

Department of
Computer Science & Informatics

Postgraduate Application Process and Study Information

2022



NATURAL AND
AGRICULTURAL SCIENCES
UFS

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Transforming lives.*

UNIVERSITY OF THE
FREE STATE
UNIVERSITEIT VAN DIE
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FREISTATA



UFS
NATURAL AND
AGRICULTURAL SCIENCES
COMPUTER SCIENCE
AND INFORMATICS

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A. UFS COVID-19 VACCINATION POLICY

The Council of the University of the Free State (UFS) carefully considered and approved a vaccination policy for the institution during its meeting on 26 November 2021.

The aim of the COVID-19 Regulations and Required Vaccination Policy is to regulate access of staff, ad hoc contract workers, and students to all the university's premises. The policy will be implemented as from 14 February 2022.

"The policy implies that the university does not force anyone to be vaccinated, but the institution has the right to require vaccination if you want to access the institution's premises in order to protect our staff and students," said Prof Francis Petersen, UFS Rector and Vice-Chancellor.

Vaccinated persons will be required to upload their vaccination certificates on an electronic platform to obtain access to campus. Staff, ad hoc contract workers, and students who are not vaccinated, who do not have an approved exemption or deferral, and who do not have a SARS COVID-19 PCR negative result that is not older than a week, will not be allowed access to the campuses or facilities. Only vaccinated students will be allowed to access on-campus accommodation.

Students who are not vaccinated by 14 February 2022, will not be prevented from registering for the academic year, but can only access the campus if vaccinated or granted an exemption. *As face-to-face class attendance is compulsory for our Honours programmes, it is important that this vaccination policy be understood to determine before registration if you will be able to adhere to the programmes' requirements.*

B. ONLINE APPLICATIONS

Visit the UFS website and follow the applications link (<https://apply.ufs.ac.za/>) to complete and submit your application form. Please ensure that you upload all the required supporting documents as requested. Terms and Conditions apply.

If you do not find the degree online for which you would like to apply, a hardcopy version of the application form can be requested from Prof De Wet (DWetL@ufs.ac.za). Fill it in and send it, together with **all the supporting documentation**, including your proof of payment of the application fee, to the address / email address below:

The Registrar: Applications
PO Box 339 | Bloemfontein | 9300 | Republic of South Africa
All enquiries regarding applications:
Tel: +27(0) 51 401 9666
Email: studentadmin@ufs.ac.za

As soon as you have applied, please send an email to this regard to Prof De Wet at DWetL@ufs.ac.za to allow her to follow up on your application.

C. INTERNATIONAL APPLICATIONS

- Applicants, who are in possession of a degree from non-South African universities, **must include the South African Qualifications Authority (SAQA) evaluation** letter with their application form.
- Non-South African certificates/degrees must be assessed by SAQA prior to applying to the UFS. This process can take anything from 2 – 3 months. Please visit www.saqa.org.za for more information.
- The application process must be completed before you arrive for registration at the University. Your details must be captured on the UFS computerised database to facilitate the registration process. For this reason, adhering to closing dates is extremely important.
- Students transferring from other universities must include a certificate of conduct as well as a study record from their previous university with their applications. The application closing date for students transferring from other universities is 30 September.
- International postgraduate students must attach certified copies of degrees/certificates to their applications. Degrees/certificates that are not certified will delay the processing of applications.
- Ensure that your application form is completed correctly and signed before submitting it. You should expect to receive feedback from the University within 3 weeks of sending your application. **However, as soon as you have applied, please send an email to this regard to Prof De Wet at DWetL@ufs.ac.za to allow her to follow up on your application.**
- All enquiries regarding applications: Tel: +27(0)51 401 3597.

If your application is successful, you will receive a letter of admission from the admissions office, as well as a letter from the Office for International Affairs for the study permit. Visit the South African Embassy in your home country with the above letters, as well as your passport to apply for your permit. Please be advised that your study permit application can take up to six weeks to be finalised.

All international students must provide proof of membership to a medical-aid, registered with the South African Medical Council. Hospital plans and travel insurance will not be accepted as medical-aid.

Visit <http://www.medicalschemes.com/MedicalSchemes.aspx> for more information on registered medical aids.

International students may also contact the Office for International Affairs for further assistance:

For application, visa, and immigration enquiries, contact:

Jeanne Niemann: +27 51 401 3219 niemannaja@ufs.ac.za

For institutional reporting and office projects, contact:

Chevon Jacobs: +27 51 401 2501 JacobsCS@ufs.ac.za

For scholarships and funding, contact:

Mbali Moiketsi: +27 51 401 3403 MoiketsiMV@ufs.ac.za

For international student activities, contact:

Bulelwa Moikwatlhai: +27 51 401 3397 MaloB@ufs.ac.za

For partnership and exchange enquiries, contact:

Zenzele Mdletshe: +27 51 401 9027 MdletsheZP@ufs.ac.za

The International Office is situated in the Mabaleng Building on the Bloemfontein campus.

Email: internationalenquiries@ufs.ac.za.

D. FEES 2022

For any financial queries, please contact:

Tuition fees

Tel: +27 51 401 3003 or Email: tuitionfees@ufs.ac.za.

For an online quotation, you can also visit: <https://kovsielife.ufs.ac.za/quote/quote.aspx>.

The Department of Computer Science and Informatics does not handle queries regarding tuition fees.

E. GUIDELINES FOR ACCEPTING POSTGRADUATE STUDENTS

1. Postgraduate applicants who apply for a research Masters or PhD, have to slot into the existing research areas within the Department of Computer Science & Informatics, namely:
 - Human-Computer Interaction (HCI),
 - Computer Science Education (CSE),
 - Eye-tracking Applications,
 - Wireless Communication Systems/Artificial intelligence,
 - Blockchain Technologies, and
 - Data Science/Natural Language Processing (NLP).
2. If the original topic/proposal does not have any links with the Department's research areas from the offset, the applicant cannot be accommodated. If the applicant's topic/study proposal, however, closely relates to one of the Department's research areas, the applicant should attempt to adapt it so that it fits in totally.
3. If the applicant is not willing to change his/her topic/proposal, the Department will not be able to accommodate the applicant.

F. APPLICATION GUIDELINES FOR MASTER'S & Ph.D. STUDENTS

1. Applicants (including applicants who did not complete their previous degree at the UFS) must apply by filling in the application form that can be obtained from the UFS website (<https://apply.ufs.ac.za>). As mentioned above, if you do not find the degree online for which you would like to apply, a hardcopy version of the application form can be requested from Prof De Wet (DWetL@ufs.ac.za).
2. All relevant documents related to the applicant's previous qualifications must (as specified in the UFS application form) be uploaded to accompany the application when it reaches the UFS Administration. This includes a SAQA evaluation certificate for non-RSA previous qualifications (it is the applicant's own responsibility to request this certification beforehand). As soon as the application is complete, Administration will send it through to the Department of Computer Science & Informatics for academic consideration.
3. If the choice of the prospective departmental research area it is not clear from the applicant's documentation, the Department may contact the applicant in order to clarify.
4. If the application was unsuccessful, the Department will communicate the reasons and specify what will be expected of the applicant to be successful when re-submitting an application in future (if applicable).
5. If the applicant's:
 - a. Application form is complete and correctly filled in;
 - b. The NQF (SAQA) level of the previous degree is correct;
 - c. In the case of a module-oriented previous qualification, the study records indicate previous modules on the correct NQF-level with the majority of modules within Computer Science; and
 - d. If the minimum average of 60% has been met,the applicant will be *conditionally* accepted.
6. The applicant will be referred to a relevant research area coordinator who will evaluate the proposed research idea/topic. Based on the relevancy/potential of the proposed idea and the Department's supervision capacity, a decision will be made as to whether the applicant will be allowed to register.
7. As soon as the student is registered, an official supervisor/promotor will be allocated based on the research area and topic. It is the responsibility of the applicant, in collaboration with the allocated supervisor/promotor, to prepare a research proposal.
8. The final proposal must be presented *within 3 months of registration*.

9. After physically presenting the research proposal to the staff during a research talk in the Department of Computer Science & Informatics, the Department will make a final decision on whether the student will be allowed to continue with his/her studies, or whether the registration of the student will be terminated.
10. If the student fails to adhere to the 3 month time restriction, Administration will be notified to terminate the registration.

G. HONOURS 2022

1. Compulsory sessions for all prospective Honours students

- **Honours Information session**

A compulsory information session will be held on Monday, the **7th February 2022 at 17:00**. Please note the following:

- It will take place online via Blackboard Collaborate (BBColab).
- All relevant information about the degree will be provided during this session to assist students with their module choices and registration.
- Each lecturer will present a brief overview of his/her module.
- It is compulsory to attend for first time Honours students. **DO NOT MISS THIS SESSION!!!**

- **CSIS6813 Contact Sessions**

CSIS6813 (Introduction to Research) is a *compulsory* module in order to obtain your Honours degree.

The contact sessions for CSIS6813 (Introduction to Research), will take place in the four days following the Information Session, namely from Tuesday the 8th of February until Friday the 11th of February, from 08:00 – 17:00 daily. These sessions will be presented online via Blackboard Collaborate (BBColab).

- Please make arrangements with your employer well in advance to attend.
- These contact sessions are compulsory if you intend to register for CSIS6813 in 2022 and will not be repeated in 2022. Assignments will also be handed out during these sessions.

The rest of the Honours classes will commence in the following week (Monday 14th February).

2. Honours Degree Codes

- BSc Honours (Computer Science and Informatics) = BC460022
- BSc Honours (Data Science) = BC460095
- BCIS Honours = BC460156

3. Honours Admission requirements

- BSc IT degree:
 - Minimum of 60% average for the four UFS (or closely related) 3rd year IT-modules
(UFS: Database Design, Internet Programming, Networks, Software Engineering).
- BSc IT (Data Science) degree:
 - Minimum of 60% average for the five UFS (or closely related) 3rd year IT-modules
(UFS: Database Design, Internet Programming, Networks, Software Engineering and Data Science)
- BCIS (Bachelor of Computer Information Systems) degree:
 - Minimum of 60% average for at least six Business Management-related modules. Must have passed Business Management modules up to NQF-level 7.
 - Minimum of 60% average for the four UFS (or closely related) 3rd year BCIS and IT-modules
(UFS: Database Design, Information Systems in Organisations, Networks and Software Engineering)

4. Duration of Honours Studies

- 7 modules plus project year module = Honours Degree
- Choice of 1 year (full time) or 2 years (part-time)

One year:

- 4 modules 1st semester & 3 modules 2nd semester & Project module
OR
- 3 modules 1st semester & 4 modules 2nd semester & Project module

Two years

- Spread the 7 modules over 2 years. Project must be completed in 1 year.

5. Honours Modules

- ***BSc Honours (Computer Science and Informatics) degree:***
 - Compulsory:
 - CSIS6809: Honours Project (36 credit year module)
 - CSIS6813: Introduction to Research.
 - Electives
 - See modules on page 8.
- ***BSc Honours (Data Science) degree:***
 - Compulsory
 - CSIS6809: Honours Data Science Project (36 credit year module)
 - CSIS6813: Introduction to Research
 - CSID6853: Data Warehousing
 - CSIA6813: Advanced Data Science
 - CSID6823: Business Intelligence
 - CSIA6843: Analytical Programming AND/OR STSD6823: Big Data
 - Electives
 - One/two of the remaining modules.
- ***BCIS Honours degree:***
 - Compulsory
 - BCIS6809: Honours BCIS Project (36 credit year module)
 - CSIS6813: Introduction to Research
 - CSIE6863: IT Project Management
 - Two modules from:
 - EFMN6814 - Financial Management for Managers
 - EOCC6824: Omni-Channel Commerce
 - EVEN6824: Venture Creation
 - Electives
 - CSII6833: Human-Computer Interaction
 - CSII6823: Information Security
 - CSID6853: Data Warehousing
 - CSID6823: Business Intelligence
 - CSIA6843: Analytical Programming
 - CSID6843: Advanced Databases
 - CSIN6843: Advanced Networks.

6. Honours Modules 2022

1st Semester 2022

MODULE	DESCRIPTION	LECTURER
CSII6833	Human-Computer Interaction	Prof Lizette de Wet
CSII6813	Information Security	Dr Wynand Nel
CSIP6853	Advance Programming I (Mobile)	Dr Pakiso Khomokhoana
CSID6853	Data Warehousing	Prof Eduan Kotzé
CSIS6813	Introduction to Research (Presented as block session)	Prof Lizette de Wet
CSIP6833	Advanced Internet Programming	Prof Liezel Nel
CSIA6813	Advanced Data Science	Mr Jaco Marais
EFMN6814	Financial Management for Managers (BCIS Hons Students only)	Prof Van Aardt Smit

2nd Semester 2022

MODULE	DESCRIPTION	LECTURER
CSID6823	Business Intelligence	Prof Eduan Kotzé
CSID6843	Advanced Databases (Presented as block session)	Prof Tanya Stott
CSII6883	Forensics	Mr Wynand Nel
CSIA6843	Analytical Programming	Mr Leon Grobbelaar (CUT)
CSIE6863	Project Management	Mr Henry Deacon
CSIN6843	Advanced Networks	Prof Paul Kogeda
EOCC6824	Omni-Channel Commerce (BCIS Hons Students only)	Prof Jacques Nel
EVEN6824	Venture Creation (BCIS Hons Students only)	Prof Van Aardt Smit

For BSc Honours, a maximum of 2 **approved** related Honours modules may be taken from other departments within the Faculty of Natural and Agricultural Sciences. It is, however, the student's own responsibility to make sure that these modules fit into our department's timetable. No changes to the timetable will be made from our side to accommodate other departments' modules.

7. Honours Class Times 2022

Will be communicated separately.

8. Honours Textbooks 2022

Will be communicated separately.

9. Honours Contact sessions

As mentioned on page 5, the contact sessions for the compulsory Introduction to Research module (CSIS6813) will take place from Tuesday the 8th of February until Friday the 11th of February, from 08:00 – 17:00 daily.

The rest of the Honours classes will commence in the following week (Monday 14th February).

Attending of contact sessions for all modules are compulsory and these sessions generally take place weekdays between 17:10 and 21:00. Depending on the modules presented, a module could also be presented between 07:00 and 08:00 in the morning or 14:30 – 16:30 in the afternoon. Your lecturers will specify the venue for each module.

10. Communication

Email: DWetL@ufs.ac.za

Blackboard: for CSIS6809 / BCIS6809.

11. Applying for Honours

All current UFS students and new applicants:

- Apply online via UFS website (closing date 30 September).
 - Conditional acceptance, depending on final results:
 - 60% average:
 - across all 4 final year IT modules for BSc (Computer Science & Informatics), or closest alternatives, *or*
 - across all 5 final year modules for BSc (Data Science), *or*
 - across all 4 final year BCIS and IT-modules for BCIS.
 - Degree must have been obtained.

12. Honours Registration in 2022

Registration can be finalised during the week after the Honours information session in 2022.

H. MASTERS – 2022

1. Master's Admission Requirements

- B.Sc. Hons or B.Com. Hons Degree (with IT or Data Science as major) on SAQA level 8.
- Minimum 60% average for the Honours degree.
- Should the applicant not have the required background for the Master's degree in a certain research field, he/she may be required to register for one or more pre-graduate, Honours or Master's modules before being accepted for the PhD.

2. Duration of Research Masters

- Full time: Minimum 1 year & maximum 3 years
- Part time: Minimum 2 year & maximum 4 years

3. Research Master's Degree and Module Codes

Programme codes: BC480022 (Computer Science & Informatics)
BC480056 (Computer Information Systems)
BC480095 (Data Science)

Module code: CSIS8900 (Dissertation (180 credits))

4. Departmental Research Areas

Your topic must fit into at least one of the Department's research areas:

- ***Human-Computer Interaction (HCI)***

The focus of HCI research is Usability and User Experience (UX) evaluation. Different evaluation methods may be applied, with emphasis on physiological testing involving brain-computer interfaces.

- ***Data Science/Natural Language Processing (NLP)***

The research area focuses on algorithms and methods to process big data sets with a data science approach. These datasets are predominately in unstructured natural language text formats (tweets, emails, blogs, reviews, text files etc.). Methods and algorithms include natural language processing (NLP) techniques, text classification algorithms, sentiment analysis, topic modelling, feature extraction, word embeddings (word2vec, doc2vec), machine learning, and deep learning.

- **Computer Science Education (CSE)**

The aim of the Computer Science Education (CSE) research area is to promote research and scholarship both in the field of Computer Science Education and the application of Computer Science to improve teaching and learning. CSE research typically focuses on finding more effective approaches to teach Computer Science to a larger and more diverse audience, or the development of software that can impact upon the teaching and learning environment.

- **Eye-tracking Applications**

This research area is aimed at promoting eye tracking applications research. This means that eye-tracking is used as a tool to collect data or as part of a proposed solution, such as eye gaze interaction. The focus of the research is currently on eye gaze interaction and reading research.

- **Wireless Communication Systems/Artificial intelligence**

Wireless Communication Systems: This includes mesh networks, cellular networks, heterogeneous wireless networks, among others employing cross layer design.

Artificial Intelligence: The specific AI topics include but not limited to:

- Probabilistic Inference - this includes: Graphical models, nonparametric Bayesian methods, problem solving and decisions.
- Vision – Human Activity Recognition.

- **Blockchain Technologies**

The research area focusses on blockchain technologies. The digital transformation of industries, known as Industry 4.0 has already started and blockchain forms part of the digital revolution. The research areas include blockchain algorithms and data structures, blockchain security, blockchain applications and crypto assets.

5. Master's Proposal

A detailed proposal should be prepared after registration with the assistance of the supervisor.

The proposal should at least address the following: Introduction, Literature review, Problem statement, Research question(s) & goals, Hypotheses, Research design & methodology, Reliability and validity, Contributions, Limitations and Future research.

The proposal must be presented in person or online to the staff of the Department of Computer Science and Informatics within 3 months of registration. Failure to do so would result in the revoking of the registration.

❖ *Final acceptance of student is subject to acceptance of proposal.*

I. PhD - 2022

1. PhD Admission Requirements

- An acceptable Master's degree in Computer Science or IT or Data Science on SAQA level 9.
- Minimum 60% average for the Master's degree.
- Should the applicant not have the required background for the PhD in a certain research field, he/she may be required to register for one or more pre-graduate, Honours or Master's modules before being accepted for the PhD.

2. Duration of PhD

- Full time: Minimum 2 years & maximum 4 years
- Part time: Minimum 4 years & maximum 6 years

3. PhD Degree and Module Codes

Programme codes: BC490022 (Computer Science & Informatics)
 BC490056 (Computer Information Systems)
 BC490095 (Data Science)

Module code: CSIS9100 (Thesis (360 credits))

4. Departmental Research Areas

The topic should fall within the research areas of the department:

- ***Human-Computer Interaction (HCI)***

The focus of HCI research is Usability and User Experience (UX) evaluation. Different evaluation methods may be applied, with emphasis on physiological testing involving brain-computer interfaces.

- ***Data Science/Natural Language Processing (NLP)***

The research area focuses on algorithms and methods to process big data sets with a data science approach. These datasets are predominately in unstructured natural language text formats (tweets, emails, blogs, reviews, text files etc.). Methods and algorithms include natural language processing (NLP) techniques, text classification algorithms, sentiment analysis, topic modelling, feature extraction, word embeddings (word2vec, doc2vec), machine learning, and deep learning.

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- Vision – Human Activity Recognition.

- **Blockchain Technologies**

The research area focusses on blockchain technologies. The digital transformation of industries, known as Industry 4.0 has already started and blockchain forms part of the digital revolution. The research areas include blockchain algorithms and data structures, blockchain security, blockchain applications and crypto assets.

5. PhD Proposal

A detailed proposal should be prepared after registration with the assistance of the supervisor.

The proposal should at least address the following: Introduction, Literature review, Problem statement, Research question(s) & goals, Hypotheses, Research design & methodology, Reliability and validity, Contributions, Limitations and Future research.

The proposal must be presented in person or online to the staff of the Department of Computer Science and Informatics within 3 months of registration. Failure to do so would result in the revoking of the registration.

❖ *Final acceptance of student is subject to acceptance of proposal.*