         | 2                      |
| 5. Classification and regression trees                                                  | face to face                 |                                                                                         | 2                      |
| 6. Naive Bayes                                                                          | face to face                 |                                                                                         | 2                      |
| 7. Support vector machine                                                               | face to face                 |                                                                                         | 2                      |
| 8. Bagging and Random Forest                                                            | face to face                 |                                                                                         | 2                      |
| 9. Boosting and AdaBoost                                                                | face to face                 |                                                                                         | 2                      |
| 10. Neural networks.                                                                    | face to face                 |                                                                                         | 4                      |
| 11. Convolutional neural networks                                                       | face to face                 |                                                                                         | 4                      |
| 12. Unsupervised algorithms                                                             | face to face                 |                                                                                         | 2                      |
| Bibliography:                                                                           |                              |                                                                                         |                        |
| 1.C. M. Bishop, Pattern Recognition and Machine Learning. Springer. ISBN 0-387-31073-8, |                              |                                                                                         |                        |

- 2006.
2. Wernick, Yang, Brankov, Yourganov and Strother, Machine Learning in Medical Imaging, IEEE Signal Processing Magazine, vol. 27, no. 4, July 2010, pp. 25-38
  3. Mannila, Heikki, Data mining: machine learning, statistics, and databases. Int'l Conf. Scientific and Statistical Database Management. IEEE Computer Society, 1996.
  4. Friedman, Jerome H. ,Data Mining and Statistics: What's the connection?, Computing Science and Statistics 29 (1): 3–9, 1998.
  5. Mitchell, T. , Machine Learning, McGraw Hill. ISBN 0-07-042807-7, 1997
  6. Russell, Stuart, Norvig, Peter , Artificial Intelligence: A Modern Approach (2nd ed.). Prentice Hall. ISBN 978-0137903955, 2003.
  7. Udriștoiu AL, Ghenea AE, Udriștoiu Ș, Neaga M, Zlatian OM, Vasile CM, Popescu M, Țieranu EN, Salan A-I, Turcu AA, Nicolosu D, Calina D, Cioboata R. COVID-19 and Artificial Intelligence: An Approach to Forecast the Severity of Diagnosis. Life. 2021;
  8. Udriștoiu AL, Cazacu IM, Gruionu LG, Gruionu G, Iacob AV, Daniela Elena Burtea, Bogdan Silviu Ungureanu, Mădălin Ionuț Costache, Alina Constantin, Carmen Florina Popescu, Ștefan
  9. Udriștoiu, Adrian Săftoiu. Real-time computer-aided diagnosis of focal pancreatic masses from endoscopic ultrasound imaging based on a hybrid convolutional and long short-term memory neural network model. PLOS ONE. 2021; 16(6): e0251701.
  10. Anca Loredana Udriștoiu, Metode pentru Diagnosticarea Automată, Asistată de Calculator a Imaginilor Medicale, ISBN 978-606-11-3213-3, SITECH, CRAIOVA, MARTIE 2013, nr. pag.186
  11. Anca Loredana Ion, Image Annotation Based on Semantic Rules, Advances in Soft Computing, Human-Computer Systems Interaction, Springer-Verlag, ISSN 1615-3871, vol. 60, 2009, pp.83-97.

| 7.2. Seminar/laboratory/project                                                         | The method of implementation | Teaching methods                                                                        | Allocated time (hours) |
|-----------------------------------------------------------------------------------------|------------------------------|-----------------------------------------------------------------------------------------|------------------------|
| 1.Presentation of software suites that contain a variety of machine learning algorithms | face to face                 | Explaining, Demonstrating, Collaborating using traditional methods and Google Classroom | 4                      |
| 2. Standard Machine Learning Datasets. Understand Data Using Descriptive Statistics     | face to face                 |                                                                                         | 4                      |
| 3.Prepare Data for Machine Learning With Pre-Processing Methods                         | face to face                 |                                                                                         | 4                      |
| 4.Machine Learning Model Evaluation Metrics                                             | face to face                 |                                                                                         | 2                      |
| 5.Linear Algorithms                                                                     | face to face                 |                                                                                         | 4                      |
| 6.Nonlinear Algorithms                                                                  | face to face                 |                                                                                         | 6                      |
| 7.Deploying ML models in production.                                                    | face to face                 |                                                                                         | 2                      |
| 8.Comparing The Performance of Machine Learning Algorithms                              | face to face                 |                                                                                         | 2                      |
| <b>Bibliography:</b>                                                                    |                              |                                                                                         |                        |
|                                                                                         |                              |                                                                                         |                        |
| 1. Anca Loredana Udristoiu. Labotatory platforms in electronic format.                  |                              |                                                                                         |                        |
| 2. C. M. Bishop, Pattern Recognition and Machine Learning. Springer. ISBN 0-387-31073-  |                              |                                                                                         |                        |

8, 2006.

3. Anca Loredana Ion, Methods for Knowledge Discovery in Images, Information Technology and Control, ISSN 1392-124X, Vol. 38, No.1,2009, pp. 43-49.
4. Anca Loredana Ion, Rough Sets and Gaussian Mixture Model in Medical Image Diagnosis, Annals of the University of Craiova - Mathematics and Computer Science Series, ISSN 1223-6934, Craiova, Romania, Vol. 38, Nr. 4, December 2011, pg. 50-62
5. Anca Loredana Udriștoiu, Metode pentru Diagnosticarea Automată, Asistată de Calculator a Imaginilor Medicale, ISBN 978-606-11-3213-3, SITECH, CRAIOVA, MARTIE 2013, nr. pag.186

**8. Correlating the content of the discipline with the expectations of representatives from the epistemic community, professional associations and representative employers in the field related to the program**

The content of the discipline is constantly updated based on continuous feedback from fellow programmers from most of the software companies based in Craiova.

**9. EVALUATION**

| Activity Type                                                                                                                                                        | 9.1. Evaluation criteria                                                                                                            | 9.2. Evaluation methods                                                                                      | 9.3. Final mark weight |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|------------------------|
| 9.4. Course                                                                                                                                                          | Level and quality of student interaction and feedback during classes.<br><br>Problem solving skills.                                | Asking constantly for solutions. Final oral exam consisting of problems covering the most important chapters | 30% of final mark      |
| 9.5. Seminar/laboratory/project                                                                                                                                      | L: Problem solving skills and the level of understanding of theoretical concepts. The level of work and constancy is also recorded. | Project development and final oral presentation.                                                             | 70% of final mark      |
| 9.6. Minimum standard of performance                                                                                                                                 |                                                                                                                                     |                                                                                                              |                        |
| The minimum standard of performance consists of abilities to develop and analyze the machine learning algorithms in order to discover patterns and make predictions. |                                                                                                                                     |                                                                                                              |                        |

| Date of Completion | Signature of the Course Activities Holder, | Signature of the Practical Activities Holder, |
|--------------------|--------------------------------------------|-----------------------------------------------|
| 23.08.2025         | Udriștoiu Anca Loredana                    | Udriștoiu Anca Loredana                       |

| Date of Approval in the Department | Signature of the Department Director, |
|------------------------------------|---------------------------------------|
|------------------------------------|---------------------------------------|

|            |                            |
|------------|----------------------------|
| 25.08.2025 | Ş.l.dr.ing. Nicolae ENESCU |
|------------|----------------------------|

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|---------------------------------|------------------------------|
| Date of Approval in the Faculty | Signature of the Dean,       |
|                                 | Prof.dr.ing. Dorin ŞENDRESCU |