

Web-Based Course Scheduling Optimization Using the Artificial Bee Colony Algorithm in the Informatics Engineering Study Program at the Sidoarjo Polytechnic

Rani Purbaningtyas, S.Kom., MT. as Supervisor

Dimas Aswito

*Informatics Engineering Study Program
Department of Information Technology*

ABSTRACT

This research focuses on the development of a web-based course scheduling system at the Informatics Engineering Study Program, POLIJE Sidoarjo Campus, to overcome the constraints of conventional scheduling methods that are time-consuming and prone to human error. The system was implemented using the Laravel framework by applying the Artificial Bee Colony (ABC) algorithm, which simulates the behavior of a bee colony in finding optimal solutions through the employed bee, onlooker bee, and scout bee phases. Integrated input variables include lecturer data, courses, rooms, days, hours, and credit weights (SKS), with the application of a penalty scheme to ensure collision-free scheduling results. Functional testing using the Function Point (FP) method showed a quality indicator value of 0.7629, which falls into the "Good" category. Additionally, usability testing through the System Usability Scale (SUS) instrument resulted in a final score of 82.5, placing the system at an "Acceptable" level with a "Excellent" adjective rating. The implementation of this system has been proven to significantly increase academic administration efficiency, where the scheduling process that previously took hours or even days can be reduced to seconds or minutes while maintaining high data placement accuracy.

Keywords: *Artificial Bee Colony, Course Scheduling, Laravel, Function Point, System Usability Scale.*