



Call for Applications for the admission to the PhD programme in Industrial and Information Engineering of the University of Udine in the Academic Year 2022/2023, 38th cycle, with scholarship subject to the research topic “First-principles Quantum transport for an atomistic engineering of nanoelectronic devices” – VINCI Program, Call 2021, C3.1631, CUP G23C21001760005 – Involved Universities: University of Udine (administrative office), Université Paris-Saclay (partner).

DISCLAIMER:

The official and legally binding Call for Applications is in Italian only. This document cannot be used for legal purposes and it is only meant to provide information in English on the Call for applications (University Chancellor’s Decree n. 653 of July 6, 2022). Please refer to the official Call for Applications published on the official register (<https://www.uniud.it/it/albo-ufficiale>) and on the PhD website of the University of Udine. Any changes and integrations will be made available on the mentioned above web pages. Therefore, no personal written communication shall be provided to applicants about examinations dates, competition results and deadlines regarding the enrollment.

ART. 1 – PhD PROGRAMMES

1. The University of Udine announces a Call for applications for assignment n. 1 position with scholarship bound to the fulfillment of the research topic “First-principles Quantum transport for an atomistic engineering of nanoelectronic devices” (VINCI Program, Call 2021, C3.1631) in the PhD Programme in Industrial and Information Engineering, 38^o cycle. The research will be developed at the University of Udine and, for at least 12 months, at the Université Paris-Saclay. At the end of the selection procedure pursuant to art. 8, the universities have to sign a joint agreement (drawn up in compliance with the law in force in each country).

2. The PhD Programme lasts three years and starts on November 1, 2022.

3. The activation of the PhD programmes is subject to the verification of the accreditation requirements by ANVUR, as required by the Decree of the Ministry of Education, of University and of Research n. 226 December 14, 2021. In the event that the accreditation should not be granted or revoked, the examination tests of the concerned PhD programme won’t be carried out and a notice will be given to all interested parties.

4. If limitations are introduced due to a sanitary or epidemiological emergency, the activities of the Ph. D. programmes could take place in a mixed modality, face to face and remotely. The methods of carrying out the activities will be communicated by the University of Udine when the programme will start.

5. In this document the titles referred to people, shown in male form only, refer indiscriminately to people of all genders.

ART. 2 – GENERAL PROVISIONS

1. This Call governs the procedures and criteria to access to the PhD programmes listed in art. 1.

2. The annexed Table to this Call for Applications is integral part of it. It indicates: the administrative location and associated location(s) (if any); locations for training, teaching and research; the coordinator; programme duration; curricula (if available); research topics (if specified); proposed research program (if specified); the PhD programme website; admission requirements; documents and qualifications to be attached to the application for admission; the composition of the Selection Committee; admission procedure (available positions); type and amount of scholarships, period abroad and referred research programs; conduct of examinations; evaluation criteria; tests schedules; publication date of the list of admitted applicants to the examinations and the final ranking lists).



3. Positions with scholarship might have reductions as provided in art. 10.
4. Any amendments and additions to this Call and its attachments are published on the official register (<https://www.uniud.it/it/albo-ufficiale>) and on the PhD website of the University of Udine.
5. Only the Italian Call for applications is equivalent to notification for all purposes, including for the purpose of notification of the examinations, if provided.
6. The submission of the application through the online procedure, as stated in art. 6, implies the acceptance by the applicant of the provisions contained in the Call for Applications and in the Internal Regulation of PhD Programmes available on the PhD website of the University of Udine.
7. Possible personal communications to applicants concerning this competition are sent only to their e-mail addresses provided during the registration process as stated in art. 6, paragraph 2.
8. The University assumes no liability for the failure to receive messages due to incorrect contact details supplied by the applicant, for the failure or delay in notifying any change from the applicant and for postal or electronic problems in each phase of this competition.

Art. 3 – ADMISSION REQUIREMENTS

1. Applicants of any nationality may apply for the competition if they have one of the following academic degrees at the expiration date of the call:

- a) “Laurea Specialistica” or “Laurea Magistrale” or “Laurea vecchio ordinamento¹” or second level academic degree comparable to them;
- b) foreign degree, issued by a foreign official institution, comparable in duration and level² to the degrees referred to in letter a), and in the foreign system allows the admission to PhD programmes. The Table attached specifies the type of degree required for participation in the competition and any additional requirements.

2. Applicants can participate in the competition, if they obtain their degree referred to paragraph 1 by October 31, 2022. Applicants who do not obtain the degree by October 31, 2022 will be excluded. If applicants with the degree not yet obtained appear to be winners, they will be admitted and enrolled with reserve. They must certify their graduation in accordance with the procedure indicated in art. 5 paragraph 5 no later than October 31, 2022.

The documentation must be submitted by filling in the form available on the website: https://helpdesk.uniud.it/SubmitSR.jsp?type=req&accountId=universityofudine&populateSR_id=42104

3. All applicants are admitted to the competition on the condition that they meet the requirements of the Call. The University reserves the right to carry out sample checks³ and it may exclude applicants at any time from the selection process if they fail to meet the requirements as set out in the present article, even after the PhD programmes have already begun.

Art. 4 – DEGREE OBTAINED ABROAD (art. 3 paragraph 1 letter b)

1. The suitability of the foreign degree is assessed by the Selection Committee (art. 7) for the only purpose of participating in the competition and enrolment in the PhD programme in accordance with:

- the current legislation in Italy and in the country where the degree was issued;
- treaties or international agreements on recognition of the degrees for further studies.

¹ Degree awarded under the ante Decree of the Ministry no. 509 of November 3, 1999, modified with Decree of the Ministry no. 270 of October 22, 2004.

² Master of Science/Art

³ Under Article 71 of D.P.R. December 28, 2000, no. 445



The Selection Committee assesses the suitability of the foreign degree on the basis of the documentation attached through the online application for the admission to the competition (articles 5 and 6). The Selection Committee may, therefore, exclude the applicant whenever the documentation submitted does not provide sufficient evidence for the evaluation. Therefore applicants must attach all the documents in their possession relating to the degree held, in order to provide sufficient elements for the assessment to the Selection Committee.

2. Applicant with a degree obtained in a foreign university, if winner of the competition, must submit during the enrolment procedure (if it has not been already submitted during the online application), under penalty of exclusion from the PhD programme:

For foreign degrees issued in a UE country:

Diploma Supplement in English.

For foreign degrees issued in an EXTRA UE country, one of these options:

- Declaration of Local Value of the degree and the certificate regarding the degree with exams and grades. The certificate in a language different than Italian or English must be accompanied by the translation in one of the two languages mentioned (the translation must be legalized by the diplomatic-consular competent authority or certified by an Italian Court).

- "Statement of comparability - CIMEA" issued in accordance with the terms set on the website: www.cimea.it.

If the Diploma Supplement or the Declaration of Local Value/Statement of comparability is not available by the enrolment procedure, the applicant must demonstrate having made a request by that date and submit it as soon as possible.

Art. 5 – QUALIFICATIONS SUBJECT TO ASSESSMENT AND DOCUMENTS TO BE SUBMITTED

1. Applicants must submit the mandatory documents and qualifications specified in the attached Table.

2. The Table also specifies optional documents and qualifications provided by each PhD programme.

3. For a correct submission of the application, candidates are invited to use the forms attached which are integral part of the Call.

4. Documents and qualifications referred to in paragraphs 1 and 2 must be submitted in Italian or English, under penalty of not evaluation. Documents and qualifications, originally in a different language, must be accompanied by a translation into Italian or English made by the applicant. Any translation into these two languages is the responsibility of the applicant. The translation of the thesis can be an extended abstract in place of the complete thesis.

5. Italian and EU applicants who present qualifications referred to states and facts attested by Public Administrations, must use a self-certification.

Non-EU citizens, legally residing in Italy, may self-certify only information that can be verified or certified by Italian public entities. They can also use a substitute statement of certification, when it is provided by an international agreement between Italy and the applicant's country.

Non-EU citizens other than those above mentioned must refer to the provisions of art. 3 paragraphs 3 and 4 of the d.P.R.445/2000⁴.

6. The only documents evaluated are those the applicant has submitted within the terms and the manners specified in art. 6 within the expiration date of the Call. Documents submitted in any other way are not be subjected to evaluation.

7. Failure to submit the mandatory documents specified in the attached Table means the exclusion from the selection process.

⁴ Under the D.P.R. December 28, 2000, n. 445 and subsequent amendments and additions.



Art. 6 – APPLICATION FOR ADMISSION

1. Entries to competitions begin on **Monday July 11, 2022 at 02:00 p.m. (Italian time)** and end on **Thursday September 1, 2022 at 02:00 p.m. (Italian time)**.

2. **The application for admission must be completed, under penalty of exclusion, using the online procedure** that involves two stages:

- **Stage I – Registration at the University website** (<https://uniud.esse3.cineca.it>): this allows the applicant to obtain a user name and password (credentials) in order to continue with the next stage⁵;
- **Stage II – Filling out the online application** (<https://uniud.esse3.cineca.it>): the applicant must print out the application form at the end of Stage II, in order to retain it as proof of submitted application together with the receipt of the fees payment, as specified in paragraph 8 of this article.

3. The instructions for the registration and for submit the application are available on the PhD website of the University of Udine.

4. Documents, qualifications and publications as listed in art. 5, must be attached to the online application in electronic format (.pdf), except for the letters of reference. **Files and/or folders, compressed in RAR or ZIP format, cannot be larger than 5 MB.** The applicant can add, delete or modify the attached documents even after the conclusion of stage II, but before the expiry of the call, on **Thursday September 1, 2022 at 02:00 p.m. (Italian time)**. The university administration assumes no liability if the documentation submitted is illegible as a result of damaged files or folders.

5. Every folder/file attached must be named as follows: surname of the applicant_PhD programme_document (e.g.: McDONALD_Industrial Engineering_Curriculum).

6. Letters of reference must be uploaded on the on line process by the referees at the applicant's request. During the submission of the application, the applicant must enter the email address of the referees, who will receive an email notification with the instructions to proceed for uploading the letter. Applicant and referee receive a notification about the successful upload of the letter, which will be available only for the Area Servizi per la Ricerca – Ufficio Formazione per la Ricerca and for the Selection Committee. The applicant can make a reminder to the referee and replace his/her name with another by the expiry date of the call (**Thursday September 1, 2022 at 02:00 p.m. Italian time**).

The referee must upload the letter of reference before **September 3, 2022**.

7. The admission to the selection procedure is subject to the payment of euro 25,00 (as a contribution for participating in the competition). Applicants have to pay the fee by **Thursday September 1, 2022**. Applicants who will not have paid the above-mentioned contribution (euro 25.00) by the day before the date of the Selection Committee's preliminary meeting, will be excluded. The dates of the Selection Committee's preliminary meeting will be posted by August 31, 2022 on the official register (<https://www.uniud.it/it/albo-ufficiale>) and on the PhD website of the University of Udine.

8. The amount as paragraph 7 is not refundable for any reason and must be paid via PagoPA service using one of the following options:

- direct access from Esse3 to one of the payment methods available in PagoPA using the data contained in the "Avviso di pagamento" (notice of Payment) issued at the end of the online application (accessing to "Student Administration Office/Payments" in the personal area of Esse3);
- payment at bank branches and receivers authorized to pay via PagoPA showing the "Avviso di pagamento" (notice of Payment) issued at the end of the online application (accessing to "Student Administration Office/Payments" in the personal area of Esse3);

⁵ If the applicant already owns the credentials to access the reserved area (e.g.: former student of University of Udine) this step should not be considered.



- from your account with online services (if activated by the bank) or with credit card or prepaid card with IBAN. For payments by credit or prepaid card refer to the circuit related to the card, NOT to the bank issuing the card. You need to print or save the "Avviso di pagamento" (notice of Payment) to have the data required to make the payment.

Applicants who are abroad and don't have an Italian current account can **exceptionally** make the payment on the bank account of the University of Udine at INTESA SANPAOLO: **IT59A0306912344100000046097 SWIFT/BIC BCITITMM** reason for payment "PhD competition – Applicant's Name and Surname". Only in this case, the receipt of the payment must be attached to the online application.

The payment is subject to the fees applied by the payment service provider.

9. Applicant cannot apply for more than one curriculum in the same PhD programme.

10. Applicants with certified disabilities or specific learning disorders, may notify during the online application (refer to paragraph 2 of this article):

- their situation attaching the certificate attesting the disability or the specific learning disorder;
- aids to conduct the examinations.

Applicants with disabilities or learning disorder, residing in foreign countries, who intend to take advantage of the measures described above, must present a certificate attesting to the state of disability or the learning disorder issued in their country of residence. The certificate has to be accompanied by a sworn translation in Italian or English language. The university bodies in charge to check the certifications verify that foreign certificate attests a condition of disability or specific learning disorder recognized by Italian legislation.

The different ways of supporting the examinations will be defined by the Selection Committee after checking the documentation submitted. In particular, for students with specific learning disorder, an additional time of 30 per cent more than the time defined for the admission test, will be granted. In case of particular gravity, additional aids may be provided.

Further information can be obtained from Direzione didattica e Servizi agli Studenti (DIDS) – Servizio studenti con disabili o dsa, tel. +39 0432 556804 - email: servizi.disabili@uniud.it, dsa@uniud.it

11. The university administration assumes no liability for information loss due to an error that has not committed, for inaccurate data given by the applicant relating to residence, mailing and email addresses and for failure or delay in notifying their change.

12. Applicants are advised not to wait until the last days before the deadline of the on line procedure. The University assumes no liability for any malfunctions due to technical problems and/or overloading of the communication line and/or application systems.

Art. 7 – SELECTION COMMITTEE

1. The Selection Committee of the PhD programme in Industrial and Information Engineering is specified in the attached Table.

2. The Selection Committee, in the first meeting, appoints its own internal President and Secretary.

3. Before the evaluation of the qualifications and before the start of the examinations, the Selection Committee defines the evaluation criteria and the scores assigned to the qualifications and to the examinations, taking into account the specifications set out in the attached Table.

4. The Selection Committee meetings can be held remotely.

5. The Selection Committee expresses the assessment of suitability with the aim of awarding scholarships indicated in art. 10.

6. The Selection Committee's tasks finish with the drawing up of the reports and final ranking lists.



Art. 8 – GENERAL COMPETITION

1. The applicants' selection foresees the evaluation of the qualifications and the conduct of the examinations, in the manner and on the dates specified in the attached Table. Any changes or additions to the examinations schedule are posted only on the official register (<https://www.uniud.it/it/albo-ufficiale>) and on the PhD website of the University of Udine.

2. Evaluation of qualifications and examinations are held according to the following general provisions:

- a. the maximum score for overall qualifications and examinations is 100 (100/100). The examinations of the PhD programmes with widely different curricula may be diversified;
- b. the maximum score for qualifications is 30 (30/100), the minimum score to be admitted to the first examination (written or oral) is stated in each table;
- c. the score assigned for the examinations is 70 points (70/100). Applicants are suitable if they obtain a score equal to or greater than 49 in the examinations;
- d. the final ranking list is unique and is prepared, for only eligible applicants, by adding up the scores obtained in the evaluation of the qualifications and in the examinations.

3. Applicants must show a valid identity document for admission to the examinations.

4. Details of the remotely oral examination are communicated to the applicants at the e-mail address entered during the registration procedure referred to art. 6 paragraph 2. Applicant must be available during the day and the timetable notified. For identification purposes, and under penalty of exclusion from the selection process, each applicant must identify itself before the interview begins, exhibiting the same identity document attached to the online application. The failure to communicate the personal address, the connection failure, the unavailability of the applicant on the day or in the established timetable or the failure exhibition of the identity document are grounds for the exclusion from the selection process.

The University accepts no responsibility in case of technical problems that do not ensure the proper conduct of the oral examination.

5. Oral examinations are public, including those which are conducted remotely.

Art. 9 – FINAL RANKING LIST

1. The final ranking list referring to art. 8 is published on the official register (<https://www.uniud.it/it/albo-ufficiale>) and on the PhD website of the University of Udine within the date detailed in the attached Table.

2. The university does not send out any communication to the applicants.

Art. 10 – ADMISSION TO THE PhD PROGRAMME

1. The first suitable candidate in the ranking will be admitted to the PhD programme if the Selection Committee expresses the assessment of suitability regarding the adequacy of the candidate's qualifications and scientific curriculum with the research topic and the characteristics of the scholarship.

1.1 The non-allocation of scholarship involves a reduction in the number of the available positions with scholarship.

1.2 In case of equal final score and equal requirements, the preference criteria to award positions with scholarship is the economic condition of the applicant's family nucleus⁶.

Art. 11– ENROLMENT

⁶ Current legislation about the right to study, ISEE.



1. **Successful applicant must enrol using the appropriate online procedure, from Monday October 10, 2022 at 2:00 pm (Italian time) to Monday October 17, 2022 at 2:00 pm (Italian time) under penalty of exclusion.** Log in at <https://uniud.esse3.cineca.it> to access the reserved area (use the same registration credentials, art. 6 paragraph 2, stage I) and select "Enrolment".

2. Enrolment to the PhD programme is subject to the payment of the amount specified in art. 14, by **October 17, 2022**, under penalty of exclusion from the programme.

3. The amount as paragraph 2 is not refundable for any reason and the payment must be made via PagoPA service using one of the following options:

- direct access from Esse3 to one of the payment methods available in PagoPA using the data contained in the "Avviso di pagamento" (notice of Payment) issued at the end of the online application (accessing to "Student Administration Office/Payments" in the personal area of Esse3);
- payment at bank branches and receivers authorized to pay via PagoPA showing the "Avviso di pagamento" (notice of Payment) issued at the end of the online application (accessing to "Student Administration Office/Payments" in the personal area of Esse3);
- from your account with online services (if activated by the bank) or with credit card or prepaid card with IBAN. For payments by credit or prepaid card refer to the circuit related to the card, NOT to the bank issuing the card. You need to print or save the "Avviso di pagamento" (notice of Payment) to have the data required to make the payment.

Applicants who are abroad and don't have an Italian current account can **exceptionally** make the payment on the bank account of the University of Udine at INTESA SANPAOLO: **IT59A0306912344100000046097 SWIFT/BIC BCITITMM** reason for payment "Enrolment in PhD programme".

4. Applicant must attach in electronic format the following documents in order to complete the enrolment:

- a passport photo (.jpeg format);
- a copy of a valid identity document (.pdf format);
- a copy of the Tax Identification Number, if available (.pdf format);
- the receipt of payment according to art. 14 (only if the payment is made on the bank account);
- the form of bank details (.pdf format);
- documents as art. 4, for applicants with degree obtained abroad (.pdf format);
- other documents if required by the University of Udine (.pdf format).

5. The amount paid is not refundable for any reason.

6. Non UE Citizens must comply with the rules on visas and residence permits. A copy of the residence permit or – pending the release – the receipt of the application for the residence permit must be submitted to Area Servizi per la Ricerca – Ufficio Formazione per la Ricerca, via Mantica, 31 – 33100 Udine.

7. The university administration assumes no liability for loss of communications due to any errors that cannot be attributed to it.

Art. 13 – REPLACEMENTS

1. Applicant who do not enrol **within October 17, 2022** is considered to have withdrawn. The position which has become available, is assigned to other applicant according to the final ranking list, taking into account art. 10.

2. The replacement applicant's name is posted by **October 19, 2022** on the official register (<https://www.uniud.it/albo-ufficiale>) and on the PhD website of the University of Udine.

3. The admitted applicant must enrol as specified in art. 11 **no later than Monday October 24, 2022 at 2:00 pm (Italian time)**, under penalty of exclusion from the programme.



4. Any further replacements positions will be communicated directly to the relevant applicants.

Art. 13 – SCHOLARSHIPS

1. Scholarship is linked to a specific research topic and financial fund.
2. Scholarship is awarded in accordance with art.10. The scholarship begins from November 1, 2022.
3. The scholarship has a duration of three years, subject to the provisions of art. 20 p. 2 and art. 25 of the Internal Regulations for the PhD Programmes. Scholarships are renewed annually on condition that the PhD student has completed the program of planned activities, as verified by the Teaching Board.
4. The annual gross amount of the scholarship is specified in the attached Table and is subject to the social security tax (INPS a gestione separata). The scholarship is paid on monthly basis in the following month. The amount of the scholarship is increased for research activities abroad by a maximum of 50% for a total period specified in the attached Table, unless additional financial resources are available. In any case, the increase is only due to periods of continuous stay and longer than 30 days.
5. The scholarship cannot be allocated to those who have already received a scholarship to attend another PhD programme or an equivalent programme.
6. The scholarship cannot be combined with research grants or other scholarships awarded for any purpose, except for those awarded by national or foreign institutions useful to integrate the abroad research activity of the PhD students. Further incompatibilities are defined by the Internal Regulation for the PhD programmes.

Art. 14 – ACADEMIC FEES

1. For the Academic Year 2022/2023 is foreseen the payment of maximum amount of euro 276,00:
 - university contribution, euro 100,00;
 - regional tax for the right to university study, from euro 120,00 to euro 160,00 (economic condition of the applicant's family nucleus⁷);
 - duty stamp, euro 16,00.The amount will be requested at the moment of the enrolment and any exemption will be applied in accordance with the current legislation.
2. However, the university administration reserves to adopt different regulations for the following academic years.

Art. 15 – PERSONAL DATA

1. The personal data collected under the procedure referred to in art. 6 are necessary for the proper management of the selection procedure, for any subsequent career management and for purposes related to the management of the services provided to students during the university PhD programme. The University of Udine is the "Data Controller". At any time, you can request access, corrections and, according to the University institutional purposes, the cancellation and limitation of the processing or oppose the processing of your data. You can always submit a complaint to the Italian Authority for data protection. The complete information is available on the University of Udine website in the section "privacy" accessible from the home page www.uniud.it.
Direct link: <https://www.uniud.it/it/it/pagine-speciali/guida/privacy>

⁷ Current legislation about the right to study, ISEE.



Art. 16 – HEAD OF PROCEDURE

1. The officer in charge of the proceedings is Dr. Sandra Salvador, Head of Area Servizi per la Ricerca of the University of Udine.

The PhD Office of the University of Udine is the Area Servizi per la Ricerca – Ufficio Formazione per la Ricerca, via Mantica n. 31 - 33100 Udine.

2. To request information, fill in the following forms available on the website of the University of Udine:

Information about the Call:

- https://helpdesk.uniud.it/SubmitSR.jsp?type=req&accountId=universityofudine&populateSR_id=42104

Information about Esse3:

- https://helpdesk.uniud.it/SubmitSR.jsp?type=req&accountId=universityofudine&populateSR_id=42094

Art. 17 – REFERENCE RULES

1. For matters not covered by this Call, please refer to the National legislation in the field of doctoral research mentioned in the introduction, to the Internal Regulations for the PhD programmes and to the Rules of Procedure relating to patents available web page of the University of Udine dedicated to the PhD programmes.



TABLE – PhD Programme INDUSTRIAL AND INFORMATION ENGINEERING

THE PhD PROGRAMME	
Administrative location	University of Udine, Polytechnic Department of Engineering and Architecture (DPIA) - via delle Scienze 206, 33100 Udine, ITALY (tel. +39 0432 558253)
Associated location	Institut National Polytechnique de Grenoble (France)
Location for training, teaching and research activity	Teaching and other training activities will take place primarily at the administrative programme location or in other locations of the University of Udine. The research program will be mainly developed, depending on the scholarship (see art. 11 of the Call) and/or on the supervisor assigned, at one of these locations: administrative location, associated location, financial supporter's location (if the financial supporter is an external institution).
Coordinator	Prof. David Esseni (david.esseni@uniud.it)
Programme duration	3 years
Curricula	<ol style="list-style-type: none"> 1. New management paradigms and fabrication technologies for competitive enterprises with low environmental impact; 2. Information and communication technology for the inclusive society; 3. Design of innovative thermo-electro-mechanical systems and development of advanced methods for the assessment of structural damage and reliability for energy saving; 4. Mechanical technologies and electronic devices for domotics, medical diagnostic and safety.
Research topics	<p>- <i>Curriculum 1 - New management paradigms and fabrication technologies for competitive enterprises with low environmental impact</i></p> <ol style="list-style-type: none"> 1. Lean management, agile project management, operations management, production planning and control, supply chain management, purchasing and supplier management, innovation management, new product development, global manufacturing, complexity management, performance measurement systems; 2. System and machinery efficiency for industrial production; 3. Cognitive features of products development in view of CAD-PLM technologies; 4. Characteristics and applicability of emerging prototyping methodologies (augmented reality, functional mock-up, interaction design, etc.); 5. Smart logistics: computation models and algorithms; 6. New technologies for the manufacturing of innovative materials; 7. Systems for monitoring and control of machine tools; 8. Methodologies for the design of energy and production efficient automatic systems Approaches to system and product innovation; 9. Robotic systems for the industrial sustainability 10. Robotic systems for production and energy efficiency <p>- <i>Curriculum 2 - Information and communication technology for the inclusive society</i></p> <ol style="list-style-type: none"> 1. Nano-electronic devices (MOSFETs, Steep Slope, etc.) for energy efficient and high performance electronics. Non volatile Memories for massive 3D integration (Flash, charge trap); 2. Advanced electron devices based on innovative materials and architectures in the Beyond CMOS and More than Moore domains: graphene, 2D crystals, III-V compound semiconductor devices; 3. Semi-classical (BTE) and quantum mechanical (NEGF) simulation of nanoelectronics devices; 4. Integrated circuit design for energy efficient communications, energy conversion and management; 5. Innovative communication paradigms and systems: systems with multiple antennae, distributed communication systems, HW and SW architectures for telecommunications; 6. Multimedia signals processing and analysis: video and image encoding, video streaming based on peer-to-peer networks, joint source/channel encoding, compressive sensing; 7. Test and development of metaheuristic algorithms for combinatorial problems; 8. Pervasive computing, cloud computing, overlay networking, distributed computing in miscellaneous networks of computers; 9. Artificial vision system, virtual sound, machine learning; 10. Wireless communication systems and networks, signal processing for communication, physical substrate algorithms, transmission system algorithms. 11. Data and Information Fusion <p><i>Curriculum 3 – Design of innovative thermo-electro-mechanical systems and development of advanced methods for the assessment of structural damage and reliability for energy saving</i></p> <ol style="list-style-type: none"> 1. Energy harvesting systems for self powered, smart, distributed sensors; 2. Electro-mechanical devices for innovative production and storage energy systems; 3. New paradigms, systems, technologies for surface and air transportation vehicles with low energy consumption; 4. Integrated power electronics for industrial plants and machinery; 5. Electric drivers and converters for distributed electric generation and co-generation systems (photovoltaic, wind, etc.); 6. On board electronics: terrestrial and satellite localisation and navigation systems; communication networks and systems;



TABLE – PhD Programme INDUSTRIAL AND INFORMATION ENGINEERING

	<p>7. Green mechatronics: mechatronics for energy saving; 8. Design methodologies for materials handling systems characterised by low environmental impact; 9. Holistic design of lightweight structures for low emissions and low energy consumption vehicles; 10. Design of energy efficiency industrial plants; 11. Stress and strain analysis of materials and structures subjected to time-dependant deformation processes; 12. Methods for structural integrity design and verification; 13. Developments of damage-tolerant design methods; 14. Multi-physics analyses for the evaluation of the stress/strain state in materials and engineering structures; 15. Micromechanical damaging processes in materials; 16. Behaviour characterisation and modelling of materials processed by advanced manufacturing techniques; 17. Modeling and control of mechanical and mechatronic systems; 18. Modeling and control of vibrations in mechanical systems; 19. Numerical modeling for the simulation of electromagnetic devices and fields.</p> <p><i>Curriculum 4 – Mechanical technologies and electronic devices for domotics, medical diagnostic and safety</i></p> <p>1. Smart systems and technologies for home, working and leisure environments 2. Systems for safety at work, on the road, at home; systems for the management of home assistance activities; 3. Sensors, devices and instrumentation for medical care and tests and for the support of the elderly; systems for the planning and support of hospital activities; 4. Innovative paradigms for the interaction of domotics, surgery and security devices; 5. Passive and active control of noise and vibration for industrial, home and surface-air transport vehicles applications; 6. Devices and instrumentation for the detection of biomedical parameters: nanosensors 7. Robots for elderly and disable people assistance; 8. Robots for surgery applications; 9. Large scale tri-dimensional image modelling, automatic synthesis of binocular video flows from monocular sources; 10. Geophysics; seismic data acquisition, vulcanology, geostatics, seismic risk evaluation.</p>
Research programs	Research programs are selected by the Teaching Board among the topics offered by the curricula.
Programme website	https://www.uniud.it/it/ricerca/lavorare-nella-ricerca/dottorato-ricerca/inostricorsi/area-physical-science-and-engineering/ingegneria-industriale-e-dellinformazione/il-dottorato https://phd.diegm.uniud.it/ie-phd/

ADMISSION REQUIREMENTS

Required degree	Italian Laurea (before DM 509/99) or Italian Laurea specialistica/magistrale (ex DM 509/1999 and DM 270/04). Foreign degrees and titles: refer to art. 3 and 4 of the Call.
Knowledge of the following foreign language	English

DOCUMENTS AND QUALIFICATIONS TO BE ATTACHED TO THE APPLICATION FOR ADMISSION

Compulsory documents (art. 5 of the Call)	<p>1. Certification or self-certification (refer to art. 5 paragraph 5 of the Call) of the academic title needed for admission to the PhD programme and list of the exams (with grades) passed during the Italian first level (bachelor) and the Laurea Specialistica/Magistrale programmess or during the Italian programmes before D.M. 509/99 or during the foreign academic programmes; 2. Curriculum vitae et studiorum, dated and signed; 3. Copy of a valid identity document (citizens of countries not belonging to the European Union a copy of a valid passport, comprehensive of the pages containing the holder's photo, personal details, passport number, date and place of issue, date of expiry).</p>
Optional documents (art. 5 of the Call)	<p>1. Master thesis ("Tesi di Laurea") associated to the degree/title providing access to the PhD programme. Applicants who are not graduated on the expiration date of this Call can submit an extended abstract in place of the complete thesis, in Italian or English language, signed by themselves and by their thesis Supervisor (approximate limit: 25.000 characters, including spaces); 2. Motivational letter by which the applicant explains the reasons for admission to the PhD programme, dated and signed (approximate limit: 2.500 characters, including spaces); 3. Publications (max 2); 4. Letters of reference (max 2), from university professors, scientific researchers or other experts in the field (art. 6 of the Call).</p>



TABLE – PhD Programme INDUSTRIAL AND INFORMATION ENGINEERING

SELECTION COMMITTEE	
Appointed members	David Esseni – Full Professor – University of Udine Marco Giuseppe Pala – Chargé de Recherche CNRS– Paolo Giannozzi – Associate Professor – University of Udine
Substitute members	Francesco Driussi – Associate Professor – University of Udine Antonio Abramo – Associate Professor – University of Udine Daniel Lizzit - Adjunt Professor – University of Udine

ADMISSION

GENERAL COMPETITION (art. 8 of the Call for Applications)

Positions available: 5					
<i>Detailed description</i>	<i>N.</i>	<i>Funding</i>	<i>Annual gross amount</i>	<i>Period abroad</i>	<i>Research topic</i>
Positions WITH SCHOLARSHIP: 1	1	Univ. Udine (Call Vinci 2021)	€ 16,243.00	Min 12 months mandatory at Université Paris-Saclay	First-principles Quantum transport for an atomistic engineering of nanoelectronic devices.

Competition procedure and test schedule

<p>Evaluation of titles and oral examination. For the evaluation of applicants' attitude for scientific research and their basic skills to tackle the course program, the Selection Committee can attribute up to 100 points to each applicant: max 30 points to the titles and max 70 points to the oral examination. The applicant is admitted to the oral examination if his/her titles receive at least 16 points. The oral examination is passed with at least 49 points. The applicant is eligible to the PhD programme if he/she passes the oral examination. Only for eligible applicants, the points attained in the oral examination will be added to the points of the titles. DATE FOR THE PUBLICATION OF ADMITTED APPLICANTS TO THE ORAL EXAMINATION: within September 6, 2022. DATE FOR THE PUBLICATION OF THE FINAL RANKING LIST: within September 30, 2022.</p>		
Foreign language that can be used for examination	Italian or English	
Evaluation Criteria of qualifications <i>During the preliminary meeting the Selection Committee may establish sub-criteria for the evaluation</i>	Curriculum vitae et studiorum	15
	Scientific publications	5
	Thesis/Abstract	2
	Letters of reference	4
	Motivational letter for admission to the PhD programme	4
Oral examination	<p>The oral examination consists of an individual interview of about 15 minutes aiming to assess the applicant flair to undertake a research doctorate and to carry out the research tasks in the areas of interest for the doctorate. The interview will be assessed considering the following criteria: a) technical and scientific competence in the topics of the doctorate; b) knowledge of the state of the art for the doctorate curricula; c) mastery of English language.</p>	
Calendar of the oral examination	Date	September 16, 2022
	Time	09:30 AM
	How to conduct the examination	The oral examination will be held online.
	Based on the number of applicants, the oral examination may take place in more than one day. Applicants must exhibit a valid ID for admission to the oral examination.	

Research topic description

Research topic: First-principles Quantum transport for an atomistic engineering of nanoelectronic devices
Research period: 12 months at the Université Paris-Saclay (and associated partner Centre de Nanosciences et de Nanotechnologies)
Brief description: The PhD project will develop a methodology for numerical simulations for nanomaterials and nanoelectronic devices, as well as its validation against physical and electrical experimental data. The specific objectives of this PhD project include theoretical aspects and an effective numerical implementation related to the development of a first-principle, quantum transport simulation environment with far-reaching applications going from material science to nanoelectronic devices. The skills and competences developed by the PhD student during the PhD program will be highly multi-disciplinary and expendable in several fields including nanoelectronic devices, synaptic devices for neuromorphic computing, and nanostructured material science. The project has an at least twofold scientific interest: the advancement of the state of the art in the field of numerical models, the technological relevance of the explored applications. The PhD student will benefit from top scientific research guidance in the field of first-principle calculations, quantum transport techniques and nanoelectronic device design. In fact the groups involved in the project have well established collaborations that will bring a significant added value to the co-tutoring of the PhD student..