



UNIVERSITY OF BRASILIA
GRADUATE PROGRAM IN MECHANICAL SCIENCES
PUBLIC CALL N° 05/2022

APPLICATION SELECTION TO THE GRADUATE PROGRAM IN MECHANICAL SCIENCES FOR DOCTORAL APPLICANTS FOR THE SECOND TERM OF 2022

1. PREAMBLE

1.1. According to his legal duties, the coordinator of the Graduate Program in Mechanical Sciences publishes and establishes the rules of the application process for the fulfillment of the vacancies in the Doctorate of the Graduate Program in Mechanical Sciences, according to the demands in the program Regulation and Resolutions 0080/2021 and 0044/2020 of the Council of Education, Research, and Extension of UnB, Resolutions 05/2020 and 11/2020 of the Chamber of Research and Graduate Studies, and Normative Ruling 03/2020 of the Graduate Deanery.

1.2 This public call was approved by the Collegiate Body of the Graduate Program in Mechanical Sciences at the 6th Regular Session of the Program conducted on June 20th, 2022, as well as by the Chamber of Research and Graduate Program in the University of Brasilia.

1.3 Information about the Program is available on the website (www.pcmec.unb.br) or can be obtained through the email enm.pcmec@unb.br.

2. NUMBER OF VACANCIES

2.1. The number of vacancies offered to applicants either living in Brazil or abroad is the following:

2.1.1 Doctorate: 14 (fourteen) vacancies, distributed among the concentration areas and research lines (see ANNEX 1) as follows:

2.1.1.1 Dynamics of Mechanical Systems: 2 vacancies

2.1.1.2 Energy and Environment: 4 vacancies

2.1.1.3 Fluid Mechanics of Complex Flow: 1 vacancies

2.1.1.4 Mechanics of Materials, Fatigue, and Fracture: 7 vacancies

2.2. 01 (one) of these vacancies must be filled preferably by self-declared people with disabilities when registering in the selection process upon meeting the criteria established in the Resolution n° 05/2020 of the Chamber of Research and Graduate Studies.

2.3. 03 (three) of these vacancies must be filled preferably by self-declared black candidates when registering in the selection process upon meeting the criteria established in the Normative Ruling CEPE 0044/2020.

2.4. 01 (one) additional vacancy is offered exclusively to self-declared indigenous candidates when registering in the selection process upon meeting the criteria established in the Normative Ruling CEPE 0044/2020.

2.5. 01 (one) additional vacancy is offered exclusively to self-declared quilombola candidates when registering in the selection process upon meeting the criteria established in the Normative Ruling CEPE 0044/2020.

2.6. POSITIONS RESERVED FOR AFFIRMATIVE ACTION POLICY

2.6.1. From CEPE Resolution No. 0044/2020, which provides for the policy of affirmative action for black, indigenous and quilombola students in graduate courses at the University of Brasilia, as well as Resolution CPP No. 0005/2020, which establishes reservation of places for people with disabilities in the selection



processes of postgraduate programs at the University of Brasília, the Selection Process for Professional Master's or Academic Master's course(s)/ and Academic Doctorate provides for reservation of places for black candidates/ for indigenous and quilombola candidates and for candidates with disabilities.

2.6.2. The information provided at the time of registration is the sole responsibility of the candidate, who must answer for any falsehood.

2.6.3. In the event of non-compliance with the eligibility for the Affirmative Actions Policy, the candidate will be eliminated from the selection process, being, before, assured the right of appeal within the framework of CPP Resolution No. 0009/2020.

2.6.4. In the event that there are no candidates who opt for the affirmative action policies for blacks approved in sufficient numbers to fill the reserved places, the remaining places will be reverted to broad competition and will be filled by the other candidates/ those approved, observing the order of classification in the selection process and distribution among the lines.

2.6.5. Vacancies destined to indigenous and quilombola candidates, if not occupied, will be canceled and cannot be reverted to broad competition.

2.7. VACANCIES FOR AFFIRMATIVE ACTION POLICY FOR BLACK CANDIDATES

2.7.1. Candidates socially recognized as such will be considered black, in accordance with CPP Resolution No. 0009/2020.

2.7.2. Candidates opting for affirmative action policies for black people must undergo the hetero-identification procedure to validate their self-declaration, in compliance with CPP Resolution No. 0009/2020.

2.7.3. Adherence to this modality will be done voluntarily by filling out a specific self-declaration form available in the Notice and addressed by means also provided for in the Notice (via the system).

2.7.4. The self-declared black candidates may compete for the broad competition and reservation of vacancies modalities, that is, the black candidates will compete concurrently with the reserved vacancies and the vacancies destined to the wide competition, respecting item 2.6.3.

2.7.5. Black applicants enrolled in the affirmative action policy, and who obtain enough grades to be approved within the number of vacancies offered in the broad competition system, will fill the vacancies in this system, thus opening the vacancy reserved by the affirmative action policy for the black candidate who was later classified.

2.8. PLACES FOR AFFIRMATIVE ACTION POLICY FOR INDIGENOUS AND QUILOMBOLA CANDIDATES

2.8.1. Candidates recognized as such will be considered indigenous and quilombolas.

2.8.2. Adherence to this modality will be done on a voluntary basis by filling out a specific self-declaration form available in the Notice and addressed by means also provided for in this Notice (see Item 3).

2.8.3. The candidate opting for affirmative action policies for indigenous peoples will have confirmation of their self-declaration given by the Hetero-identification Commission of the Graduate Deanship, which will appreciate a letter signed by an indigenous leader or organization, recognizing the candidate and his/her link to the indigenous group, complying with the provisions of CPP Resolution No. 0009/2020.

2.8.4. The candidate opting for affirmative action policies for quilombolas will have the confirmation of his/her self-declaration given by the Hetero-identification Committee of the Graduate Deanship, which will appreciate a letter signed by a quilombola leadership or organization, recognizing the candidate and his/her link to the quilombola group, in compliance with CPP Resolution No. 0009/2020.

2.9. PLACES INTENDED FOR PEOPLE WITH DISABILITIES

2.9.1. Persons with disabilities will be considered those who have a long-term physical, mental, intellectual, or sensory impairment, which, in interaction with one or more barriers, can obstruct their full and effective participation in society on equal terms with other people.

2.9.2. Adherence to this modality will be done on a voluntary basis by filling out a specific self-declaration form available in the Notice and addressed by means also provided for in this Notice (see item 3).

2.9.3. If a candidate with a disability is approved for a supplementary vacancy, the vacancy will be filled by the candidate with a disability classified in descending order of the final grade.



2.9.4. If there are not enough candidates/candidates with disabilities approved to fill the reserved places, the remaining places will be allocated, in compliance with the Affirmative Action Policy, and it is up to the PPG to decide which segment will be served (black, indigenous and quilombolas).

2.9.4.1. If the admission criteria are not met, the vacancies may be reused in the general selection process or disregarded, leaving the decision to this Graduate Program, by means of a Collegiate decision, according to CPP Resolution No. 0005/2020.

2.10. SCHOLARSHIPS

2.10.1. Whenever there are scholarships available, these must be granted to all approved self-declared indigenous, quilombolas and self-declared and hetero-identified black people and people with disabilities, primarily, in accordance with Art. 2 of the CPP Resolution No. 11/2020.

2.10.2. The remaining scholarships must be granted the remaining scholarships, according to the criteria defined by the Graduate School, according to Art. 2nd § 1st, of CPP Resolution n° 11/2020.

3. ENROLMENT IN THE SELECTION PROCESS

31. The enrolment into the application process of the Doctorate course of the Graduate Program in Mechanical Sciences for the Second Term of 2022 should be completed exclusively online on the official website <www.pcmec.unb.br> tab Selection Process -> Regular Student from August 15, 2022 to August 31, 2022, according to the schedule available on Item 7.

32. Candidates residing either in Brazil or abroad may apply.

33. Applicants who are currently finishing their master's degree are allowed to enroll in the selection process provided that they are able to complete the course until the first day of the school term corresponding to the targeted course, according to the Academic Calendar approved by the Council of Education, Research and Extension, attended to what prescribe the items 3.7 to 3.9 of this public call.

34. At the time of the enrolment, the applicant should immediately send all the required documents scanned in a **single PDF file** ordered according to this public call (subitem 3.4.1). Upon being selected, the applicant should present, between October 13, 2022 and October 14, 2022, a declaration of authenticity of the documents submitted to the email enm.pcmec@unb.br. In case of non-compliance of the demands in this public call, the enrolment is declined.

34.1. Documents to be submitted by the applicant:

- (i) Enrolment Form (standard model available on website www.pcmec.unb.br) and Annex 2 in this Public call.
- (ii) Diploma (or certificate) of completion of course(s) of Master's Degree in Mechanical Engineering or related areas or Technologist in the areas of the Program or Bachelor in Physics, Mathematics or Chemistry (or declaration of course completion until the first day of the school term for the targeted course, according to the Academic Calendar approved by the Council of Education, Research, and Extension).

Remark: Candidates to direct entry to the doctorate must present only their Diploma (or certificate) of course completion in Mechanical Engineering or related areas (or proof of expected graduation until the first day of the school term calendar to the aimed course, according to the Academic Calendar approved by the Council of Teaching, Research and Extension).

- (iii) Academic records for the master's degree and undergraduate course.
- (iv) *Curriculum Vitae* (preferably following the version provided on the platform Lattes, by CNPq). Applicants must send a chart containing their score for each element, which is available in Annex 4 (item 2) of this public call and the program website www.pcmec.unb.br. Proof of all the scored activities must be attached. Unsubstantiated



activities will not be scored.

Remark: For the candidates that are applying directly to the doctorate course, the *curriculum vitae* and the score chart will be used to evaluate the intellectual development of the candidate, as required in the Article 16, § 2º, II of the Resolution CEPE nº 080/2021.

- (v) Doctoral preliminary project according to item 4
- (vi) Identity card and CPF.
- (vii) Electoral card and proof of last vote or declaration of electoral quittance.
- (viii) Military discharge certificate, for male applicants residing in Brazil.
- (ix) Proof of payment of the registration fee in the current amount of R\$ 75.00 (seventy-five reais): Banco do Brasil (001), Agency 4201-3, account 170500-8 (Public Treasury Account), identifying code: 154040152572883814423 (management unit: 154040, management: 15257, collecting code: 288381, reference number: 4423). Employees of the University of Brasília Foundation are exempted from the registration fee, as well as low-income persons or underserved groups. The detailed request must be sent through the email address of the Program, enm.pcmec@unb.br, to be appreciated by the Selection Commission.

342. 1 (one) Academic Recommendation Letter must be sent according to the Standard Form available on the website www.pcmec.unb.br and on Annex 3 of this public call. The academic recommendation letter must be sent by the author of the letter on the website indicated in item 3.1.

343. Self-declared Black, Indigenous, Quilombola and disabled candidates must complete and deliver a Self-Declaration in order to apply for the Vacancy Reservation Mode for Black or Indigenous or Quilombola or Person Candidates with Disabilities (Annexes 5 to 8, respectively).

344. Self-declared black candidates who choose to be selected through the reservation of vacancies must submit the confirmation form of their self-declaration by the deadline provided for in the notice, in accordance with the provisions of the CEPE/UnB Resolution No. 0044/2020, available in the Notice and addressed by the copies also provided for in the Notice (via the system).

345. Indigenous candidates must deliver a Declaration of Belonging to the Indigenous Community signed by an indigenous leader or organization, respectively (Annex 9), recognizing the candidate and his/her link to the ethnic group by the deadline provided for in the notice, according to provides for CEPE/UnB Resolution No. 0044/2020, available in the Notice and addressed by the copies also provided for in the Notice (via the system).

346. In the case of quilombola candidates, confirmation of self-declaration will be based on the presentation of the Declaration of Belonging to the Quilombola Community signed by a quilombola leader or organization (Annex 10), recognizing the candidate and his/her link to the quilombola group until the deadline in the notice, in accordance with the provisions of CEPE/UnB Resolution No. 0044/2020, available in the Notice and addressed by the copies also provided for in the Notice (via the system).

347. Once classified in the selection process, the self-declared candidate/person with a disability must, at the time of enrollment in the Graduate Program in Mechanical Sciences, prove their condition by means of a medical report.

§ 1 The medical report must have been issued within a maximum period of 6 (six) months before the publication of the Notice.

§ 2 The medical report must contain:

I - The physician's signature, stamp and registration number with the Regional Council of Medicine;



II – The specification of the degree of disability.

35. Enrolments approved by the Selection Commission will include only the applicants who send the required documents within the set deadline in item 7 of this public call.
36. When presenting the required documents, the applicant is responsible for the authenticity of all information provided.
37. The admission of the selected applicants in the course is achieved upon registration at the Secretariat of Academic Administration (SAA).
38. Concomitant register in more than one *stricto sensu* graduate program in the University of Brasilia will not be allowed.
39. If selected, applicants enrolled in the selection process of the Doctorate course who are currently finishing their Master's Degree, must present their diploma or completion certificate at the time of register at the Secretariat of Academic Administration (SAA) in the University of Brasilia.
- 3.10. For applicants with educational background in institutions based abroad, in addition to the requirements in item 3.4, must have their diplomas acknowledged by the Education Ministry of their country of origin at the time of registration. Upon being selected, foreign applicants must present their student visa provided by the Brazilian Embassy or Consulate at the time of registration. If selected, the foreigner applicant must present a valid National Registry of Foreigners, passport identification page, followed by visa, and document containing the names the applicant's parents.

4. STAGES OF THE SELECTION PROCESS

- 4.1. The stages of selection will follow the dates and hours included in item 7 of this public call.
- 4.2. The selection process will be constituted of a qualification test and two subsequent stages according to the following description:
 - 4.2.1. **Test of scientific reading comprehension in English:** Qualification test for the approved applicants exclusively, who will be able to continue to the First Stage of the selection process. The test has a two-hour (2) duration on the Moodle platform of the University of Brasilia, <https://aprender2.unb.br/>. In order to take the test, the applicant must be registered on the platform until the set date, according to the Schedule, Item 7.1. It will be a written test to evaluate the applicant's scientific reading comprehension in English in the knowledge area of the targeted course. The evaluation criteria are listed in item 5 of this public call. Applicants can be exempted from this test if presenting a documentary evidence of English language proficiency at the time of enrolment, which include: document proving approval in Reading Comprehension Test and/or Reading Comprehension in English at a previous selection process at a graduate program level (Master's Degree and Doctorate) at the University of Brasilia; TOEFL iBT (Test of English as a Foreign Language – Internet-based TOEFL); ITP-TOEFL (Institutional Testing Program – TOEFL – paper-based); TOEIC (Test of English for International Communication); IELTS (International English Language Testing System); PEICE (Proficiency Exam for International Communication in English); TEAP (Test of English for Academic and Professional Purposes); Cambridge – Certificate of Proficiency in English. The minimum score for approval is 70% of the maximum exam score, except in the case of certification that uses the classification able or not able.
 - 4.2.1.1. **First stage:** The first stage selects the applicants for the final stage according to evaluation criteria listed in item 5 of this public call, in addition to the evaluations constituting this stage, as the following description:
 - 4.2.1.2. **Curriculum Vitae evaluation:** Analyzes the applicant's academic background and technical-professional experience, in addition to indicating the degree of relation of the applicant's education to the Program proposal. The evaluation will be carried out by the Selection Commission according to the criteria listed in item 5.



4.2.1.3. **Evaluation of the Doctoral Preliminary Project:** The proposal must demonstrate the relevance and adequacy of the Preliminary Dissertation Project in the scope of the Research Lines in the Graduate Program in Mechanical Sciences, as well as the consistency of its theoretical framework. Further details on the research groups and respective research lines in the PCMEC are included in Annex 1 or on www.pcmecc.unb.br. The presentation of the Preliminary Doctoral Project should not exceed the limit of 5 (five) pages typed with font "Times New Roman", size 12, spacing 1.5 (one and a half), including the following items: Cover page containing the candidate's name and title of the Preliminary Dissertation Project (does not count for numbering purposes), introduction (contextualization of the problem to be investigated), objective(s), methodological procedures to be employed (including types of data required and respective sources), and bibliographical references used in the process of writing the project. The evaluation criteria to this stage are detailed in the annex 4 of this public call.

422. Final Stage: At this stage, the applicants selected at the First Stage will be classified according to the evaluation criteria listed in item 5 of this public call. In addition to the First Stage evaluations, this stage includes the evaluation described below:

4.2.2.1. **Individual evaluation:** Performed by a member of the Selection Commission and consists of an interview to analyze the applicant's academic trajectory and verify the degree of relation of the applicant's education to the Program proposal. This evaluation can be conducted onsite or via video conference.

5. FORM OF EVALUATION

51. **Test of scientific reading comprehension in English:** Qualification test to evaluate reading comprehension of scientific texts related to the research lines in the Program.

52. Each of the evaluations at the First Stage and the Final Stage is attributed to a score from zero (0) to ten (10) points.

521. **Academic record evaluation:** Qualification test with a minimum score for approval of 7 (seven) points encompassing the evaluation of the scores and the applicant's education. Item 1 in Annex 4 of this Public call includes the criteria used to score this evaluation process applied by the Selection Commission to compose the applicant's score.

522. **Curriculum Vitae evaluation:** Classification test to evaluate the applicant's scientific production and professional experience. Item 2 in Annex 4 of this public call include the criteria used in the score of this evaluation process to be applied by the selection commission to compose the applicant's score.

523. **Evaluation of the Doctoral Preliminary Project:** Qualification and classification evaluation conducted by the Selection Commission. The following aspects will be evaluated: problem contextualization, project viability, timeliness and relevance of bibliography, content of the proposal regarding the research lines in the Graduate Program, structure of presentation, consistency between the components in the proposal and the theme relevance. Item 3 of Annex 4 in this public call contains the scoreboard to the Preliminary Doctoral Project used by the examining commission to score the points. Minimum score for approval is 7 (seven).

524. **Individual evaluation:** Classification test conducted by the Selection Commission to evaluate the applicant's academic trajectory and the degree of relation of the applicant's education to the Program proposal.

53. The candidates applying directly to the doctorate program must demonstrate relevant intellectual development, as required in Article 16, § 2º, II of the Resolution CEPE n° 080/2021. To fulfill this requirement, the doctoral project and the academic profile of the candidate must be approved by a committee composed of 3 (three) members of the Graduate Program in Mechanical Sciences. The candidate will have 40 min to present his doctorate program, which will be followed by the



defense of his academic profile (maximum of 20 min) and, finally, the candidate will be assessed by the committee. The defense of the candidate will occur at the same day of the individual evaluations.

6. FINAL CLASSIFICATION

6.1. The score of the First Stage is obtained from the weighted average of the scores obtained from the evaluations referent to this stage considering the following equation:

$$NEE = (4 \times NHE + 5 \times NCV + 1 \times NAD)/10$$

where: NEE = First Stage Score; NHE = Academic Record Evaluation Score; NCV = Curriculum Vitae Evaluation Score; NAD = Doctoral Preliminary Project Evaluation Score.

6.2. The classification of the First Stage will include only applicants who achieve at least the following scores: 7 at the Academic Record Evaluation and 7 at the NEE.

6.3. The classification of the applicants at the First Stage will follow the descending order of the NEE Scores.

6.4. The number of applicants selected for the Final Stage will be twice as high as the number of vacancies presented in item 2 of this public call according to the classification of the First Stage and the vacancies per concentration areas.

6.5. The Final Stage Score is obtained from the weighted average of the scores obtained at the First Stage and the individual evaluation according to the following equation:

$$NF = (NEE + NAI)/2$$

where: NF = Final Score; NEE = First Stage Score; NAI = Individual Evaluation Score.

6.6. Only candidates who achieve at least an NF equal to or greater than 7 will be considered approved.

6.7. The final classification will follow the descending order of the Final Scores.

6.8. The applicants who fill the number of vacancies offered per concentration area in the descending classification order will be selected.

6.9. In case of withdrawal by selected applicants, applicant approved at the First Stage can be called to occupy remaining vacancies according to the classification order.

6.10. The vacancies that could not be filled for a given concentration area can be used to enhance the share of other concentration areas provided that the area with excess demand shows interest in integrating the remainder applicants.

6.11. Tie breaker criteria in descending order of priority are: 1) the highest score weighted at the selection stage referent to the Curriculum Vitae Evaluation, 2) the highest score in the First Stage Score, and 3) the highest score in the Individual Evaluation Score.

7. SCHEDULE

7.1. The dates for enrolment and acceptance, stages of the selection process and publication of results are presented in the table below:



| DATE | STAGE | HOURS |
|---|---|----------------------|
| August 15, 2022 to August 31, 2022 | Period of enrolment | |
| September 02, 2022 | Publication and approval of enrolments and acceptance of proficiency certificates | Up to 6 pm |
| September 05, 2022 and September 06, 2022 | Period of appeals and reconsiderations of the approved enrolments and acceptance of proficiency certificates | |
| September 12, 2022 and September 13, 2022 | Period to access and test the virtual room in Moodle where the English test will take place | Up to 11 pm |
| September 14, 2022 | Period to communicate the program of any problem in accessing Moodle | Up to 2 pm |
| September 13, 2022 | Procedure of heteroidentification by an institutional committee | |
| September 16, 2022 | Test of Scientific Reading Comprehension in English | From 9 am to 11 am |
| September 19, 2022 | Publication of the Test of Scientific Reading Comprehension in English results | Up to 6 pm |
| September 20, 2022 and September 21, 2022 | Evaluation of the academic records and CV Period of appeals and reconsiderations of the Result for the Test of Scientific Reading Comprehension in English | From 8:30 am to 6 pm |
| September 23, 2022 | Publication of the First Stage results | Up to 6 pm |
| September 28, 2022 | Individual evaluation | From 8:30 am to 6 pm |
| September 29, 2022 | Confirmation from the candidates' auto declaration (Procedure of hetero identification by an institutional committee) | |
| October 07, 2022 | Final result publication | Up to 6 pm |
| October 10, 2022 and October 11, 2022 | Period of appeals and reconsiderations of the final result | |
| October 13, 2022 and October 14, 2022 | Written confirmation of course entry of the selected applicants. Presentation of the original documents or registered copies (template available in www.pcmec.unb.br) | Up to 6 pm |

7.2. Results will be published on www.pcmec.unb.br.



8. RESOURCES

81. Requirements of appeals during the selection will be sent to the Secretariat of the Graduate Program. The appeals will be received and lodged within the deadline informed in the schedule of this public call from the publication of the results and must be presented in 2 (two) copies of the same content according to a standard form named "Requirement to Reconsideration or Appeal in Selection Process of the Graduate Program", available http://dpg.unb.br/images/atividadesdodecanato/recurso_pos.pdf.

82. For the final result, it will be considered only the appeals to the Collegiate Body of the Program and the Chamber of Research and Graduate Program to the dean under the hypothesis of breach of procedure up to 10 (ten) week days after the publication of the Final Results, as indicated in the General Regulation of the University of Brasilia, Article 61.

83. The requirements for reconsideration and appeals sent to the Collegiate Body of the Graduate Program must be presented by the applicant or legal representative at the email indicated in item 1.3.

84. The appeals sent to the Chamber of Research and Graduate Program must be presented by the applicant or legal representative at the Secretariat of the Graduate Program to be directed to the dean of the graduate program - DPG/ CPP through the SEI system.

9. FINAL PROVISIONS

91. Automatic disqualification from the selection process will be applied to applicants who:

- 9.1.1. Provide false declaration or present false documents at any stages of the selection.
- 9.1.2. Do not present all documents required within the deadlines and conditions established in this public call.
- 9.1.3. Do not select the targeted concentration area/research line.
- 9.1.4. Do not confirm their participation in the Program at the date specified in this public call, upon being selected.

92. Omission cases will be resolved by the Selection Commission by the Collegiate of the Graduate Program and the dean of the Graduate Program according to the program regulation and resolution, 0080/2021, considering their competences.

93. At the discretion of the selection commission, there can be rearrangement of the vacancies available for the Master's Degree and Doctorate courses, according to the specific case, providing that there are applicants approved in the terms of this public call and public call 04/2022 (*SELECTION OF APPLICANTS TO THE GRADUATE PROGRAM IN MECHANICAL SCIENCES FOR THE MASTER COURSE FOR THE SECOND TERM OF 2022*).

94. All results, as well as other required information, will be published at the Graduate Program website (www.pcmec.unb.br).

95. By enrolling into the selection process, the applicant acknowledges and accepts the rules established in this public call and in the Graduate Program regulation.

Brasília, July 01, 2022.

Prof. Sandra Maria da Luz
Coordination of the Graduate Program in Mechanical Sciences
Department of Mechanical Engineering of the University of Brasilia



ANNEX 1

Introduction of the Program, Groups, and Research Line

The Graduate Program in Mechanical Sciences (PCMEC) at the Department of Engineering Mechanics (ENM) in the University of Brasilia (UnB) proposes to develop groundbreaking, deep knowledge, preferably innovating, resulting from scientific and technological investigations in the subareas of Mechanical Engineering involving Mechanics of Solids, Fluid Mechanics, Thermosciences and Dynamics of Mechanical Systems. The researches associated with each of subareas of mechanical engineering develop in the following research groups:

System Dynamics Group (GDS)

Responsible for developing researches in the **concentration area of Dynamics of Mechanic Systems**, the group is constituted of professor at the Department of Mechanical Engineering in the University of Brasilia and dedicates to elaborate numeric and experimental methodologies for applications in four main themes:

- Modeling and Analysis of Dynamic Systems of Structures: Non-linear and control dynamics, Vibrations in Mechanical Systems, Modeling, and Quantification of Uncertainty,
- Identification in Vibrations and Acoustics: Reverse Problems and Damage Detection, and
- Intelligent structures.

Researchers associated with the System Dynamics Group

| Lecturer | Practice Areas and Research Lines | Contacts |
|---------------------------|---|--------------------------------------|
| Adriano Todorovic Fabro | Wave propagation, modeling, and quantification of uncertainty and vibracoustic | fabro@unb.br (61) 3107 5682 |
| Aline Souza de Paula | Vibrations, non-linear dynamics, chaotic behavior, chaos control, intelligent structures | alinedepaula@unb.br (61) 31075724 |
| Marcela Rodrigues Machado | Vibrations, quantification of uncertainty, detection of structural damages, estimate of parameters in dynamic systems, and structural reliability | marcelam@unb.br (61) 3107-5711 |



Group of Fluid Mechanics of Complex Flows (VORTEX)

Responsible for developing researches in the **concentration area of Fluid Mechanics of Complex Flows**, VORTEX is an academic unit of scientific investigation at the Department of Mechanical Engineering in the University of Brasilia including professors and researchers from different areas of exact sciences and technology. The main research lines relate to:

- Hydrodynamics and Rheology of Magnetic flows
- Microhydrodynamics and Rheology of Complex flows
- Mechanics, Dispersion Hydrodynamics, and Suspension Aggregation

Researchers associated with the Group of Fluid Mechanics of Complex Flows:

| Lecturer | Practice Areas and Research Lines | Contacts |
|----------------------------|---|--|
| Francisco Ricardo da Cunha | Microhydrodynamics of suspensions and emulsions, rheology of complex flows, hydrodynamic dispersion in suspensions and emulsions, hydrodynamics of magnetic flows, stability of fluidized beds, reduction of drag in turbulent flows, dynamics of bubbles in complex flows, methods of perturbation in fluids. | frcunha@unb.br (61) 3107 5687 |
| Rafael Gabler Gontijo | Currently focuses on the physical description of magnetic suspensions from the discreet point of view of the particles composing a magnetic fluid (stable colloidal suspensions and non-colloidal suspensions magnetorheological) through computational simulations of many bodies capable to count hydrodynamic and magnetic interactions. | rafaelgabler@gmail.com (61) 3107 5696 |



Group of Fatigue, Fracture, and Materials (GFFM)

Responsible for developing researches in the **concentration areas of Materials and Mechanics of Materials, Fatigue, and Fracture**, the GFFM is a research group constituted of professors at the University of Brasilia – UnB, Campuses Darcy Ribeiro and Gama. The main research lines relate to:

- Analysis of structural integrity against fatigue of mechanical components and structures encompassing themes such as fatigue and fracture of materials, structural reliability, and computing methods;
- Processing and characterizing of metallic materials, composite (including composite with natural fibers), polymeric, ceramic, and with shape memory,
- Bioengineering and biomechanics.

Researchers associated with the Group of Fatigue, Fracture, and Materials:

| Lecturer | Practice Areas and Research Lines | Contacts |
|-----------------------------------|---|---|
| Alysson Martins Almeida Silva | Characterization of materials, magnetic materials, welding and ceramic materials. | alyssonmartins@unb.br (61) 3107-5698 |
| Cosme Roberto Moreira da Silva | Materials metallic of aerospace use, ceramic materials, polymeric materials, analyses of aircraft accidents, non-destructive testing, destructive testing, fluency in metallic and ceramic materials, functional and structural ceramic materials, structural and functional metallic materials, powder metallurgy, gas sensors and fuel cells, microabrasive wear, ceramic machining tools, titanium and its alloys. | cosmeroberto@unb.br (61) 31071144 |
| Eder Lima de Albuquerque | Mechanics of solids, composite materials, contour elements, plates and shells, and stability of structures. | eder@unb.br (61) 31071157 |
| Edgar Nobuo Mamiya | Modeling and numeric simulation of non-linear behavior of solid materials, new criteria for strength to metallic materials fatigue, non-linear elasticity - location of deformities, non-linear elasticity – constitutive equation for fragile materials subjected to damage, description of thermoelasticity problems through finite elements method. | mamiya@unb.br (61) 31071156 |
| Fabio Comes de Castro | Fatigue in metals, multiaxial fatigue, fatigue through fretting, constitutive models for cyclical plasticity. | fabiocastro@unb.br (61) 31071158 |
| Jorge Luiz de Almeida Ferreira | Fatigue, fracture, analysis of tensions through finite elements, experimental analysis of tensions, structural reliability. | jorge@unb.br (61) 31071155 |
| José Alexander Araújo | Fatigue, multiaxial fatigue, fatigue through fretting, linear fracture mechanics, fatigue of electrical power cables, biomedical engineering – mechanical strength and fatigue of dental materials and prostheses, cryogenics, and microabrasive wear. | alex07@unb.br (61) 31071148 |
| Lucival Malcher | Plasticity, computational plasticity, mechanics of continuous damage, mechanics of continuous media, finite elements method, computational methods, multiaxial fatigue, and mechanics of fracture. | malcher@unb.br (61) 31071150 |
| Thiago de Carvalho Rodrigues Doca | Mechanics of contact, wear, structural damage and development of computational codes to solve problems of contact between solids and solutions to estimate the useful life of mechanic components. | doca@unb.br (61) 31071058 |
| Sandra Maria da Luz | Preparation of composite, reinforced composite with natural fibers. | sandraluz@unb.br (61) 82055197 |



Laboratory of Energy and Environment (LEA)

Responsible for the **concentration area of energy and environment**, LEA acts in activities of Education, Research, and Extension in fields involving the mechanical approach of Use and Generation of Energy and Technical Evaluation of Environmental Problems. The scope of action of the LEA-UnB integrates themes associated with Thermodynamics, Heat Transference, Thermal Systems, Combustion, Turbomachinery, and Environmental Sciences. The main areas of interest related to: Internal Combustion Engine, Gas Turbine Cycles, Combustion, Environmental Flows, Thermal and Water Systems, Alternative Energy Sources, and Heat Transference in Thermal Systems.

Researchers associated with Laboratory of Energy and Environment:

| Lecturer | Practice Areas and Research Lines | Contacts |
|-------------------------------------|--|--|
| Antônio Cesár Pinho Brazil Junior | Finite elements in fluids, turbulent flows, and environmental flows. | Braziljr@unb.br (61) 31075709 |
| Armando de Azevedo Caldeira Pires | Combustion, processes of energy generation through fossil fuels, optical techniques of experimental diagnosis in flows with or without reaction, assessment of environmental impact in industrial processes, chemiluminescence in combustion chambers. | armandcp@unb.br (61) 31075710 |
| Carlos Alberto Gurgel Veras | Combustion, carbonation, and propulsion, thermals machines, environment, energy, residues, and climate changes, advanced studies in energy and environment. | gurgel.unb@gmail.com (61) 31075712 |
| Mario Benjamim Baptista de Siqueira | Biosphere-atmosphere interaction with emphasis on the processes occurring in the boundary atmospheric layer linked to the mechanics of fluids and transference of heat and mass in natural systems. | mariosiqueira@unb.br (61) 31075714 |
| Sandra Maria da Luz | Chemistry of biomass, environmental impacts, and ecodesign. | sandraluz@unb.br (61) 98205 5197 |
| Taygoara Felamingo de Oliveira | Rheology of complex flows, microhydrodynamics of emulsions, simulation of physical phenomena in engineering. | taygoara@unb.br (61) 98411 2868 |
| Edgar Amaral Silveira | gasification, biomass conversion, biogas, life cycle assessment | edgar.silveira@unb.br (61) 31075765 |
| | | |



| | | |
|--|---|---|
| | UNIVERSITY OF BRASILIA TECHNOLOGY SCHOOL DEPARTMENT OF MECHANICAL ENG. | GRADUATE PROGRAM IN MECHANICAL SCIENCES |
|--|---|---|

ANNEX 2 – REQUEST OF ENROLMENT IN THE DOCTORATE

Personal information (Print or type clearly)

1. Name:

Date of birth: _____/____/____ City: _____ State:

Sex: _____ Marital status: _____ Identity:

Parentage: _____ and

C.P.F.: _____ email:

2. Address:

 ZIP CODE: _____ City: _____ State:

Landline: _____ Cellphone: _____

3. Commercial address:

 ZIP CODE: _____ City: _____ State:

Landline: _____

4. Summary of Higher Education (start with the last course attended)

| University / Department | Period | Degrees and Specialty Courses |
|-------------------------|------------------------|-------------------------------|
| | ____/____ to ____/____ | |
| | ____/____ to ____/____ | |
| | ____/____ to ____/____ | |

5. Knowledge on foreign languages:

_____ () Reading () Writing () Speaking



_____ () Reading () Writing () Speaking

6. Summary of Professional Experience (start with the last position occupied)

| Organization | Position | Period |
|--------------|----------|--------------------|
| | | ___/___ to ___/___ |
| | | ___/___ to ___/___ |
| | | ___/___ to ___/___ |

7. Financial support during the course from:

- () Own financial resources;
() Scholarship request;
() Others (please specify)

8. Enrolment request (MANDATORY FIELDS)

I require to enroll as applicant to the MASTER'S DEGREE of the Graduate Program in Mechanical Engineering as Regular Student for the concentration area of:

- () Dynamics of Mechanic Systems;
() Energy and Environment;
() Mechanics of Fluids of Complex Flows,
() Mechanics of Materials, Fatigue, and Fracture

See **Presentation of the Program, Groups, and Research Lines** in Annex 1 of the Public Call for the Selection or on www.pcmec.unb.br.

Place and date

Applicant's signature



ANNEX 3 - ACADEMIC RECOMMENDATION LETTER

ACADEMIC RECOMMENDATION LETTER

NOTE: Fill in items A and B and hand out the sheet to a professor of your choice.

A - Applicant's information

Name: _____

Degree certificate in: _____

B – Recommender's Information

Name: _____

Institution: _____ Department: _____

Education: Title: _____ Institution: _____ Year: _____

Recommender:

The above-mentioned applicant intends to take the master's degree course in the Graduate Program in Mechanical Sciences, at the Department of Mechanic Engineering of UnB. The confidential information and remarks provided by you will enable the Department to assess the applicant's skills more satisfactory.

1. Initially, we kindly ask you to objectively describe a profile that allows to qualify the applicant's potential.

2. I have known the applicant since, ____ ____ but we have established a closer relationship since _____ as:

a) His/Her professor at discipline(s): _____

b) His/Her supervisor in the activity of: _____

c) His/Her boss or superior in the work environment of: _____

d) Other activities, such as: _____

3. How would you classify the applicant regarding the following attributes:

| Attribute | E | S | G | R | W | Not able to evaluate |
|--|---|---|---|---|---|----------------------|
| Intellectual capacity | | | | | | |
| Motivation for advanced studies | | | | | | |
| Capacity for individual works | | | | | | |
| Ease of written communication | | | | | | |
| Easy of spoken communication | | | | | | |
| Initiative / Resourcefulness / Leadership | | | | | | |
| Attendance / Perseverance | | | | | | |
| Relationship with colleagues and superiors | | | | | | |

E = Excellent S= Superior G= Good R= Regular W= Weak

4. If you compare the applicant with other students of yours over the past two years, how would you classify him/her regarding his/her ability to carry out advanced studies and researcher:

Exceptional Superior Good Regular Weak

5. Other information that you consider worth mentioning:

On ___ / ___ / ___

_____ Recommender's signature

Please send it directly to the following email address: enm.pcmecc@unb.br.

Annex 4 – Evaluation Criteria and Scoreboards

1. Score of the Academic Record (NHE)

The score of the academic record is calculated by adding the scores of the following items: (1) Education (degree certificate) and (2) Index of Academic Performance (IRA) or equivalent.

1.1. Score of the Applicant's Education (PFC)

According to the applicant's education, the score is attributed according to Table 1:

Table 1 – Score of the applicant's education at an undergraduate course.

| Undergraduate or Bachelor in | Score |
|---|-------|
| Mechanical Engineering, Mechatronic Engineering, Material Engineering, Aeronautical Engineering, Spatial Engineering, Naval Engineering, Oceanic Engineering, Petroleum Engineering, Automotive | 10.0 |
| Electrical Engineering, Electronic Engineering, Industrial Engineering, Mining Engineering, Production Engineering, Technologist in Electromechanics, Mechanics, Electric, Electronic etc. | 8.0 |
| Mathematics, Chemistry, Physics, Computer Science, and other Engineering courses. | 7.0 |

For students who had studied abroad, the score is based on the adequacy of the applicant's degree certificate to one of the courses listed in Tab. 1.

1.2. IRA (Index of Academic Performance)

For applicants from the University of Brasilia, the IRA can be applied as instrument to evaluate this item, according to Table 2:

Table 2 – Score corresponding to the applicant's IRA

| Interval of IRA | Score |
|-----------------|-------|
| >4.0 | 10 |
| 3.8 – 3.9 | 9 |
| 3.5 – 3.7 | 8 |
| 2.9 – 3.4 | 7 |
| <2.9 | 0 |

Upon the absence of IRA or for universities that use other concepts and criteria for performance index, the Selection Commission is responsible for establishing the criteria to generate equivalence between these concepts and the score system presented in Table 2. We propose the calculation of a score obtained through the average of the scores for all disciplines of the second, fourth and eighth periods by weighting the number of credits per discipline. Averages below five are attributed with score 0 (zero).

For institutions that use the system of citations, we propose to take the mean value of the scores corresponding to the system of citations of UnB. For example, SS=9.5, MS=8.0, MM=6.0, MI=4.0, II=1.5, SR=0.

1.3. Calculation of the Academic Record Score

The score of the academic record is given by the sum of the previous items and expressed at an interval from 0 (zero) to 10 (ten), according to formulation (1):

$$NHE = (3xPFC + 7xIRA) / 10(1)$$

2. Curriculum Vitae Score (NCV)

The points will be attributed to the applicant's Curriculum Vitae according to the items and limits in Table 3:

Table 3 – Points attributed to the Curriculum Vitae per activity

| Item | Score | Maximum Limit |
|---|---|---------------|
| Post-graduate level monitoring | 0.25 Point/Semester | 0.5 Point |
| Full paper published or accepted in journal $M_p \geq 87,5\%$ (*) | 1.00 Point/Paper | |
| Full paper published or accepted in journal $75\% \leq M_p < 87,5\%$ (*) | 0.875 Point/Paper | |
| Full paper published or accepted in journal $62,5\% \leq M_p < 75\%$ (*) | 0.750 Point/Paper | |
| Full paper published or accepted in journal $50\% \leq M_p < 62,5\%$ (*) | 0.625 Point/Paper | |
| Full paper published in International Congresses | 0.1 Point/Paper | |
| Full paper published in National Congresses | 0.05 Point/Paper | 0.5 Point |
| Abstract published in National or International Congress | 0.02 Point/Paper | 0.2 Point |
| Engineering activity for companies belonging to the area related to the Graduate Program | 0.4 Point/Year | 1.0 Point |
| Teaching activities at a higher education level | 0.2 Points/Semester/Discipline | 2.0 Points |
| Teaching activities at a high school level | 0.4 Points/Year | 2.0 Points |
| Supervision of students at an undergraduate level | 0.3 Points/Supervision | 1.5 Points |
| Co-Supervision of students at a higher education level | 0.15 Points/Co-Supervision | 1.5 Points |
| Coordination of funded research project | 0.3 Points/Project | |
| Participation of funded research project | 0.3 Points/Project | |
| Patent registration | 1.00 Point/Patent | |
| Consulting, technical report or development of products in technological or engineering areas | 0.1 Point for Consulting(s), Report(s) or Product (s) | 1.0 Point |

(*) M_p is the highest percentile in SCOPUS (<https://www.scopus.com/sources>).

All points in Table 3 are added for each applicant. The applicant who obtain the highest



number of points will be attributed with score 10, while the applicant with the lowest performance will receive score 7. The remaining applicants will receive scores in a descending order within the scale from 10 to 7, corresponding the points obtained according to Table 3.

The applicant is responsible for elaborating a chart containing their score per element. The score chart of activities is available on www.pcmec.unb.br. If the filled chart is not sent by the applicant, the score is considered equal to 0 (zero).

NCV= Score of Table 3 followed by the descending rating of the applicants from 10 to 7 (2)

3. Score of the Doctoral Preliminary Project (NAD)

Score from 0 (zero) to 10 (ten) according to the points achieved by the applicant regarding the items in Table 4:

Table 4 – Items evaluated for the doctoral preliminary project.

| Items |
|---|
| Theme contextualization, timeliness, and bibliographical relevance. |
| Project viability. |
| Content of the proposal regarding the research lines in the PPG. |
| Availability of the supervisor indicated for the research project. |

The score of the preliminary doctoral project is given by the simple average of the scores attributed to the items in Table 5.

4. First Stage Score (NEE)

The score of the First Stage is obtained from the average of the scores in items 1 and 2, according to formulation (3):

$$\text{NEE}=(6\text{NHE} + 4\text{NCV})/10 \quad (3)$$

5. Final Score (NF)

The final score is reached from the average of the scores in the First Stage, NEE, and the Individual Evaluation, NAI, according to formulation (4):

$$\text{NF}=(\text{NEE} + \text{NAI})/2 \quad (4)$$



ANNEX 5
UNIVERSITY OF BRASILIA
POSTGRADUATE PROGRAM IN MECHANICAL SCIENCES
BID NOTICE No. 05/2022
SELF-DECLARATION FOR PURPOSES OF COMPETING IN THE MODALITY
RESERVATION OF PLACES FOR BLACK CANDIDATES

Me,

_____,
Birth date: ____/____/____,

Place of Birth: _____ (city,
state, country)

RG: _____ Issue Date: ____/____/____ Agency

Issuer: _____

CPF: _____ Marital Status:

Address: _____

Zip Code _____ City: _____ State:

Phone(s): _____

Email: _____

I am aware of and agree with the rules of the Notice, declaring myself black. For
this reason, I choose to
compete in the modality of reservation of vacancies for blacks.

_____ of _____, 2022



ANNEX 6
UNIVERSITY OF BRASILIA
POSTGRADUATE PROGRAM IN MECHANICAL SCIENCES
BID NOTICE No. 05/2022
SELF-DECLARATION FOR PURPOSES OF COMPETING IN THE MODALITY
OF VACATIONS
ADDITIONS FOR INDIGENOUS CANDIDATES

Me, _____

Belonging to the indigenous community

Birth date: ____/____/____

Place of Birth: _____ (city, state, country)

RG _____ Date Issue: _____ Issuing Agency:

CPF: _____

Marital status: _____

Address: _____

Zip Code _____

City: _____ State: _____

Phone(s): _____

Email: _____

I am aware of and agree with the rules of the Notice, declaring myself indigenous. For this reason, I choose to compete for the vacancies made available to indigenous candidates. I further commit myself to submit to this Graduate Program by the deadline established in the Notice, letter from indigenous leadership or organization attesting to my link.

_____ of _____, 2022

(signature)



ANNEX 7
UNIVERSITY OF BRASILIA
POSTGRADUATE PROGRAM IN MECHANICAL SCIENCES
BID NOTICE No. 05/2022
SELF-DECLARATION FOR PURPOSES OF COMPETING IN THE MODALITY
OF VACATIONS
ADDITIONS FOR QUILOMBOLA CANDIDATES

Me, _____

_____ Belonging to the quilombola community _____

Birth date: ____/____/____

Place of Birth: _____ (city, state, country)

RG _____ Date Issue: _____ Issuing Agency: _____

_____ CPF: _____

Marital status: _____

Address: _____

_____ Zip Code _____

City: _____ State: _____

Phone(s): _____

Email: _____

I am aware of and agree with the rules of the Notice, declaring myself a quilombola. For this reason, I choose for competing for the vacancies made available to candidates/the quilombolas. I further commit myself to submit to this Graduate Program by the deadline established in the Notice, letter from the quilombola leadership or organization attesting to my bond. _____ of _____, 2022

(signature)



ANNEX 8
UNIVERSITY OF BRASILIA
POSTGRADUATE PROGRAM IN MECHANICAL SCIENCES
BID NOTICE No. 05/2022
SELF-DECLARATION FOR PURPOSES OF COMPETING IN THE MODALITY
RESERVATION OF PLACES FOR CANDIDATES WITH DISABILITIES

Name: _____

Birth date: ____/____/____

Place of Birth: _____ (city, state, country)

RG _____ Date Issue: _____ Issuing Agency: _____

CPF: _____

Marital status: _____

Address: _____

Zip Code _____

City: _____ State: _____

Phone(s): _____

Email: _____

I am aware of and agree with the rules of the Notice, declaring myself a person with disability. For this reason, I choose to compete in the modality of reservation of vacancies for candidates with disabilities.

_____ of _____, 2022

ANNEX 9
UNIVERSITY OF BRASILIA
POSTGRADUATE PROGRAM IN MECHANICAL SCIENCES
BID NOTICE No. 05/2022
DECLARATION OF BELONGING TO THE INDIGENOUS COMMUNITY

(Letter signed by indigenous leader(s) or organization)
I/We leadership(s) or I/We representatives of the Indigenous People

_____ of the Village (if applicable) _____

, located in the Indigenous Territory (if applicable) _____.

we declare that _____

_____ is a recognized member of this community, being the child of _____

_____ it's from _____

_____ having (short text describing the candidate's links with the ethnic community) _____

_____ As it is true, we have signed this declaration.

_____ of _____ 2022

(Location/State and Date)

_____ Full name of lead(s)/Signature

or

_____ Name of indigenous organization/ Signature of President or Legal Responsible



ANNEX 10
 UNIVERSITY OF BRASILIA
 POSTGRADUATE PROGRAM IN MECHANICAL SCIENCES
 BID NOTICE No. 05/2022
 DECLARATION OF BELONGING TO THE QUILOMBOLA COMMUNITY

(Letter signed by leader(s) or quilombola organization)

I/We leadership(s) or I/We representatives of the Quilombola People

_____ located at _____, we declare what _____ is a recognized member of this community, being the child of _____ it's from _____, having (short text describing the candidate's links with the ethnic community) _____

As it is true, we have signed this declaration.
 _____ of _____,
 2022

(Location/State and Date)

 Full name of quilombola leader(s) /Signature
 or
 Name of the quilombola organization/ Signature of the President or Legal Responsible