**Universitatea Națională de Știință și Tehnologie Politehnica București /**
**National University of Science and Technology POLITEHNICA Bucharest**
**Facultatea de Inginerie în Limbi Străine/ Faculty of Engineering in Foreign Languages**
**Departamentul de Inginerie în Limbi Străine/ Department of Engineering in Foreign Languages**

## Informații concurs post nr. 5 Profesor
## Recruitment information post no. 5 Professor

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| **Poziţia în statul de funcţii/**<br>**Number in workload plan** | **5/**<br>**5** |
| **Funcţie/**<br>**Position** | **Profesor/**<br>**Professor** |
| **Disciplinele din planul de învăţământ/**<br>**Disciplines in the curriculum** | Data Structures and Algorithms (curs); Semantic Web (laborator); Programmation des ordinateurs et langages de programmation (curs); Méthodes et techniques de développement des logiciels (curs)/<br>Data Structures and Algorithms (Course); Semantic Web (Laboratory); Computer programming and programming languages (Course); Software development methods and techniques (Course) |
| **Domeniu ştiinţific/**<br>**Scientific field** | Calculatoare și tehnologia informației/<br>Computers and Information Technology |
| **Descriere post/**<br><br>**Job description** | **Activităţi specifice postului:**<br>Îndeplinirea normei universitare conform art. 211 din Legea 199/2023 a învăţământului superior și a Instrucțiunilor privind evidența cadrelor didactice și a activităților procesului de învățământ 2023-2024 din Universitatea Națională de Știință și Tehnologie POLITEHNICA București - Norma didactică minimă săptămânală - 9 ore convenţionale, dintre care cel puțin patru ore convenționale de activități de predare.<br>Suma totală a orelor dintr-o normă didactică sau de cercetare este de 1720 ore pe săptămână.<br>Ocuparea acestui post necesită studii de specialitate în domeniul de referință şi implică îndeplinirea criteriilor din Metodologia organizării şi desfășurării concursurilor pentru ocuparea posturilor didactice în UNSTPB si a Legii 199/2023 cu modificările si adăugirile ulterioare.<br>Titularul postului este subordonat direct Directorului Departmentului de Inginerie în Limbi Străine si asigură aplicarea conținutului fișelor disciplinelor prin cursuri , lucrări și aplicații practice; elaborează lucrări practice şi alte materiale didactice necesare învăţământului şi cercetării ştiinţifice; pregătește şi conduce lucrări şi aplicații practice la disciplina la care este desemnat, în conformitate cu planurile de învăţământ aprobate; îndrumă pregătirea şcolară a studenţilor./<br><br>**Activities specific to the job:**<br>Fulfilling the university norm according to art. 211 of Law 199/2023 on higher education and the Instructions regarding the record of teaching staff and the activities of the educational process 2023-2024 from the National University of Science and Technology POLITEHNICA Bucharest – Minimum weekly teaching norm - 9 conventional hours., including 4 hours of lecturing<br>The total amount of hours in a didactic or research norm is 1720 hours per week.<br>The occupation of this position requires specialized studies in the referred field and involves the fulfillment of the criteria of the Methodology of organizing and conducting contests for the occupation of teaching positions in UNSTPB and of Law 199/2023 with subsequent amendments and additions.<br>The post holder is directly subordinate to the Director of the Department of Engineering in Foreign Languages and ensures the application of the content of the Subject Description through courses, papers and practical applications; elaborates practical works and other didactic materials necessary for education and scientific research; prepares and conducts works and practical applications in the discipline to which he is assigned, in accordance with the approved educational plans; guides the school preparation of students. |

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| **Atributiile/activitatile aferente/**<br><br>**Duties/ativities related to the job** | **Atribuţiile/activităţile aferente postului scos la concurs:**<br>Activităţi didactice normate în statul de funcțiuni (predare curs în limbă străină, aplicații de laborator în limbă străină, îndrumare activități de proiect în limbă străină), activități de cercetare (activitate de cercetare programată în cadrul normei didactice de bază, elaborarea rapoartelor de cercetare, elaborarea de articole și comunicări științifice, activități de coordonare a cercetării a unui grup sau a unui colectiv, elaborarea de oferte pentru câștigarea de granturi de cercetare), alte activități didactice (îndrumare realizare proiect de diplomă, îndrumare realizare proiect de dizertație, îndrumare activitatea de practică tehnologică în facultate), activități pregătitoare pentru activități didactice (redactarea cursurilor predate, redactarea materialelor didactice suport pentru desfășurarea activităților aplicative, redactarea de culegeri de probleme/îndrumare de laborator/ îndrumare de proiectare realizarea proiectului de disciplină, redactarea fișei de disciplină la începutul fiecărui an universitar), activități desfășurate în timpul semestrelor pentru activități didactice (pregătirea pentru buna desfășurare a activității didactice, pregătirea / organizarea orelor de curs/ seminar/ laborator/ proiect/ îndrumarea realizării proiectului de diplomă sau disertație, participarea in comisii de îndrumare doctoranzi in stagiu, pregătirea/ organizarea pentru îndrumarea activității de practică tehnologică<br>Pregătirea / organizarea pentru îndrumarea activității de practică, evaluarea studenților la examenului final/ în timpul semestrelor la disciplinele cu verificare pe parcurs, corectarea lucrărilor programate la curs de tip parțial și a temelor de casă impuse prin programa cursului), participarea la activitățile administrative ale catedrei și la cele utile comunității academice.<br><br>**Duties/ activities pertaining to the opening:**<br>Regulated didactic activities (teaching a course in a foreign language, laboratory applications in a foreign language, guiding project activities in a foreign language), research activities (programmed research activity within the basic didactic norm, writing research reports, preparation of scientific articles and communications, research coordination activities of a group or collective, preparation of research grants proposals), other didactic activities (guidance for the realization of a diploma project, guidance for the realization of a dissertation project, guidance for the activity of techological internships within the faculty), preparatory activities for didactic activities (drafting of taught courses, drafting of didactic materials supporting the implementation of applied activities, drafting of problem collections/laboratory guidance/design guidance, realization of the discipline project, drafting of the discipline sheet at the beginning of each academic year), activities carried out during the semesters for didactic activities (preparation for the good performance of the didactic activity, preparation/organization of class hours/seminar/laboratory/project/guidance in the realization of the diploma or dissertation project, participation in the guidance committees of PhD students in internship , the preparation/organization for the guidance of the technological practice activity<br>Preparation/organization for the guidance of the practical activity, evaluation of the students in the final exam/during the semesters in the subjects with verification along the way, correction of the papers scheduled for the part-type course and the homework imposed by the course syllabus), participation in the administrative activities of the department and to those useful to the academic community. |
| **Salariul minim de incadrare/**<br><br>**Engagement min. salary** | - în conformitate cu prevederile din Legea-cadru nr. 153 din 28 iunie 2017, cu modificările și completările ulterioare, privind salarizarea personalului plătit din fonduri publice/<br>- in accordance with the provisions of the Law-frame no. 153 of 28 June 2017, with subsequent amendments, on the salary of the personnel paid from public funds |
| **Înscrierea la concurs/**<br><br>**Application process period** | Conform calendarului concursului<br>https://posturivacante.upb.ro/didactice/<br>See recruitment calendar<br>https://posturivacante.upb.ro/didactice/ |
| **Data susţinerii probelor Locul susţinerii /**<br><br>**Date of recruitment process unfolding**<br><br>**Place of recruitment process unfolding** | https://posturivacante.upb.ro/didactice/ |
| **Comunicarea rezultatelor/**<br><br>**Announcement of results** | Ziua desfășurării ultimei probe de concurs conform programării probelor/<br>Day of unfolding last stage of recruitment process according to the schedule |
| **Perioadă de contestaţii/ Contestation deadline** | 3 zile lucrătoare după comunicarea rezultatelor conform calendarului concursului<br>(exclusiv pentru nerespectarea procedurilor legale de concurs)/<br>Withing 3 working days since the announcement of the results (only limited to breach |

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| | of recruitment legal procedures) |
| **Tematica probelor de concurs/** | **Data Structures and Algorithms – Tematică**<br>• Introduction to C/C++ (Fundamentals of C/C++, static arrays, matrices, multidimensional arrays, struct vs classes, template classes and functions, recursive functions)<br>• Dynamic memory allocation in C/C++, pointers in C/C++<br>• Abstract data type vs. data structures<br>• Stack<br>• Queue<br>• Linked lists. Implementation of Stack and Queue data types using linked lists<br>• Hash tables<br>• Graphs<br>• Binary trees<br>• Binary search trees<br>• Heaps and heap sort<br><br>**Data Structures and Algorithms – Bibliografie**<br>• M. A. Weiss, “Data Structures and Algorithm Analysis in C++”, 3rd edition, Addison-Wesley, 2007<br>• T.H. Cormen, C. E. Leiserson, R. L. Rivest, C. Stein, "Introduction to Algorithms", 2nd edition, MIT Press, 2002<br>• M. La Rocca, “Advanced Algorithms and Data Structures”, Manning Press, 2021<br><br>**Semantic Web – Tematică**<br>• Introduction to Web and Semantic Web (What is the World Wide Web? Notes on creating distributed applications. The HTTP protocol. What is the Semantic Web? What are the main applications of the Semantic Web?)<br>• Development of Web applications at client level (HTML5, CSS3, JavaScript and Jquery, DHTML)<br>• Development of Web applications at server level (Session control, Java EE, Web servers, Querying databases through Web applications, Model-View-Controller architecture)<br>• XML markup language (Characteristics, transformations - XPath& XSLT, XSL style sheets, XML validations - DTD, XML Schema, XML processing - DOM model, SAX interface - Simple API for XML, Query languages - XQuery)<br>• The RDF standard - Resource Description Framework. SPARQL queries<br>• Ontologies (Definition, specification modes, description languages – OWL, ontology alignment, creation tools – Protege, processing API - JENA)<br>• Social Web (Web journals, collaborative web applications, social networks, on-demand Web streaming, combining content from multiple sources, through Web services)<br>• Web and semantic web services (Transition from Web services to Semantic Web services, SOA, SOAP vs. REST, ESB - Enterprise Service Bus vs. WCF - Windows Communication Foundation, OWL-S)<br><br>**Semantic Web – Bibliografie**<br>• Grigoris Antoniou, Frank Van Harmelen - Semantic Web Primer, MIT Press, 2004<br>• Dean Allemang, James Hendler - Semantic Web for the Working Ontologist: Effective Modeling in RDFS and OWL, 2nd edition, Elsevier, 2011<br>• Gaševic, Dragan, Djuric, Dragan, Devedžic, Vladan - Model Driven Engineering and Ontology Development, 2nd edition, Springer, 2009<br>• Hall M., Core Servlets and Java Server Pages, Prentice Hall, 2006<br>• Monson-Haefel R., J2EE Web Services, Addison-Wesley Professional, 2003<br><br>**Programmation des ordinateurs et langages de programmation – Tematică**<br>• Introduction aux langages de programmation<br>• Introduction à Java<br>• Développement et l'exécution d'une application de programme en Java<br>• Types et variables<br>• Types de données en Java<br>• Eléments de langage<br>• Les instructions de contrôle<br>• Fonctions/ methodes; visibilité des variables: locale vs globales |

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| **Contest examination themes** | • Functions recursives<br>• Structures de données et algorithms en JAVA API<br>• Classes et objets<br>• Relations entre classes<br>• Héritage, polymorphisme, surcharge(overloading) vs sous-typage (overriding), classes abstraites<br>• I/O en Java<br><br>**Programmation des ordinateurs et langages de programmation – Bibliografie**<br>• Horstmann, C., Cornell, G., “Core Java 2”, 9th edition, 2014<br>• Mughal, K., Rasmussen, R. “Programmer's Guide to Java SCJP Certification”, 3rd edition, 2008<br>• Serbanati, L.D., Bogdan, C., “Programare orientata spre obiecte cu exemplificari in limbajul Java”, vol.1, Politehnica Press, 2011<br>• Eckel, B., “Penser en. Java”, 2nd edition, President, MindView, Inc., 2012<br>• Lassoff, M., “Java Programming for Beginners Learn the Fundamentals of Programming with Java”, Packt Publishing, 2017<br><br>**Méthodes et techniques de développement des logiciels – Tematică**<br>• Intro: du développement de systèmes au développement de logiciels, activités dans le développement de logiciels<br>• Modèles du processus de développement logiciel (e.g. Waterfall, V model, iterative, spiral, Agile)<br>• Analyse et définition des besoins (e.g. Business Modeling vs Software Modeling, User Requirements vs Software Requirements)<br>• Modélisation de systèmes logiciels (e.g. modèles orientés objet, UML)<br>• Conception architecturale (types d'architectures, styles architecturaux – e.g. Client – Server, 3-Tier, Model - View - Controller etc, modèles de conception)<br><br>**Méthodes et techniques de développement des logiciels – Bibliografie**<br>• G. Booch, J.Rumbaugh, I. Jacobson, „Software Testing and Quality Assurance: Theory and Practice”, Wiley&Sons, 2008<br>• R. Miles, K. Hamilton,”Learning UML 2.0”, O'Reilly Media, 2006<br>• E. Gamma, R. Helm, R. Johnson, J. Vlissides, ” Design Patterns-Elements of Reusable Object-Oriented Software”, O'Reilly Media, 2006<br>• G. Caldwell,” Agile Project Management-The Complete Guide for Beginners to Scrum, Agile Project Management, and Software Development”, Alakai Publishing LLC, 2021<br><br>**Data Structures and Algorithms – Themes**<br>• Introduction to C/C++ (Fundamentals of C/C++, static arrays, matrices, multidimensional arrays, struct vs classes, template classes and functions, recursive functions)<br>• Dynamic memory allocation in C/C++, pointers in C/C++<br>• Abstract data type vs. data structures<br>• Stack<br>• Queue<br>• Linked lists. Implementation of Stack and Queue data types using linked lists<br>• Hash tables<br>• Graphs<br>• Binary trees<br>• Binary search trees<br>• Heaps and heap sort<br><br>**Data Structures and Algorithms – Bibliography**<br>• M. A. Weiss, "Data Structures and Algorithm Analysis in C++", 3rd edition, Addison-Wesley, 2007<br>• T.H. Cormen, C. E. Leiserson, R. L. Rivest, C. Stein, "Introduction to Algorithms", 2nd edition, MIT Press, 2002<br>• M. La Rocca, "Advanced Algorithms and Data Structures", Manning Press, 2021<br><br>**Semantic Web – Themes**<br>• Introduction to Web and Semantic Web (What is the World Wide Web? Notes on creating distributed applications. The HTTP protocol. What is the Semantic Web? What are the main applications of the Semantic Web?) |

- Development of Web applications at client level (HTML5, CSS3, JavaScript and Jquery, DHTML)
- Development of Web applications at server level (Session control, Java EE, Web servers, Querying databases through Web applications, Model-View-Controller architecture)
- XML markup language (Characteristics, transformations - XPath& XSLT, XSL style sheets, XML validations - DTD, XML Schema, XML processing - DOM model, SAX interface - Simple API for XML, Query languages - XQuery)
- The RDF standard - Resource Description Framework. SPARQL queries
- Ontologies (Definition, specification modes, description languages – OWL, ontology alignment, creation tools – Protege, processing API - JENA)
- Social Web (Web journals, collaborative web applications, social networks, on-demand Web streaming, combining content from multiple sources, through Web services)
- Web and semantic web services (Transition from Web services to Semantic Web services, SOA, SOAP vs. REST, ESB - Enterprise Service Bus vs. WCF - Windows Communication Foundation, OWL-S)

**Semantic Web – Bibliography**


- Grigoris Antoniou, Frank Van Harmelen - Semantic Web Primer, MIT Press, 2004
- Dean Allemang, James Hendler - Semantic Web for the Working Ontologist: Effective Modeling in RDFS and OWL, 2nd edition, Elsevier, 2011
- Gaševic, Dragan, Djuric, Dragan, Devedžic, Vladan - Model Driven Engineering and Ontology Development, 2nd edition, Springer, 2009
- Hall M., Core Servlets and Java Server Pages, Prentice Hall, 2006
- Monson-Haefel R., J2EE Web Services, Addison-Wesley Professional, 2003


**Programmation des ordinateurs et langages de programmation – Themes**

- Introduction to programming languages
- Introduction to Java language
- Developing and running a program application in Java
- Types and variables
- Data Types in Java
- Elements of language
- Control instructions
- Functions/methods; visibility of variables: local vs global
- Recursive functions
- Data structures and algorithms in JAVA API
- Classes and objects
- Relations between classes
- Inheritance, polymorphism, overloading vs. overriding, abstract classes
- I/O in Java

**Programmation des ordinateurs et langages de programmation – Bibliography**


- Horstmann, C., Cornell, G., “Core Java 2”, 9th edition, 2014
- Mughal, K., Rasmussen, R. “Programmer's Guide to Java SCJP Certification”, 3rd edition, 2008
- Serbanati, L.D., Bogdan, C., “Programare orientata spre obiecte cu exemplificari in limbajul Java”, vol.1, Politehnica Press, 2011
- Eckel, B., “Penser en. Java”, 2nd edition, President, MindView, Inc., 2012
- Lassoff, M., “Java Programming for Beginners Learn the Fundamentals of Programming with Java”, Packt Publishing, 2017


**Méthodes et techniques de développement des logiciels – Themes**

- Intro: from systems development to software development, activities in software development
- Models of the software development process (e.g. Waterfall, V model, iterative, spiral, Agile)
- Analysis and definition of needs (e.g. Business Modeling vs Software Modeling, User Requirements vs Software Requirements)
- Modeling of software systems (e.g. object-oriented models, UML)
- Architectural design (architecture types, architectural styles – e.g. Client –Server, 3-Tier, Model - View - Controller etc, design patterns)

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| | **Méthodes et techniques de développement des logiciels – Bibliography**<br>• G. Booch, J.Rumbaugh, I. Jacobson, „Software Testing and Quality Assurance: Theory and Practice”, Wiley&Sons, 2008<br>• R. Miles, K. Hamilton,”Learning UML 2.0”, O'Reilly Media, 2006<br>• E. Gamma, R. Helm, R. Johnson, J. Vlissides, ” Design Patterns-Elements of Reusable Object-Oriented Software”, O'Reilly Media, 2006<br>• G. Caldwell,” Agile Project Management-The Complete Guide for Beginners to Scrum, Agile Project Management, and Software Development”, Alakai Publishing LLC, 2021 |
| **Descrierea procedurii de concurs/**<br><br>**Evaluation criteria** | Candidatul va fi evaluat de către comisia de concurs din perspectiva:<br>a) relevanţei şi impactului rezultatelor ştiinţifice;<br>b) capacitatii candidatului de a îndruma studenţi sau tineri cercetători;<br>c) competenţei didactice;<br>d) capacitatii de a transfera cunoştinţele sale către mediul economic sau social ori de a populariza propriile rezultate ştiinţifice;<br>e) capacitatii de a lucra în echipă şi eficienţa colaborărilor ştiinţifice ale acestuia, în funcţie de specificul domeniului;<br>f) capacitatii de a derula sau conduce proiecte de cercetare-dezvoltare;<br>g) experienţei profesionale în alte instituţii decât POLITEHNICA Bucureşti /<br><br>The candidate shall be evaluated by the commission as regards the following:<br>a) relevance and impact of scientific results;<br>b) candidate’s ability to supervise students or young researchers;<br>c) didactic competence;<br>d) ability to transfer their knowledge to the economic or social environment, or to publish their own scientific results;<br>e) teamwork skills and effectiveness of their scientific collaboration in function of the field specifics<br>f) the ability of running or managing research development<br>g) professional experience in other institutions than NUST POLITEHNICA Bucharest |
| **Lista completa a documentelor pe care candidatii trebuie sa le includa în dosarul de concurs/**<br>**Full list of documents the candidates have to include in the application file** | Conform cu metodologia privind ocuparea posturilor didactice și de cercetare vacante https://posturivacante.upb.ro/wp-content/uploads/2022/02/Metodologie.Concurs.UPB_.Modificata-2022.pdf/<br><br>In accordance with the methodology regarding the recruitment process for the vacant didactic and research positions https://posturivacante.upb.ro/wp-content/uploads/2022/02/Metodologie.Concurs.UPB_.Modificata-2022.pdf/ |
| **Adresa la care trebuie transmis dosarul de concurs/**<br>**Address where the application file has to be sent** | - Rectorat, camera R207 (Centrul Universitar București);/<br>Rectorate Building, room R207 (Bucharest University Centre)<br><br>- Registratură, corp R, camera 37 (Centrul Universitar Pitești)/<br>Registration office, R Building, room 37 (Piteşti University Centre) |