



# AIMS Graduate Profile

The African Institute for Mathematical Sciences (AIMS) is a pan-African network of Centres of Excellence for postgraduate training, research and public engagement in mathematical sciences. Its mission is to enable Africa's brightest students to flourish as independent thinkers, problem solvers and innovators capable of propelling Africa's future scientific, educational and economic self-sufficiency. The goal of the AIMS Next Einstein Initiative (AIMS-NEI) is to build a pan-African network of 15 Centres of Excellence across the continent by 2023.



### AIMS graduates are characterised by:

- (a) being able to think outside of the box and use mathematical theory, applications, and tools to solve development problems faced by African countries;
- (b) possessing a common core set of problem-solving skills: estimation, computation, approximation, modelling, data analysis and statistics;
- (c) having the attitude and commitment to find solutions to many of the environmental, social, and economic problems on the African continent;
- (d) the ability to think analytically and critically;
- (e) a broad technical and scientific competence in theoretical and applied mathematics, computer technology, and physics (such as financial mathematics, biomathematics, quantum mechanics);
- (f) entrepreneurial ability to recognise a social or technological need in society and find an innovative way to fulfill the need;
- (g) ability to conduct research and prepare and present a scientific report of their results; and
- (h) leadership and teamwork and ability to interact and collaborate with others in a multi-cultural environment.

### Formative areas      An AIMS Graduate

<b>Mathematical, Computing, and Scientific Knowledge and Skills</b>	<ol style="list-style-type: none"> <li>1 Uses software packages such as visualisation software or statistical packages to solve problems, test conjectures, or visualise concepts.</li> <li>2 Applies data mining techniques to solve real-world problems.</li> <li>3 Is able to demonstrate a comprehensive and focused knowledge and understanding in one or more specialisations in the mathematical sciences (e.g., topology, numerical analysis, statistics and probability).</li> <li>4 Applies mathematical techniques to solve problems using, for example, differential equations, statistics, and mathematical modelling.</li> <li>5 Demonstrates proficiency in the use of programming languages such as Java and Python.</li> </ol>
<b>Communications</b>	<ol style="list-style-type: none"> <li>6 Reads and understands basic technical mathematics and presents mathematical ideas in a coherent fashion, orally and in writing.</li> <li>7 Performs as an effective inter-cultural communicator, drawing on his or her enriching experience of interactions within a diverse student body.</li> <li>8 Communicates complex quantitative data clearly &amp; precisely.</li> <li>9 Is capable of writing and presenting a clear and well-organised paper on a mathematical topic.</li> </ol>
<b>Research and Analytical Skills</b>	<ol style="list-style-type: none"> <li>10 Is capable of conducting research on a mathematical topic, preparing a written scientific report, and presenting &amp; defending research findings.</li> <li>11 Designs and evaluates novel approaches for processing and analysing data.</li> <li>12 Formulates insightful, relevant questions and solutions to a problem.</li> </ol>
<b>Attitudes and Values</b>	<ol style="list-style-type: none"> <li>13 Supports the efforts of other team members in achieving project goals.</li> <li>14 Demonstrates an understanding of and respect for cultural differences.</li> <li>15 Possesses a "can do" attitude to achieve personal and career goals.</li> <li>16 Committed to finding solutions to problems faced by African countries.</li> <li>17 Self-directed learner who can work independently or as part of a team.</li> </ol>
<b>Innovation and Entrepreneurship</b>	<ol style="list-style-type: none"> <li>18 Recognises opportunities for initiating an entrepreneurial venture that can solve a problem or fulfill a need in society.</li> <li>19 Understands what skills are needed to be a successful entrepreneur.</li> <li>20 Is creative and innovative in exploring possible solutions to problems.</li> <li>21 Understands the role of innovation in improving productivity and creating new jobs and opportunities for people in Africa.</li> <li>22 Thinks like a social entrepreneur and considers the need to address societal issues such as youth employment, poverty, and food scarcity.</li> </ol>